

# THE INSECTS AND ARACHNIDS OF CANADA

## PART 21

The Weevils of Canada and  
Alaska: Volume 1

Coleoptera: Curculionoidea,  
excluding Scolytidae and  
Curculionidae



Agriculture  
Canada



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Donald E. Bright

Centre for Land and Biological Resources Research  
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Research Branch  
Agriculture Canada

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## Abstract

This monograph includes all species in the families Anthribidae (18), Apionidae (47), Attelabidae (3), Brentidae (1), Ithyceridae (1), Nemonychidae (8), Platypodidae (1), and Rhynchitidae (11) that occur or may occur in Canada and Alaska. The work includes a key to all the families of Curculionoidea in North America, as well as keys to all genera and species of the families included. Each genus is described. Species entries include a list of synonyms, a description, data on distribution, information on host plants and on other aspects of biology (if known), and diagnostic features. Distribution maps and illustrations of taxonomic characters for a number of species are included, as well as habitus illustrations of representative species.

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## Introduction

This is the first volume of a projected three-part series treating the superfamily Curculionoidea of Canada and Alaska. This first volume treats all families in the superfamily except Curculionidae, or true weevils, which will be treated in the two subsequent volumes, and

Scolytidae, or bark-beetles, which have already been treated (Bright 1976). The families included in this part are: Anthribidae, Apionidae, Attelabidae, Brentidae, Ithyceridae, Nemonychidae, Platypodidae, and Rhynchitidae.

This work describes 90 species and provides keys to all taxa. Sections on individual species include a description, information on host plants and distribution, such biological information as exists, and pertinent references. A distribution map, showing all known localities where the species has been found in Canada or Alaska (or both) is provided for each species if there are enough localities known to form a pattern. Since this book's primary audience are nonspecialists in Coleoptera, the descriptions include only those characters that are needed for accurate identification or comparison. Synonymy and literature references are also limited to those that provide the most information to the user. For complete descriptions or references, please consult the following: Kissinger (1968) for Apionidae; Arnett (1960) for all families; O'Brien and Wibmer (1982) for a checklist for all families treated herein, except Brentidae, Anthribidae, and Platypodidae; Valentine (1960) for Anthribidae; Wood (1979) for Platypodidae; Hamilton (1969, 1971, 1974) for Nemonychidae, Attelabidae, and Rhynchitidae; and Kuschel (1989) for Nemonychidae.

With few exceptions, all members of Curculionoidea are phytophagous. The superfamily includes some of the most destructive pests affecting humans and their agricultural or forestry activities. The larvae of weevils attack plants from almost every aspect, and it is at this stage that the insects cause the most damage; larvae of broad-nosed Curculionidae generally live free in the soil and feed on roots; larvae of other Curculionidae develop in the roots of herbaceous plants; still others cause galls to form on the roots and stems. Many species burrow in the stems of plants, and other species are leaf miners. Adults of some species deposit their eggs in the developing flower buds, whereas others place the egg in the seedpods of plants. Some species attack dead or dying trees, whereas others apparently attack vigorous, healthy trees. Many species attack tree fruits, and a whole host of forms live under the bark and in the wood of dead tree trunks and limbs. Members of Anthribidae feed on fungus, dead wood, and dried plant material, or on stored food products. Adult Attelabidae are leaf rollers, and the larvae feed on the dead tissue within the roll.

In number of species the superfamily Curculionoidea is one of the largest of all the groups of Coleoptera, with an estimated 40 000 species known around the world. In Canada the group is exceeded in size only by Staphylinidae, mainly because Staphylinidae are well adapted for success in northern environments. Curculionoidea is essentially a southern group and is not abundant in northern regions. Of the 90 species included herein, only six are known to extend north of 55° latitude, and a significant proportion (45%) of the 90 species do not occur north of 50° latitude.

The families treated herein, with the exception of Platypodidae, are generally regarded as more primitive than Curculionidae. Some, especially Nemonychidae, are known from pre-Cretaceous fossils, which differ little from extant taxa. The families treated in this part represent only a small fraction of the weevils of Canada and Alaska—only 90 species, compared with the estimated 600 species in Curculionidae, which will be treated in the next two volumes of this study.

## Anatomy

The anatomical terms used in this book should be familiar to those who study Coleoptera. Detailed definitions of terms can be found by consulting Webster's *Seventh New Collegiate Dictionary*, Nichols and Schuh (1989), or the glossary at the end of this book. Most of the features used in this work are illustrated in Fig. 14.

The following discussion is not intended to be a complete treatment of curculionoid anatomy. It merely explains certain structural features that may be of use in interpreting the keys or the descriptions. It includes only those conditions that exist in the families treated herein.

**Head.** The head is usually conical or globular, with an elongate rostrum extending in front of the eyes. The mouthparts are located at the tip of the rostrum. The rostrum (called the beak by some authors) varies in length, width, and structure. It is absent in Platypodidae; broad and flattened in Anthribidae (Figs. 27–29); rather slender and cylindrical in Apionidae (Fig. 6); stout and short in Ithyceridae; strongly sexually dimorphic in Brentidae, in which it is straight and cylindrical with minute mandibles in the female (Fig. 46) and flattened and broad with prominent mandibles in the male (Fig. 45); short and muzzle-like, widening beyond the antennal insertions in Attelabidae (Fig. 11); slender and parallel-sided from the base to the antennal insertions and widened and depressed beyond the antennal insertions in Nemonychidae (Figs. 42, 44); and parallel-sided or widened apically and strongly arcuate to nearly straight in Rhynchitidae (Figs. 146, 149, 154, 155). Laterally the rostrum bears the antennae; the rostrum is usually grooved to receive the scape of the antenna, and this groove, which is short in most taxa treated herein, is called the scrobe. The antennae are straight in most families but geniculate or elbowed in *Nanophyes* (Fig. 19) and Platypodidae (Figs. 12, 13). Each antenna has 11 segments; the terminal three are usually enlarged, forming a more or less distinct club (Figs. 15, 17, 18). The eyes are round or oval, flat to strongly convex, sometimes notched opposite the antennal insertion.

The mouthparts are difficult to observe and are therefore not extensively used in diagnosis. In some instances, however, the mandibles offer valuable diagnostic characters. The mandibles of



Nemonychidae are rather long, flattened, and pincer-like; those of Attelabidae are also pincer-like but are thick and not elongate; those of Rhynchitidae (unlike those in other families) are toothed on outer and inner surfaces (Fig. 22); those of Brentidae are large and thick in the male and minute in the female (Figs. 45, 46); and those of Platypodidae and Ithyceridae are thick and stout. The mandibles are generally thin and relatively unmodified in the remaining families treated herein. In Anthribidae and Nemonychidae the maxillary palpi have 4 segments and are flexible, and the labrum is distinct and separate; in the remaining families, the maxillary palpi have 2 or 3 segments and are rigid, and the labrum is never fully free. It is absent in some families.

The gular sutures on the underside of the head are important structures in family classification. These sutures are more or less obsolete in Anthribidae. In Nemonychidae they are paired and distinct (Fig. 24). In the remaining families the sutures merge together to form a single median line (Fig. 23). The presence of pregonal sutures and a pregonal sclerite between the labial articulation and the anterior end of the median gular suture are important characters separating the families Scolytidae and Platypodidae from Curculionidae (Figs. 25, 26).

**Thorax.** The shape and sculpture of the prothorax vary greatly among the families treated here. The lateral borders are rounded except in Anthribidae, where the border has an acute, elevated, lateral line. Anthribidae is also unique in bearing an acute, elevated, basal or antebasal dorsal line (Figs. 31–34). The mesothorax and metathorax are not modified in any special way and do not generally have structures of taxonomic significance.

The legs are not generally used in classification, but a few characters should be noted. In Apionidae the trochanter is long and cylindrical, and the femur is attached to its apex (Fig. 20). In other families the femur is attached to the side of the short, triangular trochanter (Fig. 21). The tarsal claws may be free (Figs. 35–38) or connate (Fig. 39); they may also have a basal process. The tarsi are very long in Platypodidae (Figs. 12, 13).

The elytra are extremely variable. In general they are elongate and convex at the apex. Occasionally the apex is notched or abbreviated so as to expose the pygidium, which in most cases is concealed. Each elytron has 10 striae or longitudinal rows of punctures, separated by interstriae. The striae and interstriae provide several important characters for generic and specific identification. The basal “shoulders” of the elytra are termed humeri; in wingless forms the humeri may be reduced or absent. In male Platypodidae the elytra terminate in spinose processes (Fig. 12).

**Abdomen.** The ventral portions of the abdominal segments are termed sternites. Generally there are 5 visible sternites. The relative length of the sternites and the nature of the sutures separating them are

of some diagnostic value. The pygidium, as indicated above, may be exposed or concealed.

## Methods

In the descriptive section for each species, measurements and observations were taken from dried specimens, usually mounted on points. For instruction on these techniques, see Martin (1977). Most structures mentioned in the keys or descriptions may be observed at magnifications of  $50\times$ , although higher magnifications are occasionally required. A good light source is essential.

The remarks on host plants lists records from both collected specimens and the literature. Most records are Canadian. Records from non-Canadian locations may be included if they might be helpful for species identification or if they provide biological information. The host data should be used with care. One cannot be sure whether the records describe a true biological relationship or an accidental occurrence. Plant names follow Scoggan (1979) or Little (1953). Common names have been provided in most, but not all, cases.

Locality names listed under "Distribution" were recorded from specimen label data and from the literature. When possible the locality names have been checked against the *Gazetteer of Canada* and other appropriate sources. In some cases the place names cannot be validated; these names are set off by quotation marks. In a few cases localities were received too late to be included on the distribution map; these are so indicated.

Abbreviations used in the text to designate location of type specimens are as follows:

CAS	California Academy of Sciences, San Francisco, Calif.
MCZ	Museum of Comparative Zoology, Cambridge, Mass.
NHMP	Musée nationale d'histoire naturelle, Paris, France
NHRM	Naturhistoriska Riksmuseet, Stockholm, Sweden
OSU	Ohio State University, Columbus, Ohio
UBC	University of British Columbia, Vancouver, B.C.
USNM	United States Museum of Natural History, Washington, D.C.
UZMC	Universitets Zoologisk Museum, Copenhagen, Denmark
ZMHU	Museum für Naturkunde an der Humboldt-Universität, Berlin, Germany

## Classification

In the modern classification of Coleoptera, Curculionoidea forms a superfamily in the suborder Polyphaga. Members of this superfamily

are distinguished by the following: the head is more or less produced into a rostrum (except in Platypodidae and most Scolytidae); the gular sutures are nearly always confluent; and the antennae are usually geniculate and clubbed, the first segment (scape) often retractable into a groove (scrobe).

The number of families into which the group should be divided is still not completely settled. The classification adopted here basically follows Crowson (1953), as modified by Lawrence (1982) and Crowson (1985), except that Rhynchitidae, Ithyceridae, Scolytidae, and Platypodidae are regarded as families, following the treatments of Hamilton (1969), Sanborne (1981), and Wood (1973).

## Key to families of Curculionoidea in Canada and Alaska

1. Pronotum with lateral and basal or subbasal margins with acutely elevated line (Figs. 31–34). Abdomen with first 4 visible sternites connate. Gular sutures obsolete ..... **Anthribidae** (p. 17)  
 Pronotum with lateral margins rounded; basal or subbasal lines absent. Abdomen with all visible sternites freely movable. Gular sutures present (Figs. 23–26) ..... 2
2. Antennae straight, moniliform (Figs. 15–18). Tibiae 1 and 2 simple, without teeth externally, or protibiae without process at apex (except Tachyoninae) ..... 3  
 Antennae geniculate (Fig. 19). Tibiae 1 and 2 with series of teeth externally or protibiae with curved process at apex ..... 9
3. Rostrum joining head at acute angle (Figs. 40–42). Two gular sutures distinct, separated (Fig. 24). Maxillary palpus 4-segmented, flexible ..... **Nemonychidae** (p. 51)  
 Rostrum confluent with head, not joining at acute angle. One gular suture present. Maxillary palpus 2- or 3-segmented, more or less rigid (4-segmented in Attelabidae) ..... 4
4. Legs with hind coxae separated (by distance at least four to five times greater than width of coxae); hind femora much longer than femora 1 and 2, spinose ventrally. Eyes nearly contiguous. Frons much narrower than tip of rostrum. Body broadly ovate, flattened, with prostrate setae and tufts of erect setae ..... **Curculionidae (Tachyoninae)** (not included herein)  
 Legs with hind coxae separated by distance less than twice width of coxae; hind femora about equal in length to femora 1 and 2, never spinose ventrally. Eyes widely separated. Frons about equal to or wider than tip of rostrum. Body shape variable, never with rostrate setae and tufts of erect setae ..... 5

5. Antennae with distinct clubs (Fig. 15). Body stout, glabrous or pubescent. Rostrum similar in both sexes ..... 6  
Antennae without distinct clubs (Fig. 16). Body very slender and elongate, glabrous (Fig. 4). Rostrum of male broad, flattened (Fig. 45); rostrum of female needle-shaped (Fig. 46) ..... **Brentidae** (p. 66)
6. Trochanter short, triangular; femur attached to side of trochanter (Fig. 21) ..... 7  
Trochanter longer, somewhat cylindrical; femur attached to apex of trochanter (Fig. 20) ..... **Apionidae** (p. 70)
7. Mandibles not toothed on outer margin. Tarsal claws without basal process (as in Fig. 36) ..... 8  
Mandibles toothed on outer margin (Fig. 22). Tarsal claws with basal process (as in Figs. 35, 37, 38) ..... **Rhynchitidae** (p. 142)
8. Tarsal claws free (as in Fig. 36). Antennal club compact, 3-segmented; segments closely united (Fig. 10). Body length greater than 10 mm ..... **Ithyceridae** (p. 171)  
Tarsal claws connate (as in Fig. 39). Antennal club clearly 3-segmented but not compact; segments not closely united (Fig. 11). Body length less than 10 mm ..... **Attelabidae** (p. 175)
9. Pregular sutures present; pregular sclerite distinct, between median gular suture and labial articulation (Figs. 25, 26). Rostrum absent ..... 10  
Pregular sutures absent; pregular sclerite not evident (as in Fig. 23). Rostrum varying from very long to short and broad, or nearly absent ..... 11
10. Tarsal segment 1 as long as segments 2–5 combined (Figs. 12, 13). Head as wide as pronotum (Figs. 12, 13). Pronotum usually with lateral constriction near middle (Figs. 12, 13). Antennal club without sutures (Figs. 12, 13). Lateral denticles on protibiae never socketed ..... **Platypodidae** (p. 184)  
Tarsal segment 1 not longer than segments 2 or 3. Head narrower than pronotum, often concealed by pronotum when viewed from above. Pronotum not constricted laterally. Antennal club with sutures. Lateral denticles on protibia usually socketed ..... **Scolytidae** (not included herein)
11. Trochanter long, somewhat cylindrical; femur attached to apex of trochanter (Fig. 20) ..... **Apionidae** (**Nanophyes**) (p. 70)  
Trochanter short, triangular; femur attached to side of trochanter (Fig. 21) ..... **Curculionidae** (not included herein)

# Clé des familles des Curculionoidea du Canada et de l'Alaska

1. Pronotum pourvu de marges latérales et basales ou subbasales formant saillie aiguë (fig. 31 à 34). Quatre premiers sternites abdominaux visibles soudés. Sutures gulaire indistinctes ..... ***Anthribidae*** (p. 17)  
 Pronotum aux marges latérales arrondies; lignes basales ou subbasales absentes. Tous les sternites visibles articulés. Sutures gulaire présentes (fig. 23 à 26) ..... 2
2. Antennes rectilignes, moniliformes (fig. 15 à 18). Pro- et métatibia simples, sans denticule sur leur côté externe, ou apex protibial sans prolongement (sauf chez les *Tachygoninae*) ..... 3  
 Antennes géniculées (fig. 19). Côté externe du pro- et du mésotibia orné d'une série de denticules, ou apex protibial avec prolongement courbé ..... 9
3. Jonction du rostre et de la tête formant un angle aigu (fig. 40 à 42). Deux sutures gulaire distinctes, séparées (fig. 24). Palpe maxillaire quadri-segmenté, souple ..... ***Nemonychidae*** (p. 51)  
 Jonction du rostre et de la tête sans former d'angle aigu. Suture gulaire unique. Palpe maxillaire bi- ou tri-segmenté, plus ou moins rigide (quadri-segmenté chez les *Attelabidae*) ..... 4
4. Métacoxas séparés (par une distance d'au moins quatre à cinq fois leur largeur); métafémur beaucoup plus long que le pro- et le mésosfémur; épineux sur sa face ventrale. Yeux presque contigus. Front beaucoup plus étroit que l'extrémité du rostre. Corps généralement ové, aplati, orné de soies couchées et de touffes de soies dressées ..... ***Curculionidae*** (***Tachygoninae***) (non traités ici)  
 Métacoxas séparés par une distance moindre que deux fois leur largeur; métafémur à peu près aussi long que le pro- et le mésosfémur, toujours sans épine sur sa face ventrale. Yeux largement séparés. Front au moins aussi large que l'extrémité du rostre. Forme du corps variable; jamais de soies couchées ou de touffes de soies dressées ..... 5
5. Antennes à massue différenciée (fig. 15). Corps robuste, glabre ou pubescent. Rostre semblable chez les deux sexes ..... 6  
 Antennes sans massue différenciée (fig. 16). Corps grêle, glabre (fig. 4). Rostre du mâle large, aplati (fig. 45); rostre de la femelle en forme d'aiguille (fig. 46) ..... ***Brentidae*** (p. 66)

6. Trochanter court, triangulaire; fémur attaché à son côté (fig. 21) ..... 7  
Trochanter long, quelque peu cylindrique; fémur attaché à son apex (fig. 20) ..... **Apionidae** (p. 70)
7. Mandibules dépourvues de dents sur leur marge extérieure. Griffes tarsales dépourvues de prolongement basal (comme dans la figure 36) ..... 8  
Mandibules pourvues de dents sur leur marge extérieure (fig. 22). Griffes tarsales à prolongement basal (comme dans les figures 35, 37, 38) ..... **Rhynchitidae** (p. 142)
8. Griffes tarsales articulées (comme dans la figure 36). Massue antennaire compacte, tri-segmentée; segments étroitement unis (fig. 10). Longueur du corps dépassant les 10 mm ..... **Ithyceridae** (p. 171)  
Griffes tarsales soudées (comme à la figure 39). Massue antennaire nettement tri-segmentée, sans être compacte; segments lâchement réunis (fig. 11). Longueur du corps inférieure à 10 mm ..... **Attelabidae** (p. 175)
9. Sutures pré-gulaires présentes; sclérite pré-gulaire différencié, entre la suture gulaire médiane et l'articulation labiale (fig. 25 et 26). Rostre absent ..... 10  
Sutures pré-gulaires absentes; sclérite pré-gulaire non différencié (comme à la fig. 23). Rostre très long à court et large ou presque absent ..... 11
10. Premier article tarsal aussi long que l'ensemble des articles 2 à 5 (fig. 12 et 13). Tête aussi large que le pronotum (fig. 12 et 13). Constriction latérale, habituellement, près du milieu du pronotum (fig. 12 et 13). Massue antennaire sans suture (fig. 12 et 13). Jamais d'alvéoles d'insertion pour les denticules latérales du protibia .... **Platypodidae** (p. 184)  
Premier article tarsal pas plus long que les articles 2 ou 3. Tête plus étroite que le pronotum, souvent cachée par ce dernier en vue verticale. Pas de constriction latérale du pronotum. Sutures à la massue antennaire. Denticules latéraux du protibia s'insérant habituellement dans des alvéoles .... **Scolytidae** (non traités ici)
11. Trochanter long, quelque peu cylindrique; fémur attaché à l'apex du trochanter (fig. 20) ..... **Apionidae (Nanophyes)** (p. 70)  
Trochanter court, triangulaire; fémur attaché latéralement au trochanter (fig. 21) ..... **Curculionidae** (non traités ici)

## Family Anthribidae

The family Anthribidae (fungus weevils) contains approximately 3200 species in the world. About 90 species in 23 genera are known to occur in North America, and 18 species are recorded or should be expected in Canada.

Adults are frequently collected by beating dead or diseased branches or clumps of dead twigs, or by sweeping weedy fields or overgrown areas. Larvae are usually found in similar habitats. Species whose larvae feed in the stems or receptacles of various weeds probably feed, in the adult stage, on the pollen of the same plants; species with fungivorous larvae feed, as adults, on the surface of the same fungi; and species with wood-boring larvae feed, as adults, on dead or dying tree trunks or branches or, in some cases, on bark. One species, *Araecerus fasciculatus* (De Geer) (coffee bean weevil), lives in seeds and other types of dried plant materials.

The name Anthribidae, first used by Billberg (1820), is based on the genus *Anthribus* Muller. Other names by which the family has been known include Anthotribidae, Choragidae, Platyrhinidae, Platystomatidae, and Platystomidae. Choragidae is the oldest available name for the family, but it has not been used since Kirby (1818) first proposed it. Since 1820 the name Anthribidae has been used for the family, and I follow this usage.

This family is in need of further taxonomic study. Valentine (1960) reviewed the generic and higher classification of the North American species. Wolfrum (1929) provides references for many of the species herein. Anderson (1947) described and illustrated the larvae.

**Description.** Body elongate to oval, convex, usually brownish. Pubescence abundant; setae in mixed shades of white, grey, brown, or black. Head large, sometimes retractile into pronotum; gular sutures obsolete; preular sutures absent; rostrum broad, flattened, not sexually dimorphic. Maxillary palpi flexible, 4-segmented; laciniae distinct; labrum distinct, separate. Antennae straight, clubbed; club indistinct, 3-segmented. Trochanter small to moderate, triangular; femur attached to side of trochanter. Abdomen with first 4 sternites connate.

### Key to genera of Anthribidae in Canada and Alaska

1. Antennae inserted on head or on anterior surface of rostrum ... 2  
Antennae inserted on lateral or ventral surface of rostrum ... 3
2. Eyes rounded; upper margins not closer together than lower.  
Pronotum with single carina on basal half of lateral margins. Body

- somewhat elongate. Head not retracted into pronotum .....  
..... **Araecerus Schoenherr** (p. 19)
- Eyes elongate-oval; upper margins closer together than lower.  
Pronotum with double carina on lateral margin. Body compact,  
oval. Head often retracted into pronotum .....  
..... **Euxenus LeConte** (p. 21)
3. Mandibles with ventral cutting edge strongly toothed. Eyes  
approximate to antennal insertions. Frons covered with dense  
white pubescence ..... **Euparius Schoenherr** (p. 22)
- Mandibles without toothed ventral cutting edge. Eyes variable.  
Frons with or without white pubescence ..... 4
4. Eyes entire, evenly rounded, not truncate or faintly sinuate on  
anterior margin (Figs. 27, 28) ..... 5
- Eyes acutely angled ventrally, or eyes slightly sinuate opposite or  
near antennal insertion (Fig. 30) ..... 6
5. Eyes, in anterior view, not protuberant laterally or only slightly so  
(Fig. 27). Frons covered with dense white pubescence .....  
..... **Tropideres Schoenherr** (p. 25)
- Eyes, in anterior view, noticeably protuberant laterally (Fig. 28).  
Frons without white pubescence .....  
..... **Allandrus LeConte** (p. 33)
6. Rostrum (excluding mandibles) narrowed from base to apex. Eyes  
acutely angled ventrally, not sinuate opposite antennal insertions  
..... **Trigonorhinus Wollaston** (p. 37)
- Rostrum (excluding mandibles) quadrate or with rounded apical  
angles (Fig. 29). Eyes rounded ventrally, distinctly emarginate  
opposite antennal insertions (Fig. 30) .....  
..... **Ormiscus Waterhouse** (p. 47)

## Clé des genres des Anthribidae du Canada et de l'Alaska

1. Antennes insérées sur la tête ou sur la face antérieure du rostre  
..... 2
- Antennes insérées sur la face latérale ou ventrale du rostre ... 3
2. Yeux arrondis; bordures supérieures pas plus rapprochées l'une de  
l'autre que les bordures inférieures. Une seule carène sur la moitié  
basale des marges latérales du pronotum. Corps quelque peu  
allongé. Tête non rétractée dans le pronotum .....  
..... **Araecerus Schoenherr** (p. 19)



- Yeux allongés-ovales; bordures supérieures plus rapprochées l'une de l'autre que les marges inférieures. Double carène sur la marge latérale du pronotum. Corps compact, ovale. Tête souvent rétractée dans le pronotum ..... **Euxenus LeConte** (p. 21)
3. Mandibules au tranchant ventral fortement denticulé. Yeux très proches des fovéas antennaires. Front couvert d'une pubescence blanche, dense ..... **Euparius Schoenherr** (p. 22)
- Mandibules sans tranchant ventral denticulé. Yeux variables. Front couvert ou non d'une pubescence blanche ..... 4
4. Yeux entiers, d'un arrondi régulier, ni tronqués ni légèrement sinueux sur leur bord antérieur (fig. 27 et 28) ..... 5
- Yeux formant un angle aigu sur le plan ventral ou légèrement sinueux vis-à-vis ou près de la fovéa antennaire (fig. 30) ..... 6
5. Yeux latéralement non protubérants ou à peine protubérants, lorsque vus d'en arrière (fig. 27). Front couvert d'une pubescence blanche, dense ..... **Tropideres Schoenherr** (p. 25)
- Yeux, latéralement bien protubérants, lorsque vus d'en arrière (fig. 28). Front sans pubescence blanche ..... **Allandrus LeConte** (p. 33)
6. Rostre (à l'exclusion des mandibules) devenant plus étroit de la base vers l'apex. Yeux formant un angle aigu sur le plan ventral, non sinueux vis-à-vis des fovéas antennaires ..... **Trigonorhinus Wollaston** (p. 37)
- Rostre (à l'exclusion des mandibules) carré ou aux angles apicaux arrondis (fig. 29). Yeux arrondis sur le plan ventral, nettement émarginés vis-à-vis des fovéas antennaires (fig. 30) ..... **Ormiscus Waterhouse** (p. 47)

## Genus *Araecerus* Schoenherr

*Araecerus* Schoenherr, 1823:1135; Valentine 1960:50, 79; Holloway 1982:155.

*Araecerus* Schoenherr, 1839:273.

*Araeosarus* Walker, 1859:262.

*Doticus* Pascoe, 1882:27.

This is a rather large genus, occurring mainly in the Oriental and Australian regions. One species, the coffee bean weevil—*A. fasciculatus* (De Geer),—has been spread over most of the world by commerce.

**Description.** Pubescence abundant. Head not retractile. Rostrum truncate, only slightly prolonged apically; frons convex. Antennae inserted on anterior surface of frons; insertion very close to eye. Eyes rounded, located on lateral surface of head. Pronotum wider than long; lateral margins arcuate, converging anteriorly, with single raised carina on basal half; surface reticulate. Elytra with sides parallel, broadly rounded behind; striae marked by 10 rows of indistinct punctures.

**Type species.** *Anthribus coffeae* Fabricius, original designation and monotypy.

**Comments.** The name *Araecerus* is derived from the Greek "araios," meaning "slender," and "kéras," meaning "horn, antenna." It is masculine in gender. The name is evidently incorrectly formed and should be *Araeocerus*; this name, however, is preoccupied in Staphylinidae (Holloway 1982). Only one species is found in Canada.

*Araecerus fasciculatus* (De Geer)

*Curculio fasciculatus* De Geer, 1775:276 (type, Surinam; Rijksmuseum, Stockholm).

*Araecerus fasciculatus*: Wolfrum 1929:105; Valentine 1960:50; Valentine 1971:244; White 1983:306, 308.

Additional synonymy in Valentine (1960).

**Description.** Length 2.4–4.5mm (head excluded). Integument or surface of head, pronotum, and elytra varying from light to dark red and black; setae abundant, recumbent, gray to light brown or dark brown to nearly black; setae of elytral interstriae light and dark, clustered together, appearing as spots; setae of pronotum generally more intermixed, often darker on median portion of disc. Frons distinctly, closely punctured, with a faint, longitudinal carina extending from vertex to near level of antennal insertion. Pronotum convex, distinctly, closely punctured, about 1.5 times wider than long, widest at base; base broadly emarginate; basal carina acute; lateral carina forming 90° angle with basal carina. Elytra about 1.2 times longer than wide; striae weakly impressed, with shallow punctures; interstriae abundantly punctured, with punctures smaller than those in striae. Pygidium vertical, evenly rounded at apex (male) or not vertical, produced at apex (female).

**Distribution.** Cosmopolitan. British Columbia: Vancouver (ex Hong Kong, in nutmeg) and Victoria (ex Hong Kong, in dehydrated potatoes). Ontario: Smiths Falls (in chocolate) and Toronto (ex Indonesia).

**Comments.** Originally Indo-Malayan, this species is known as the coffee bean weevil. It has become established around the world and has been introduced a number of times into North America in nutmeg, corn stalks, dehydrated potatoes, chocolate, coffee beans, and a vast variety of dry plant materials. It is probably not established in Canada, being unable to survive the winter, although it may be established in warehouses and factories. It is included here because of its frequent interception. The larva of this species has been illustrated by Boving and Craighead (1930) and described and illustrated by Anderson (1947).

## Genus *Euxenus* LeConte

*Euxenus* LeConte, 1876:409; Valentine 1960:52.

This genus is distinctive in having 2 carinae on the lateral margin of the pronotum. The upper of these carinae is acutely elevated, whereas the lower is less elevated and may be obscured by a row of punctures. The head of most specimens is retracted into the pronotum, and the features of the head are not readily visible. The genus includes two species from eastern North America, one of which is found in Canada.

**Description.** Pubescence almost completely absent; body shining. Head retractable. Rostrum not prolonged, narrowly rounded apically. Antennae inserted on anterior surface of frons; bases of antennae close, located at inner lower margins of eyes. Eyes elongate-oval, converging dorsally. Pronotum wider than long; surface punctured; sides arcuate, converging anteriorly, with 2 lateral carinae on base. Elytra globose; sides and base evenly arcuate; each striae with 1 or more rows of punctures.

**Type species.** *Euxenus punctatus* LeConte, monotypic.

**Comments.** This genus needs careful study. Although it currently contains only two species, Valentine (1960) mentions the possibility of several additional undescribed species. Until such a study is completed, the name used below must be considered tentative.

### *Euxenus punctatus* LeConte

*Euxenus punctatus* LeConte, 1876:409 (holotype, Detroit, Mich.; MCZ); Blatchley and Leng 1916:45; Valentine 1960:52, 79.

**Description.** Length 1.3–1.4 mm (head excluded). Body light to dark brown, shining. Frons weakly convex, the surface weakly punctured,

reticulate, dull; epistoma very narrowly rounded, anteriorly expanded. Pronotum 1.4–1.5 times wider than long, widest at base; surface convex, glabrous, with distinct, small, close, evenly distributed punctures; base broadly angulate, with prominent basal carina; lateral margin with 2 carinae on basal half, these separated by distinct row of punctures; upper carina distinct, elevated; lower carina less well developed. Elytra about as long as wide, widest near middle; apex and sides broadly rounded; surface generally glabrous, with or without a few fine setae; striae punctured in irregular double rows; interstriae smooth. Pygidium vertical; sexual differences not detected.

**Distribution.** Known only in Quebec, Michigan, and Washington, D.C. Quebec: Montreal.

**Comments.** Of the Anthribidae occurring in Canada, *E. punctatus* is the smallest. The small size, compact body, glabrous body surface, and retractile head easily distinguish this species. The species is rare, and nothing is known of its life history or habits.

## Genus *Euparius* Schoenherr

*Euparius* Schoenherr, 1826:36; Valentine 1960:56.

*Cratoparis* Dejean, 1833:235.

*Caccorhinus* Sharp, 1891:321.

Five species of this genus occur in North America, with another 40 or more in the Neotropical area and 10 or so in the Old World. Only one common species occurs in Canada.

Members of the genus are easily recognized by the sharp tooth on the ventral edge of the mandible. This tooth is usually larger and closer to the mandibular base than the dorsal tooth. Other diagnostic characters are mentioned below.

**Description.** Body abundantly pubescent. Head not retractable. Rostrum distinctly prolonged; apex broadly, sinuately emarginate. Mandibles with sharp tooth on ventral margin. Antennae inserted on lateral surface of rostrum, adjacent to eyes. Eyes located on lateral surface of head and truncate or slightly convex on side adjacent to antennal insertion. Pronotum punctured, reticulate, wider than long; lateral margins with acute carina on basal half; basal carina joining dorsal carina at abrupt angle. Elytra with sides parallel; apex broadly rounded behind; striae marked with large, shallow punctures.

**Type species.** *Anthribus lunatus* Fabricius, monotypic.

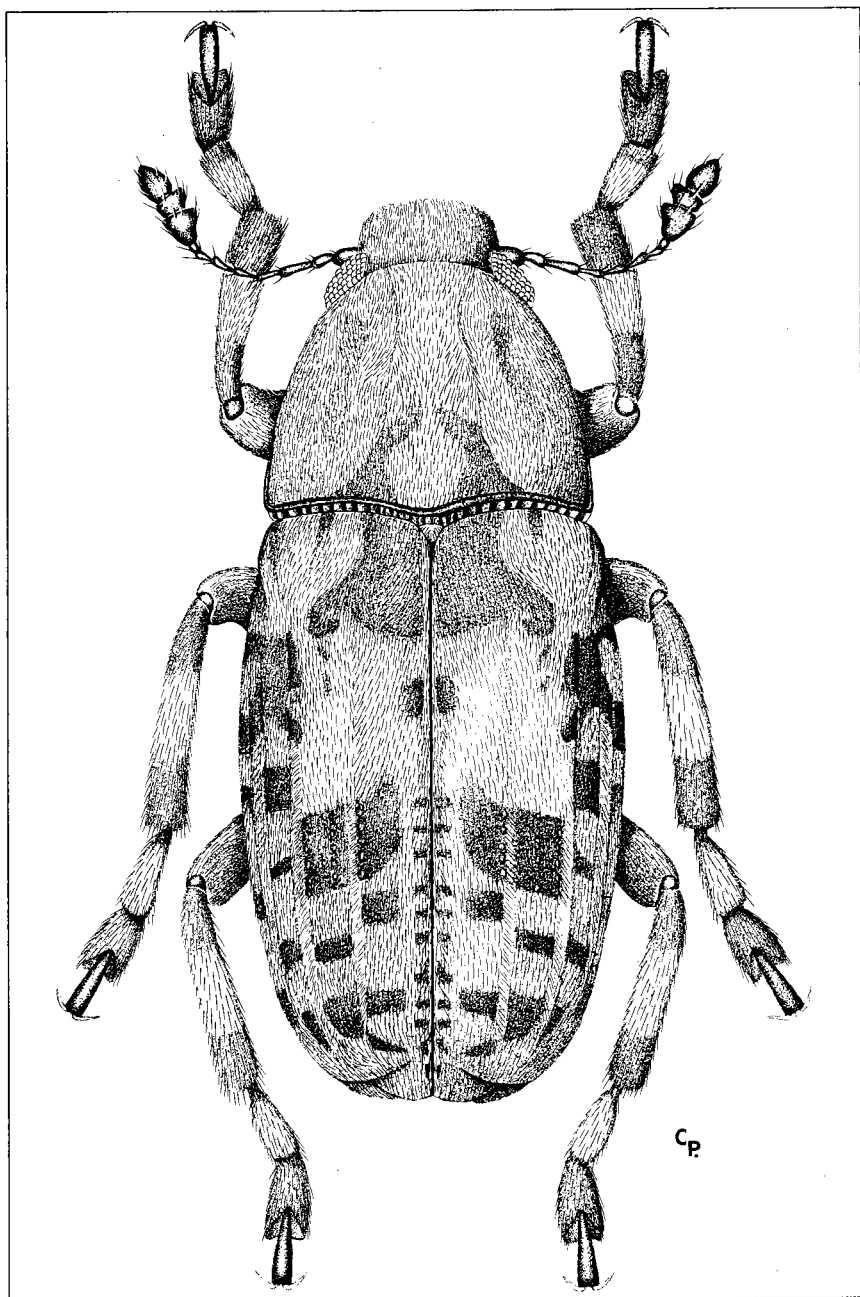


Fig. 1. *Euparius marmoreus*

## *Euparius marmoreus* (Olivier)

Figs. 1, 18; Map 1

*Macrocephalus marmoreus* Olivier, 1795:12 (type material probably lost).

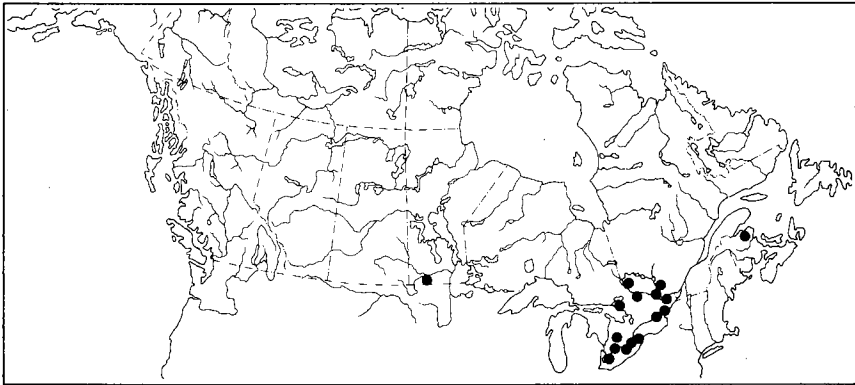
*Euparius marmoreus*: Blatchley and Leng 1916:37; Wolfrum 1929:91; Valentine 1960:56, 80; Dillon and Dillon 1961:742; White 1983:306, 308.

**Description.** Length 5.5–7.0 mm (head excluded). Body pubescent; pubescence patterned as follows: setae on frons and rostrum either all light brown or white with few light brown setae at middle at upper level of eyes; setae on pronotum and elytra light brown, dark brown, and white, intermixed in various combinations, usually with spots as follows: pronotal disc with 2 dark brown spots on lateral-basal portion and 1 light brown patch basally; elytral disc with 1 large white patch on anterior portion; elytral interstriae with numerous dark brown, white, and light brown patches. Frons convex, with prominent, weakly elevated median carina extending from epistomal margin to level of middle of eyes; surface of frons obscured by pubescence. Pronotum about 1.1–1.2 times wider than long, widest at base; sides converging to narrowly rounded anterior margin; base broadly emarginate; basal carina acute; lateral carina acute, joining basal carina at about 80° angle; disc convex, with medial and basal impressions; basal impression deep; median impression broad, weak, longitudinal; surface strongly punctured, reticulate between punctures, usually obscured by abundant vestiture. Elytra 1.6–1.7 times longer than wide; apex broadly rounded; disc weakly impressed along suture, more distinctly impressed over declivity; striae weakly impressed; strial punctures shallow, moderate to large. Pygidium vertical; apex broadly rounded in both sexes.

**Distribution.** New Brunswick to Manitoba, throughout the eastern United States south to Florida and Texas. Manitoba: Aweme. New Brunswick: Bathurst. Ontario: Arnprior, St. Williams, Bells Corners, Chaffey's Locks, Chalk River, Constance Bay, DeCew Falls, Dunrobin, Grand Bend, Leamington, Marmora, Merivale, Normandale, Ojibway, Osgoode, Ottawa, Perth, Prince Edward County, Rondeau Park, Spencerville, Strathroy, and Turkey Point. Quebec: Aylmer, Duparquet, Fort Coulonge, Harrington Lake (Gatineau Park), Hemmingford, Laniel, and Wakefield.

**Comments.** This is one of the largest species (in body size) of Anthribidae occurring in Canada. Adults may be easily recognized by the color pattern of the setae, by the characters as given above, and by the large size. Although the species is common throughout its range,

nothing is recorded about its life history or habits. The larva of this species has been illustrated by Boving and Craighead (1930) and described and illustrated by Anderson (1947). The larvae occur on a variety of woody plants but seem always to be associated with fungus.



Map 1. Collection localities of *Euparis marmoreus*.

## Genus *Tropideres* Schoenherr

*Tropideres* Schoenherr, 1823: column 1135; Valentine 1960:70.

*Tropidoderes* Gemminger and van Harold, 1872:2733.

*Gonotopis* LeConte, 1876:393.

*Eurymycter* LeConte, 1876:394.

This is a fairly large genus, containing over 100 species throughout the world. Only four species occur in North America, all of which are found in Canada. All species feed under the bark of decaying wood.

**Description.** Pubescence abundant, recumbent. Head not retractile. Rostrum distinctly prolonged, with sides converging at middle; apex broadly expanded; surface clothed with abundant white setae. Frons flattened, becoming strongly convex at eye level. Antennae inserted on sides of rostrum; insertion remote from eye. Eyes rounded, slightly protuberant or flat, located on lateral surface of head. Pronotum (Fig. 31) wider than long, with lateral margins sinuate and converging anteriorly; basal carina distinct, remote from base; surface irregular, punctate-reticulate. Elytra with sides parallel, broadly rounded behind; surface irregular, usually with basal elevations; striae punctured in nearly regular rows; interstriae variously elevated.

**Type species.** *Anthribus albirostris* Fabricius, by original designation.

## Key to species of *Tropideres* in Canada

1. Elytral base with 2 prominent elevations; elytral disc with large patch of pale pubescence on anterior half. Pronotum with central broad, triangular impression bordered by triangular patch of light brown pubescence. Length 4.5–6.0 mm. Newfoundland to Alaska ..... ***dorsalis* (Thunberg)** (p. 27)  
 Elytral base with pair of weak elevations; elytral disc with large patch of pale pubescence on posterior half, the patch extending to or beyond base of declivity. Pronotum with central narrow, deep angulate groove, without light pubescence ..... 2
2. Pubescence on abdomen brown in centre, white or gray laterally. Length 5.2–7.5 mm. Quebec, Ontario ..... ***tricarinatus* (Pierce)** (p. 28)  
 Pubescence on abdomen white throughout ..... 3
3. Legs with 2 narrow median bands of pale setae on hind tibiae or tibial apex with brown and white setae intermixed. Elytra with declivital interstriae 3, 5, and 7 weakly elevated. Length 5.8–7.5 mm. Quebec to British Columbia ..... ***fasciatus* (Olivier)** (p. 31)  
 Legs with 1 wide median band of pale setae on hind tibia; tibial apex solid brown. Elytra with declivital interstriae 5 and 7 not elevated; declivital interstria 3 elevated in white patch. Length 3.2–5.5 mm. Nova Scotia to Ontario ..... ***latifascia* (Pierce)** (p. 32)

## Clé des espèces du genre *Tropideres* du Canada

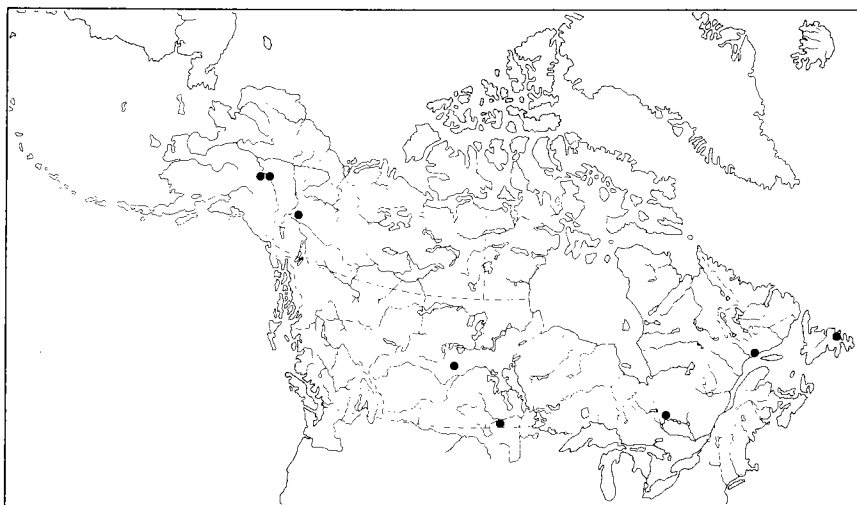
1. Deux proéminences à la base de l'élytre; moitié antérieure du disque élytral couverte d'une pubescence pâle étendue. Pronotum creusé en son milieu d'une large empreinte triangulaire, bordée d'un triangle de pubescence brun pâle. Longueur : de 4,5 à 6,0 mm. De Terre-Neuve à l'Alaska ..... ***dorsalis* (Thunberg)** (p. 27)  
 Deux faibles proéminences à la base de l'élytre; moitié postérieure du disque élytral couverte d'une pubescence pâle étendue, qui atteint ou dépasse la base de la déclivité. Pronotum creusé d'un sillon central étroit, anguleux et profond, sans pubescence claire ..... 2





Valentine (1971) records specimens, without exact localities, from the Northwest Territories, Alberta, Montana, and Colorado. Alaska: Fairbanks and Nenana Highway. Manitoba: Aweme. Newfoundland: Gander. Quebec: Duparquet and Godbout. Saskatchewan: Waskesiu. Yukon Territory: Yukon River.

**Comments.** Adults of this species are readily recognized by the prominent elevations on the elytral bases and by the large spot of white or yellowish pubescence on the base of the elytra. The elytral spot makes *T. dorsalis* unique among Canadian species. Specimens have been collected from "dead hemlock." Pierce (1930) states that in Europe the species is found on dry branches of *Quercus* (oak) and *Betula* (birch) in May. Nothing else is known of the habits or life history of this species.



Map 2. Collection localities of *Tropideres dorsalis*.

### *Tropideres tricarinatus* (Pierce)

Figs. 2, 27, 31, 35; Map 3

*Eurymycter tricarinatus* Pierce, 1930:18 (holotype, Branchtown, Pa.; USNM).

*Tropideres tricarinatus*: Valentine 1960:70; Valentine 1971:247.

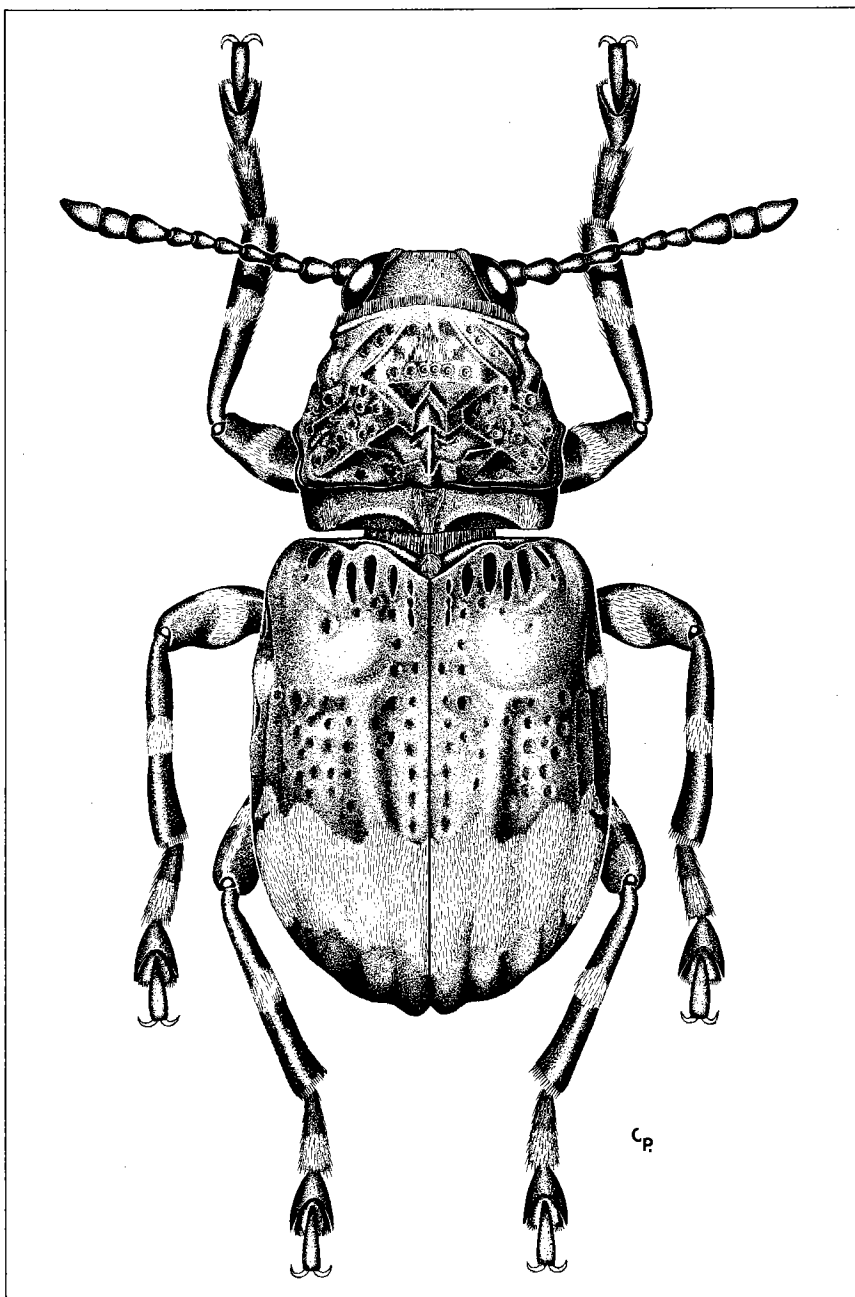
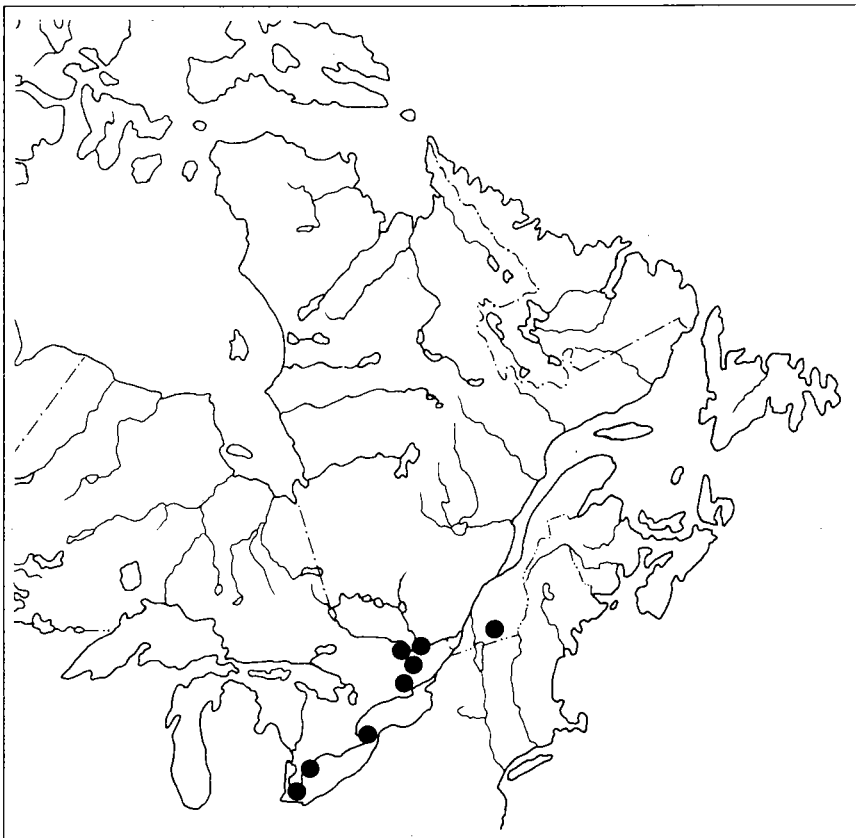


Fig. 2. *Tropideres tricarinatus*



Map 3. Collection localities of *Tropideres tricarinatus*.

**Description.** Length 5.2–7.5 mm (head excluded). Frons convex, with narrowly impressed longitudinal groove; surface concealed by dense, white, recumbent setae. Rostrum flattened, with 3 carinae; 2 carinae parallel, longitudinal, distinctly elevated; median carina less distinctly elevated; surface concealed by dense, white, recumbent setae, brown at rostral apex. Pronotum about 1.3 times wider than long, widest behind middle; sides angulate at base, converging toward broadly rounded anterior margin; base broadly emarginate; basal carina transverse, strongly elevated; lateral carina acute, strongly elevated; surface very irregular, with median, narrow, deeply impressed W-shaped groove; lateral areas of disc with various weak elevations and distinct, strong punctures or small impressions; surface shining, with dense, minute punctures; vestiture consisting of small, light brown setae, with scattered, small, white or yellow patches. Elytra about 1.4 times longer than wide, with light brown setae; posterior half with distinct transverse band of white setae; apex of elytra brown, broadly rounded; striae

indistinct, with large, shallow punctures that are much deeper behind base; interstriae 3, 5, and 7 weakly elevated, elevations smooth on summit; base of interstria 3 with slight elevation. Pygidium vertical; apex narrowly rounded in both sexes. Abdominal sternites with brown setae in centre, white or gray laterally.

**Distribution.** Ontario and Quebec south to Georgia, west to Wisconsin. Ontario: Arnprior, DeCew Falls, Fonthills, Innisville, Pelee Island, Prince Edward County, and Rondeau Park. Quebec: Hull and Knowlton.

**Comments.** Adults of this species resemble those of *T. latifascia* and *T. fasciatus*. The color of the abdominal pubescence distinguishes *T. tricarinatus* from the other two mentioned above. In adults of *T. tricarinatus*, the pubescence of the abdomen is brown in the central area and white or gray laterally. In the adults of the other two species, the abdominal pubescence is all white, sometimes with a few brown spots on the sides. Nothing is known of the life history or biology of this species, except that it is recorded from dead beech (*Fagus* sp.).

Valentine (1971) records this species from Lillooet, B.C., based on a specimen in the Canadian National Collection. This specimen was examined and found to be *T. fasciatus*. The white setae on the median portion of the abdominal sternites are darker than usual, but otherwise the specimen is typical of *T. fasciatus*.

### *Tropideres fasciatus* (Olivier)

Map 4

*Macrocephalus fasciatus* Olivier, 1795:9 (type material probably lost).

*Eurymycter fasciatus*: Pierce 1930:17; Dillon and Dillon 1961:741.

*Tropideres fasciatus*: Valentine 1960:70; Valentine 1971:248.

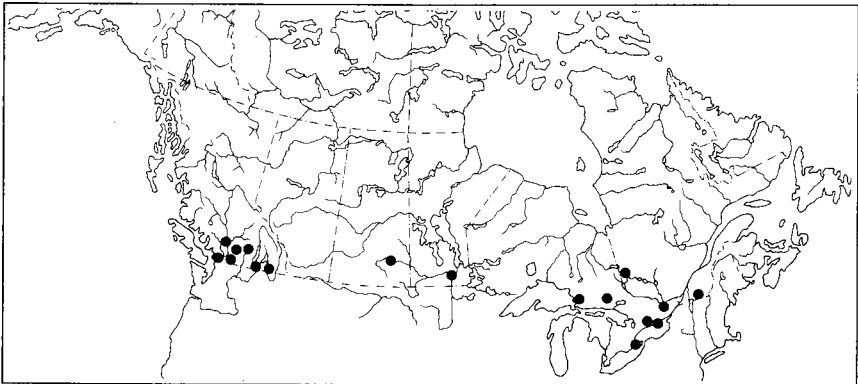
*Eurymyctes bicarinatus* Pierce, 1930:17 (holotype, Tenino, Wash.; USNM).

**Diagnosis.** Length 5.8–7.5 mm (head excluded). Setae on frons and elytra as in *T. tricarinatus*; setae on each hind tibia forming 2 pale, narrow median bands. Frons evenly convex; median longitudinal groove not evident. Rostrum as in *T. tricarinatus*, except white setae extend onto apex. Pronotum about 1.3 times wider than long, essentially as in *T. tricarinatus*. Elytra about 1.4 times longer than wide; apex broadly rounded; striae indistinct, with rather small, deep punctures, these larger and much deeper on base; interstriae 3, 5, and 7 weakly elevated, the elevations smooth on summit; base of interstria 3 slightly elevated. Pygidium vertical; apex narrowly rounded. Abdominal

sternites with white setae, sometimes with scattered, small brown spots on sides.

**Distribution.** Quebec to British Columbia, south to Texas, Mississippi, Utah, and Oregon. British Columbia: Creston, Lillooet, Nicola, Oliver, Salmon Arm, Seton Lake, and Vancouver. Manitoba: Stony Mountain and Winnipeg. Ontario: Belleville, Frater, Marmora, Ottawa, Prince Edward County, St. Davids, Sudbury, and Toronto. Quebec: Brome and Duparquet. Saskatchewan: Fort Qu'Appelle.

**Comments.** Adults of this species closely resemble those of *T. tricarinatus* and *T. latifascia*. Adults of *T. fasciatus* are distinguished from *T. tricarinatus* by the white pubescence on the abdominal sternites (brown in the middle in *T. tricarinatus*). Adults of *T. fasciatus* may be distinguished from *T. latifascia* by the tibial characters mentioned in the key. Anderson (1947) has described the larva. Anderson (1947) also reports that H.S. Barber collected specimens from under a knob of a hard black fungus on the surface of an old sycamore log in a gallery. Collections from *Sassafras* and *Betula* were also reported. This species is always associated with a fungus, usually on a variety of woody plants.



Map 4. Collection localities of *Tropideres fasciatus*.

*Tropideres latifascia* (Pierce)

*Eurymycter latifascia* Pierce, 1930:17 (holotype, Buffalo, N.Y.; USNM).

*Tropideres latifascia*: Valentine 1960:70.

**Diagnosis.** Length 3.2–5.5 mm (head excluded). Color of setae on frons and elytra as in *T. tricarinatus*; hind tibiae with 1 wide median

band of pale setae. Frons convex, with median longitudinal groove absent or only weakly evident. Rostrum flattened, with only weak trace of elevated carinae; surface obscured by dense, white, recumbent setae. Pronotum about 1.3 times wider than long, widest behind middle, essentially as in *T. fasciatus*; W-shaped median groove less deeply and sharply impressed. Elytra about 1.5 times longer than wide; apex broadly rounded; striae and interstriae as in *T. fasciatus*, except interstriae 5 and 7 not elevated; interstria 3 weakly to distinctly elevated in white patch. Pygidium vertical; apex narrowly rounded.

**Distribution.** Eastern Canada, south to New York. Ontario: 24 miles north of Parry Sound. Quebec: Beechgrove.

**Comments.** This rather poorly differentiated species closely resembles *T. fasciatus*. Adults of *T. latifascia* differ from those of *T. fasciatus* by the characters summarized in the key. Nothing is known of its life history or habits, and no host has been recorded.

## Genus *Allandrus* LeConte

*Allandrus* LeConte, 1876:396; Valentine 1960:77.

Only three North American species are contained in this genus; all three occur in Canada. This genus is characterized by widely separated and protuberant eyes (Fig. 28). The minimum distance between the eyes is always greater than the minimum width of the rostrum near the base. Other features that serve to characterize this genus are the flat, spatulate rostrum (Fig. 28), the strongly elevated antebasal pronotal carina (Fig. 32), and the reticulate-punctate pronotum. Valentine (1960) discusses the genus and gives a key to the North American species.

**Description.** Pubescence abundant. Head not retractable. Rostrum prolonged, constricted at base; sides strongly diverging; apex broadly expanded. Antennae inserted on lateral surfaces of rostrum; insertion remote from eye. Eyes lateral, slightly oval, with entire margins; distance between eyes greater than rostrum width at base. Pronotum (Fig. 32) wider than long; surface punctate-reticulate; lateral margin without carina except at posterior angle; antebasal carina strongly elevated, transverse to weakly emarginate, curved slightly at basal angles. Elytra with sides parallel; apex broadly rounded; striae in regular rows, weakly marked with shallow punctures.

**Type species.** *Allandrus bifasciatus* LeConte, monotypic.

## Key to species of *Allandrus* in Canada and Alaska

1. Tarsal claws cleft; inner tooth minute, located on basal half of claw (Fig. 36). Rostrum of male with longitudinal carina ..... 2  
Tarsal claws simple, not cleft (Fig. 36). Rostrum of male without longitudinal carina. Length 2.2–4.0 mm. Alaska to Quebec .....  
..... ***populi* Pierce** (p. 35)
2. Elytral surface nearly even, with obscure basal swellings; foveae behind swellings absent or very weak. Rostrum of male with median carina strongly elevated, keel-like. Legs of male with protibia very strongly curved. Length 2.6–3.5 mm. Ontario, Quebec .....  
..... ***bifasciatus* LeConte** (p. 36)  
Elytral surface uneven, more strongly swollen behind bases; foveae behind swellings deeply impressed. Rostrum of male with median carina weakly elevated, definitely not keel-like. Legs of male with protibia straight. Length 2.3–2.9 mm. Manitoba to Alberta .....  
..... ***brevicornis* Frost** (p. 37)

## Clé des espèces du genre *Allandrus* du Canada et de l'Alaska

1. Griffes tarsales fissurées; minuscule denticule interne sur la moitié basale de la griffe (fig. 36). Rostre du mâle caréné dans le sens longitudinal ..... 2  
Griffes tarsales simples, non fissurées (fig. 36). Rostre du mâle non caréné dans le sens longitudinal. Longueur : de 2,2 à 4,0 mm. De l'Alaska au Québec ..... ***populi* Pierce** (p. 35)
2. Surface de l'élytre presque égale, mais vagues protubérances basales; au-delà de celles-ci, fossettes absentes ou très peu marquées. Saillie médiane du rostre du mâle, forte, à l'allure de carène. Protibia du mâle très fortement courbé. Longueur : de 2,6 à 3,5 mm. Ontario, Québec ..... ***bifasciatus* LeConte** (p. 36)  
Surface de l'élytre inégale, à protubérances plus marquées au-delà de la partie basale; au-delà des protubérances, fossettes profondément marquées. Rostre du mâle portant une faible saillie médiane, qui n'a absolument pas l'allure d'une carène. Protibia du mâle rectiligne. Longueur : de 2,3 à 2,9 mm. Du Manitoba à l'Alberta ..... ***brevicornis* Frost** (p. 37)

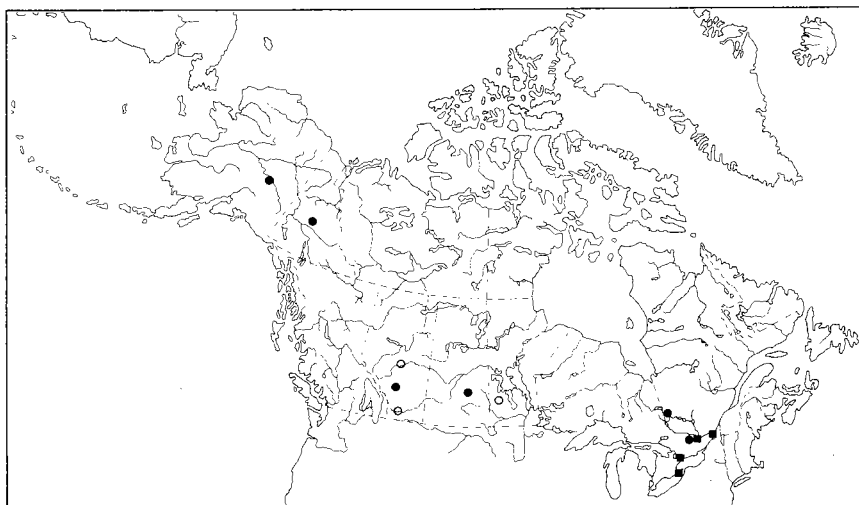


## *Allandrus populi* Pierce

### Map 5

*Allandrus populi* Pierce, 1930:19 (holotype, Williams, Ariz.; USNM); Valentine 1960:77, 83; Valentine 1971:248.

**Description.** Length 2.2–4.0 mm (head excluded). Head and pronotum dark brown to black, with mostly dark setae and sparse, scattered, white setae. Frons convex, broad, deeply and densely punctured. Rostrum without carinae, with sculpture as on frons, except punctures smaller. Pronotum 1.2 times wider than long, widest at lateral extension of basal carina; surface of disc even, convex before antebasal carina, weakly impressed before middle, with dense, reticulate punctures; antebasal carina strongly, sharply elevated, weakly emarginate. Elytra about 1.4–1.5 times longer than wide, reddish brown to black, with predominately dark setae, but with white setae in scattered small patches or individually; basal quarter of elytra with bar of white setae extending to scutellum; posterior third of elytra with transverse patch of white setae on each elytron; disc relatively even, with very slight swellings just behind basal margin, weakly impressed behind swellings; striae punctures moderate in size, weakly impressed; interstriae flat, densely and minutely punctured. Tarsal claws simple (Fig. 36). Protibiae of male straight.



Map 5. Collection localities of *Allandrus populi* (●), *A. bifasciatus* (■), and *A. brevicornis* (○).

**Distribution.** Known from Alaska to Quebec and in the United States from New Hampshire to Michigan, south to Arizona. Alaska: Bonanza Creek (Fairbanks). Alberta: Olds. Ontario: 6 miles west of Richmond. Quebec: Duparquet. Saskatchewan: Punnichy. Yukon Territory: mile post 38 (Klondike Highway), Mayo, and mile 8 (Mayo Road).

**Comments.** Adults of this species are readily recognized by the simple tarsal claws; by the rostrum, which is flat, densely punctured, and not carinate; and by the even elytral surface, which has only weak basal swellings and weak impressions behind the swellings. Nothing is known about the life history or habits of this species. The Alaska specimen was collected on a sticky trap in a pheromone study of the spruce beetle (*Dendroctonus rufipennis* Kirby; Scolytidae). Two specimens from the Yukon Territory are labelled "*Populus tremuloides*."

*Allandrus bifasciatus* LeConte

Fig. 37; Map 5

*Allandrus bifasciatus* LeConte, 1876:396 (syntypes, Canada; MCZ); Pierce 1930:20; Valentine 1960:79, 83.

**Description.** Length 2.6–3.5 mm (head excluded). Head and pronotum black, with a mixture of white, light brown, and dark brown to black setae. Frons convex, broad, punctured, the punctures dense, deep. Rostrum with sculpturing as on frons; carina sharply elevated, longitudinal, keel-like in male; carina evident but not elevated in female. Pronotum slightly wider than long or as long as wide, widest at lateral extension of basal carina; surface of disc convex, even, very weakly impressed before middle, with dense, deep punctures, these reticulate internally; antebasal carina strongly, sharply elevated, rather strongly emarginate. Elytra about 1.6 times longer than wide, reddish to dark brown, with color pattern as described for *A. populi*; disc generally nearly even, with obscure basal swellings, weakly impressed behind swellings; striae punctures moderate in size, deeply impressed; interstriae flat, densely, minutely punctured. Tarsal claws cleft; inner tooth minute (Fig. 37). Protibiae of male very strongly curved.

**Distribution.** Ontario and Quebec, south in the United States to Virginia, west to Iowa. Ontario: DeCew Falls and Toronto. Quebec: Aylmer and Hudson Heights.

**Comments.** Adults of this species are easily recognized by the sharply elevated, keel-like longitudinal carina on the male rostrum, by the cleft tarsal claws, by the obscure swelling on the base of each elytron,

and by the very strongly curved protibiae of the male. Nothing is known of the life history or habits of this species. Blatchley and Leng (1916) record this species on linden (*Tilia* species) in New Jersey.

### *Allandrus brevicornis* Frost

Map 5

*Allandrus brevicornis* Frost, 1920:252 (lectotype, Farmington, Mass.; USNM); Barber in Pierce 1930:19; Valentine 1960:78, 83; Valentine 1971:248.

**Diagnosis.** Length 2.3–2.9 mm (head excluded). Color pattern essentially as described for *T. bifasciatus*. Frons convex, broad, granulate between punctures; punctures dense, strong. Rostrum punctured as on frons; longitudinal carina slightly but distinctly elevated in male, evident but not distinctly elevated in female. Pronotum as described for *T. bifasciatus*. Elytra about 1.4 times longer than wide, with distinct, elevated, basal swelling on each elytron; surface distinctly impressed behind swelling; disc generally even; stria punctures of moderate size, deeply impressed; interstriae flat, densely, minutely punctured. Tarsal claws cleft; inner tooth minute. Protibiae of male straight.

**Distribution.** Manitoba to Alberta, south to California and Illinois, east to Maine. Alberta: 14 miles east of Lethbridge and Edmonton. Manitoba: Riding Mountain National Park.

**Comments.** Adults of this species are similar to those of *A. bifasciatus* but differ by the much lower longitudinal carina on the male rostrum, by the straight protibiae of the male, and by the much more strongly elevated swellings just behind the elytral base. Nothing is known of the life history or habits of this species, except that it has been reported from willow (*Salix* species). The lectotype of this species was designated by H.S. Barber in a note appended to Pierce's (1930) treatment of *Allandrus*.

### Genus *Trigonorhinus* Wollaston

*Trigonorhinus* Wollaston, 1861:102; Valentine 1960:58.

*Brachytarsus* LeConte, 1876:405.

*Anthribulus* LeConte, 1876:406.

*Brachytarsoides* Pierce, 1930:29.

This genus includes 21 North American species, but a number of names are of questionable validity. This genus needs to be reviewed. Six species occur in Canada; their names are probably all valid.

All *Trigonorhinus* species feed on smut fungi on various grasses or shrubs. Species in this genus can be recognized by characters of the rostrum. The lateral margins of the rostrum narrow progressively from the base to the apex; the central portion of the apex is distinctly produced beyond the lateral corners and is slightly emarginate. Other features of the genus are the basal pronotal carina and the produced anterior portion of the pronotum, which usually hides the head from dorsal view.

**Description.** Pubescence abundant. Head not retractile. Rostrum prolonged; sides evenly narrowed from base to apex; apex with central portion produced beyond corners, slightly emarginate. Antennae inserted on sides of rostrum; insertion close to eye. Eyes lateral, acutely angled ventrally, not notched or emarginate opposite antennal insertion. Pronotum slightly wider than long; anterior margin produced; lateral margins rounded, not carinate except at base; basal carina sharply elevated; surface punctured. Elytra with sides parallel or slightly arcuate; apex broadly rounded; striae punctured in even, impressed rows. Tarsal claws cleft; inner tooth minute.

**Type species.** *Trigonorhinus pardalis* Wollaston, monotypic.

**Comments.** Valentine (1960) gives a checklist of the species in this genus and also (1971) provides a key to the western species. Anderson (1947) describes and illustrates the larva of several species under the generic name *Brachytarsoides*.

### Key to species of *Trigonorhinus* in Canada

1. Tibiae with 2 dark brown areas and 2 or 3 light brown areas with white setae. Abdomen often with lateral spot of brown setae on each sternite ..... 2  
Tibiae uniformly reddish brown, sometimes slightly darker at apex or base. Setae on abdominal sternites uniformly gray or white, without lateral dark spot ..... 3
2. Pronotal disc roughly punctured, the punctures close, and the interpuncture space elevated into short, irregular rugae. Pronotal surface moderately shining, appearing microgranulose. Elytral pubescence silvery, with numerous brown spots, with 1 larger brown spot medially on elytral disc and 1 on elytral base. Length

- 3.2–3.7 mm. Alberta, British Columbia ..... **annulatus (Carr)** (p. 41)
- Pronotal disc evenly punctured, the interpuncture space not elevated. Pronotal surface smooth, more brightly shining. Elytral pubescence light brown, with numerous dark brown spots; median spot slightly smaller; basal spot less well defined. Length 2.1–3.3 mm. Ontario to Alberta ..... **alternatus (Say)** (p. 41)
3. Length 1.3–2.0 mm. Pronotum with base broadly emarginate, forming shallow V opposite scutellum. British Columbia to Ontario ..... **tomentosus (Say)** (p. 43)
- Length 1.8 mm or greater. Pronotum with base very shallowly emarginate, arcuate opposite scutellum ..... 4
4. Dorsal color pattern obscure; setae all white or various shades of white, or light brown; borders between colors obscure, blending from one to another ..... 5
- Dorsal color pattern distinct; setae very dark brown in spots contrasting with light brown or white setae over surface; borders between colors abrupt, distinct. Length 1.8–3.2 mm. Quebec to British Columbia and Northwest Territories ..... **sticticus (Boheman)** (p. 44)
5. Setae on elytral disc all white or intermixed with very light brown and white or all very light brown; no distinct color pattern. Pronotum with light and dark brown setae intermixed. Length 1.8–3.2 mm. Quebec to Alberta ..... **limbatus (Say)** (p. 46)
- Setae on elytral disc pale yellow or yellowish white from suture to interstria 4, the setae on interstriae 5–7 more distinctly white; setae on interstriae 8–10 white and yellowish white intermixed. Pronotum with white and yellowish white setae intermixed, forming a vague, white, median, longitudinal stripe, somewhat more white laterally. Length 2.7–3.5 mm. Alberta, Saskatchewan ..... **griseus (LeConte)** (p. 47)

### Clé des espèces du genre *Trigonorhinus* du Canada

1. Tibias portant deux zones brun foncé et deux ou trois zones brun pâle, plantées de soies blanches. Tache latérale de soies brunes sur chaque sternite abdominal ..... 2
- Tibias uniformément brun rougeâtre, parfois un peu plus foncé à l'apex ou à la base. Soies des sternites abdominaux uniformément grises ou blanches; pas de tache latérale foncée ..... 3

2. Disque du pronotum irrégulièrement perforé, les perforations étant rapprochées, tandis que l'espace les séparant se soulève en courtes rides irrégulières. Surface du pronotum modérément luisante, à l'aspect très finement granuleux. Pubescence de l'élytre argentée, ornée de nombreuses taches brunes, dont une, plus grosse, se trouve en position médiane sur le disque élytral et une autre à la base de l'élytre. Longueur : de 3,2 à 3,7 mm. Alberta, Colombie-Britannique ..... **annulatus (Carr)** (p. 41)

Disque du pronotum régulièrement perforé; espace entre les perforations non soulevé. Surface du pronotum lisse, d'un éclat plus brillant. Pubescence de l'élytre brun pâle, parsemée de taches brun foncé. Tache médiane un peu plus petite; tache basale moins bien marquée. Longueur : de 2,1 à 3,3 mm. De l'Ontario à l'Alberta ..... **alternatus (Say)** (p. 41)

3. Longueur : de 1,3 à 2,0 mm. Base du pronotum largement émarginée, formant vis-à-vis de l'écusson un V peu profond. De la Colombie-Britannique à l'Ontario ..... **tomentosus (Say)** (p. 43)

Longueur : au moins 1,8 mm. Base du pronotum très superficiellement émarginée, arquée vis-à-vis de l'écusson .... 4

4. Motif coloré dorsal vague; soies toutes blanches ou colorées de diverses nuances de blanc ou brun pâle; transition entre les couleurs vague, par gradation ..... 5

Motif coloré dorsal différencié; soies brun très foncé en taches contrastant avec les soies brun pâle ou les soies blanches sur toute la surface; transition abrupte, nette, entre les plages de couleur. Longueur : de 1,8 à 3,2 mm. Du Québec à la Colombie-Britannique et aux Territoires du Nord-Ouest ..... **sticticus (Boheman)** (p. 44)

5. Soies du disque de l'élytre toutes blanches, brun très pâle entremêlé de blanc ou tout brun très pâle; aucun motif coloré distinct. Pronotum orné de soies brun pâle et brun foncé entremêlées. Longueur : de 1,8 à 3,2 mm. Du Québec à l'Alberta ..... **limbatus (Say)** (p. 46)

Soies du disque de l'élytre jaune pâle ou blanc jaunâtre, de la suture jusqu'à l'interstrie 4, les soies des interstries 5 à 7 étant plus nettement blanches; soies des interstries 8 à 10 blanc entremêlé de blanc jaunâtre. Pronotum planté de soies blanches et blanc jaunâtre entremêlées, formant une vague bande médiane longitudinale, blanche, quelque peu plus blanche latéralement. Longueur : de 2,7 à 3,5 mm. Alberta, Saskatchewan ..... **griseus (LeConte)** (p. 47)

*Trigonorhinus annulatus* (Carr)

*Brachytarsus annulatus* Carr, 1930:279 (holotype, Medicine Hat, Alta.; CNC).

*Trigonorhinus annulatus*: Valentine 1957:9; Valentine 1960:58, 80; Valentine 1971:245.

**Description.** Length 3.2–3.7 mm (head excluded). Integument of head, pronotum, and elytra dark reddish brown to almost black. Pubescence consisting of white and brown setae; setae on elytra silvery with numerous brown spots, with larger spot on base and at middle; setae on pronotum white and brown intermixed or white and forming at least traces of 3 longitudinal stripes; pubescence on tibiae annulate or spotted, with 2 dark and 3 pale areas; each abdominal sternite often with a lateral spot of brown setae. Frons weakly and transversely impressed just below eye level, weakly convex above; surface densely punctured, the rims of punctures elevated. Rostrum moderately prolonged; surface as on frons. Pronotum 1.1 times wider than long, widest at basal angles; sides weakly arcuate, converging to narrowly rounded anterior margin; disc evenly convex, weakly impressed before basal carina; surface densely punctured, the rims of punctures slightly elevated; basal carina weakly emarginate, acutely elevated. Elytra about 1.4 times longer than wide; sides weakly arcuate to broadly rounded apex; disc evenly convex; striae moderately impressed in even rows; interstriae flat, densely and finely punctured, about 4.0 times wider than striae.

**Distribution.** Alberta and British Columbia, south to Oregon and Utah. Alberta: Medicine Hat. British Columbia: Osoyoos.

**Comments.** This species is rarely encountered. Adults can be recognized by the densely punctured pronotal disc, on which the surface between the punctures is elevated in what appear to be short, irregular rugae, and by the color pattern previously described. Nothing is known of the life history or habits of the species, except that specimens have been collected on fungus-infected sagebrush (*Artemisia* species).

*Trigonorhinus alternatus* (Say)

Map 6

*Anthribus alternatus* Say, 1826:250 (no type locality given; type destroyed).

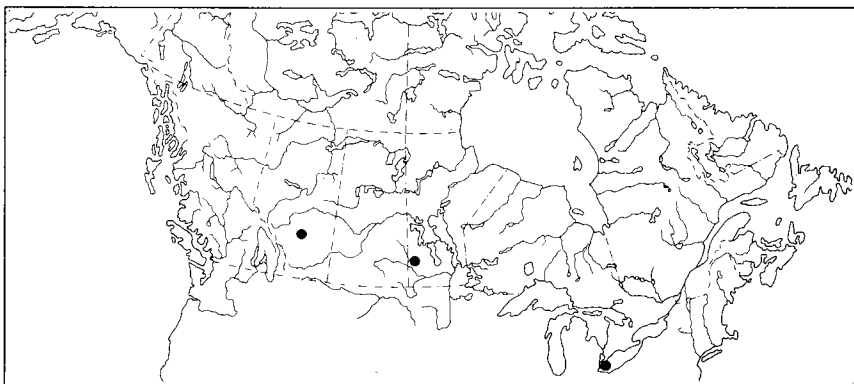
*Brachytarsus alternatus*: Blatchley and Leng 1916:38.

*Brachytarsoides alternatus*: Pierce 1930:30.

*Trigonorhinus alternatus*: Valentine 1957:9; Valentine 1960:58, 80; Valentine 1971:246.

**Diagnosis.** Length 2.1–3.3 mm (head excluded). Color pattern similar to *T. annulatus* except elytral interstriae 3, 5, and 7 with abundant white setae; elytral interstriae 1, 2, 4, and 6 with light brown setae and with very dark brown setae scattered in very small, numerous spots; elytra with median spot slightly smaller and basal spot less well defined than in *T. annulatus*. Tibiae as in *T. annulatus*. Frons and rostrum flattened, not transversely impressed, with surface as in *T. annulatus*. Pronotum 1.2 times wider than long, widest at basal angles; sides as in *T. annulatus*; disc as in *T. annulatus*, except rims of punctures not elevated; interpuncture space of disc smooth, brightly shining; otherwise as in *T. annulatus*. Elytra 1.4 times longer than wide; sides, sculpturing, and other characters as in *T. annulatus*.

**Distribution.** Ontario to Alberta, south through the United States to Florida in the east and Utah in the west. Alberta: Drumheller. Manitoba: Riding Mountain National Park. Ontario: Point Pelee and Ridgeway.



Map 6. Collection localities of *Trigonorhinus alternatus*.

**Comments.** This is another rarely encountered species that is known in only a few localities. Adults are similar to those of *T. annulatus*, but they can be recognized most easily by the smooth interpuncture space on the pronotum, by the color pattern, and by other characters, as described. Pierce (1930) found this species laying eggs on the new lateral stems of *Sideranthus* species. The larvae feed in the stems, surrounded by plant fragments and debris. Pupation occurs in the tips of the stem or in the main stem. The insects can be so numerous that they completely riddle the stem in which they are breeding.



Specimens of this species are also reported in fungus galls and flower heads of numerous plant species. They have been found hibernating in cotton bolls and laying eggs on kernels of dry corn. The type material of this species has been destroyed, and a neotype has not been designated. The concept of the species is based on specimens in the LeConte collection (MCZ).

*Trigonorhinus tomentosus* (Say)

Map 7

*Anthribus tomentosus* Say, 1826:251 (no type locality given; type destroyed).

*Brachytarsus tomentosus*: Blatchley and Leng 1916:40.

*Brachytarsoides tomentosus*: Pierce 1930:31.

*Trigonorhinus tomentosus*: Valentine 1957:9; Valentine 1960:58, 81; Valentine 1971:246.

*Brachytarsus brevis* Fahraeus, 1839:168 (type, Pennsylvania; NHMP).

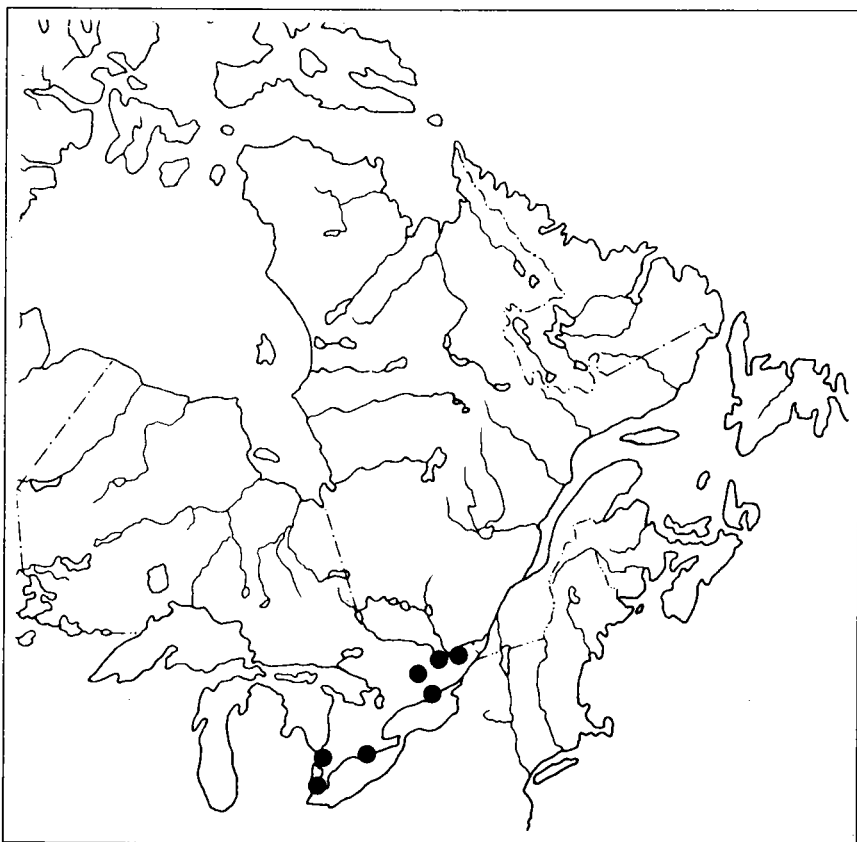
*Brachytarsus paululus* Casey, 1884:194 (holotype, Milford, Del.; USNM).

**Description.** Length 1.3–2.1 mm (head excluded). Integument of head, pronotum, and elytra light to dark reddish brown to black. Pubescence gray and brown, randomly mixed; brown setae sometimes forming large and diffuse basal, humeral, and median spots. Frons weakly convex; surface finely punctured, with short, gray, recumbent scales. Rostrum separated from frons by weak transverse impression just below level of eyes; surface flat; lateral margins of rostrum weakly elevated, punctured, and setose as on frons. Pronotum 1.3 times wider than long, widest at basal angles; sides weakly arcuate, strongly converging to narrowly rounded anterior margin; disc evenly convex, weakly transversely impressed before basal carina; surface of disc shining, with, shallow, irregularly placed, almost obsolete punctures; interpuncture space finely granulose-punctate; basal carina on disk acutely elevated, forming a very shallow V. Elytra about 1.2 times longer than wide; sides evenly arcuate to broadly rounded apex; disc evenly convex; striae narrowly and weakly impressed, with small punctures, these slightly more deeply impressed than striae; interstriae flat, finely granulose-punctate, about 4.0 times wider than striae.

**Distribution.** Ontario, south throughout the United States to Honduras. Ontario: Arnprior, Belleville, Chatterton, "Fisher Glen," Leamington, Marmora, Ottawa, Roseland, Simcoe, and Tillsonburg.

**Comments.** This is a variable, abundant species that oviposits in the male flowers of the common ragweed (*Ambrosia* species). A number of

variable populations have been described as separate species, but all merge from one to another. Valentine (1971) regards these populations as subspecies. All specimens in eastern Canada belong to the nominate subspecies; those from the western United States, and possibly southern British Columbia, are *T. tomentosus irregularis* Tanner. Adults are readily recognized by the small size, by the very shallow V formed by the basal carina on the pronotum, and by the diffuse color pattern. Nothing is known of the life history or habits of this species except for the notes given above.



Map 7. Collection localities of *Trigonorhinus tomentosus*.

### *Trigonorhinus sticticus* (Boheman)

Map 8

*Brachytarsus sticticus* Boheman, 1833:172 (type "America boreali"; NHRM); Blatchley and Leng 1916:39; Dillon and Dillon 1961:742.

*Trigonorhinus sticticus*: Valentine 1957:9; Valentine 1960:58, 81; Valentine 1971:247.

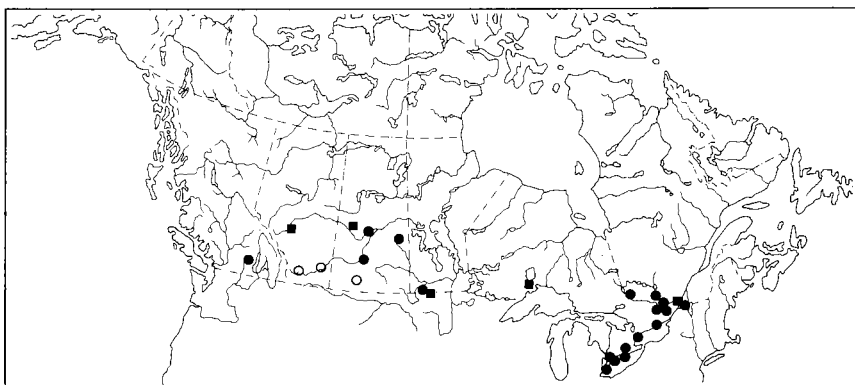
*Anthribus variegatus* Say, 1826:251 (name preoccupied) (no type locality given; type destroyed).

*Brachytarsus obsoletus* Fahraeus, 1839:167 (type, Pennsylvania; NHMP).

**Description.** Length 1.8–3.2 mm (head excluded). Integument of head, pronotum, and elytra mottled black and reddish brown. Pubescence tricolored, composed of white, light brown, and very dark brown setae, arranged as follows: pronotum with dark brown setae predominant on basal area and white or light brown setae predominant on anterior portion. Elytra with scattered light brown setae intermixed with white setae; posterior and lateral portions sometimes with scattered spots of dark brown setae surrounded by white setae in irregular pattern; interstriae 1–4 with 1 large or 2 connected dark brown spots on basal portion and 2 dark spots on median portion; median spots sometimes connected by dark setae on interstriae 1 and 2. Frons weakly convex, transversely impressed below eye level; surface finely punctured. Rostrum moderately prolonged; surface as on frons. Pronotum very slightly wider than long, widest just behind middle; sides distinctly arcuate, converging to narrowly rounded anterior margin; disc evenly convex, with narrow transverse impression just before basal carina; surface shining, with obscure, shallow punctures; interpuncture space minutely punctured or reticulate; basal carina weakly arcuate, acutely elevated. Elytra about 1.3 times longer than wide; sides evenly and slightly arcuate to broadly rounded apex; disc evenly convex; striae weakly impressed, with large, obscure, more deeply impressed punctures; interstriae 1.0–2.0 times wider than striae, minutely punctured.

**Distribution.** Quebec to British Columbia, and Northwest Territories south through the United States to California and Utah in the west and to Iowa and Florida in the east. British Columbia: 5 km south of Vernon. Manitoba: Boissevain. Northwest Territories: Fort Simpson (not on map). Ontario: Brittania, Chatham, Constance Bay, Delhi, Forestville, Leamington, Madoc, Marmora, Ottawa, Pelee Island, Rondeau Park, Tilbury, Toronto, Turkey Point, "Victoria," and Walsingham. Quebec: Covey Hill, Gatineau Park, Hull, Laniel, and Wakefield. Saskatchewan: Elbow, Greenbush (not on map), Hudson Bay, and Prince Albert.

**Comments.** This is probably the most common species of this genus in Canada. Adults are readily recognized by the color pattern described above. Nothing is known of the life history or habits of the species, except that it breeds in smut fungi, especially on corn, wheat, and wild grasses (*Andropogon* species).



**Map 8.** Collection localities of *Trigonorhinus stricticus* (●), *T. limbatus* (■), and *T. griseus* (○).

### *Trigonorhinus limbatus* (Say)

Map 8

*Anthrribus limbatus* Say, 1826:250 (no type locality given; type destroyed).

*Brachytarsus limbatus*: Blatchley and Leng 1916:40.

*Brachytarsoides limbatus*: Pierce 1930:30.

*Trigonorhinus limbatus*: Valentine 1959:9; Valentine 1960:58, 80; Valentine 1971:246.

**Description.** Length 1.8–3.2 mm (head excluded). Integument of head, pronotum, and elytra black to dark reddish brown; legs light reddish brown. Setae on elytral disc white, white and light brown intermixed, or all very light brown, with light brown setae often in small scattered spots. Setae on pronotum pale gray or brown, in spots or intermixed with darker brown. Frons weakly convex, weakly transversely impressed below eye level; surface finely punctured. Rostrum moderately prolonged; surface as on frons. Pronotum 1.2 times wider than long, widest at basal angles; sides distinctly arcuate, strongly converging to narrowly rounded anterior margin; disc evenly and strongly convex, weakly transversely impressed before basal carina; surface shining, with shallow, sparse punctures; interpuncture space minutely punctured or minutely reticulate; basal carina very weakly arcuate, acutely elevated. Elytra 1.2 times longer than wide; sides evenly and weakly arcuate to broadly rounded apex; disc evenly convex; striae weakly and narrowly impressed, with small, deeply impressed punctures; interstriae 3.0–4.0 times wider than striae, minutely reticulate-granulate.

**Distribution.** Quebec to Alberta; in the northern United States from Oregon and Washington to New Jersey. Alberta: Bilby. Manitoba: Treesbank. Ontario: Black Sturgeon Lake. Quebec: Choisy, Hudson Heights, and Rigaud. Saskatchewan: Great Deer.

**Comments.** Adults of this species are most easily recognized by the very diffuse color pattern, which is composed of white and very light brown (almost white) setae in various configurations. Over a dozen populations of this species have been described as separate species or subspecies, including, according to Valentine (1971), all nine forms named by Dethlefsen (1954). This synonymy has not been confirmed. Nothing is known of the life history or habits of this species, except that adults breed in the heads and stems of a variety of composite flowers, especially various species of sneezeweed (*Helenium* species).

*Trigonorhinus griseus* (LeConte)

Map 8

*Brachytarsus griseus* LeConte, 1876:405 (syntypes, Colorado; MCZ).

*Trigonorhinus griseus*: Valentine 1957:9; Valentine 1960:58, 80.

**Diagnosis.** Length 2.7–3.5 mm (head excluded). Integument as in *T. limbatus*. Setae on elytra bicolored; setae on interstriae 1–4 pale yellow, yellowish white, or pale brown; setae on interstriae 5–7 white; setae on interstriae 8–10 intermixed white and yellowish white. Pronotum with white and yellowish white setae intermixed, with a more or less distinct, narrow, longitudinal stripe. Otherwise as in *T. limbatus*.

**Distribution.** Known only in Alberta and Saskatchewan. Alberta: Lethbridge and Medicine Hat. Saskatchewan: St. Victor.

**Comments.** This species may be a particularly well-marked variant of *T. limbatus* or a distinct species. Valentine (1960) records it as a separate species, but in 1971 he does not mention the name, even though the species occurs near the geographic area he treated. Adults of this species are nearly identical to those of *T. limbatus* but may be distinguished by the color pattern described above. Adults have been collected on Colorado rubber plant (*Hymenoxys richardsonii*).

Genus *Ormiscus* Waterhouse

*Ormiscus* Waterhouse, 1845:37; Valentine 1960:62.

*Hormiscus* Gemminger and von Harold, 1872:2738.  
*Entomops* Gemminger and von Harold, 1872:2738.  
*Toxotropis* LeConte, 1876:397.  
*Gonops* LeConte, 1876:398.  
*Eusphyrus* LeConte, 1876:398.

This genus contains 21 species in North America, only two of which occur in Canada. The genus has never been revised. Species in this genus may be recognized by the strongly notched anterior margin of the eyes; by the strongly curving pronotal antebasal carina, which is closer to the base at the centre than at the sides; by the short and quadrate rostrum; and by the lack of a lateral carina on the pronotum. Many of the species bear a deceptive resemblance to species in *Trigonorhinus*, but the wide, quadrate rostrum, the lack of a lateral pronotal carina, and the distinctly notched eye distinguish *Ormiscus*.

**Description.** Pubescence abundant. Head not retractile. Rostrum (Fig. 29) prolonged, quadrate; sides straight, diverging; apex distinctly wider than distance between eyes; central portion of apex not produced. Antennae inserted on sides of rostrum, the insertion remote from eye. Eyes lateral, distinctly emarginate opposite antennal insertion (Fig. 30). Pronotum wider than long; lateral margins rounded, not carinate; antebasal carina sharply elevated, remote from elytral bases (Fig. 32) or fitting closely to elytral bases (Fig. 33); surface punctured or granulate. Elytra with sides parallel; apex broadly rounded; striae punctured in even rows. Tarsal claws cleft, with minute inner tooth (Fig. 38).

**Type species.** *Ormiscus variegatus* Waterhouse, monotypic.

**Comments.** Valentine (1960) gives a checklist of the species in this genus.

### Key to species of *Ormiscus* in Canada

1. Length (excluding head) 1.5–2.0 mm. Pronotum with antebasal carina remote from elytral bases (Fig. 33). Pronotal disc with large, shallow, abundant punctures. Quebec, Ontario ..... ***saltator* (LeConte)** (p. 49)
- Length (excluding head) 2.0–2.8 mm. Pronotum with antebasal carina close to elytral bases (Fig. 34). Pronotal disc with fine granules. Ontario ..... ***walshii* (LeConte)** (p. 50)

## Clé des espèces du genre *Ormiscus* du Canada

1. Longueur (à l'exclusion de la tête) : de 1,5 à 2,0 mm. Pronotum à carène antébasale éloigné de la base des élytres (fig. 33). Disque du pronotum percé de grosses perforations peu profondes, abondantes. Québec, Ontario ..... ***saltator* (LeConte)** (p. 49)  
Longueur (à l'exclusion de la tête) : de 2,0 à 2,8 mm. Pronotum à carène antébasale rapproché de la base des élytres (fig. 34). Disque du pronotum finement granuleux. Ontario .....  
..... ***walchii* (LeConte)** (p. 50)

### *Ormiscus saltator* LeConte

Figs. 29, 30, 33, 38; Map 9

*Hormiscus saltator* LeConte, 1876:397 (syntypes, middle and western states; MCZ).

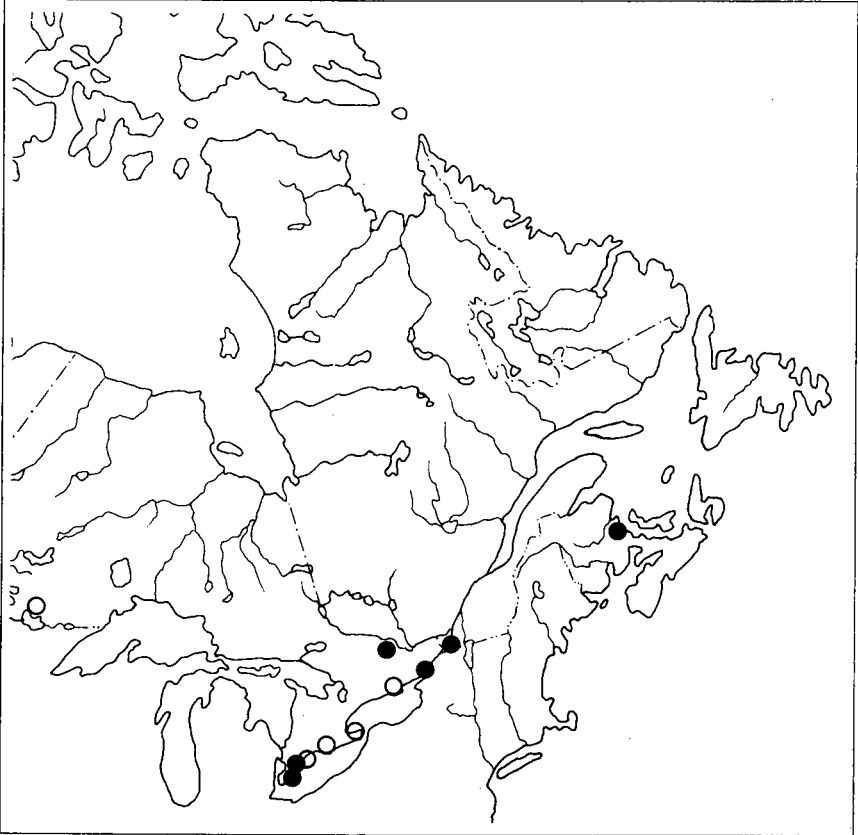
*Ormiscus saltator*: Blatchley and Leng 1916:26; Wolfrum 1929:47; Pierce 1930:7; Valentine 1960:62, 82.

*Ormiscus angulatus* Pierce, 1930:6 (holotype, Dallas, Texas; USNM).

**Description.** Length 1.5–2.0 mm (head excluded). Integument light to dark reddish brown; legs generally lighter. Elytral pubescence white or gray, with dark brown setae; white or gray setae usually more abundant, forming vague transverse line on basal third; posterior third variously mottled; brown setae in basal spot and large transverse median spot, and scattered on posterior two-thirds. Frons strongly convex, with large, shallow, closely placed punctures. Rostrum distinctly flattened, broad; surface as on frons. Pronotum 1.2 times wider than long, widest at basal angles; sides arcuate to broadly rounded anterior margin; disc weakly convex before antebasal carina; surface smooth, with dense, shallow, rather large, close set punctures; antebasal carina remote from base, acutely elevated, emarginate. Elytra about 1.3 times longer than wide; sides parallel on basal two-thirds; apex broadly rounded; striae punctured, not impressed, with deeply impressed moderately large punctures; interstriae about as wide as striae, smooth, with scattered minute points.

**Distribution.** New Brunswick to Ontario, south through the eastern United States to Texas and Florida and west to Nebraska. New Brunswick: Kouchibouguac National Park. Ontario: Arnprior, Brockville, Leamington, Prince Edward County, and Rondeau Provincial Park. Quebec: Hudson Heights.

**Comments.** Adults of this species are easily recognized and may be distinguished from *O. walshii* by the very different position of the basal carina and by the size as given in the key. Nothing is known of the biology or life history of this species, except that it breeds in dead wood of deciduous trees.



Map 9. Collection localities of *Ormiscus saltator* (●) and *O. walshii* (○).

*Ormiscus walshii* (LeConte)

Fig. 34; Map 9

*Eusphyrus walshii* LeConte, 1876:400 (holotype, Illinois; MCZ); Blatchley and Leng 1916:29; Wolfrum 1929:48; Pierce 1930:28.

*Ormiscus walshii*: Valentine 1960:62, 82.



**Description.** Length 2.0–2.8 mm (head excluded). Integument light to dark reddish brown; pronotum usually darker. Pubescence of elytra bicolored; setae white or gray and light brown to dark brown; brown setae scattered on posterior half of elytra and forming vague median spot; white setae scattered in small spots on posterior half of elytra and forming vague transverse spot extending to base of interstriae 6 and 7; interstriae 3–5 with basal brown spot. Frons strongly convex; surface dull, with small shallow punctures; interpuncture space densely reticulate. Rostrum broad, distinctly flattened; surface as on frons. Pronotum 1.5 times wider than long, widest at basal angles; sides weakly arcuate, converging to broadly rounded anterior margin; disc convex, surface densely granulate-punctate; antebasal carina emarginate, acutely elevated, close to elytral bases. Elytra 1.3 times longer than wide; sides parallel on basal two-thirds, broadly rounded behind; striae weakly impressed, with moderately deep moderately large punctures; interstriae smooth, convex, about 2.0 times wider than striae, with minute points.

**Distribution.** Ontario, south through the eastern United States to Florida. Ontario: Fisher Glen, Prince Edward County, Rainy River District, Rondeau Park, and St. Catharines.

**Comments.** Adults of this species are larger than those of *O. saltator* and may be further distinguished by the granulate pronotal disc, by the antebasal carina on the pronotum located near the elytral bases, and by the color pattern as described above. Nothing is known of the habits or biology of this species, except that it breeds in dead wood of deciduous trees.

## Family Nemonychidae

This small family has usually been included in Curculionidae or Attelabidae, although the larvae and adults show a distinct affinity to Anthribidae. In Anthribidae and Nemonychidae, the larval mandible has a molar area, which is otherwise lacking in the superfamily.

Crowson (1985) divided Nemonychidae into two families: Nemonychidae, containing only the genus *Nemonyx*; and Cimberidae, containing the remaining genera previously in Nemonychidae. *Nemonyx* differs from all modern Curculionoidea in that the procoxal cavities are not externally closed behind and the mesonotal cavities are not closed externally by the sterna. Moreover, *Nemonyx* breeds in the flowers of the genus *Delphinium* (Ranunculaceae) instead of in the male cones of Coniferae. The genus does not occur in Canada.

Kuschel (1989) shows that the traditional concept of Nemonychidae is correct because it represents a monophyletic unit. Kuschel points out

that the absence of a frontoclypeal suture in the larvae is a phylogenetically important feature that unites the genera of Nemonychidae into one unit.

Nine species in four genera occur in Canada; 17 species in five genera occur in North America. Adults and larvae feed on the staminate flowers of various pines and other conifers (Kuschel 1989).

This family has been revised recently (Kuschel 1989).

**Description.** Body elongate to oval, somewhat flattened, densely pubescent. Head with gular sutures distinct, separate; preular sutures absent; rostrum flattened, broad on distal half, not sexually dimorphic. Maxillary palpi flexible, 4-segmented; laciniae distinct; labrum distinct, separate. Antennae straight, 11-segmented, moniliform; antennal club 3-segmented, the segments only slightly enlarged. Legs with trochanter short, triangular; femur attached to side of trochanter. Abdomen with all 5 sternites free.

### Key to genera of Nemonychidae in Canada (in part after Kuschel 1989)

1. Mandibles inserted laterally; mandibular sockets only partly exposed in dorsal view; mandibles horizontal, continuous with rostral axis in lateral view. Antennae distinctly closer to mandibular sockets than combined length of first 3 antennal segments. Pronotum not emarginate at apex or moderately so. Epipleural carina narrow ..... 2  
Mandibles inserted dorsally; mandibular sockets entirely exposed in dorsal view; mandibles directed obliquely downward in relation to rostral axis. Antennae at least as distant from mandibular sockets as combined length of first 3 antennal segments. Pronotum deeply emarginate at apex. Epipleural carina broad ..... ***Lecontellus* Kuschel** (p. 53)
2. Mandibles evenly curved on outer edge in dorsal and lateral view, each with strong tooth on inner edge ..... ***Cimberis* des Gozis** (p. 55)  
Mandibles angulate on outer edge in dorsal or lateral view, unarmed on inner edge ..... 3
3. Frons abruptly sloping, forming deep impression at base of rostrum; frons nearly at right angles to base of rostrum (Fig. 40). Abdominal sternites of both sexes without tufts of white setae. Pubescence of pronotum and elytra moderately long, semierect ..... ***Acromacer* Kuschel** (p. 64)

Frons more gradually descending to rostral base (as in Fig 41). Abdomen of female with sternites 3 and 4 with or without 2 tufts of white setae in middle. Pubescence of pronotum and elytra fine, short, recumbent ..... **Pityomacer Kuschel** (p. 65)

### Clé des genres des Nemonychidae du Canada (en partie d'après Kuschel, 1989)

1. Mandibules insérées latéralement; insertions mandibulaires visibles en partie uniquement, en vue dorsale; mandibules horizontales, prolongeant l'axe du rostre en vue latérale. Distance entre les antennes et les insertions mandibulaires nettement plus petite que la longueur combinée des trois premiers articles antennaires. Pronotum non ou modérément émarginé à l'apex. Carène épipleurale étroite ..... 2

Mandibules insérées dorsalement; insertions entièrement visibles en vue dorsale; mandibules orientées obliquement vers le bas par rapport à l'axe du rostre. Distance entre les antennes et les insertions mandibulaires au moins égale à la longueur combinée des trois premiers articles antennaires. Pronotum profondément émarginé à l'apex. Carène épipleurale large ..... **Lecontellus Kuschel** (p. 53)

2. Bordure extérieure des mandibules courbée régulièrement, en vues dorsale et latérale, chaque mandibule portant une forte dent sur l'arête intérieure ..... **Kimberis des Gozis** (p. 55)

Bordure extérieure des mandibules anguleuse en vues dorsale ou latérale; arête intérieure non dentée ..... 3

3. Front formant une pente abrupte, profondément creusé à la base du rostre avec laquelle il fait un angle presque droit (fig. 40). Pas de touffes de soies blanches sur les sternites abdominaux chez aucun sexe. Pubescence du pronotum et des élytres modérément longue, semi-dressée ..... **Acromacer Kuschel** (p. 64)

Front descendant plus graduellement vers la base du rostre (comme à la figure 41). Sternites abdominaux 3 et 4 de la femelle ornés ou non de deux touffes de soies blanches au milieu. Poils de la pubescence du pronotum et des élytres fins, courts et couchés .... **Pityomacer Kuschel** (p. 65)

### Genus *Lecontellus* Kuschel

*Lecontellus* Kuschel, 1989:153.

This genus contains three species, only one of which might occur in western Canada. All members of the genus are associated with pine (*Pinus*) species. Members of this genus are easily recognized by the characters summarized in the above key.

**Description.** Head not fully retractile to eye. Frons about twice as wide as rostral apex. Eyes small, strongly convex, round or slightly oval in lateral view. Rostrum long, slender, widened at apex, curved, without carinae. Scrobes very shallow. Antennae inserted about midpoint of rostrum, at least as distant from mandibular sockets as combined length of first 3 antennal segments. Mandibles dorsolateral; sockets fully visible in dorsal view; mandibles armed or not on inner edge. Pronotum deeply emarginate at apex. Prosternum longer in males than in females; prosternal process small, often indistinct. Elytra elongate, punctate. Abdominal sternite 4 usually with 1 or 2 patches of dense, long setae (female) or patches absent (male). Tibiae straight with strong spur in both sexes, mucronate (male) or not mucronate (female).

**Type species.** *Dodyrhynchus byturoides* LeConte, by original designation.

*Lecontellus byturoides* (LeConte)

*Diodyrhynchus byturoides* LeConte, 1880:215 (lectotype, California; MCZ); Hatch 1971:337; Hamilton 1983b:42.

*Lecontellus byturoides*: Kuschel 1989:156.

**Description.** Length 3.0–5.1 mm. Body yellowish, reddish, or blackish; if elytra dark, then pronotum reddish; metasternum darker; abdomen dark (male) or pale (female); vestiture coarse, recumbent, or nearly so. Head coarsely and densely punctured. Frons convex, more finely punctured than head. Rostrum moderately to strongly curved; rostrum in males much less than three times longer than apical width; rostrum in females slightly more than three times longer than apical width; surface of rostrum densely punctured. Pronotum globular, punctured, more so in male. Elytra lacking postbasal impression; epipleural carina explanate. Abdominal sternites 3 and 4 each with 1 or 2 setaceous patches.

**Distribution.** Known from central Washington to southern California; not yet known in Canada, but probably occurs in southern British Columbia.

**Comments.** Nothing is known of the biology or life history of this species, except that specimens have been collected on Ponderosa pine (*Pinus ponderosa*). The lectotype was designated by Hamilton (1983b).

## Genus *Cimberis* des Gozis

*Rhinomacer* Olivier, 1807:457, 458 (nec Fabricius 1781: nec Mueller 1764).

*Cimberis* des Gozis, 1881:112 (replacement name for *Rhinomacer* Fabricius 1781); Anderson 1947:515; Kuschel 1989:131.

*Neocimberis* O'Brien and Wibmer, 1982:18.

This genus contains seven species in North America and one in Europe. Six species occur or may occur in Canada.

Members of the genus are easily recognized by the large tooth arming the inner edge of the mandible. Species from western Canada (British Columbia and Alberta) are difficult to distinguish by external characters alone. It is quite possible that additional collecting from varied hosts would yield several additional species.

The proper generic name for this group of species has been the subject of considerable debate. Most authors have used the name *Rhinomacer* Fabricius. Des Gozis (1881) showed this name to be a homonym, and then proposed the name *Cimberis* as a replacement. *Rhinomacer*, however, continued to be used, although some authors used *Cimberis*. O'Brien and Wibmer (1982), in attempting to resolve the issue, determined that neither of the above names was correct and proposed *Neocimberis* as a replacement. Kuschel (1983, 1989) states that *Cimberis* is the legitimate name for this group of species because the name was proposed to replace *Rhinomacer* Fabricius (1781). Kuschel's concept is adopted here.

Adults and larvae of species in this genus occur on pines and other coniferous trees. They feed on the staminate flowers, on which adults lay their eggs.

**Description.** Head not fully retractile to eyes. Frons 1.5–1.7 times wider than rostral apex. Eyes round or slightly elongate-oval, weakly to strongly convex. Rostrum robust or slender, slightly curved, densely punctured on dorsal surface, with carinae or smooth lines. Scobes shallow. Antennae inserted near apex of rostrum; distance of insertion from mandibular sockets less than combined length of first 2 antennal segments. Mandibles lateral, with evenly curved sides and strong tooth on inner edge; mandibular sockets partly exposed in dorsal view. Pronotum about as long as wide or slightly wider than long, narrower than elytra; surface punctured. Elytra elongate, covering pygidium. Abdominal sternites 3 and 4 with 1 or 2 patches of long, dense setae in males; patches absent in females. Front tibiae longer in males than in females, slightly curved inwards.

**Type species.** *Rhinomacer attelaboides* Fabricius, by original designation.

## Key to species of *Cimberis* in Canada

1. Pronotum broadly flattened or concave dorsally. Pubescence long, coarse, light brown to yellowish, with coppery reflections. Length 2.8–5.1 mm. British Columbia to Quebec ..... ***elongata* (LeConte)** (p. 58)  
     Pronotum not flattened or impressed dorsally. Pubescence variable but not as described above ..... 2
2. Species east of Continental Divide (Alberta, Ontario, Quebec, New Brunswick) ..... 3  
     Species west of Continental Divide (British Columbia) ..... 4
3. Frons narrow, 1.2–1.3 times wider than rostrum at apex. Rostrum robust, 2.0–2.2 longer than wide at apex. Abdominal sternites 3 and 4 of female each with 1 or 2 setaceous pits. Length 2.7–3.9 mm. Quebec, Alberta ..... ***pallipennis* (Blatchley)** (p. 59)  
     Frons wide, 1.4–1.6 times wider than rostrum at apex. Rostrum slender, 2.5–3.3 times longer than wide at apex. Abdominal sternites 3 and 4 of female each with 1 setaceous pit. Length 2.0–3.8 mm. Ontario, Quebec, New Brunswick .... ***pilosa* (Le Conte)** (p. 60)
4. Area of rostrum between antennal insertion and base similar in length in both sexes. Color uniformly black. Abdominal sternites 3 and 4 of female each with 1 setaceous pit. Length 2.8–4.0 mm .... ***decipens* Kuschel** (p. 60)  
     Area of rostrum between antennal insertion and base distinctly longer in female than in male. Color variable. Abdominal sternites 3 and 4 of female each with 1 or 2 setaceous pits ..... 5
5. Femora yellowish, reddish, or dark brown. Rostrum shorter than combined length of head and pronotum in both sexes. Abdominal sternites 3 and 4 of female each with 1 setaceous pit. Length 2.7–4.2 mm ..... ***compta* (LeConte)** (p. 61)  
     Femora dark brown. Rostrum as long as length of combined head and pronotum in female, shorter in male. Abdominal sternites 3 and 3 of female each with 2 setaceous pits. Length 2.5–4.1 mm ..... ***bihirsuta* Hatch** (p. 62)

## Clé des espèces du genre *Cimberis* du Canada

1. Pronotum largement aplati ou concave sur le plan dorsal. Poils de la pubescence longs, gros, brun pâle à jaunâtres, à éclat cuivreux.

- Longueur : de 2,8 à 5,1 mm. De la Colombie-Britannique au Québec  
..... ***elongata* (LeConte)** (p. 58)
- Pronotum ni aplati ni déprimé sur le plan dorsal. Pubescence variable, mais différant de la description ci-dessus ..... 2
2. Espèces à l'est de la ligne continentale de partage des eaux (Alberta vers l'est) ..... 3
- Espèces à l'ouest de la ligne continentale de partage des eaux (Colombie-Britannique) ..... 4
3. Front étroit, de 1,2 à 1,3 fois plus large que le rostre à l'apex. Rostre robuste, de 2,0 à 2,2 fois plus long que large à l'apex. Sternites abdominaux 3 et 4 de la femelle percés chacun d'un ou de deux pores sétigères. Longueur : de 2,7 à 3,9 mm. Québec et Alberta .....  
..... ***pallipennis* (Blatchley)** (p. 59)
- Front large, de 1,4 à 1,6 fois plus que le rostre à l'apex. Rostre grêle, de 2,5 à 3,3 fois plus long que large à l'apex. Sternites abdominaux 3 et 4 de la femelle percés chacun d'un pore sétigère. Longueur : de 2,0 à 3,8 mm. Ontario, Québec, Nouveau-Brunswick .....  
..... ***pilosa* (LeConte)** (p. 60)
4. Distance entre la fovéa antennaire et la base du rostre semblable chez les deux sexes. Couleur uniformément noire. Sternites abdominaux 3 et 4 de la femelle percés chacun d'un pore sétigère. Longueur : de 2,8 à 4,0 mm ..... ***decipens* Kuschel** (p. 60)
- Distance entre la fovéa antennaire et la base du rostre nettement plus longue chez la femelle que chez le mâle. Couleur variable. Sternites abdominaux 3 et 4 de la femelle percés chacun d'un ou de deux pores sétigères ..... 5
5. Fémurs jaunâtres, rougeâtres ou brun foncé. Rostre plus court que la longueur combinée de la tête et du pronotum chez les deux sexes. Sternites abdominaux 3 et 4 de la femelle percés chacun d'un pore sétigère. Longueur : de 2,7 à 4,2 mm .....  
..... ***compta* (LeConte)** (p. 61)
- Fémurs brun foncé. Rostre aussi long que la tête et le pronotum réunis chez la femelle, plus court chez le mâle. Sternites abdominaux 3 et 3 de la femelle percés chacun de deux pores sétigères. Longueur : de 2,5 à 4,1 mm .....  
..... ***bihirsuta* Hatch** (p. 62)

*Cimberis elongata* (LeConte)

Map 10

*Rhinomacer elongatus* LeConte, 1876:2 (lectotype, Pennsylvania; MCZ); Blatchley and Leng 1916:50, 51.

*Cimberis elongatus*: Hamilton 1969:52.

*Neocimberis elongatus*: O'Brien and Wibmer 1982:18.

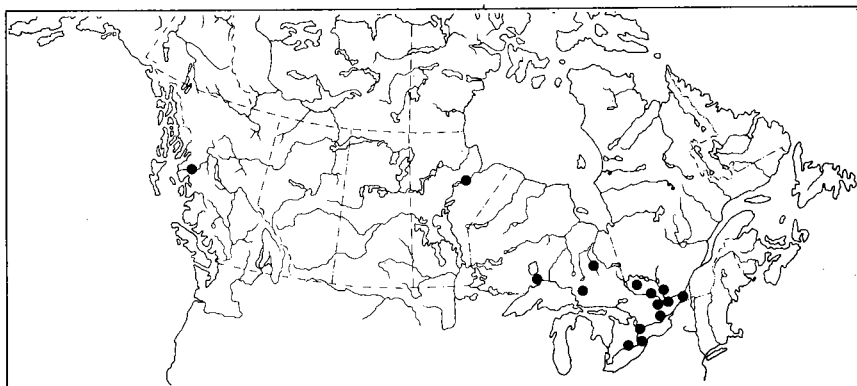
*Cimberis elongata*: Kuschel 1989:134.

**Description.** Length 2.8–5.1 mm. Integument black to dark reddish brown; legs, antennae, and sometimes rostrum lighter reddish brown. Pubescence light brown to yellowish, with coppery reflection. Head moderately convex between eyes. Frons 1.2–1.3 times wider than rostrum at apex; surface shining, with abundant, oval punctures, these forming vague longitudinal furrows; each puncture bearing 1 erect, moderately long yellowish seta. Rostrum 2.3–2.4 times longer than wide at apex, moderately curved; sides broadly curved: surface smooth, with numerous shallow, elongate punctures and 3 abbreviated carinae. Pronotum less than 1.1 times wider than long, widest at middle; sides moderately arcuate; disc broadly impressed; surface shining, densely, deeply punctured, setaceous; setae abundant, semierect, moderately long, light brown or yellowish. Elytra 1.8 times longer than wide; surface pubescent, with dense, random, deep punctures; setae abundant, semierect or nearly recumbent, moderately long. Abdominal sternites 3 and 4 of female each with 1 elongate tuft of white or yellowish white setae; abdominal sternites of male unmodified.

**Distribution.** British Columbia (?) to Quebec; eastern United States south to Georgia and west to Wisconsin and Kansas. British Columbia: Terrace (probably erroneous). Manitoba: Gillam. Ontario: Carleton County, Constance Bay, Marmora, Mattagami River, Nipigon, Normandale, Ottawa, Petawawa, Prince Edward County, Ridgeway, Smoky Falls, Toronto, and Wilno. Quebec: Aylmer, Fort Coulonge, Great Whale River, Kirks Ferry, Lake Opasatika, Mistassini Lake, Mont Fenowillet, Sainte-Rose, and Wright.

**Comments.** Adults of this species are readily distinguished from other members of the genus by the flattened to weakly impressed dorsal surface of the pronotum and by the type of vestiture as given in the key. The British Columbia locality given above is almost certainly erroneous. Adults have been taken on white pine (*Pinus strobus*), Virginia pine (*P. virginiana*), Jack pine (*P. banksiana*), lodgepole pine (*P. contorta*), and loblolly pine (*P. taeda*). Nothing else is known of the biology or life history of this species.





Map 10 Collection localities of *Cimberis elongata*.

*Cimberis pallipennis* (Blatchley)

*Rhinomacer pallipennis* Blatchley, 1916:51 (lectotype, Mount Washington, N.H.; MCZ).

*Cimberis pallipennis*: Kuschel 1989:136.

**Description.** Length 2.7–3.9 mm. Integument black; base of rostrum, elytra, and legs reddish brown; antennal club, parts of femora, and tarsi sometimes dark brown. Pubescence reddish gray, more reddish on elytra. Head moderately convex between eyes. Frons 1.2–1.3 times wider than rostrum at apex; surface shining, densely punctured. Rostrum 1.9–2.2 times longer than wide at apex, moderately curved; sides broadly curved; surface with or without carinae or smooth lines. Pronotum less than 1.1 times as long as wide, widest at middle; sides subparallel to distinctly arcuate; disc flat or nearly so; surface randomly punctured. Elytra 1.9 times longer than wide; surface randomly punctured. Abdominal sternites 3 and 4 of female each with 1 or 2 setaceous pits of variable size; abdominal sternites of male unmodified.

**Distribution.** Quebec, Alberta, south through the eastern United States to North Carolina and Tennessee, west to New Mexico. Alberta: Edmonton. Quebec: Duparquet, Gaspé County, and Mistassini Lake.

**Comments.** Hamilton (1969) and O'Brien and Wibmer (1982) placed this species as a synonym of *C. pilosa* (LeConte). Kuschel (1989) reestablished species status and stated that adults are easily separated from those of *C. pilosa* by both internal and external characters. His revision should be consulted for a full discussion of these differences. In most cases the narrow frons and the robust rostrum distinguish adults of this species from others in the genus. This species is relatively

unknown; Kuschel (1989) had only 22 specimens when he prepared his revision. Little is known of its distribution and nothing is known of its life history or biology, except for an unconfirmed record of one specimen from fir (*Abies* species) in New Mexico.

*Cimberis pilosa* (LeConte)

*Rhinomacer pilosus* LeConte, 1876:2 (lectotype, Virginia; MCZ); Blatchley and Leng 1916:50.

*Cimberis pilosus*: Hamilton 1969:59.

*Neocimberis pilosus*: O'Brien and Wibmer 1982:18.

*Cimberis pilosa*: Kuschel 1989:139.

**Description.** Length 2.0–3.8 mm. Integument reddish brown to black; if elytra reddish brown, then head, pronotum, and sterna often darker; antennae, basal area of rostrum, and legs entirely or partly reddish brown. Pubescence grayish to reddish. Head convex between eyes. Frons 1.4–1.6 times wider than rostrum at apex; surface densely punctured. Rostrum 2.5–3.3 times longer than wide at apex, moderately curved; sides broadly curved, abruptly widened at base; surface with or without carinae. Pronotum 1.0–1.3 times wider than long, widest at middle; sides strongly arcuate; disc weakly convex, with dense, coarse, elongate punctures. Elytra 1.7–1.9 times as long as wide; surface randomly punctured. Abdominal sternites 3 and 4 of female each with 1 setaceous pit of variable size; abdominal sternites of male unmodified.

**Distribution.** Ontario to New Brunswick, south through the eastern United States to Florida, west to Minnesota and Texas. New Brunswick: (no exact locality). Ontario: Ottawa. Quebec: Duparquet.

**Comments.** Adults of this species can be recognized by the distinctly slender rostrum, by the wide frons, and by the small, strongly convex eyes. Pupation occurs in ground litter. The lectotype was designated by Hamilton (1983b). Anderson (1947) described and illustrated the larva. Nothing further is known about the life history or biology of the species, except that specimens have been collected from staminate cones of pines (*Pinus* species).

*Cimberis decipiens* Kuschel

*Cimberis decipiens* Kuschel, 1989:137 (holotype, California; USNM).

**Description.** Length 2.8–4.0 mm. Integument black; labrum and sometimes base of rostrum reddish; antennal club and sometimes scape darkened; legs with tarsus, tibia, and base and apex of femur reddish or

rusty brown. Pubescence grey, sometimes golden brown on elytra, greyish on lateral elytral margins. Head moderately convex between eyes. Frons 1.2–1.3 times wider than rostrum at apex; surface punctured. Rostrum 1.8–2.0 times longer than wide at apex, robust, moderately curved; surface with 1–3 weak carinae. Pronotum about as long as wide or slightly wider than long, widest at middle; sides weakly or moderately arcuate; disc weakly convex, with shallow or deep, sparse to dense punctures. Elytra 1.9–2.1 times longer than wide; surface randomly punctured. Abdominal sternites 3 and 4 of female each with 1 setaceous transverse pit; abdominal sternites of male unmodified.

**Distribution.** British Columbia, south to California and Colorado. British Columbia: Errington and Vernon.

**Comments.** Adults of this species can be recognized by the robust rostrum and by the color pattern. In addition, the length and coarseness of the pubescence, the punctuation of the pronotum, and the length of the rostrum are distinctive. This is a common species in the Pacific Northwest, but nothing is known of its habits or life history, except that specimens have been collected on western white pine (*Pinus monticolae*) in Oregon.

### *Cimberis compta* (LeConte)

(Figs. 3, 17, 43, 44)

*Rhinomacer comptus* LeConte, 1876:2 (holotype, Lake Tahoe, Calif.; MCZ).

*Cimberis comptus*: Hamilton 1969:62; Hatch 1971:336.

*Neocimberis comptus*: O'Brien and Wimber 1982:18.

*Cimberis compta*: Kuschel 1989:141.

**Description.** Length 2.7–4.2 mm. Integument black to reddish brown, pronotum and head sometimes darker; legs and antennae usually lighter. Pubescence short, recumbent, white. Head moderately convex between eyes. Frons 1.2–1.4 times wider than rostrum at apex; surface shining, with deep, dense, scattered punctures, these not forming rows or grooves as in *C. elongata*; each puncture with moderately short, semirecumbent white setae. Rostrum 2.0–2.5 times as long as wide at apex, shorter than head and pronotum combined, moderately curved; sides broadly recurved; surface of rostrum smooth, finely punctured, with 1 or 3 low carinae or smooth lines on base. Pronotum less than 1.1 times wider than long, widest at middle; sides strongly arcuate; pronotal disc evenly convex; surface of pronotum shining, densely, deeply punctured, with abundant, fine, recumbent setae. Elytra 1.8 times as long as wide; surface punctured; punctures

dense, random, moderately deep, each bearing 1 seta; setae recumbent, coarse, narrowly scale-like. Abdominal sternites 3 and 4 of female each with 1 oval tuft of white or yellowish white setae; abdominal sternites of male unmodified.

**Distribution.** British Columbia, south in the western United States to California and New Mexico, east to Colorado and Montana. British Columbia: Vernon and Westbank.

**Comments.** Adults of this species are most easily distinguished by the evenly convex pronotum; by the distinct oval tufts of whitish setae on the median portion of abdominal sternites 3 and 4 of the female, by the coarse, somewhat flattened elytral setae, and by the distribution. Nothing is known of the life history or habits of this species, except that adults have been taken on ponderosa pine (*Pinus ponderosa*), lodgepole pine (*P. contorta*), and Douglas-fir (*Pseudotsuga menziesii*) in Canada, and on other species of pines (*Pinus*) and cypress (*Cupressus*) in the United States.

*Cimberis bihirsuta* (Hatch)

*Cimberis bihirsutus* Hatch, 1971:336 (holotype, Bear Springs, Ore.; USNM).

*Neocimberis bihirsutus*: O'Brien and Wibmer 1982:18.

*Cimberis bihirsuta*: Kuschel 1989:143.

**Description.** Length 2.5–4.1 mm. Very similar to *C. comptus*. Rostrum as long as combined head and pronotum in females; rostrum shorter in males. Abdominal sternites 3 and 4 of female with 2 small tufts of white setae.

**Distribution.** British Columbia south to central California, east to Idaho and Wyoming. British Columbia: Aspen Grove, Cariboo, Copper Mountain, Merritt, Midday Valley, and Westwick Lake.

**Comments.** Adults of this species are difficult to distinguished from those of related species. The only reliable feature is that females of *C. bihirsuta* consistently have 2 elongate, setaceous pits on abdominal sternites 3 and 4. Adults have been collected on lodgepole pine (*Pinus contorta*) and ponderosa pine (*P. ponderosa*).

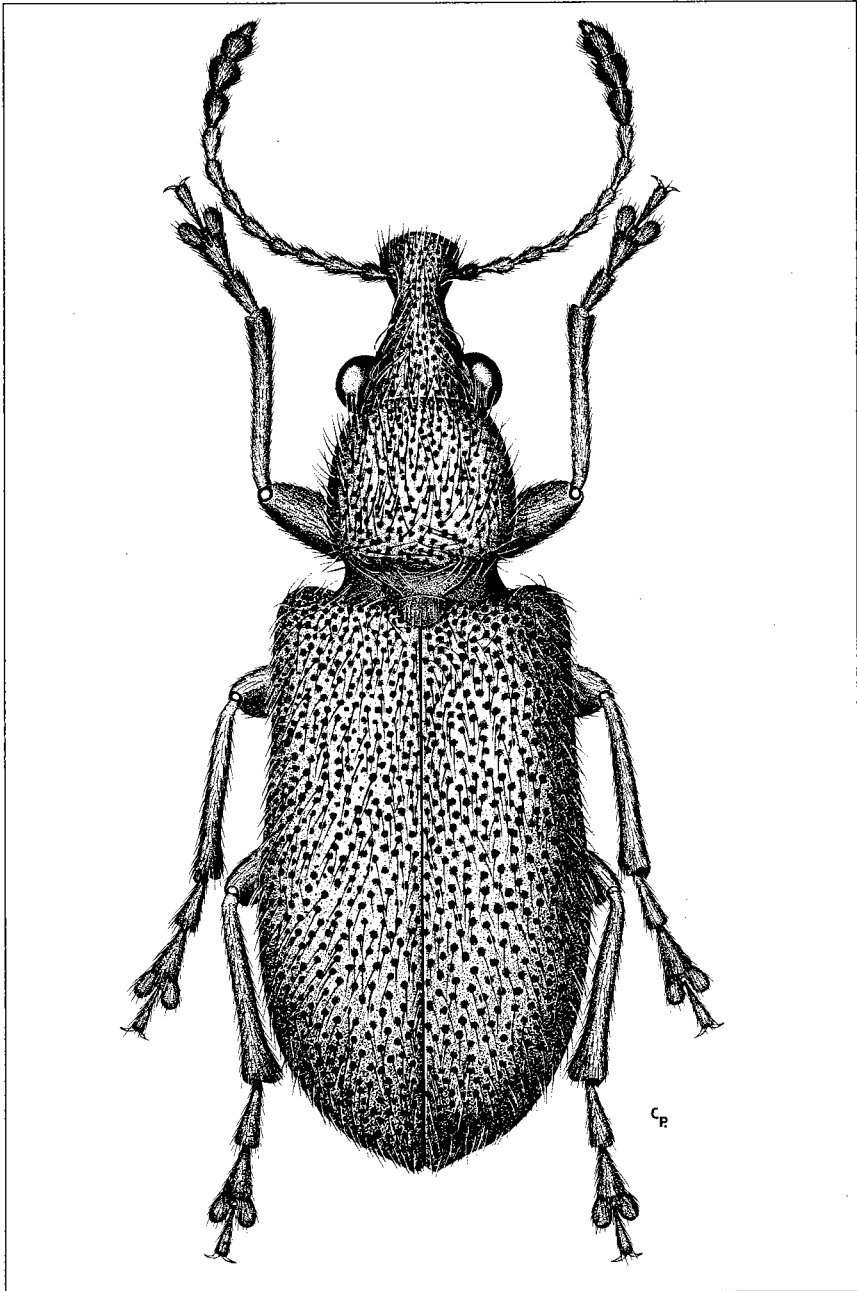


Fig. 3. *Cimberis compta*

## Genus *Acromacer* Kuschel

*Acromacer* Kuschel, 1989:152.

This genus contains one species. The genus is readily recognized by the dorsally smooth rostrum, which is inserted on the lower portion of the head at a nearly right angle to the frons and by a labrum, which tapers to a point and has no peg-like apical setae. It differs from *Cimberis* by the unarmed inner edge of the mandibles and from *Pityomacer* by (in addition to the characters mentioned in the key to genera) the labrum, which is trapezoidal or broadly rounded at the apex with 6 peg-like apical setae.

**Description.** Head not retractile to eyes. Frons wider than rostrum at apex. Eyes small, round, strongly convex. Rostrum moderately slender, strongly curved, without carinae. Antennae inserted about midpoint of rostrum; insertion point distant from mandibular sockets by less than length of scape in males or by more than length of scape in females; scrobes shallow. Mandibles inserted laterally; sockets fully visible in dorsal view; mandibles angulate on lateral margin, unarmed on inner margin. Pronotum wider than long, truncate or emarginate at apex; surface of pronotum deeply punctate. Elytra elongate, covering pygidium. Abdominal sternites lacking setaceous pits in both sexes.

**Type species.** *Rhinomacer bombifrons* LeConte, original designation and monotypy.

*Acromacer bombifrons* (LeConte)

Fig. 40

*Rhinomacer bombifrons* LeConte, 1876:412 (holotype, British Columbia; MCZ); Hatch 1971:337.

*Cimberis bombifrons*: Hamilton 1969:57.

*Neocimberis bombifrons*: O'Brien and Wibmer 1982:18.

*Acromacer bombifrons*: Kuschel 1989:153.

**Description.** Length 2.8–5.4 mm. Integument of head, pronotum, and rostrum dark brown; elytra, legs, and ventral surfaces lighter brown. Pubescence light brown. Head strongly convex just above eyes, weakly flattened just above base of rostrum. Frons nearly at right angles to base of rostrum and 1.4–1.6 times wider than rostrum at apex: surface shining, with rather large, deep punctures, each bearing 1 moderately long, erect, light brown seta. Rostrum 2.6–3.7 times longer

than wide at apex, weakly curved; sides gradually diverging to apex; surface smooth, with a few scattered, impressed points. Pronotum about 1.2 times wider than long, widest just behind middle; sides moderately to strongly arcuate; disc evenly convex; surface shining and densely, deeply punctured; setae brown, abundant, semirecumbent. Elytra about 1.5 times longer than wide and densely, randomly punctured; setae brownish, erect, abundant. Abdominal sternites unmodified.

**Distribution.** British Columbia and Alberta, south in the western United States to California and Nevada. Alberta: Banff. British Columbia: Canal Flats, Cariboo, Chilcotin, Clinton, Indian Meadows, "O'Keefe," Riske Creek, "Sorenson Lake," and "Spious Creek."

**Comments.** Adults of this species can be readily distinguished from those of other species in the family by the abrupt angle of the junction of the rostrum with the head (Fig. 40) and by the fact that the female lacks tufts of setae on the abdominal sternites. Nothing is known of the biology or life history of this species. Hamilton (1969) reports on a single adult collected on *Pinus* species in California. Kuschel (1989) lists lodgepole pine (*Pinus contorta*) and Jeffrey pine (*P. jeffreyi*) as hosts.

## Genus *Pityomacer* Kuschel

*Pityomacer* Kuschel, 190:145.

Three species are included in this genus by Kuschel (1989), one of which occurs in western Canada. Members of this genus are distinguished from those in *Acromacer* and *Cimberis* by the granulose pronotum and by characters of the male genitalia. See Kuschel (1989) for details of these differences. In addition, members of *Pityomacer* differ from those in *Cimberis* by the antennae inserted closer to the middle of the rostrum and by mandibles that are angulate on the outer margin and unarmed on the inner margin. Members of this genus are distinguished from those in *Acromacer* by the distinct punctures on the dorsum of the basal portion of the rostrum and by other characters of the mouthparts.

**Description.** Head not retractile to eyes. Frons less than 2.0 times wider than rostral apex. Eyes small, round or slightly oval, strongly convex. Rostrum slender, widened at apex, weakly curved, with 3 carinae or smooth lines separated by 2 rows of punctures. Scrobes shallow. Antennae distant from mandibular sockets by about combined length of first 2 antennal segments. Mandibles inserted laterally; mandibular sockets partly exposed in dorsal view; sides of mandibles angulate on outer margin, unarmed on inner margin. Pronotum shallowly to deeply emarginate at apex, wider than long; surface of

pronotum weakly granulose. Elytra elongate, covering pygidium. Abdominal sternites 3 and 4 with patches of dense setae present or absent in females, absent in males.

**Type species.** *Pityomacer carmelites* Kuschel, by original designation.

### *Pityomacer pix* Kuschel

*Pityomacer pix* Kuschel, 1989:147 (holotype, Vernon, B.C.; UBC).

**Description.** Length 3.0–3.3 mm. Integument of head, pronotum, and sterna black; elytra and legs usually dark brown. Pubescence uniformly gray or golden brown on dorsum, pale laterally. Head convex between eyes. Frons 1.5–1.7 times wider than rostrum at apex; surface punctured. Rostrum 3.5–3.7 times longer than wide at apex, robust, weakly curved; base with 1 distinct carina, the lateral carinae obsolete. Pronotum 1.1–1.2 times wider than long, widest at middle; sides moderately arcuate; disc weakly concave; surface sparsely to densely granulate-punctate. Elytra 1.8–2.0 times longer than wide; surface randomly punctured. Abdominal sternites 3 and 4 (or 4 only) of female each with or without 1 pair of setal tufts; abdominal sternites of male unmodified.

**Distribution.** British Columbia and Alberta, south to Washington, Oregon, and Montana. Alberta: Elkwater. British Columbia: Vernon.

**Comments.** This species is rarely encountered, and nothing is known of its habits or life history.

## Family Brentidae

This family contains over 1000 species around the world, but only six species in five genera occur in North America, including one species in Canada. The females lay their eggs in wood; adults are found under bark or in decayed wood. The adults attack wood-eating insects or feed on mycelia or on the sap flowing from tree wounds. The larvae consume wood or mycelium and live in fallen logs of oak, poplar, maple, and beech.

The generic classification of this family is well established.

**Description.** Body narrow, elongate, cylindrical (Fig. 4), reddish with obscure black markings or entirely blackish. Pubescence absent except on appendages. Head elongate, constricted at base; gular sutures fused; preular sutures absent. Rostrum of male broad, generally short



(Fig. 45); rostrum of female narrow, slender, cylindrical (Fig. 46). Maxillary palpi and labrum absent. Antennae straight, 11-segmented, moniliform; antennal club not distinct (Fig. 4). Legs with trochanter small, triangular; femur attached to side of trochanter. Abdomen with first 2 or 4 sternites connate.

## Genus *Arrhenodes* Schoenherr

*Arrhenodes* Schoenherr, 1826:70.

This genus contains only one species, which occurs from eastern North America to Mexico. It can be easily recognized by the illustration (Fig. 4).

**Description.** Elongate, brown. Head broad; hind angles obsolete; mouthparts concealed by mentum. Mandibles of male curved, flattened, pointed, toothed on inner edge; mandibles of female small, pincer-shaped. Legs with mesocoxa rounded, separated; femur slender, cylindrical at base; protibia sinuate, obliquely grooved on inner side, armed with hook on outer side of tip and spur on inner side; tarsal claws large, simple, divergent.

**Type species.** *Brentus dispar* Linnaeus, subsequent designation.

### *Arrhenodes minutus* (Drury)

Figs. 4, 16, 45, 46; Map 11

*Curculio minutus* Drury, 1770:95 (type, Virginia; BMNH?).

*Brentus minutus*: Drury and Westwood 1837:90.

*Eupsalis minuta*: von Schonfeldt 1908:36; Blatchley and Leng 1916:20.

*Platysystrophus minutus*: Kleine 1927:38.

*Arrhenodes minutus*: Jaques 1951:308; Rossi 1955:61; Arnett 1960:967; Dillon and Dillon 1961:737-739; Arnett, Downie, and Jaques 1980:352; White 1983:308, 310.

*Brentus septentrionis* Herbst, 1797:183 (type, North America; ZMHU).

*Brentus brunneus* Panzer, 1800:44 (type material unknown).

*Brentus maxillosus* Olivier, 1807:443 (types, "Carolina" and Georgia; NHMP).

*Eupsalis lecontei* Power, 1878:494 (type, Canada; NHMP).

*Eupsalis sallei* Power, 1878:494 (type, Canada; NHMP).

*Eupsalis minuta* var. *paupercula* Blatchley, 1916:21.

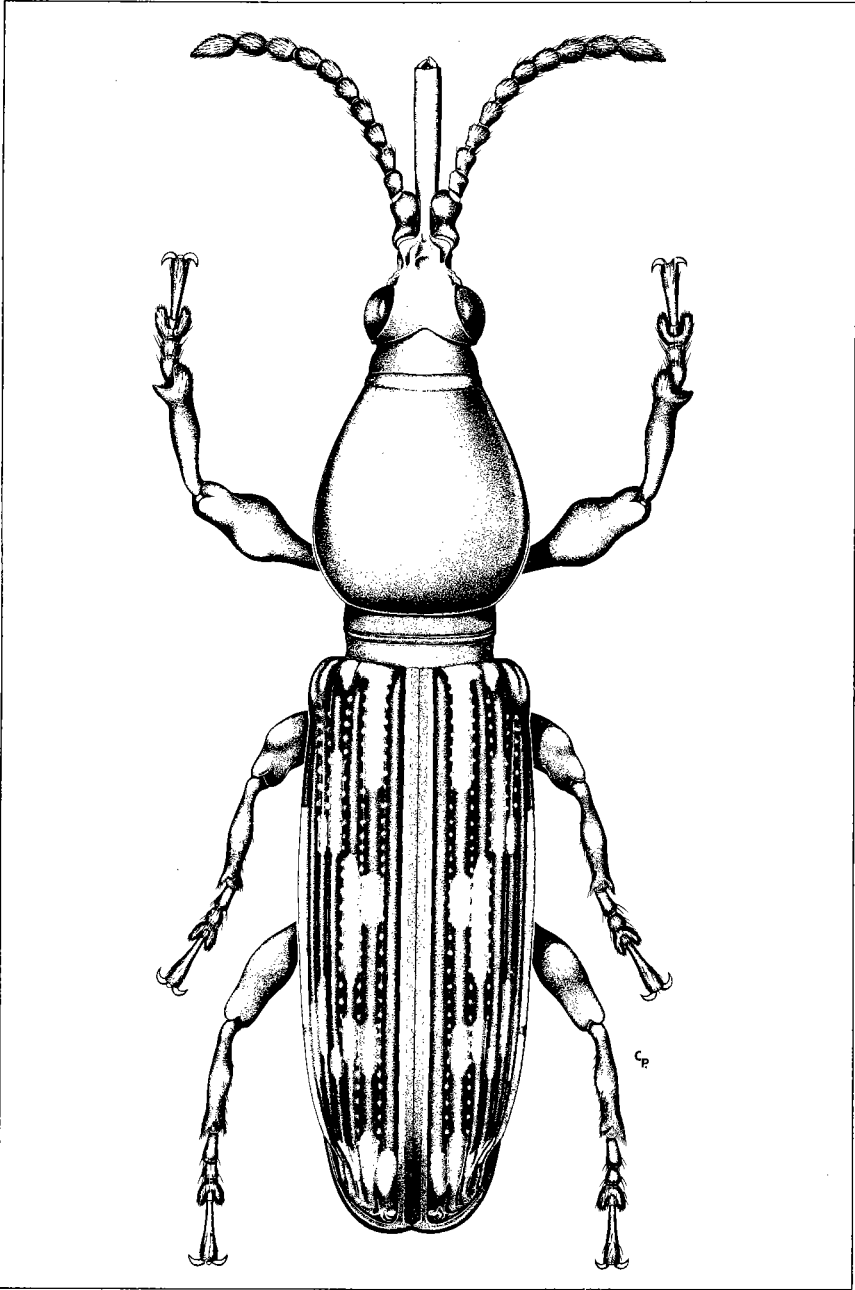
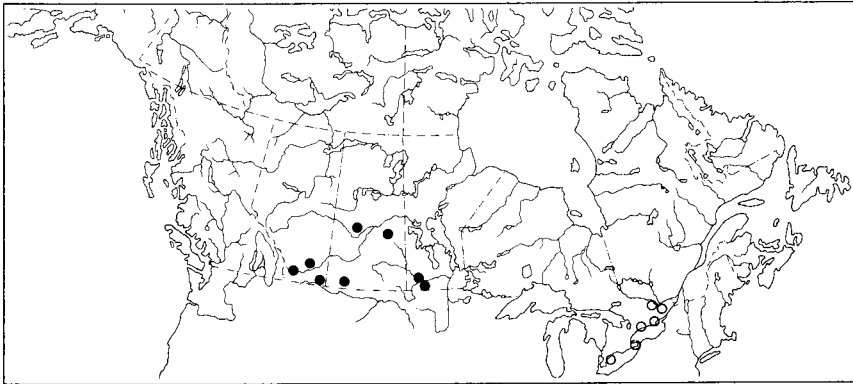


Fig. 4. *Arrhenodes minutus*

**Description.** Length 7.0–17.0 mm (male), 6.5–14.0 mm (female). Integument reddish brown to black. Elytra with narrow, elongate yellowish spots; spots often joined to form 2 or 3 transverse bars. Pronotum about 1.4 times longer than wide, widest behind middle; base constricted; sides broadly arcuate, strongly converging to truncate apex; disc smooth, brightly shining, with minute, sparse punctures. Elytra more than 2.5 times longer than wide; sides parallel on basal two-thirds; apex broadly rounded; striae deeply impressed, with coarse punctures; interstriae convex, about 2.0–3.0 times as wide as striae, the interstriae smooth, with scattered finely impressed points.

**Distribution.** Southern Ontario and Quebec, south through the eastern United States to northern Mexico, west to Nebraska. Ontario: Bells Corners, Constance Bay, DeCew Falls, Dunrobin, Hastings County, Kanata, "Kerr Lake," Kinburn, Marmora, Osgoode, Paris, Pelee Island, Point Pelee, Prince Edward County, Rondeau Provincial Park, South March, and Toronto. Quebec: Lac Lucerne and Lac Taylor (not on map).



Map 11. Collection localities of *Nanophyes canadensis* (●) and *Arrhenodes minutus* (○).

**Comments.** This species is easily recognized by the illustrations (Fig. 4, female; Fig. 45, female; and Fig. 46, male) and cannot be confused with any other Canadian beetle. The larva was described by Boving and Craighead (1930). Buchanan (1960) investigated the biology of this species in Missouri, and his observations are probably valid for Canada. This species is often known as the oak timberworm because of the damage caused by the larva as it bores into the wood. The resulting damage can degrade or even destroy the value of commercial oak stock. Eggs are laid from mid May to mid June in wounds or other injuries that expose the bare wood on living trees. Each egg is placed in a hole bored by the female; each hole is nearly as deep as the length of the rostrum. No

protective cover or fluid is placed over the egg. The incubation period is not known. Upon hatching, the larvae tunnel into the wood. The galleries are nearly straight across the grain of the wood. The larva keeps the tunnel clean by pushing the boring dust out through the hole made by the female to deposit her egg. Most larvae develop in living trees, but some are found to mature in trees that have been dead for at least 2 years. Larvae can be so numerous that the wood is rendered commercially useless. Pupation takes place within the gallery, but the length of the pupal period has not been determined. In addition to oak (*Quercus* species), specimens have been found in paper birch (*Betula papyrifera*), elm (*Ulmus* species), basswood (*Tilia americana*), poplar (*Populus* species), and beech (*Fagus* species).

## Family Apionidae

This is a large family, with more than 1500 species around the world. Approximately 300 species in three genera occur in North America. The taxonomy of this group poses formidable difficulties. In addition to the large number of species, the individuals are small, usually 1.0–3.0 mm long, and diagnostic taxonomic characters are difficult to observe. The present treatment recognizes species in three genera that occur or probably occur in Canada and Alaska.

**Description.** Body robust to moderately slender, usually black; appendages may be lighter. Pubescence sparse. Head with gular sutures fused; preular sutures absent. Rostrum usually longer in female than in male. Maxillary palpus rigid, 2-segmented; lacinia distinct; labrum absent. Antennae straight, moniliform (except *Nanophyes*); antennal club distinct, compact. Legs with trochanter elongate, cylindrical; femur attached to apex of trochanter (Fig. 20). Abdomen with first and second visible sternites connate.

**Comments.** Kissinger (1968) reviewed the entire family for North and Central America. He provided keys and descriptions for all species, and his monograph should be consulted for further information.

### Key to genera of Apionidae in Canada and Alaska

1. Antennae geniculate; scapes very long, slender (Fig. 19). Elytra nearly monochromatic, pale. Pubescence consisting of small, sparse, fine, recumbent scales. Interstria 8 smooth on basal quarter. Length 1.2–1.6 mm. Alberta, Manitoba ..... *Nanophyes* Schoenherr (p. 71)

- Antennae straight; scapes variable in length (Fig. 15). Combination of other characters not as above ..... 2
2. Pronotum nearly cylindrical in dorsal view; sides parallel or weakly arcuate. Elytra with 10 complete striae. Tarsal segment 1 usually longer than wide. Length less than 3.0 mm ..... **Apion Herbst** (p. 74)
- Pronotum with sides broadly rounded, widest near middle. Elytra with 9 complete striae. Tarsal segment 1 as wide as long. Length 3.1–4.8 mm ..... **Podapion Riley** (p. 140)

## Clé des genres des Apionidae du Canada et de l'Alaska

1. Antennes géniculées; scapes très longs, grêles (fig. 19). Élytres presque monochromes, pâles. Pubescence constituée de petites écailles clairsemées, fines, couchées. Interstrie 8 lisse dans son quart basal. Longueur : de 1,2 à 1,6 mm. Alberta, Manitoba ..... **Nanophyes Schoenherr** (p. 71)
- Antennes droites; scapes de longueur variable (fig. 15). Combinaison des autres caractères différents de la description ci-dessus ..... 2
2. Pronotum presque cylindrique en vue dorsale; côtés parallèles ou faiblement arqués. Dix stries élytrales complètes. Article 1 du tarse habituellement plus long que large. Longueur : moins de 3,0 mm ..... **Apion Herbst** (p. 74)
- Pronotum ayant les côtés généralement arrondis, plus larges près du milieu. Neuf stries élytrales complètes. Article 1 du tarse aussi large que long. Longueur : de 3,1 à 4,8 mm ..... **Podapion Riley** (p. 140)

## Genus *Nanophyes* Schoenherr

*Nanodes* Schoenherr, 1825:587.

*Nanophyes* Schoenherr, 1838:780.

*Pseudotychius* Blatchley, 1922:102; Kissinger 1956:264.

*Nanodactylus* Blatchley, 1922:103; Kissinger 1956:264.

This genus of about 400 species is known in all parts of the world except Central and South America. Four species are known in North America, only one of which occurs in Canada. Hoffmann (1958) states that in France species of this genus form galls on various plants.

**Description.** Rostrum elongate, cylindrical. Antennae geniculate (Fig. 19); scape very long, slender; funicle with basal 4 or 5 segments moderately slender and apical 2 segments enlarged and setose; antennal club compact, composed of 3 or 4 closely fused segments. Eyes round, laterally extending to dorsal surface, dorsally very close. Frons narrow. Pronotum conical; sides tapering sharply to anterior margin; basal margin finely elevated. Elytra widest near humeri; sides strongly and evenly curved to broadly rounded apex; striae punctured in even rows. Legs with middle coxae separated by intercoxal process; femur with 0–3 teeth; male tibia mucronate.

**Type species.** *Curculio lythri* Fabricius, by original designation.

**Comments.** Schoenherr (1838) proposed *Nanophyes* as a replacement name for *Nanodes* Schoenherr (1825), which he erroneously thought was preoccupied by *Nanodes* Stephens (1826) (Aves). According to the *International Code of Zoological Nomenclature*, *Nanodes* is the correct name for this group of species; however, Alonso-Zarazaga and Dieckman (1987) appealed to the International Commission on Zoological Nomenclature to have *Nanophyes* declared the valid name. The commission decided in 1989 to conserve *Nanophyes* and declared it to be the proper name for this genus. Kissinger (1968) revised this genus (under the name *Nanophyes* Schoenherr) for North America and gives a key to distinguish the North American species.

### *Nanophyes canadensis* Brown

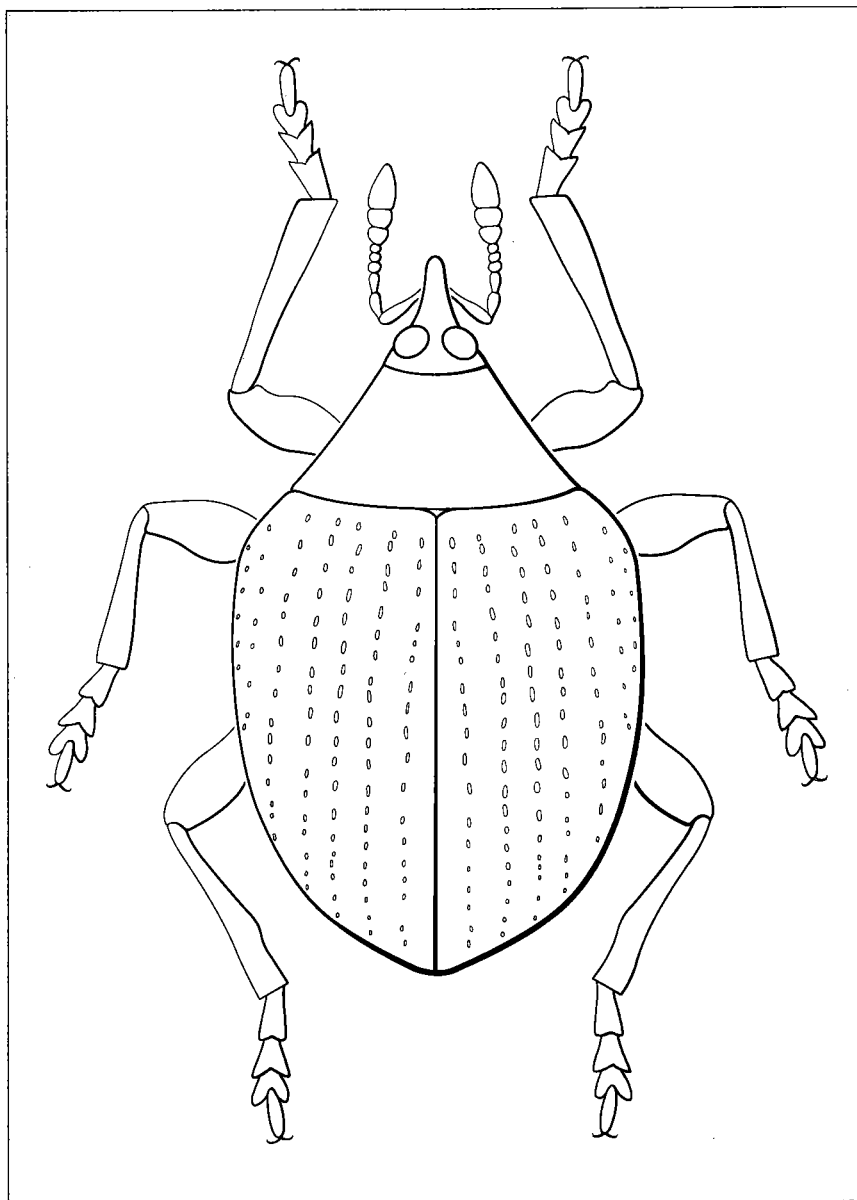
Figs. 5, 19; Map 11

*Nanophyes canadensis* Brown, 1944:10 (holotype, Brooks, Alta.; CNC); Kissinger 1968:14; Hatch 1971:332.

*Nanodes canadensis*: O'Brien and Wibmer 1982:19.

**Description.** Length 1.2–1.6 mm. Body light reddish brown; head and ventral surface much darker. Pubescence consisting of white, very fine, sparse setae. Rostrum of male slightly curved in lateral view, 1.3–1.4 times longer than pronotum; sides in dorsal view evenly diverging from base to antennal insertion, then nearly parallel to tip; surface with moderately high, median, with dorsal carina behind antennal insertion and with sublateral carina, lateral carina, and low, indistinct carina representing dorsal margin of scrobe; surface finely alutaceous, with minute shallow punctures and fine short scales. Rostrum of female similar to that of male, but portion beyond antennal insertion polished and with more distinct punctures. Antennae inserted at basal 0.5–0.6 of rostrum. Frons 0.3–0.4 times wider than tip of rostrum. Pronotum 1.6–1.7 times as wide as long; sides strongly converging; surface with shallow

punctures and fine scales. Elytra 1.2 times longer than wide, strongly convex; striae distinct, with shallow punctures; interstriae about twice as wide as striae; surface smooth, shining, with numerous fine scales similar to those on pronotum.



**Fig. 5.** *Nanophyes canadensis*

**Distribution.** Manitoba to Alberta, south in the western United States to Colorado. Alberta: Brooks, Cypress Hills, and Lethbridge. Manitoba: Brandon, Ninette, and 5 miles southwest of Shilo. Saskatchewan: Fort Walsh, "Great Bear," Willow, and 13 km west of Tisdale.

**Comments.** This species is easily recognized, since it is the only member of Apionidae with geniculate antennae (Fig. 19). The other characters given in the key and the generic and species diagnosis also help in recognizing this distinctive species. Specimens of this species have been collected from alfalfa (*Medicago sativa*) fields in Alberta.

### Genus *Apion* Herbst

*Apion* Herbst, 1797:100; Wagner 1910:7-67; Kissinger 1968:28; O'Brien and Wibmer 1982:20.

Kissinger (1968) provides 51 generic synonyms.

This is a large and extremely complex genus of over 300 North and Central American species. Identifications to the specific level are very difficult, the difficulty increased by the small size of specimens (usually 1.5-3.0 mm long) and by the lack of reliable, readily discernable taxonomic characters. Correct identification is usually possible only if a series of correctly determined specimens is available for comparison. Canadian specimens are somewhat easier to identify, simply because the number of species is much smaller.

Forty-five species are treated in the following key and discussions. A number of these are not yet recorded in Canada, but they should occur in the southern regions of this country.

The key that follows uses mostly male characters. Males are distinguished from females by the shorter, more coarsely sculptured rostrum and (sometimes) by an upward deflection of the last abdominal sternite. Also, the last abdominal sternite of males is often notched at the apex, making the tip of the last abdominal tergite visible. Measurements are given from the anterior margin of the pronotum to the elytral apex in dorsal view, head and rostrum excluded.

**Description.** Rostrum variable in length, cylindrical, filiform, sometimes thick, straight to strongly curved, sometimes wedge- or needle-shaped. Antennae straight; funicle with 7 segments; antennal club generally oval or oblong. Eyes round or oval, weakly to strongly convex. Pronotum variable, cylindrical, rounded laterally. Elytra oval or oblong, more or less convex, wider than pronotum; sides broadly rounded to elytral apex; striae usually punctured in regular rows; interstria 9 often with 1 or 2 specialized setae. Pygidium covered by



elytral apices. Middle coxae separated by junction between mesosternal process and metasternal piece (Fig. 48), or middle coxae contiguous or narrowly separated with a distinct gap between the mesosternal and metasternal processes (Fig. 47). Tibiae of males often mucronate in some species.

**Type species.** *Attelabus frumentarius* Fabricius, by subsequent designation.

**Comments.** Over 1300 species of this genus are known from all areas of the world. The genus has been broken into a number of subgenera, which are not used in the following treatment, except in the key to species. The larvae burrow in stems, feed on the developing pericarp of fruit, or develop in seeds of a wide variety of herbaceous plants, mostly Compositae and Leguminosae. They are often the cause of serious economic loss. Kissinger (1968) revised the genus, but a considerable number of taxonomic problems still remain. For ease in finding a species discussion, individual species discussions are arranged in alphabetical order following the key.

Key to subgenera and species of *Apion* in Canada and  
Alaska

- 1. Middle coxae separated by mesosternal process and intercoxal process of metasternum (Fig. 48) ..... 2
- Middle coxae contiguous or narrowly separated, with distinct gap between mesosternal and metasternal processes (Fig. 47) ..... 44
- 2. Tibiae of male wholly or partly mucronate ..... 3
- No male tibiae mucronate ..... 26
- 3. Front legs of male with polished area on ventral surface of femur; area generally limited posteriorly by prominent longitudinal carina, with or without striate area (Figs. 50–54). Metasternum generally with paired spicules near median area of posterior margin (subgenus *Fallapion*) ..... 4
- Front legs of male not modified as above on ventral surface of femur. Metasternum without paired spicules near median area of posterior margin ..... 12
- 4. Limiting carina of smooth area on ventral surface of each front femur of male absent or located on outer lateral side of femur (Figs. 50–54) ..... 5

- Limiting carina of smooth area on ventral surface of each front femur of male located on inner lateral side of femur. Length 2.0–2.3 mm. Washington ..... ***funereum* Fall** (p. 112)
5. Forelegs of male each with abrupt tubercle on inner side of apical third of femur (Figs. 52, 53, 54) ..... 6
- Forelegs of male each with apical third of inner side of femur not swollen or only slightly so (Figs. 50, 51) ..... 10
6. Polished area of each front femur of male with more or less distinct limiting lateral carina (Figs. 53, 54) ..... 7
- Polished area of each front femur of male lacking lateral carina. Length 1.8–2.3 mm. Manitoba to Alberta ..... ***speculiferum* Fall** (p. 136)
7. Abdominal sternites finely, sparsely punctured ..... 8
- Abdominal sternites coarsely, deeply punctured. Length 1.8–2.2 mm. Quebec ..... ***impeditum* Fall** (p. 117)
8. Front tibiae not greatly expanded toward apex (Fig. 54). Front femora of male weakly protuberant on inner side ..... 9
- Front tibiae strongly expanded toward apex (Fig. 52). Front femora of male strongly protuberant on inner side. Length 1.7–2.1 mm. New Brunswick to British Columbia ... ***finitimum* Fall** (p. 110)
9. Ventral surface of polished area of each front femur of male lacking distinct striae (Fig. 54). Length 2.0–2.5 mm. Ontario ..... ***melanarium* Gerstaecker** (p. 120)
- Ventral surface of polished area of each front femur of male with distinct, separated striae next to lateral carina. Length 2.0–3.0 mm. Saskatchewan, Alberta ..... ***robustum* Smith** (p. 132)
10. Distance between each eye and antennal insertion not less than width of frons ..... 11
- Distance between each eye and antennal insertion less than width of frons. Length 1.7–2.1 mm. Eastern United States ..... ***bischoffi* Fall** (p. 94)
11. Rostrum of male less than 1.4 times longer than pronotum. Rostrum of female 1.9–2.0 times longer than pronotum. Polished area of each front femur of male with fine, distinct striae throughout. Elytra more than 1.5 times longer than wide. Length 2.2–2.8 mm. Alberta ..... ***occidentale* Fall** (p. 122)
- Rostrum more than 1.4 times (male) or 1.6–2.4 times (female) longer than pronotum. Polished area of each front femur of male generally without striae or with striae very faint and occurring near

- limiting ridge (Fig. 50). Elytra less than 1.5 times longer than wide. Length 1.8–2.3 mm. Ontario to British Columbia ..... ***pennsylvanicum* Boheman** (p. 125)
12. All tibiae of male mucronate and legs pale reddish yellow. Male pronotum distinctly longer than wide at base. Length 2.6–3.2 mm. Quebec, Ontario (subgenus *Rhopalapion*) ..... ***longirostre* Olivier** (p. 118)
- Middle and hind tibiae of male mucronate. Front legs variously modified. If all tibiae mucronate, then legs dark (subgenus *Trichapion*) ..... 13
13. Metasternum in male with paired acute tubercles near middle of posterior margin ..... 14
- Metasternum in male lacking paired acute tubercles near middle of posterior margin ..... 15
14. Aedeagus in lateral view with apex of median lobe produced dorsally and ventrally (Fig. 142); lobe in dorsal view with sides near apex parallel (Fig. 143). Rostrum of female 0.56–0.79 mm long. Antennae of female inserted in front of eye at a distance 1.5–2.3 times width of frons. Length 1.6–2.5 mm. Washington ..... ***opacicolle* Smith** (p. 123)
- Aedeagus in lateral view with median lobe flat at apex (Fig. 140); lobe in dorsal view with sides evenly converging toward apex (Fig. 141). Rostrum of female 0.46–0.53 mm long. Antennae of female inserted in front of eye at a distance 1.2–1.5 times width of frons. Length 1.6–2.0 mm. Washington ..... ***hatchi* Kissinger** (p. 113)
15. All tibiae of male mucronate, the anterior tibiae sometimes minutely so ..... 16
- Tibiae of male forelegs and middle legs, or middle and hindlegs, mucronate ..... 18
16. Pronotum with distinct basal flange ..... 17
- Pronotum without basal flange. Length 2.1–2.3 mm. Manitoba to Alberta ..... ***tenuirostrum* Smith** (p. 137)
17. Antennal scrobes with dorsal margins oblique, angulate behind antennal insertion. Frons without median impression. Length 2.3–3.3 mm. Manitoba to Alberta ..... ***commodum* Fall** (p. 101)
- Antennal scrobe with dorsal margins evenly descending to below eye. Frons with shallow median impression and 2 lateral rows of punctures. Length 2.0–2.8 mm. Washington ..... ***cordatum* Smith** (p. 103)

18. Tibiae of male forelegs mucronate. Length 1.6–2.3 mm. Washington  
..... ***cribricolle* LeConte** (p. 104)  
Tibiae of male forelegs not mucronate ..... 19
19. Distance between each eye and antennal insertion equal to or  
slightly greater than width of frons ..... 20  
Distance between each eye and antennal insertion distinctly greater  
than 1.3 times width of frons ..... 23
20. Pronotum with basal flange more or less distinct. Antennal scrobes  
without large, acute, dentiform process on dorsal margin ..... 21  
Pronotum lacking basal flange at base. Antennal scrobes with  
dorsal margin produced into large, acute, dentiform process. Length  
1.2–2.1 mm. Washington .... ***troglodytes* Mannerheim** (p. 139)
21. Antennal scrobes with dorsal margin evenly descending. Length  
1.5–2.1 mm. Quebec, Ontario .....  
..... ***reconditum* Gyllenhal** (p. 130)  
Antennal scrobes with dorsal margin oblique anteriorly or more or  
less angulate ..... 22
22. Elytra with interstriae strongly convex, slightly wider than striae.  
Antennal club shorter than segments 4–6 of funicle. Length  
2.5–3.0 mm. Ontario ..... ***porcatum* Boheman** (p. 127)  
Elytra with interstriae flat or nearly so; middle of interstriae usually  
more than 1.5 times as wide as striae. Antennal club about as long as  
segments 2–7 of funicle. Length 2.0–2.5 mm. Ontario to British  
Columbia ..... ***centrale* Fall** (p. 98)
23. Forelegs with tarsus dilated and with dense, moderately long  
pubescence on ventral surface. Pronotum with sides rounded,  
distinctly wider at middle than base. Length 1.8–2.6 mm. Wisconsin  
..... ***nigrum* Herbst** (p. 121)  
Forelegs with tarsus unmodified. Pronotum not as above ..... 24
24. Elytra with 1 specialized seta on interstria 9. Ventral surface of head  
nearly flat; lateral margins of surface very low, not reaching middle  
of eye. Elytra with inconspicuous pubescence consisting of 1 row of  
scales per interstria ..... 25  
Elytra with 2 specialized setae, 1 each on interstriae 7 and 9  
(Fig. 49). Ventral surface of head with lateral margin extending to  
middle of eye; lateral margins high. Elytra with conspicuous  
pubescence consisting of 2 rows of scales per interstria. Length  
1.7–2.8 mm. British Columbia ..... ***proclive* LeConte** (p. 128)

25. Elytral disc with scales on striae distinctly coarser than those on interstriae. Length 3.0–3.5 mm. Northeastern United States, west to Iowa, south to West Virginia ..... **rostrum** Say (p. 133)  
 Elytral disc with scales on striae not coarser than those on interstriae. Length 1.7–2.2 mm. Newfoundland to Saskatchewan ..... **simile** Kirby (p. 135)
26. Forelegs with segment 1 of tarsus nearly as wide as long. Body gibbose in lateral view. Elytra with transverse row of white scales on posterior half (subgenus *Ixapion*) ..... 27  
 Forelegs with segment 1 of tarsus distinctly longer than wide. Body not gibbose in lateral view. Elytra without transverse pattern of white scales ..... 28
27. Rostrum dull, minutely reticulate, faintly punctured. Distance from anterior margin of each eye to antennal insertion greater than length of eye. Metepisternum with abundant scales, these randomly placed in several rows. Length 2.2–2.6 mm. Nova Scotia to Ontario ..... **frosti** Kissinger (p. 112)  
 Rostrum shining to alutaceous, deeply and distinctly punctured. Distance from anterior margin of each eye to antennal insertion less than length of eye. Metepisternum with scales dense at base, thinning out to more or less single row on apical half. Length 2.1–2.7 mm. Ontario, Quebec ..... **idiastes** Kissinger (p. 116)
28. Metasternum of male with median tubercle. Pronotum without distinct basal flange (subgenus *Eutrichapion*) ..... 29  
 Metasternum of male without median tubercle. Pronotum variable ..... 32
29. Elytra black. Rostrum of male not strongly expanded at antennal insertion. Tarsal claw with acute basal tooth ..... 30  
 Elytra blue. Rostrum of male strongly expanded laterally at antennal insertion. Tarsal claws simple. Length 2.2–2.6 mm. Transcontinental ..... **cyanitinctum** Fall (p. 105)
30. Legs black or blackish ..... 31  
 Legs light reddish yellow. Length 1.7–2.2 mm. Alberta to Alaska ..... **alaskanum** Fall (p. 89)
31. Frons deeply impressed adjacent to eye, sometimes entirely impressed below level of eye. Rostrum 1.30–1.35 times (female) or 0.8–1.0 times (male) longer than pronotum. Antennae of male inserted at basal 0.3 of rostrum. Length 1.6–2.5 mm. Alberta and British Columbia ..... **cavifrons** LeConte (p. 97)

- Frons flat, not impressed near eye (rarely slightly impressed).  
 Rostrum 1.2–1.3 times (female) or 1.1–1.2 times (male) longer than pronotum. Antennae of male inserted at basal 0.3–0.4 of rostrum. Length 1.7–2.3 mm. Ontario to Alberta . . . . . **huron Fall** (p. 115)
32. Pronotum in male with distinct basal flange . . . . . 33  
 Pronotum in male without distinct basal flange . . . . . 37
33. Rostrum more or less expanded in apical third, with punctures and sculpture not finer or sparser on apical third than on basal third. Length 1.5–2.2 mm. Quebec to British Columbia (subgenus *Alocentron*) . . . . . **attenuatum Smith** (p. 92)  
 Rostrum more slender apically than basal third, with punctures and sculpture finer and sparser on apical third than on basal third (subgenus *Coelocephalapion*) . . . . . 34
34. Eyes moderately prominent. Pubescence consisting of very sparse, uniform scales. Rostrum similar in both sexes. Pronotum with lateral margins subparallel on basal half . . . . . 35  
 Eyes flat or slightly prominent. Pubescence conspicuous; scales more or less condensed at base of interstriae 3. Rostrum longer and more slender in female than in male. Pronotum subconical. Length 2.2–2.9 mm. Ontario . . . . . **segnipes Say** (p. 134)
35. Scales on head behind eyes and on dorsal apical region of each femur distinctly coarser than stoutest seta on antenna. Eyes with maximum width between outer margins (dorsal view) less than or about equal to width of head at base . . . . . 36  
 Scales on head behind eyes and on dorsal apical region of each femur as coarse as stoutest seta on antenna. Eyes with maximum width between outer margins (dorsal view) slightly greater than width of head at base. Length 1.5–2.0 mm. Ontario . . . . . **emaciipes Fall** (p. 108)
36. Scales behind eye and on side of pronotum of similar coarseness. Length 1.5–2.0 mm. Eastern United States . . . . . **decoloratum Smith** (p. 106)  
 Scales behind eyes distinctly coarser than scales on side of pronotum. Length 1.5–1.8 mm. Ontario . . . . . **carinatum Smith** (p. 96)
37. Tarsal claw of male with acute basal tooth . . . . . 38  
 Tarsal claw of male lacking basal tooth . . . . . 43
38. Body moderately robust. Tarsi of male lacking spine (subgenus *Pseudapion*) . . . . . 39

- Body narrow, elongate, subcylindrical. Middle legs of male with spine on inner margin of first segment of tarsus (subgenus *Ceratapion*) ..... 41
39. Femur yellow or reddish. Rostrum with apical two-thirds yellow in male. Length 1.8–2.6 mm. Manitoba to Alberta ..... ***disparatum* Sharp** (p. 107)
- Femur black or blackish; rostrum of male blackish ..... 40
40. Distance between anterior margin of antennal scrobe and front of eye generally less than 1.5 times width of frons, distinctly less than maximum width of femur of foreleg. Frons generally greater than 1.1 times wider than dorsal tip of rostrum. Rostrum less than 1.2 times (male) or 1.3–1.6 times (female) longer than pronotum. Length 1.5–2.0 mm. Manitoba and Alberta ..... ***amaurum* Kissinger** (p. 90)
- Distance between anterior margin of scrobe and front of eye greater than 1.5 times width of frons, equal to or greater than width of femur of foreleg. Frons 1.0–1.1 times wider than dorsal tip of rostrum. Rostrum 1.1–1.2 times (male) or 2.0–2.3 times (female) longer than pronotum. Length 1.4–1.9 mm. Manitoba to Alberta ..... ***capitone* Kissinger** (p. 95)
41. Segment 1 of middle and hind tarsi produced into spine-like process on inner margin. Length 1.8–2.6 mm. Quebec ..... ***contusum* Smith** (p. 102)
- Segment 1 of middle tarsi only produced into spine-like process on inner margin ..... 42
42. Elytral interstriae flat, finely transversely rugose, with 2 rows of fine punctures. Pubescence conspicuous. Length 1.8–2.2 mm. Saskatchewan ..... ***extensum* Smith** (p. 109)
- Elytral interstriae convex, nearly smooth, with 1 row of fine punctures. Pubescence moderately conspicuous. Length 1.4–2.0 mm. Eastern and midwestern United States ..... ***parallelum* Smith** (p. 124)
43. Length 1.9–2.3 mm. Alaska, British Columbia, Yukon Territory ..... ***antennatum* Smith** (p. 91)
- Length 1.6–2.4 mm. Nova Scotia (subgenus *Omphalapion*) ..... ***hookeri* Kirby** (p. 114)
44. Scales on elytra nearly uniform, conspicuous, moderately coarse; scales behind scutellum only slightly denser and coarser than those on remainder of elytra. Elytral interstriae 2–5 with 3 or 4 rows of scales. Length 2.4 mm. Saskatchewan ..... ***wickhami* Kissinger** (p. 140)

Scales on elytra fine, sparse; scales denser and coarser in conspicuous postscutellar spot. Elytral interstriae 2-5 with 1 or 2 rows of scales. Length 1.7-2.5 mm. Ontario to British Columbia  
 ..... **punctinasum** **Smith** (p. 129)

## Clé des sous-genres et des espèces des *Apion* du Canada et de l'Alaska

1. Mésocoxas séparés par le prolongement mésosternal et le prolongement intercoxal du métasternum (fig. 48) ..... 2  
 Mésocoxas contigus ou très rapprochés, un espace net séparant les prolongements mésosternal et métasternal (fig. 47) ..... 44
2. Tibias du mâle en tout ou en partie mucronés ..... 3  
 Tibias du mâle non mucronés ..... 26
3. Profémur du mâle ayant une zone lisse sur la face ventrale, limitée vers l'arrière par une carène longitudinale proéminente, avec ou sans zone striée (fig. 50 à 54). Métasternum généralement orné de spicules appariés près de la partie médiane de la marge postérieure (sous-genre *Fallapion*) ..... 4  
 Profémur du mâle non modifié sur sa face ventrale comme il est décrit ci-dessus. Métasternum sans spicules appariés près de la région médiane de la marge postérieure ..... 12
4. Absence de carène bornant la zone lisse de la face ventrale du profémur du mâle ou carène située sur le côté latéral extérieur du fémur (fig. 50 à 54) ..... 5  
 Absence de carène bornant la zone lisse de la face ventrale du profémur du mâle ou carène située sur le côté latéral intérieur du fémur. Longueur : de 2,0 à 2,3 mm. Washington .....  
 ..... **funereum** **Fall** (p. 112)
5. Côté intérieur du tiers apical du profémur du mâle orné d'un tubercule abrupt (fig. 52, 53, 54) ..... 6  
 Côté intérieur du tiers apical du profémur du mâle à peine ou non gonflé (fig. 50, 51) ..... 10
6. Carène latérale plus ou moins distincte limitant la zone polie du profémur du mâle (fig. 53, 54) ..... 7  
 Absence de carène latérale délimitant la zone polie du profémur du mâle. Longueur : de 1,8 à 2,3 mm. Du Manitoba à l'Alberta .....  
 ..... **speculiferum** **Fall** (p. 136)



7. Sternites abdominaux parsemés de fines perforations ..... 8  
 Sternites abdominaux perforés profondément et grossièrement.  
 Longueur : de 1,8 à 2,2 mm. Québec ... ***impeditum* Fall** (p. 117)
  
8. Faible prolongement du protibia vers l'apex (fig. 54). Faible  
 protubérance sur le côté intérieur du profémur du mâle ..... 9  
 Fort prolongement des protibias vers l'apex (fig. 52). Forte  
 protubérance sur le côté intérieur du profémur du mâle.  
 Longueur : de 1,7 à 2,1 mm. Du Nouveau-Brunswick à la  
 Colombie-Britannique ..... ***finitimum* Fall** (p. 110)
  
9. Surface ventrale de la zone polie du profémur du mâle sans strie  
 nette (fig. 54). Longueur : de 2,0 à 2,5 mm. Ontario .....  
 ..... ***melanarium* Gerstaecker** (p. 120)  
 Surface ventrale de la zone polie du profémur du mâle sillonnée de  
 stries nettes et distinctes à côté de la carène latérale. Longueur : de  
 2,0 à 3,0 mm. Saskatchewan et Alberta .....  
 ..... ***robustum* Smith** (p. 132)
  
10. Distance entre l'œil et la fovéa antennaire au moins égale à la  
 largeur du front ..... 11  
 Distance entre l'œil et la fovéa antennaire inférieure à la largeur du  
 front. Longueur : de 1,7 à 2,1 mm. Est des États-Unis .....  
 ..... ***bischoffi* Fall** (p. 94)
  
11. Rostre du mâle moins de 1,4 fois plus long que le pronotum. Rostre  
 de la femelle de 1,9 à 2,0 fois plus long que le pronotum. Zone polie du  
 profémur du mâle sillonnée entièrement de stries fines et nettes.  
 Élytres plus de 1,5 fois plus longs que larges. Longueur : de 2,2 à  
 2,8 mm. Alberta ..... ***occidentale* Fall** (p. 122)  
 Rostre plus de 1,4 fois (mâle) ou de 1,6 à 2,4 fois (femelle) plus long  
 que le pronotum. Zone polie du profémur du mâle généralement  
 dépourvue de stries ou sillonnée de stries très peu prononcées,  
 cantonnées près de la crête limitant la zone (fig. 50). Élytres moins  
 de 1,5 fois plus longs que larges. Longueur : de 1,8 à 2,3 mm. De  
 l'Ontario à la Colombie-Britannique .....  
 ..... ***pennsylvanicum* Boheman** (p. 125)
  
12. Tibias du mâle tous mucronés et pattes d'un jaune rougeâtre pâle.  
 Pronotum du mâle nettement plus long que large à la base.  
 Longueur : de 2,6 à 3,2 mm. Québec, Ontario (sous-genre  
*Rhopalapion*) ..... ***longirostre* Olivier** (p. 118)  
 Mésos- et métatibia du mâle mucronés. Pattes antérieures  
 diversement modifiées. Si tous les tibias sont mucronés, les pattes  
 sont alors d'une couleur foncée (sous-genre *Trichapion*) ..... 13

13. Métasternum du mâle portant des tubercules appariés aigus près du milieu de la marge postérieure ..... 14  
Métasternum du mâle sans tubercules aigus appariés près du milieu de la marge postérieure ..... 15
14. Lobe médian de l'édéage, en vue latérale, élongé à l'apex dans le sens dorsal et ventral (fig. 142); côtés du lobe, en vue dorsale, parallèles près de l'apex (fig. 143). Rostre de la femelle de 0,56 à 0,79 mm de longueur. Antennes de la femelle insérées devant l'œil à une distance de 1,5 à 2,3 fois la largeur du front. Longueur : de 1,6 à 2,5 mm. Washington ..... **opacicolle Smith** (p. 123)  
Lobe médian de l'édéage, en vue latérale, aplati à l'apex (fig. 140); côté du lobe, en vue dorsale, convergeant de façon régulière vers l'apex (fig. 141). Rostre de la femelle de 0,46 à 0,53 mm de longueur. Antenne de la femelle insérée devant l'œil à une distance de 1,2 à 1,5 fois la largeur du front. Longueur : de 1,6 à 2,0 mm. Washington ..... **hatchi Kissinger** (p. 113)
15. Tous les tibias du mâle mucronés, le protibia quelquefois à peine ..... 16  
Pro- et mésotibia ou méso- et métatibia du mâle mucronés ... 18
16. Pronotum au rebord basal différencié ..... 17  
Pronotum sans rebord basal. Longueur : de 2,1 à 2,3 mm. Du Manitoba à l'Alberta ..... **tenuirostrum Smith** (p. 137)
17. Marge dorsale du scrobe antennaire oblique, anguleuse derrière la fovéa. Front dépourvu d'empreinte médiane. Longueur : de 2,3 à 3,3 mm. Du Manitoba à l'Alberta ..... **commodum Fall** (p. 101)  
Marge dorsale du scrobe antennaire descendant régulièrement jusque sous l'œil. Sur le front, empreintes médianes peu profondes et deux rangées latérales de perforations. Longueur : de 2,0 à 2,8 mm. Washington ..... **cordatum Smith** (p. 103)
18. Protibia du mâle mucroné. Longueur : de 1,6 à 2,3 mm. Washington ..... **cribricollé LeConte** (p. 104)  
Protibia du mâle non mucroné ..... 19
19. Distance entre l'œil et la fovéa antennaire au moins égale à la largeur du front ..... 20  
Distance entre l'œil et la fovéa antennaire nettement plus grande que 1,3 fois la largeur du front ..... 23
20. Pronotum ayant un rebord basal plus ou moins différencié. Scrobe antennaire sans prolongement en forme de grosse dent aiguë sur sa marge dorsale ..... 21

- Pronotum sans rebord basal. Marge dorsale du scrobe antennaire prolongé en forme de grosse dent aiguë. Longueur : de 1,2 à 2,1 mm. Washington ..... **troglodytes Mannerheim** (p. 139)
21. Marge dorsale du scrobe antennaire descendant régulièrement. Longueur : de 1,5 à 2,1 mm. Québec et Ontario ..... **reconditum Gyllenhal** (p. 130)
- Marge dorsale du scrobe antennaire oblique sur le devant ou plus ou moins anguleuse ..... 22
22. Interstries élytraux fortement convexes, un peu plus larges que les stries. Massue antennaire plus courte que les articles 4 à 6 du funicule. Longueur : de 2,5 à 3,0 mm. Ontario ..... **porcatum Boheman** (p. 127)
- Interstries aplatis ou presque; habituellement plus de 1,5 fois plus large, dans leur partie médiane, que les stries. Massue antennaire à peu près aussi longue que les articles 2 à 7 du funicule. Longueur : de 2,0 à 2,5 mm. De l'Ontario à la Colombie-Britannique ..... **centrale Fall** (p. 98)
23. Protarse dilaté, à pubescence ventrale dense, aux poils modérément longs. Côtés du pronotum arrondis, nettement plus larges au milieu qu'à la base. Longueur : de 1,8 à 2,6 mm. Wisconsin ..... **nigrum Herbst** (p. 121)
- Protarse non modifié. Pronotum différent de la description ci-dessus ..... 24
24. Une soie spécialisée sur l'interstrie 9 de l'élytre. Face ventrale de la tête presque plate, aux marges latérales très basses, n'atteignant pas le milieu de l'œil. Interstries élytraux couverts d'une rangée d'écailles formant une pubescence discrète ..... 25
- Une soie spécialisée sur chacune des interstries 7 et 9 (fig. 49). Face ventrale de la tête bordée d'une marge latérale allant jusqu'au milieu de l'œil; marges latérales élevées. Interstries couverts de deux rangées d'écailles formant une pubescence visible. Longueur : de 1,7 à 2,8 mm. Colombie-Britannique ..... **proclive LeConte** (p. 128)
25. Écailles des stries du disque élytral nettement plus grossières que celles des interstries. Longueur : de 3,0 à 3,5 mm. Du nord-est des États-Unis vers l'ouest jusqu'en Iowa et vers le sud jusqu'en Virginie-Occidentale ..... **rostrum Say** (p. 133)
- Écailles des stries du disque élytral pas plus grossières que celles des interstries. Longueur : de 1,7 à 2,2 mm. De Terre-Neuve à la Saskatchewan ..... **simile Kirby** (p. 135)

26. Article 1 du protarse presque aussi large que long. Corps bossu en vue latérale. Moitié postérieure de l'élytre barrée transversalement par une rangée d'écailles blanches (sous-genre *Ixapion*) ..... 27
- Article 1 du protarse nettement plus long que large. Corps non bossu en vue latérale. Pas de bande transversale d'écailles blanches sur l'élytre ..... 28
27. Rostre émoussé, finement réticulé, faiblement perforé. Distance entre la marge antérieure de l'œil et la fovéa antennaire plus grande que la longueur de l'œil. Abondantes écailles sur le métépistérne, disposées au hasard en plusieurs rangées. Longueur : de 2,2 à 2,6 mm. De la Nouvelle-Écosse à l'Ontario ..... **frosti Kissinger** (p. 112)
- Rostre luisant à alutacé, profondément et nettement perforé. Distance entre la marge antérieure de l'œil et la fovéa antennaire moins grande que la longueur de l'œil. Écailles denses à la base du métépistérne, se raréfiant plus ou moins en une simple rangée sur la moitié apicale. Longueur : de 2,1 à 2,7 mm. Ontario, Québec ..... **idiastes Kissinger** (p. 116)
28. Méta sternum du mâle ayant un tubercule médian. Pronotum sans rebord basal différencié (sous-genre *Eutrichapion*) ..... 29
- Méta sternum du mâle sans tubercule médian. Pronotum variable ..... 32
29. Élytre noir. Rostre du mâle faiblement prolongé à la fovéa antennaire. Griffes tarsales portant une dent basale acérée ..... 30
- Élytre bleu. Rostre du mâle fortement prolongé latéralement à la fovéa antennaire. Griffes tarsales simples. Longueur : de 2,2 à 2,6 mm. Tout le continent ..... **cyanitinctum Fall** (p. 105)
30. Pattes noires ou noirâtres ..... 31
- Pattes jaune rougeâtre pâle. Longueur de 1,7 à 2,2 mm. De l'Alberta à l'Alaska ..... **alaskanum Fall** (p. 89)
31. Front profondément creusé près de l'œil, parfois entièrement sous le niveau de l'œil. Rostre de 1,30 à 1,35 fois (femelle) ou de 0,8 à 1,0 fois (mâle) plus long que le pronotum. Antennes du mâle insérées au 0,3 basal du rostre. Longueur : de 1,6 à 2,5 mm. Alberta et Colombie-Britannique ..... **cavifrons LeConte** (p. 97)
- Front plat, sans empreinte près de l'œil (il est rare qu'il le soit un peu). Rostre de 1,2 à 1,3 fois (femelle) ou de 1,1 à 1,2 fois (mâle) plus long que le pronotum. Antennes du mâle implantées au 0,3 à 0,4 basal du rostre. Longueur : de 1,7 à 2,3 mm. De l'Ontario à l'Alberta ..... **huron Fall** (p. 115)

32. Pronotum du mâle bordé d'un rebord basal différencié ..... 33  
 Pronotum du mâle sans rebord basal différencié ..... 37
33. Rostre plus ou moins prolongé dans le tiers apical, orné de perforations et d'une sculpture ni plus fines ni plus clairsemées sur le tiers apical que sur le tiers basal. Longueur : de 1,5 à 2,2 mm. Du Québec à la Colombie-Britannique (sous-genre *Alocentron*) ..... ***attenuatum* Smith** (p. 92)  
 Rostre plus grêle à l'apex que dans le tiers basal, orné de perforations et d'une sculpture plus fines et plus clairsemées sur le tiers apical que sur le tiers basal (sous-genre *Coeleocephalopion*) ..... 34
34. Oeil modérément proéminent. Pubescence constituée d'écailles très clairsemées, uniformes. Rostre semblable chez les deux sexes. Marges latérales du pronotum presque parallèles sur la moitié basale ..... 35  
 Oeil plat ou légèrement proéminent. Pubescence remarquable; écailles plus ou moins assemblées à la base de l'interstrie 3. Rostre plus long et plus grêle chez la femelle que chez le mâle. Pronotum presque conique. Longueur : de 2,2 à 2,9 mm. Ontario ..... ***segnipes* Say** (p. 134)
35. Écailles de derrière les yeux et celles de la région dorso-apicale du fémur nettement plus grossières que les soies les plus grosses de l'antenne. Distance maximale entre l'œil et la marge extérieure (en vue dorsale) inférieure ou à peu près égale à la largeur de la tête à sa base ..... 36  
 Écailles de derrière les yeux et celles de la région dorso-apicale du fémur aussi grossières que les soies les plus grosses de l'antenne. Distance maximale entre l'œil et la marge extérieure (en vue dorsale) excédant de peu la largeur de la tête à sa base. Longueur : de 1,5 à 2,0 mm. Ontario ..... ***emaciipes* Fall** (p. 108)
36. Écailles de derrière les yeux et celles du côté du pronotum semblablement grossières. Longueur : de 1,5 à 2,0 mm. Est des États-Unis ..... ***decoloratum* Smith** (p. 106)  
 Écailles de derrière les yeux nettement plus grossières que celles du côté du pronotum. Longueur : de 1,5 à 1,8 mm. Ontario ..... ***carinatum* Smith** (p. 96)
37. Griffes tarsales du mâle armées d'une dent basale acérée ..... 38  
 Griffes tarsales du mâle sans dent basale ..... 43
38. Corps modérément robuste. Tarses du mâle sans épine (sous-genre *Pseudapion*) ..... 39

- Corps étroit, allongé, presque cylindrique. Premier article du mésotarse du mâle armé d'une épine sur sa marge intérieure (sous-genre *Ceratapion*) ..... 41
39. Fémur jaune ou rougeâtre. Rostre jaune sur ses deux tiers apicaux chez le mâle. Longueur : de 1,8 à 2,6 mm. Du Manitoba à l'Alberta ..... ***disparatum* Sharp** (p. 107)
- Fémur noir ou noirâtre; rostre du mâle noirâtre ..... 40
40. Distance entre la marge antérieure du scrobe antennaire et le devant de l'œil généralement inférieure à 1,5 fois la largeur du front, nettement inférieure à la largeur maximale du profémur. Front généralement plus de 1,1 fois la largeur de l'extrémité dorsale du rostre. Rostre moins de 1,2 fois (mâle) ou de 1,3 à 1,6 fois (femelle) plus long que le pronotum. Longueur : de 1,5 à 2,0 mm. Manitoba et Alberta ..... ***amaurum* Kissinger** (p. 90)
- Distance entre la marge antérieure du scrobe et le devant de l'œil plus grande que 1,5 fois la largeur du front et au moins égale à la largeur du profémur. Front de 1,0 à 1,1 fois plus large que l'extrémité dorsale du rostre. Rostre 1,1 à 1,2 fois (mâle) ou 2,0 à 2,3 fois (femelle) plus long que le pronotum. Longueur : de 1,4 à 1,9 mm. Du Manitoba à l'Alberta ..... ***capitone* Kissinger** (p. 95)
41. Article 1 du méso- et du métatarse prolongé en un appendice spinuleux sur sa marge intérieure. Longueur : de 1,8 à 2,6 mm. Québec ..... ***contusum* Smith** (p. 102)
- Article 1 du métatarse prolongé en un appendice spinuleux sur sa marge intérieure ..... 42
42. Interstries de l'élytre plats, à fines rugosités transversales, traversés de deux rangées de fines perforations. Pubescence remarquable. Longueur : de 1,8 à 2,2 mm. Saskatchewan ..... ***extensum* Smith** (p. 109)
- Interstries convexes, presque lisses, traversés d'une rangée de fines perforations. Pubescence modérément remarquable. Longueur : 1,4 à 2,0 mm. Est des États-Unis et Midwest ..... ***parallelum* Smith** (p. 124)
43. Longueur 1,9–2,3 mm. Alaska, Colombie-Britannique, Yukon ... ***antennatum* Smith** (p. 91)
- Longueur 1,6–2,4 mm. Nouvelle-Écosse (sous-genres *Omphalapion*) ..... ***hookeri* Kirby** (p. 114)
44. Écailles de l'élytre presque uniformes, remarquables, modérément grossières; écailles derrière le scutellum seulement un peu plus denses et plus grossières que celles du reste de l'élytre. Interstries 2 à

5 de l'élytre portant trois ou quatre rangées d'écailles. Longueur : 2,4 mm. Saskatchewan ..... **wickhami Kissinger** (p. 140)

Écailles de l'élytre fines, clairsemées; plus denses et plus grossières dans une zone postscutellaire bien visible. Interstries 2 à 5 de l'élytre portant une ou deux rangées d'écailles. Longueur : de 1,7 à 2,5 mm. De l'Ontario à la Colombie-Britannique ..... **punctinasum Smith** (p. 129)

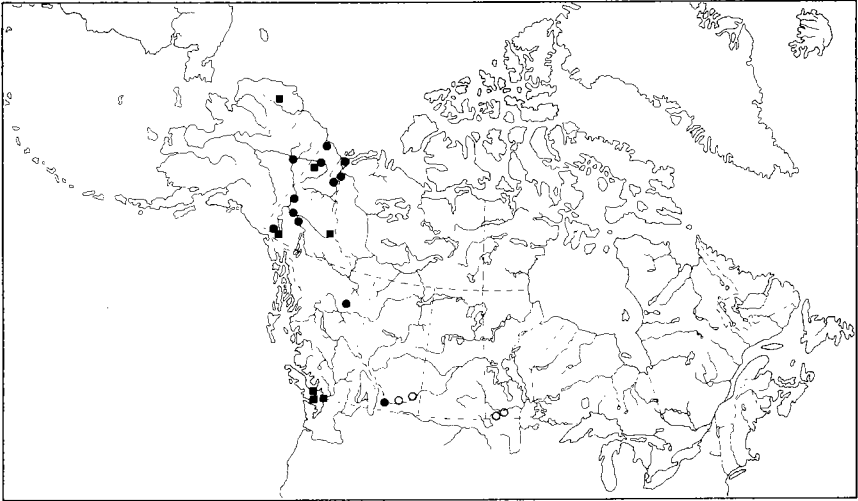
### *Apion alaskanum* Fall

Figs. 47, 55, 56; Map 12

*Apion alaskanum* Fall, 1926:205 (holotype, Yukon River, 30 miles east of Fort Yukon, Alaska; MCZ); Kissinger 1968:241; O'Brien and Wibmer 1982:20.

**Description.** Length 1.7–2.2 mm. Body moderately slender, black; legs and antennae reddish to light reddish yellow. Pubescence distinct, consisting of dense, white scales, these denser on sides of pronotum and elytra of male. Frons grooved, wider than dorsal tip of rostrum. Rostrum of male slightly curved, about 1.1 times longer than pronotum; sides, in dorsal view, converging beyond antennal insertion and expanding to apex; surface alutaceous, with fine punctures bearing long, moderately dense scales; apex bare, smooth. Rostrum of female slightly curved, 1.3–1.4 times longer than pronotum; sides, in dorsal view, nearly parallel in apical half, slightly expanded at antennal insertion, expanded toward apex; surface alutaceous on basal two-thirds, glabrous beyond antennal insertion, with fine, shallow, sparse punctures and with sparse scales at base. Antennae inserted between basal 0.3–0.4 (male) or at basal 0.3 (female) of rostrum. Eyes moderately convex. Pronotum at base 1.1–1.2 times wider than long; sides slightly constricted apically, without basal flange; disc slightly convex; surface alutaceous and deeply punctured. Elytra 1.3–1.5 times as long as wide; striae deeply impressed, with coarse punctures; interstriae slightly less than twice as wide as striae, flat, each interstria with 2 rows of long, fine scales; interstria 9 with 1 long specialized seta. Metasternum of male with 1 median acute tubercle. Tarsal claw with acute basal tooth (both sexes).

**Distribution.** Western Canada and Alaska. Alaska: 30 miles east of Fort Yukon. Alberta: Coleman and Waiparous Creek Forestry Trunk Road. British Columbia: Sikanni Chief. Northwest Territories: Fort McPherson and Reindeer Depot. Yukon Territory: Dawson, Firth River, Kluane, 16 km east of McQuesten, Old Crow, 10 km east of Old Crow, 10 km north of Old Crow, Rock River on Dempster Highway, and Stewart Crossing.



Map 12. Collection localities of *Apion alaskanum* (●), *A. amaurum* (○) and *A. antennatum* (■).

**Comments.** This species belongs to the subgenus *Eutrichapion* and is distinguished from other members of the subgenus by its reddish yellow legs and by its northern distribution. This species and *A. antennatum* occur farther north than any other species of *Apion* in Canada. The reddish legs distinguish adults of *A. alaskanum* from those of *A. antennatum*, which has black legs. Adults were found in July on *Hedysarum alpinum*. Nothing more is known of its life history or habits.

### *Apion amaurum* Kissinger

Figs. 57, 58; Map 12

*Apion amaurum* Kissinger, 1968:228 (holotype, 10 miles south of Catavina, Baja Calif.; CAS); O'Brien and Wibmer 1982:20.

**Description.** Length 1.5–2.0 mm. Body moderately robust, black; elytra with slight coppery luster; antennae with pale bases. Pubescence consisting of white, moderately fine, moderately sparse scales, these coarser and denser on sides of mesothorax and metepisternum and beneath eye in male. Frons 1.1–1.2 times wider than dorsal tip of rostrum. Rostrum of male slightly curved, 1.1 times longer than pronotum; sides, in dorsal view, slightly expanded at antennal insertion, nearly parallel in apical third; surface smooth beyond antennal insertion, with sparse, fine scales below antennal insertion; lateral areas with sparse, moderately coarse punctures, these finer and



sparser toward tip. Rostrum of female 1.3–1.6 times longer than pronotum, similar to male, except scales below antennal insertion finer and sparser. Antennae inserted between basal 0.3 (male) or 0.2–0.3 (female) of rostrum. Eye slightly convex. Pronotum at base 1.1–1.2 times wider than long; sides slightly diverging to near basal third, rounding to slightly constricted apex, lacking basal flange; disc moderately convex, with moderately deep punctures bearing fine scales, these sometimes lying transversely toward median line of pronotum; interpuncture spaces finely alutaceous. Elytra 1.2–1.4 times longer than wide; striae fine, moderately deeply impressed, bearing scales slightly coarser than scales on pronotum; interstriae flat, about 3.0 times wider than striae, each with 1 or 2 partly confused rows of fine punctures bearing scales like those on striae; interstriae 7 and 9 each with 1 long specialized seta. Tarsal claw in males with acute basal tooth.

**Distribution.** Manitoba to Alberta, south throughout the western half of the United States to Baja California, Mexico. Alberta: Medicine Hat and Scandia. Manitoba: Aweme, 2 miles east of Douglas, and Ninette.

**Comments.** This species is placed in the subgenus *Pseudapion* and is probably best distinguished by the characters summarized in the key. Kissinger (1968) states that the species is complex. At least two distinct populations exist in the United States and Canada. One population occurs in Texas, Arizona, Utah, and Oklahoma, whereas the other is widespread from Canada to Texas. This latter population occurs sympatrically at various points with *A. capitone* and tends to have the front femur comparatively stout. This character helps to distinguish sympatric males of *A. amaurum* from those of *A. capitone*. In addition, in males of *A. amaurum* the anterior margin of the antennal scrobe is situated at a distance in front of the eye distinctly less than the maximum width of femur 1 in profile, whereas in males of *A. capitone* the same measurement is equal to or greater than the width of femur 1. Nothing is known of the life history of this species. The Canadian host is unrecorded. Specimens have been collected from prairie clover (*Petalostemon* species) and *Mimosa borealis* in Mexico and United States. Salsbury (1984) records this species from *Dalea aurea* and *Petalostemon candidus* in Kansas.

#### *Apion antennatum* Smith

Figs. 59, 60, Map 12

*Apion antennatum* Smith, 1884:53 (lectotype, California; USNM); Kissinger 1968:248; Hatch 1971:331; O'Brien and Wibmer 1982:20.

**Description.** Length 1.8–2.3 mm. Body moderately slender, black; antennae slightly paler. Pubescence consisting of minute inconspicuous setae. Frons 1.0–1.2 times wider than dorsal tip of rostrum. Rostrum of male evenly, slightly curved, 1.1–1.3 times longer than pronotum; sides, in dorsal view, slightly converging in apical half, slightly expanded over antennal insertion, nearly parallel or slightly expanded toward tip; surface finely, densely punctured except near tip and coarsely alutaceous in basal three-quarters; tip polished. Rostrum of female evenly, moderately strongly curved, 1.3–1.5 times longer than pronotum; sides, in dorsal view, slightly expanded over antennal insertion, slightly expanded toward apex; surface densely and moderately finely punctured except at apex, with minute scales to near apex, coarsely alutaceous except at tip. Antennae inserted between basal 0.3–0.4 of rostrum; scrobe with dorsal margin evenly descending. Eye moderately convex. Pronotum at base 1.1–1.2 times wider than long; sides nearly evenly converging to middle, rounded to slightly constricted apex, without basal flange; disc nearly flat with deep punctures bearing scales, these fine, yellowish, projecting slightly beyond anterior margin of puncture; interpuncture spaces coarsely alutaceous. Elytra 1.4–1.5 times longer than wide; striae moderately deep, with coarse punctures; interstriae flat, densely and coarsely alutaceous, about twice as wide as striae, each with 1 or 2 rows of minute punctures bearing very fine scales; interstria 9 with 1 specialized seta. Male legs lacking special characters.

**Distribution.** Alaska, British Columbia and Yukon Territory, south through the western United States to Arizona. Alaska: Titaluk River (69°42'N 155°42'W). British Columbia: Departure Bay, Langford, Nanaimo, Snake Island, and Victoria. Yukon Territory: Kluane at Slims River Delta, Macmillan River on Canol Highway, Old Crow, and 6 km east of Old Crow.

**Comments.** Kissinger (1968) did not place this species in a subgenus. It is an unusual species, easily recognized by the first segment of the front tarsi longer than wide, by the lack of a basal flange on the male pronotum, and by the lack of a basal tooth on the male tarsal claw. The lectotype was designated by Kissinger (1968). Adults were recorded on *Franseria* species and collected on alfalfa (*Medicago sativa*). Nothing else is recorded on the habits or life history.

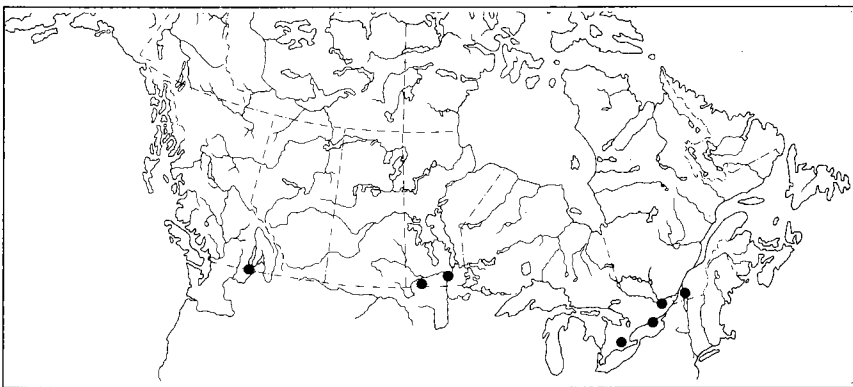
*Apion attenuatum* Smith

Figs. 61, 62; Map 13

*Apion attenuatum* Smith, 1884:60, 62 (lectotype, Nebraska; MCZ); Kissinger 1968:235; O'Brien and Wibmer 1982:21.

**Description.** Length 1.5–2.2 mm. Body slender, black. Pubescence consisting of white, moderately conspicuous, sparse scales, these coarser on base of elytra and along sides of pronotum. Frons 0.9–1.1 times wider than dorsal tip of rostrum. Rostrum of both sexes moderately curved, 1.2–1.4 times longer than pronotum; sides, in dorsal view, nearly parallel beyond antennal insertion, not expanded at antennal insertion; surface punctured and finely alutaceous at base, polished toward apex, with distinct punctures bearing scales, these becoming shorter toward apex. Antennae inserted at basal third of rostrum. Eyes slightly prominent. Pronotum at base 1.1–1.2 times wider than long; sides expanded more or less distinctly at base, slightly expanded toward middle, rounded to weakly constricted apex; disc moderately convex, with moderately deep punctures; interpuncture spaces alutaceous. Elytra 1.3–1.5 times longer than wide; striae coarse, moderately deep; interstriae nearly flat, about twice as wide as striae, with distinct transverse rugae and 1 row of fine punctures; interstria 3 with patch of several rows of coarser scales at base; interstria 9 with 1 long specialized seta. Male legs lacking special characters.

**Distribution.** Quebec to British Columbia, south throughout most of the United States. Alberta: "Tp. 13, Rge. 14, W. 4 Mer." British Columbia: Oliver. Manitoba: Ninette, Onah, and Winnipeg. Ontario: Delhi, Ottawa, and Trenton. Quebec: Mont Saint-Hilaire.



Map 13. Collection localities of *Apion attenuatum*.

**Comments.** This species is the only Canadian representative of the subgenus *Alocentron*. Adults are distinguished by the unmodified male legs, by the conspicuous pubescence as outlined in the description above, by the distinct basal flange on the pronotum, by the similarity of the rostrum in both sexes, by the single long specialized seta on interstriae 9, and by the other characters given in the key and

description. Kissinger (1968) designated the lectotype. Adults were collected from May to September. Adults have been beaten from willow (*Salix* species). The species may occur in sawfly galls on willow. Kissinger (1968) notes this species developing in the galls of a sawfly (*Euura* species) on arroyo willow (*Salix lasiolepis*) in the western United States. Nothing else is known of the biology or life history.

*Apion bischoffi* Fall

Figs. 51, 63, 64

*Apion bischoffi* Fall, 1925:86 (holotype, Montclair, N.J.; MCZ); Kissinger 1968:131; O'Brien and Wibmer 1982:21.

*Apion atripes* Fall, 1898:116 (*nec* Smith 1884).

**Description.** Length 1.7–2.1 mm. Body moderately robust, black. Pubescence consisting of very fine sparse scales. Frons 1.2–1.4 times (male) or 1.4–1.6 times (female) wider than dorsal tip of rostrum. Rostrum of male moderately strongly curved, 1.2–1.3 times longer than pronotum; sides, in dorsal view, nearly parallel beyond middle, distinctly expanded over antennal insertion; surface minutely punctured; basal two-thirds coarsely alutaceous; tip more polished; setae minute at base, short, erect, very sparse beyond antennal insertion. Rostrum of female strongly curved, 1.3–1.4 times longer than pronotum; sides, in dorsal view, slightly expanded at antennal insertion, slightly converging from base to apex, slightly expanded at apex; surface sparsely, finely punctured, finely alutaceous on basal three-quarters; apex polished; scales minute at base, short and sparse beyond antennal insertion. Antennae inserted between basal 0.2–0.3 of rostrum. Eyes prominent, distinctly longer than wide. Pronotum at base 1.0–1.2 times wider than long; sides arcuate, widest near middle, converging to weakly constricted apex; basal flange absent; disc convex, flattened apically, with fine punctures and fine scales, these barely extending beyond anterior rim; interpuncture spaces ridged; median furrow extending nearly complete length of pronotum. Elytra 1.1–1.3 times longer than wide; striae deep, fine; apex with striae 1, 2, and 9 joined and deeper at union; striae 7 and 8 joined at apex, ending in deep puncture; interstriae more than twice as wide as striae, slightly convex, each interstria with 1 or 2 partly confused rows of punctures bearing fine scales. Femora of male forelegs slightly swollen, with area polished, finely striated (Fig. 51), extending one-third length of femur; lateral limiting margin of polished area low, nearly straight. Tibiae of middle and hind legs mucronate.

**Distribution.** Eastern United States north to Pennsylvania, northern Illinois, and North Dakota. The species is not recorded in Canada but may occur in southern Manitoba or southern Ontario.

**Comments.** This species is in the subgenus *Fallapion*. It is not closely related to any Canadian species, and adults should be readily recognized by the characters of the front legs of the male as given in the key. Adults were collected from May through September. Nothing else is known of the biology or life history of this species.

*Apion capitone* Kissinger

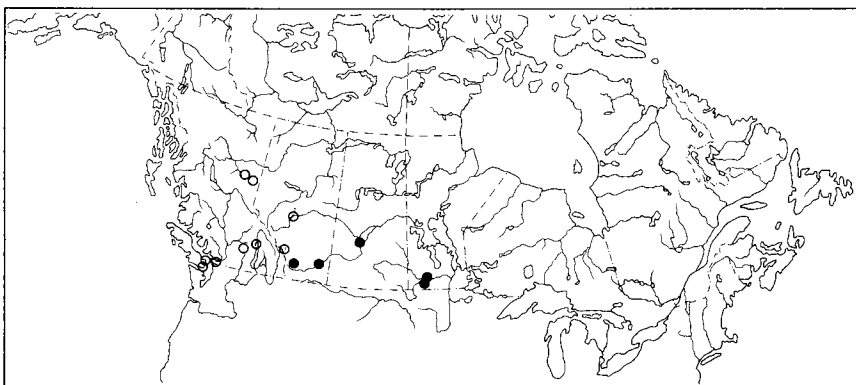
Figs. 65; 66; Map 14

*Apion capitone* Kissinger, 1968:230 (holotype, North Platte, Neb.; MCZ); O'Brien and Wibmer 1982:21.

**Description.** Length 1.4–1.9 mm. Body moderately slender, black; elytra with faint brassy or metallic luster; antennae with paler bases. Pubescence consisting of white, moderately coarse, moderately sparse scales, these slightly denser on sides of metathorax and metepisternum. Frons 0.9–1.1 (male) or 1.0–1.2 (female) times wider than dorsal tip of rostrum. Rostrum of male moderately curved, 1.1–1.2 times longer than pronotum; sides, in dorsal view, slightly expanded toward apex; surface with moderately coarse, sparse punctures, becoming finer toward apex; scales very sparse below antennal insertion, mostly confined to region near eye. Rostrum of female slightly curved in apical quarter, 2.0–2.3 times longer than pronotum; sides, in dorsal view, not expanded at antennal insertion, slightly expanded at apex; surface largely polished distal to antennal insertions; lateral areas with moderately coarse, dense, elongate punctures, becoming finer and sparser toward apex; base with sparse, small scales, mostly near anterior margin of eye. Antennae inserted between basal 0.3–0.4 (male) or at 0.2 (female) of rostrum. Eye slightly convex. Pronotum at base 1.1 times wider than long, without basal flange; sides slightly diverging to widest point near basal third, rounding to very slightly constricted apex; disc slightly convex, with moderately coarse scales and moderately deep punctures; interpuncture spaces much narrower than diameter of punctures and finely alutaceous. Elytra 1.2–1.4 times longer than wide; striae moderately deep, with fine punctures; interstriae nearly flat, about three times wider than striae, each interstria with 1 or 2 partly confused rows of fine punctures and with scales similar to those on dorsal surface of pronotum; interstriae 7 and 9 each with 1 long specialized seta. Male legs lacking special characters.

**Distribution.** Manitoba to Alberta, south through the western United States to Baja California, Mexico, east to Illinois. Alberta: Lethbridge and Medicine Hat. Manitoba: Aweme and Shilo. Saskatchewan: Pike Lake.

**Comments.** This species belongs in the subgenus *Pseudapion*. It is sympatric with *A. amaurum* in several areas in the United States and Canada. The female of *A. capitone* is easily recognized by the very long rostrum. The male of *A. capitone* has a longer rostrum compared with the pronotum; in males the antennae are inserted further toward the apex on the rostrum, the frons is comparatively narrower (usually about equal in width to the dorsal apex of the rostrum), and the front femora in profile are more slender—the maximum width of the femur is generally less than the distance between the anterior margin of the scrobe and the anterior margin of the eye. In *A. amaurum* males the rostrum is shorter, the antennae are inserted closer to the eye, and the frons is usually wider than the dorsal apex of the rostrum; in both sexes the front femora in profile are stout, with the maximum width distinctly greater than the distance between the anterior margin of the scrobe and the anterior margin of the eye. Adults were collected from May through July on prairie-clover (*Petalostemon purpureus*). Salsbury (1984) also lists *P. candidus* as a host plant. Nothing more is known of the life history or habits of this species.



Map 14. Collection localities of *Apion cavifrons* (○) and *A. capitone* (●).

### *Apion carinatum* Smith

Figs. 67, 68

*Apion carinatum* Smith, 1884:52 (lectotype, New Smyrna, Fla.; MCZ); Kissinger 1968:177; O'Brien and Wibmer 1982:21.

*Apion concoloratum* Smith, 1884:52 (lectotype, Michigan; MCZ).

**Description.** Length 1.5–1.8 mm. Body robust, black; antennae, tarsi, and posterior parts of tibiae slightly lighter. Pubescence consisting of white, inconspicuous, minute scales on head and femora, the scales

finer on antennae. Frons 1.0–1.3 times wider than dorsal tip of rostrum. Rostrum of both sexes moderately curved, 1.2–1.4 times longer than pronotum; sides, in dorsal view, nearly parallel beyond antennal insertion, slightly expanded at antennal insertion; male rostrum alutaceous; female rostrum slightly longer than male rostrum, with apical portion polished. Antennae inserted between basal 0.2 and 0.3 of rostrum. Eye moderately convex. Pronotum at base 1.1–1.3 times wider than long, with small basal flange; sides nearly parallel to middle, rounded to constricted apex; disc moderately convex, with minute scales and deep punctures; interpuncture spaces irregular, slightly alutaceous. Elytra 1.2–1.4 times longer than wide; striae deep, with fine punctures; interstriae twice as wide as striae, convex, each interstriae with somewhat confused row of minute scales; interstria 9 with 1 long specialized seta. Legs of males lacking special characters.

**Distribution.** Southern Ontario, through the eastern United States to northern Mexico. Ontario: Turkey Point.

**Comments.** This species is in the subgenus *Coelocephalapion* and is distinguished by the fact that the scales on the head behind the eye and on the femora are coarser than those on the antennae, by the nearly equal length of the male and female rostrum, and by the other characters given in the key. Adults closely resemble those of *A. emaciipes*. Adults were found from March through September and are recorded from the tick trefoil (*Desmodium* sp.) in Florida. Nothing else is known of the biology or life history of this species. Kissinger (1968) designated the lectotypes of *A. carinatum* and *A. concoloratum*.

### *Apion cavifrons* LeConte

Figs. 69, 70; Map 14

*Apion cavifrons* LeConte, 1857:53 (lectotype, Oregon; MCZ); Kissinger 1968:241; Hatch 1971:330; O'Brien and Wibmer 1982:21.

**Description.** Length 1.6–2.5 mm. Body moderately robust, black; antennae yellowish or reddish, especially at base. Pubescence consisting of conspicuous white scales, these denser and coarser laterally on male. Frons wider than dorsal tip of rostrum, strongly impressed near eye. Rostrum of male slightly curved, 0.9–1.0 times longer than pronotum; sides, in dorsal view, converging to apex, not expanded at antennal insertion; surface densely, finely punctured, with dense, fine pubescence; apex bare at tip. Rostrum of female slightly curved, 1.3–1.4 times longer than pronotum; sides, in dorsal view, nearly parallel in apical half; surface coarsely alutaceous, with fine sparse pubescence, more finely alutaceous and more sparsely and finely

punctured beyond antennal insertion. Antennae inserted in basal third of rostrum. Eye moderately convex. Pronotum at base 1.0–1.2 times wider than long; sides slightly constricted apically, without basal flange; disc nearly flat, with deep punctures; interpuncture spaces alutaceous. Elytra 1.2–1.3 times longer than wide; striae deeply impressed, with coarse punctures and with scales similar to those on interstriae; interstriae less than twice as wide as striae, flat, each interstria with 2 rows of scales; interstria 7 with 1 long specialized seta. Metasternum of male with median, low, blunt tubercle on posterior margin. Legs of male lacking special characters; tarsal claw with acute basal tooth.

**Distribution.** Alberta, British Columbia, and south through the western United States to Utah and southern California. Alberta: Edmonton and Banff. British Columbia: "Bowser," Errington, "Hudson," Hope, Merritt, Nicola, Royal Oak, Saanich, Salmon Arm, Sidney, "Spanish Hills" (on Galiano Island), Tomslake, Vernon, and Victoria.

**Comments.** This species is in the subgenus *Eutrichapion* and is easily distinguished by the very deep, concave impression on the frons. Other characters of value are the black legs, the tarsal claw with an acute basal tooth, and the long female rostrum. Adults are encountered from February through September. Adults have been reared from flower buds of wild pea (*Lathyrus sulphureus*) and occur on flowers and foliage of wild pea (*Lathyrus* species), giant vetch (*Vicia gigantea*), and other *Vicia* species. Specimens from Merritt, B.C., are labeled "*Pseudotsugae taxifolia*" (Douglas-fir) and "*Pinus ponderosa*" (ponderosa pine). They are probably incidental records. Nothing else is recorded of the life history or habits. Kissinger (1968) designated the lectotype.

### *Apion centrale* Fall

Figs. 6, 71, 72; Map 15

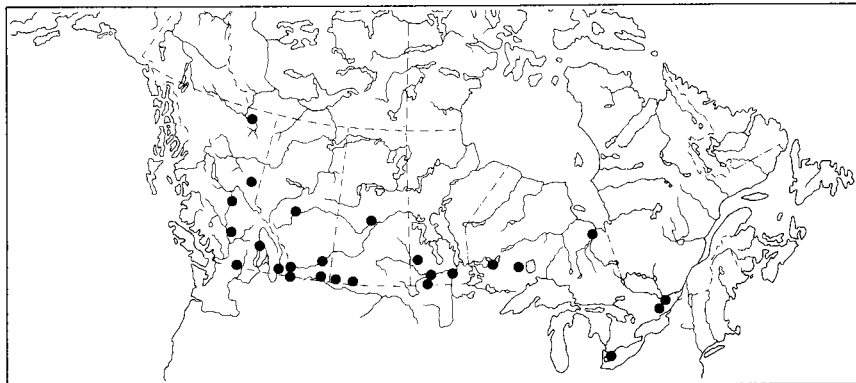
*Apion centrale* Fall, 1898:151 (lectotype, Garland, Colo.; MCZ); Kissinger 1968:93; Hatch 1971:327; O'Brien and Wibmer 1982:21.

**Description.** Length 2.0–2.5 mm. Body robust, black. Pubescence consisting of white, coarse scales, these slightly coarser laterally and ventrally. Frons 1.2–1.3 times wider than dorsal tip of rostrum, with shallow median impression bordered laterally by 2 rows of punctures. Rostrum of male evenly, slightly curved, 1.3–1.4 times longer than pronotum; sides, in dorsal view, expanded laterally and ventrally at antennal insertions, abruptly narrowed beyond antennal insertions and nearly cylindrical from middle to apex. Rostrum of female evenly, slightly curved, similar to male rostrum, 1.4–1.6 times longer than pronotum; area beyond antennal insertion glabrous, with



fine, sparse punctures. Antennae inserted in basal 0.2 of rostrum; scrobe with dorsal margin oblique anteriorly. Eyes convex, nearly round. Pronotum at base 1.2–1.3 times wider than long; sides on basal two-thirds slightly diverging to middle, the sides rounded to the slightly constricted anterior margin; disc slightly and evenly convex, with coarse, deep punctures; interpuncture spaces alutaceous. Elytra 1.1–1.3 times longer than wide; striae deeply impressed, with a row of scales, these coarser than those of adjacent interstriae; interstriae twice as wide as striae, flat to very slightly convex, each interstria with row of fine punctures and scales; interstria 9 with 1 long specialized seta. Tibiae of middle and hind legs of male with subangulate mucrones.

**Distribution.** Ontario to British Columbia, south through the western half of the United States, east to Iowa and Wisconsin. Alberta: Edmonton, Elkwater, Medicine Hat, "Morrin," Pincher Creek, and Scandia. British Columbia: "Cariboo," Cawston, Charlie Lake, Clinton, Creston, 90 km north of Fort Nelson, Prophet River, Quesnel, Robson, Terrace, Teta River at Alaska Highway, Tupper, and Vernon. Manitoba: Horton, Reynolds, Riding Mountain Provincial Park, and Winnipeg. Ontario: Kinburn, Leamington, Minnitaki, Moosonee, Ogoki, and Ottawa. Saskatchewan: Cypress Hills, Fort-à-la-Corne, Prince Albert, and Scout Lake.



Map 15. Collection localities of *Apion centrale*.

**Comments.** This species is a member of the subgenus *Trichapion*. Among Canadian species, it is most similar to *A. porcatum* and somewhat less similar to *A. reconditum*. Adults of *A. centrale* are distinguished from those of *A. porcatum* by the flat to very slightly convex elytral interstriae that are about twice as wide as the striae. The characters given in the key distinguish adults of *A. reconditum* from those of *A. centrale*. Nothing is known of the biology or life history, other

than that adults are found most commonly from late May through July. Kissinger (1959) designated the lectotype.

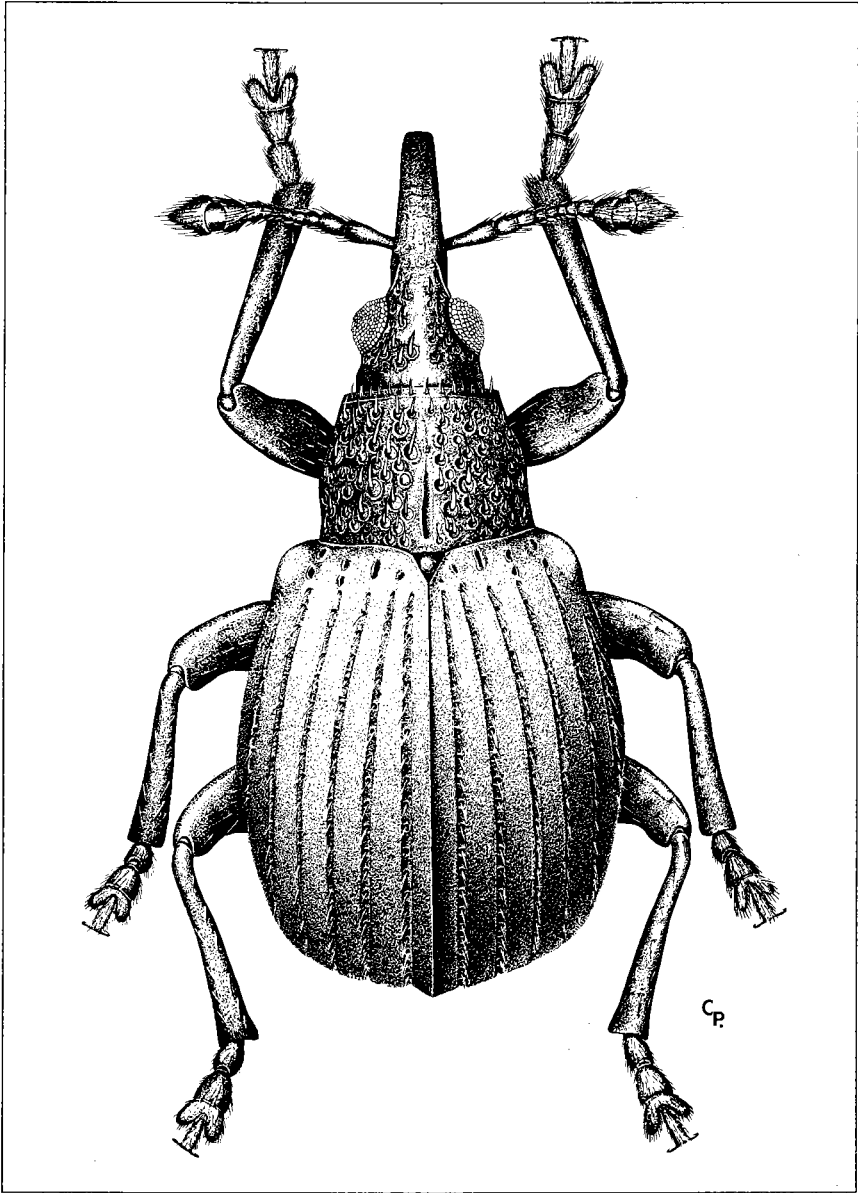


Fig. 6. *Apion centrale*

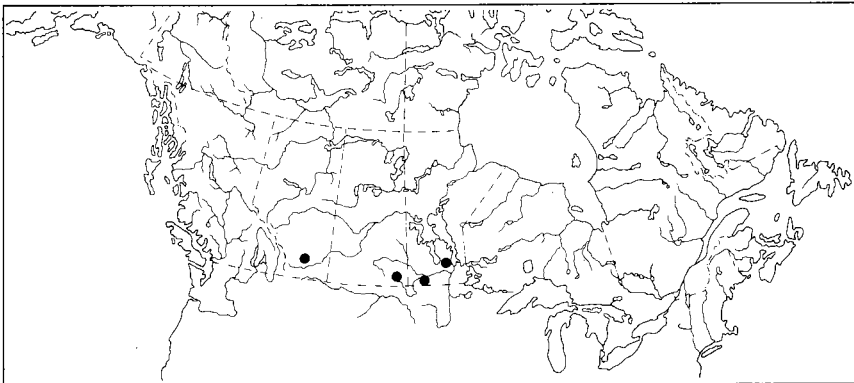
## *Apion commodum* Fall

Figs. 73, 74; Map 16

*Apion commodum* Fall, 1898:154 (holotype, Montana; USNM); Kissinger 1968:84; O'Brien and Wibmer 1982:21.

**Description.** Length 2.3–3.3 mm. Body moderately robust, black. Pubescence consisting of white, conspicuous, moderately coarse, sparse scales. Frons 1.1–1.3 times wider than tip of rostrum. Rostrum of male evenly, moderately curved, 1.1–1.2 times longer than pronotum; sides, in dorsal view, expanded at antennal insertions, converging to apical third; surface coarsely punctured. Rostrum of female slightly curved, 1.5–1.8 times longer than pronotum; sides, in dorsal view, slightly expanded at antennal insertions; basal two-thirds moderately coarsely punctured; apical third finely punctured; apex shining. Antennae inserted in basal 0.2–0.3 (male) or in basal 0.2 (female) of rostrum. Eye moderately convex. Pronotum at base 1.1 times wider than long; sides broadly rounded; disc moderately strongly convex, flattened apically and basally, with deep punctures; interpuncture spaces convex, alutaceous. Elytra 1.4–1.5 times longer than wide; striae deeply impressed; interstriae about twice as wide as striae, flat to slightly convex, each interstria with 1–3 rows of fine punctures bearing fine scales; interstria 9 with 1 long specialized seta; interstria 3 with short setae. Tibiae in male mucronate; tibiae of forelegs with minute simple mucro; tibiae of middle and hind legs with larger subdentate mucrones.

**Distribution.** Manitoba to Alberta, south to Iowa, Montana, and North Dakota. Alberta: Scandia. Saskatchewan: Aweme, Duck Lake, and Stony Mountain. Saskatchewan: Roche Percee.



Map 16. Collection localities of *Apion commodum*.

**Comments.** This species, a member of the subgenus *Trichapion*, is distinguished from other Canadian species of that subgenus by the characters given in the key. The species has been reared from the pods of breadroot (*Psoralea esculenta*). Adults are found in the field from June to August. Nothing else is known about its biology or life history.

*Apion contusum* Smith

Figs. 75, 76

*Apion contusum* Smith, 1884:61 (holotype, locality not recorded, Carnegie Museum); Kissinger 1968:216; O'Brien and Wibmer 1982:22.

*Apion spinipes* Fall, 1898:169 (lectotype, Arizona; MCZ).

*Apion notabile* Buchanan, 1922:83 (holotype, Lake Okoboji, Iowa; USNM).

**Description.** Length 1.8–2.6 mm. Body moderately slender, black; antennae with bases reddish brown. Pubescence consisting of conspicuous, white, fine, sparse scales, these becoming coarser on sides, denser on mesothorax and metepisternum. Frons 0.9–1.1 times wider than dorsal tip of rostrum, punctured; punctures fine, forming several longitudinal striae separated by narrow intervals; punctures more distinct laterally. Rostrum of male strongly curved, 1.3–1.4 times longer than pronotum; sides, in dorsal view, nearly parallel beyond middle, slightly expanded over antennal insertions, expanded to apex; surface alutaceous; basal three-quarters with fine, fairly dense punctures; apex smooth, nearly impunctate; base with moderately coarse, sparse pubescence, nearly glabrous beyond antennal insertion. Rostrum of female strongly curved, 1.5–1.7 times longer than pronotum; sides, in dorsal view, parallel from base to near apex, expanded at apex; surface similar to that of male rostrum; pubescence on base finer and sparser than in males. Antennae inserted in basal 0.2–0.3 of rostrum. Eyes moderately convex. Pronotum at base 1.1–1.2 times wider than long; sides slightly expanded to widest point at middle, rounded to constricted apex, without basal flange; disc moderately convex, flattened at base and apex, with short scales and deep punctures; interpuncture spaces alutaceous. Elytra 1.4–1.6 times longer than wide; striae deeply impressed, with fine punctures and scales; interstriae more than twice as wide as striae, convex, smooth, each interstria with very fine, sparse, transverse rugae and 1 row of fine punctures bearing fine scales; interstriae 7 and 9 each with 1 long specialized seta; interstria 3 with several short specialized setae on apical half. Tarsi of middle and hind legs of male each with inner apical margin of segment 1 produced into long spine.

**Distribution.** Quebec, south throughout the eastern United States, west to Arizona and Colorado. Quebec: Montreal.

**Comments.** This species is in the subgenus *Ceratapion* and is most similar to *A. extensum*. The female of *A. contusum* has the rostrum strongly curved, the elytral interstriae somewhat convex and nearly smooth, with 1 row of fine punctures, and the punctures on the metepisternum separated by intervals greater than half the diameter of the punctures. The female of *A. extensum* has the rostrum slightly curved, the elytral interstriae nearly flat, with fine, transverse rugae and with 2 rows of punctures, and the punctures on the metepisternum separated by less than half the diameter of the punctures. Adults were found from April through July. The host is unknown, but adults have been taken by beating willow (*Salix* species) and black locust (*Robinia pseudoacacia*). Salsbury (1984) reports collecting specimens from a prairie habitat where *Lespedeza* was common. Nothing more is known of the life history or habits. Kissinger (1963) designated the lectotype of *A. spinipes*.

#### *Apion cordatum* Smith

Figs. 77, 78

*Apion cordatum* Smith, 1884:54 (lectotype, California; MCZ); Kissinger 1968:85; Hatch 1971:328; O'Brien and Wibmer 1982:22.

**Description.** Length 2.0–2.8 mm. Body moderately robust, black. Pubescence consisting of white, conspicuous, long, coarse, sparse scales. Frons 1.2–1.3 times wider than tip of rostrum, with shallow median impression and 2 lateral rows of punctures. Rostrum of male slightly curved, 1.2 times longer than pronotum; sides, in dorsal view, slightly expanded at antennal insertions, converging to middle, parallel beyond middle; punctures moderately coarse, in rows, fine and sparse in apical third; pubescence consisting of very fine scales. Rostrum of female 1.2–1.3 times longer than pronotum; surface and shape similar to that of male. Antennae inserted into basal 0.3 (male) or 0.2 (female) of rostrum. Eyes moderately convex. Pronotum at base 1.1–1.2 times wider than long; sides arcuate; apex constricted; disc slightly convex, flattened basally and apically, with deep punctures; interpuncture spaces convex, alutaceous. Elytra 1.2–1.4 times as long as wide; striae deeply impressed; interstriae twice as wide as striae, slightly convex, each interstria with 1 or 2 rows of fine punctures bearing fine scales; interstria 9 with 1 long specialized seta. Tibiae of male mucronate.

**Distribution.** California to Washington. Not recorded in Canada but may occur in southern British Columbia.

**Comments.** This species belongs to the subgenus *Trichapion* and is distinguished by the characters given in the key and in the description. It does not appear to be closely related to any Canadian species. Nothing is known of its biology or life history, other than that adults were found on California tea (*Psoralea physodes*) and manzanita (*Arctostaphylos* species). Adults were found from April through July. Kissinger (1959) designated the lectotype.

*Apion cribricolle* LeConte

Figs. 79, 80

*Apion cribricolle* LeConte, 1857:53 (neotype, San Francisco, Calif.; USNM); Kissinger 1968:112; Hatch 1971:327; O'Brien and Wibmer 1982:22.

*Apion brevicolle* Smith, 1884:53 (lectotype, San Francisco, Calif.; USNM).

*Apion porosicollae* Gemminger, 1871:122 (unnecessary replacement name for *A. cribricolle*, LeConte 1857, not Perris 1857).

**Description.** Length 1.6–2.3 mm. Body moderately robust, black; elytra with slight brassy or metallic sheen. Pubescence consisting of fine, sparse, yellowish scales. Frons 1.0–1.4 times wider than tip of rostrum. Rostrum of both sexes moderately curved, tapered at apex, 1.0–1.2 times as long as pronotum; sides, in dorsal view, slightly expanded at apex, slightly expanded at antennal insertion, converging to near apical third, parallel beyond; surface sparsely and finely punctured to near tip and having short fine scales. Antennae inserted in basal third of rostrum. Eyes slightly prominent. Pronotum at base 1.1–1.2 times wider than long; sides more or less parallel on basal half, rounded to constricted apex; disc nearly flat, with deep punctures, and bearing fine scales; interpuncture spaces smooth. Elytra 1.3–1.5 times longer than wide; striae fine, moderately deeply impressed; interstriae about twice as wide as striae, nearly flat or slightly convex, each interstria with 1 or 2 rows of fine punctures bearing scales similar to those on dorsal surface of pronotum; interstria 9 with 1 specialized seta. Tibiae of male forelegs and middle legs mucronate; mucrones stout, dentate apically.

**Distribution.** Western United States north to Washington. Not recorded in Canada but may occur in southern British Columbia.

**Comments.** This species belongs to the subgenus *Trichapion*. Among the western species, it is most closely related to *A. opacicolle* and *A. hatchi*, both from Washington. Compared with these two species, adults of *A. cribricolle* are distinguished by the more shining elytral and

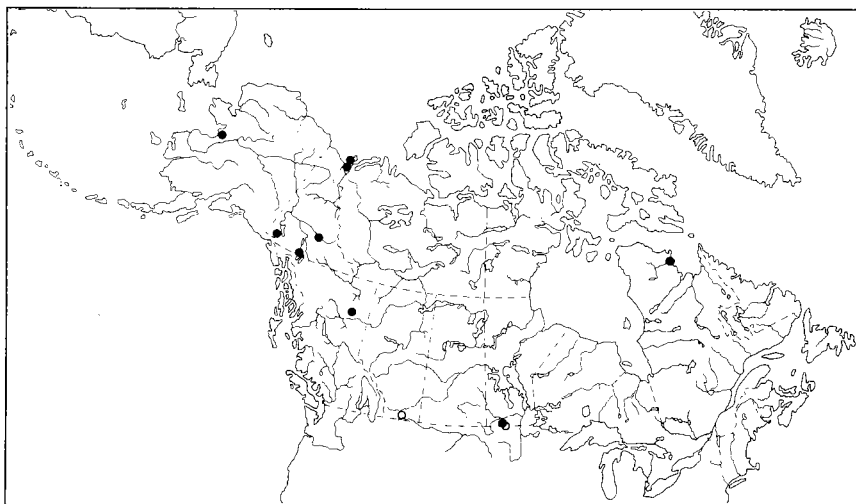
pronotal surfaces, by the lack of acute tubercles on the posterior margin of the metasternum of the male, and by the more strongly punctured elytral striae. Nothing is known of the biology or life history of this species, other than the host plants. Adults have been collected from deer vetch (*Lotus* species). Adults are also recorded from deer weed (*Lotus scoparius*), wild buckwheat (*Fagopyrum* species), and olive (*Olea* species) in California. Kissinger (1968) designated the neotype of *A. cribricolle* and the lectotype of *A. brevicolle*.

### *Apion cyanitinctum* Fall

Figs. 81, 82; Map 17

*Apion cyanitinctum* Fall, 1927:141 (holotype, Aweme, Man.; MCZ); Kissinger 1968:242; O'Brien and Wibmer 1982:22.

**Description.** Length 2.2–2.6 mm. Body moderately slender, black; elytra with bluish luster; antennae slightly blackish. Pubescence consisting of very fine, white, sparse scales. Frons 1.4–1.5 (male) or 1.3 (female) times wider than dorsal tip of rostrum; surface with series of completely or nearly contiguous punctures resembling dense, longitudinal striae. Rostrum of male slightly curved, 1.2–1.3 times longer than pronotum; sides, in dorsal view, converging moderately strongly in apical third, strongly, acutely expanded at antennal insertion, nearly parallel in apical quarter; surface alutaceous, more shining near tip, punctured; punctures fine, sparse, shallow, with fine, sparse scales, these finer, sparser, and shorter beyond antennal insertion. Rostrum of female 1.5–1.6 times longer than pronotum; sides, in dorsal view, very slightly converging in apical quarter, slightly expanded at antennal insertion, slightly expanded toward tip; surface finely alutaceous at base, polished toward tip, with fine, moderately deep, slightly elongate punctures; scales inconspicuous. Antennae inserted in basal 0.4–0.5 (male) or 0.4 (female) of rostrum; scrobe with dorsal margin slightly oblique anteriorly. Eyes moderately prominent. Pronotum at base 1.0–1.1 times wider than long; sides converging or slightly diverging from base to middle, slightly rounded beyond middle, without basal flange; apex slightly constricted; disc slightly convex, with deep punctures bearing fine, acute scales; interpuncture spaces flat, coarsely alutaceous. Elytra 1.4–1.5 times longer than wide; striae deep, punctures moderately fine; interstriae flat, about 3.0 times wider than striae, each interstria with 2 somewhat confused rows of fine punctures bearing scales similar to those on dorsal surface of pronotum; interstria 7 with 1 specialized seta (absent in some specimens). Metasternum of male with acute tubercle near posterior margin. Legs of male unmodified.



Map 17. Collection localities of *Apion cyanitinctum* (●) and *A. disparatum* (○).

**Distribution.** Alaska to Quebec, south to southern Manitoba. Alaska: Unalakleet. British Columbia: Sikanni Chief. Manitoba: Aweme. Quebec: Payne Bay. Yukon Territory: Burwash Landing, Herschel Island, Reindeer Depot, Ross River, and Tagish.

**Comments.** This species belongs to the subgenus *Eutrichapion*. Adults are distinguished from the other three Canadian representatives of the subgenus (see key) by the simple tarsal claws, by the bluish elytra, and by the strongly expanded apex of the male rostrum. Adults were collected from July through October on *Astragalus* species. Nothing else is known of the biology or life history of the species.

### *Apion decoloratum* Smith

Figs. 83, 84

*Apion decoloratum* Smith, 1884:52 (neotype, Washington, D.C.; USNM); Kissinger 1968:178; O'Brien and Wibmer 1982:22.

**Description.** Length 1.5–2.0 mm. Body robust, black; femora, tibiae, tarsi, and antennae (in part) varying from light to dark reddish brown. Pubescence consisting of distinct, white, moderately fine, sparse scales. Frons 1.0–1.3 times wider than dorsal tip of rostrum. Rostrum of both sexes moderately curved, 1.1–1.4 times longer than pronotum; sides, in dorsal view, converging slightly from antennal insertion to apex, weakly expanded at antennal insertions; surface punctured, alutaceous,



with distinct pubescence beyond antennal insertions; punctures deep, moderate sized, extending to tip; tip smooth, nearly glabrous. Antennae inserted in basal 0.2–0.3 of rostrum. Eyes prominently convex. Pronotum at base 1.2–1.3 times wider than long; sides nearly parallel to middle, arcuate to apex, with small basal flange; apex constricted; disc moderately convex, with moderately deep punctures and short scales; interpuncture spaces alutaceous. Elytra 1.2–1.3 times longer than wide; striae deeply impressed, with coarse punctures; interstriae about twice as wide as striae, nearly flat, finely alutaceous, each interstria with 1 or 2 irregular rows of scales, these coarser at base of interstriae 1–4 especially on 3; interstria 9 with 1 long specialized seta. Legs of male lacking special characters.

**Distribution.** Central New York to southern Michigan and North Dakota, south to Chiapas and Veracruz, Mexico. Not recorded in Canada, but may occur in southern Ontario.

**Comments.** This species is in the subgenus *Coelocephalapion*. Adults are distinguished from other members of the subgenus by the scales on the femora and on the head behind the eye, which are coarser than those on other body parts, by the prominently convex eye, by the very sparse pubescence, by the lack of sexual dimorphism in the shape of the rostrum, and by the presence of a distinct basal flange on the pronotum of the male. Larvae develop in legumes of bush-clover (*Lespedeza* species), in lomentos of tick trefoil (*Desmodium* species), in *Galactia volubilis*, and in seeds of prairie-clover (*Petalostemon* species). Salsbury (1984) reports specimens from several species of *Lespedeza* and *Desmodium* and from *Galactia volubilis* in Kansas. Kissinger (1968) designated the neotype of this species.

### *Apion disparatum* Sharp

Figs. 85, 86; Map 17

*Apion disparatum* Sharp, 1890:75 (lectotype, Guatemala City, Guatemala; British Museum); Kissinger 1968:223; O'Brien and Wibmer 1982:22.

*Apion nasutum* Fall, 1898:61 (lectotype, New Mexico; MCZ).

**Description.** Length 1.8–2.6 mm. Body moderately robust, black; elytra with brassy luster; antennal segment 1, femora, centre of tibiae, and apical two-thirds of male rostrum yellow or reddish. Pubescence consisting of white, conspicuous, fine, sparse scales on dorsal surface of pronotum and elytra, these coarser and denser on base of elytral interstria 3, on sides of mesothorax and metathorax, and on base of male rostrum. Frons 0.9–1.2 times wider than dorsal tip of

rostrum, with 2 rows of punctures separated by 1 wide, shallow sulcus. Rostrum of male slightly curved, 1.0–1.4 times longer than pronotum; sides, in dorsal view, nearly parallel on basal third, narrowing slightly to beyond middle, nearly parallel to tip; base with 3 rows of fine punctures bearing fine scales; surface shining, sparsely but distinctly punctured on apical two-thirds. Rostrum of female slightly curved, 1.3–1.7 times longer than pronotum; basal fifth dull and alutaceous, with minute scales; apical four-fifths shining, glabrous; sides with coarse punctures arranged in irregular rows. Antennae inserted in basal 0.3 of rostrum (both sexes). Eyes large, not prominent. Pronotum at base 1.1–1.2 times wider than long, widest at basal third; sides somewhat arcuate from base to constricted apex; disc noticeably convex, flattened apically and basally, with moderately deep punctures; interpuncture spaces irregular, usually narrower than diameter of punctures. Elytra 1.3–1.4 times longer than wide; striae moderately deep; interstriae flat, twice as wide as striae, each interstria with 1 or 2 irregular rows of fine punctures bearing fine scales; surface transversely rugose. Legs stout; femur of foreleg three times longer than wide.

**Distribution.** Manitoba to Alberta, south through the western United States to Guatemala. Alberta: Milk River. Manitoba: Aweme and Glenboro.

**Comments.** This species is placed in the subgenus *Pseudapion* and is distinguished by the color pattern mentioned above. The other two Canadian species in the subgenus have the male rostrum completely black, not mostly yellowish as in *A. disparatum*. Larvae develop in stem galls, in flower heads, or possibly in seed pods. No Canadian host species is recorded; in Texas the species is found in prairie-clover (*Petalostemon multiflorum*). Kissinger designated the lectotype both of *A. disparatum* (1968) and of *A. nasutum* (1957).

### *Apion emaciipes* Fall

Figs. 87, 88

*Apion emaciipes* Fall, 1898:166 (lectotype, Massachusetts; MCZ); Kissinger 1968:179; O'Brien and Wibmer 1982:22.

**Description.** Length 1.5–2.0 mm. Body robust, black; femora black to brownish; tibiae black with apical third dark brown to entirely brown; tarsi and antennae largely brownish. Pubescence consisting of inconspicuous, very fine, yellowish, short setae behind eyes and on femora, the setae not coarser than those on antennae. Frons about as wide as dorsal tip of rostrum. Rostrum of both sexes stout, slightly curved, 1.0–1.4 times longer than pronotum; sides, in dorsal view,

slightly expanded at antennal insertion, parallel on apical third; surface finely punctured and coarsely alutaceous to near apex; setae minute, uniform. Antennae inserted in basal 0.2–0.3 of rostrum. Eyes prominent. Pronotum as wide as long at base, narrower at middle than at base; sides expanded at base, slightly converging beyond middle, and then rounded to strongly constricted apex; disc slightly arcuate, deeply punctured; interpuncture spaces irregular; nearly flat, finely alutaceous. Elytra 1.2–1.4 times longer than wide; striae deep, with moderately coarse punctures; interstriae slightly convex, each usually with 1 row of minute, very fine setae; interstria 9 with 1 specialized seta. Male legs unarmed.

**Distribution.** Ontario, south through the eastern United States, possibly to southern Mexico. Ontario: Northumberland and Prince Edward County.

**Comments.** This species belongs in the subgenus *Ceolocephalapion* and is distinguished by the lack of marked sexual dimorphism in the rostrum and by the equal coarseness of setae on the area behind the eyes, on the femora, and on the antennae. Nothing is known of its life history or biology. One specimen in the Museum of Natural History in Washington, D.C., bears the host label of *Desmodium* sp. (tick trefoil); the record needs to be confirmed. Kissinger (1968) designated the lectotype of this species.

*Apion extensum* Smith

Figs. 89, 90

*Apion extensum* Smith, 1884:61 (lectotype, Montana; USNM); Kissinger 1968:218; O'Brien and Wibmer 1982:23.

**Description.** Length 1.8–2.2 mm. Body moderately slender, black; antennae with lighter bases. Pubescence consisting of white, dense, coarse scales, these denser on metepisternum. Frons 1.2 times as wide as dorsal tip of rostrum. Rostrum of male moderately curved, 1.2 times longer than pronotum; sides, in dorsal view, nearly parallel on apical half, expanded at antennal insertion; surface coarsely alutaceous, smoother at apex; lateral areas with coarse, deep, dense punctures, these sparser and finer apically; pubescence at base of rostrum consisting of sparse scales, these minute beyond antennal insertion. Rostrum of female slightly curved, about 1.5–1.7 times longer than pronotum, otherwise as described for *A. contusum*. Antennae inserted at basal quarter of rostrum. Eyes moderately convex. Pronotum as long as wide at base, lacking basal flange; sides slightly diverging in basal half; apex moderately constricted; disc slightly convex, with deep punctures;

interpuncture spaces coarsely alutaceous. Elytra 1.7 times longer than wide; striae moderately deeply impressed, with fine punctures, bearing scales as coarse as those on adjacent interstriae; interstriae more than twice as wide as striae, flat or nearly flat, each interstria with fine, transverse rugae and with 2 (sometimes 1) partly confused rows of minute punctures; punctures bearing scales similar in length and coarseness to those on dorsal surface of pronotum; interstria 7 with 1 long specialized seta. Femora of male all nearly equal in stoutness; tarsus of middle leg with segment 1 produced into spine on inner apical margin.

**Distribution.** Known only in Saskatchewan, Kansas, North Dakota, and Wyoming. Saskatchewan: Pike Lake.

**Comments.** This species is in the subgenus *Ceratapion* and is most similar to *A. contusum*. See comments under *A. contusum* for help in recognizing adults (especially females) of this species. Salsbury (1984) reports this species as common on *Lespedeza cuneata* and *Dalea enneandra* in Kansas. Adults were taken from May to October; otherwise nothing is known of the life history or habits. Kissinger (1968) designated the lectotype of this species.

*Apion finitimum* Fall

Figs. 52, 91; Map 18

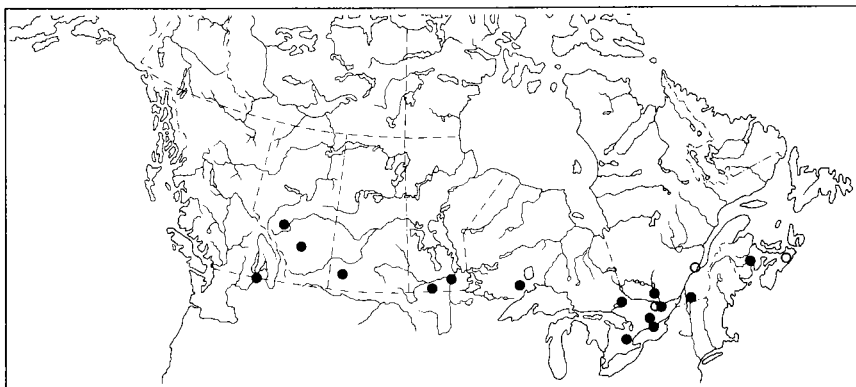
*Apion finitimum* Fall, 1898:116 (lectotype, Washington, D.C.; MCZ); Kissinger 1968:135; Hatch 1971:329; O'Brien and Wibmer 1982:23.

**Description.** Length 1.7–2.1 mm. Body moderately slender, black; legs sometimes slightly lighter. Pubescence consisting of very fine, minute, sparse scales. Frons striated, 1.3–1.6 times wider than dorsal tip of rostrum. Rostrum of male moderately curved, 1.1–1.2 times longer than pronotum; sides, in dorsal view, nearly parallel beyond middle, slightly depressed at apex, distinctly expanded at antennal insertion; surface finely and sparsely punctured to apex, coarsely alutaceous near antennal insertion, finely alutaceous elsewhere. Rostrum of female moderately curved, 1.6–2.2 times longer than pronotum; sides, in dorsal view, gradually converging beyond antennal insertion; surface in basal three-quarters finely alutaceous, with fine, sparse, slightly elongate punctures; tip polished, nearly impunctate. Antennae inserted at basal 0.3 of rostrum. Eyes moderately convex. Pronotum 0.9–1.0 times wider than long; sides of basal third slightly converging, expanding to apical four-fifths, then narrowing to slightly constricted apex; disc slightly convex, with deep punctures, these bearing very fine scales, interpuncture spaces coarsely alutaceous. Elytra

1.3–1.5 times longer than wide; striae deep, with moderately coarse punctures; interstriae about twice as wide as striae, flat, slightly narrowed toward base, each interstria with a row of randomly placed minute punctures, these bearing scales similar to those on pronotum. Femora of male forelegs strongly swollen; polished area with nearly straight limiting ridge; area extending about 0.4 length of femur, striated; striae distinct, coarse, dense, uniform on ventral surface of area (Fig. 52); tibiae of forelegs strongly widened toward apex; tibiae of middle and hind legs mucronate.

**Distribution.** New Brunswick to British Columbia, south through the eastern and northern United States to the District of Columbia, Wisconsin, Idaho, and Washington. Alberta: 3 km south of Huxley (Ghost Pine Creek), and 7 km south of Riviere Qui Barre. British Columbia: Oliver. Manitoba: Husavick, Magnus, Stonewall, and Treesbank. New Brunswick: Fredericton. Ontario: Black Sturgeon Lake, Brant, Brittania, 5 km south of Galt, Marmora, and Trenton. Quebec: Kazabazua and Knowlton. Saskatchewan: Waldeck.

**Comments.** This is another species in the subgenus *Fallapion*. In addition to the characters given in the key, adults of this species may be distinguished by characters of the polished area of the front femur, which bears deep, coarse, well-defined striations and has a prominent limiting ridge. Nothing is recorded on the life history or habits of this species. Specimens from Alberta are labeled “*ex. Carex/Eleocharis*,” and were likely collected in sweeps of marshes dominated by these plants. Kissinger (1968) designated the lectotype of this species.



Map 18. Collection localities of *Apion finitimum* (●) and *A. frosti* (○).

*Apion frosti* Kissinger

Figs. 92, 93; Map 18

*Apion frosti* Kissinger, 1968:45 (holotype, Hopkinton, Mass.; MCZ); O'Brien and Wibmer 1982:23.

**Description.** Length 2.2–2.6 mm. Body moderately elongate, dark chestnut brown. Pubescence conspicuous, consisting of white, off-white, and dark scales; scales on basal and apical regions of elytra lighter, separated by transverse bands of finer, darker scales appearing as dark band slightly below middle; scales on basal part of metepisternum denser and in wider band than in apical region. Frons wider than dorsal tip of rostrum. Rostrum of male slightly curved, about 1.4–1.5 times longer than pronotum; sides, in dorsal view, nearly parallel to tip, sometimes weakly expanded at antennal insertion; surface dull, minutely reticulate, with obscure punctures and sparse, scattered scales. Rostrum of female very long, 2.0–2.1 times longer than pronotum, otherwise similar to male. Antennae inserted in front of eye at distance greater than length of eye. Eyes prominent, strongly convex. Pronotum at base about 1.1 times wider than long; sides distinctly arcuate, abruptly rounded at constricted apex; disc slightly convex, transversely impressed at base, with shallow punctures and long, narrow scales; interpuncture spaces strongly reticulate. Elytra about 1.3 times longer than wide; striae moderately deep; interstriae about twice as wide as striae, convex to nearly flat, mostly finely rugose, each interstria with a few scattered, fine scales. Legs of male lacking special characters.

**Distribution.** Nova Scotia to Ontario, south to Massachusetts, Pennsylvania, New Jersey, and Ohio. Nova Scotia: South Ohio. Ontario: Merivale. Quebec: Quebec City.

**Comments.** This species belongs in the subgenus *Ixapion*. Adults may be distinguished by the relatively large distance between the antennal insertion and the eye, by the evenly sloped dorsal margin of the antennal scrobe, and by the very long female rostrum. Adults have been found on flowers and in the fruit of witherod (*Viburnum cassinoides* L.).

*Apion funereum* Fall

Figs. 94, 95

*Apion funereum* Fall, 1898:123 (lectotype, Camp Umatilla, Wash.; MCZ); Kissinger 1968:136; Hatch 1971:329; O'Brien and Wibmer 1982:23.

**Description.** Length 2.0–2.3 mm. Body slender, black. Pubescence consisting of white, very fine, very sparse setae. Frons 1.2–1.6 times wider than tip of rostrum, distinctly impressed near eye. Rostrum of male moderately curved, 1.3–1.5 times longer than pronotum; sides, in dorsal view, nearly parallel on apical half, slightly expanded at antennal insertion, slightly expanded at tip; basal two-thirds coarsely alutaceous, with moderately fine punctures extending to near apex and with minute setae beyond antennal insertion. Rostrum of female 1.5–1.6 times longer than pronotum, similar to male rostrum but alutaceous in basal three-quarters, minutely punctured on apical quarter. Antennae inserted between basal 0.2 and 0.3 of rostrum. Eyes slightly convex. Pronotum at base about as wide as long; sides nearly parallel; disc slightly convex, with deeply impressed punctures and fine scales; interpuncture spaces finely alutaceous. Elytra 1.6–1.8 times longer than wide; striae deeply impressed, with moderately fine punctures; interstriae convex, about as wide as striae, each interstria with 1 row of minute punctures bearing fine scales. Femora of male forelegs slightly swollen, with ventral polished area; surface area unstriated; limiting carina of area distinct, acute, nearly straight, located on inner, lateral side of femur. Tibiae of middle and hind legs mucronate.

**Distribution.** California to Washington. Not recorded in Canada but probably occurs in southern British Columbia.

**Comments.** This species is a member of the subgenus *Fallapion* and is distinguished from Canadian representatives of the subgenus by the location of the limiting carina of the polished area on the male front femur. The carina is on the inner lateral side of the femur, not on the outer side, as in the remaining Canadian species in this subgenus, except *A. speculiferum*, which has no carina. Adults have been found from April through October. Rabbit brush (*Chrysothamnus nauseosus*) is a possible host plant. Nothing else is recorded about the biology or life history of this species. Kissinger (1968) designated the lectotype of this species.

*Apion hatchi* Kissinger

Figs. 96, 97, 140, 141

*Apion hatchi* Kissinger, 1968:113 (holotype, Villa, Wash.; USNM); Hatch 1971:327; O'Brien and Wibmer 1982:23.

**Description.** Length 1.6–2.0 mm. Adults of this species are nearly identical to those of *A. opacicolle*. Males may be distinguished by differences in the aedeagus (Figs. 140, 141) as given in the key. Females

of *A. hatchi* may be distinguished (with difficulty) by the antennal insertion which is slightly closer to the front margin of the eye, and by the shorter rostrum (see key).

**Distribution.** Known only in Washington. Not recorded in Canada but probably occurs in southern British Columbia.

**Comments.** See the diagnosis and the key for characters that distinguish adults of this species. Nothing is known of the biology or life history of this species.

*Apion hookeri* Kirby

*Apion hookeri* Kirby, 1808:69 (Type unlocated, "Anglia"; BMNH); Germar, 1817:235; Wagner, 1910:33; Lohse, 1981:157.

**Description.** Length of male 1.6–2.0 mm; length of female 1.7–2.4 mm. Body robust, black. Pubescence consisting of short, fine, moderately sparse setae on pronotum, elytral interstriae, and legs. Frons wider than dorsal tip of rostrum. Rostrum of male slightly curved, about as long as pronotum; sides, in dorsal view, evenly converging from eye to apex; surface alutaceous, with very sparse fine setae; apex smooth, shining, glabrous. Rostrum of female 1.2 times longer than pronotum and slightly curved; sides, in dorsal view, nearly parallel from antennal insertion to apex and very weakly expanded at antennal insertion; surface alutaceous, glabrous over entire surface. Antennae inserted at basal 0.2 (male and female) of rostrum. Eyes moderately convex. Pronotum at base as long as wide; sides distinctly arcuate, not constricted apically, without basal flange; disc convex; surface alutaceous and deeply punctured. Elytra 1.3 times longer than wide; striae deeply impressed, with fine, moderately deep punctures; interstriae flat, about twice as wide as striae, each interstriae with a medium row of fine, short setae; interstriae 9 without a specialized seta. Metaepisternum of male unmodified. Tarsal claws simple (both sexes).

**Distribution.** In Canada known only in Antigonish Landing and Harbour Centre, Antigonish County, Nova Scotia. In the Old World known in Asia, through Europe to North Africa (Lohse 1981).

**Comments.** This species is known in Canada by several series of specimens recently collected in Nova Scotia from flowers of *Matricaria perforata* Merat (= *Tripleurospermum perforatum* (Merat) Wagenitz). This European weevil was being considered as a potential introduction for biological control of *M. perforata* when these apparently native specimens were discovered. The Nova Scotia specimens were carefully compared to several series of *A. hookeri* from Europe and appear to be



conspecific. This is the first record of *A. hookeri* in North America. Freese (1981) described the biology of *A. hookeri*. Field and laboratory data confirm that this species is monophagous on *M. perforata*. Eggs are laid in developing flowerheads; apical flowerheads appear to be preferred over nonapical ones. About 4 to 5 larvae are found per flowerhead and each larva requires about 21 seeds for complete development. In one study area in Europe, only about 35% of the seeds in a flowerhead are used because of a high level of larval mortality resulting from parasitoids. Similar data for Canadian conditions are unavailable. Adults of this species can be recognized by the simple male tibiae, by the lack of any color pattern on the elytra, by the lack of a tubercle on the male metasternum, by the lack of a basal flange on the male pronotum, and by the simple tarsal claws. *Apion hookeri* is placed in the subgenus *Omphalapion* (Lohse 1981) and is the only North American representative of that subgenus.

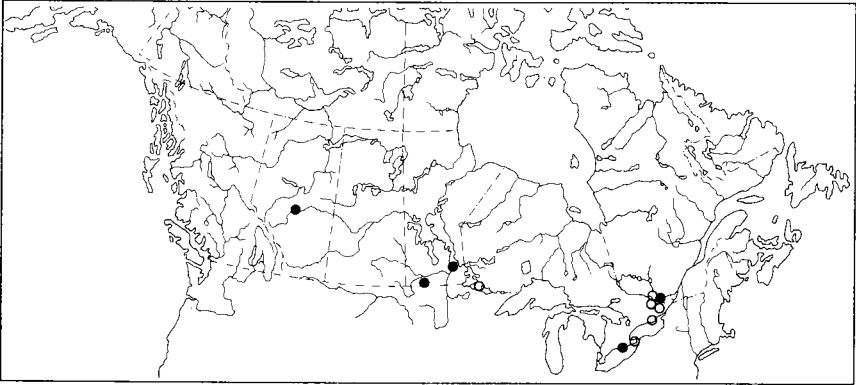
### *Apion huron* Fall

Figs. 98, 99; Map 19

*Apion huron* Fall, 1898:159 (lectotype, Detroit, Mich.; MCZ); Kissinger 1968:243; O'Brien and Wibmer 1982:24.

**Description.** Length 1.7–2.3 mm. Body moderately slender, black; antennae with base and club paler. Pubescence consisting of white, conspicuous setae; setae of male coarser and denser on lateral areas. Frons wider than dorsal tip of rostrum, generally flat, rarely slightly impressed near eye. Rostrum of male slightly curved, 1.1–1.2 times longer than pronotum; sides, in dorsal view, converging to apex, not expanded at antennal insertion; sculpture and pubescence as in *A. cavifrons*. Rostrum of female moderately curved, 1.2–1.3 times longer than pronotum; sides, in dorsal view, nearly parallel in apical half, converging slightly beyond antennal insertion to tip; surface below antennal insertion coarsely alutaceous, with sparse, minute vestiture; surface above antennal insertion nearly smooth with minute punctures. Antennae inserted between basal 0.3–0.4 (male) or at basal 0.3 (female) of rostrum. Eyes moderately prominent. Pronotum at base 1.1–1.2 times wider than long; sides lacking basal flange; apex slightly constricted; disc nearly flat, with deep punctures; interpuncture spaces alutaceous. Elytra 1.2–1.3 times longer than wide; striae deeply impressed, with coarse punctures; interstriae more than twice as wide as striae, nearly flat, each interstria with 1 row of scales; interstria 7 with 1 specialized seta. Metasternum of male with 1 median low tubercle near posterior margin.

**Distribution.** Ontario to Alberta, south through the northern United States from North Dakota to Michigan, south to Indiana. Alberta: Edmonton. Manitoba: Aweme and Husavick. Ontario: Ottawa and Turkey Point.



Map 19. Collection localities of *Apion huron* (●) and *A. idiaestes* (○).

**Comments.** This species belongs to the subgenus *Eutrichapion* and most closely resembles *A. cavifrons*. Adults of *A. huron* are distinguished by the flat frons and by the single row of setae on the elytral interstriae. Adults were collected from May through August. Nothing is known of the life history or habits of this species. Kissinger (1968) designated the lectotype of this species.

*Apion idiaestes* Kissinger

Figs. 100, 101; Map 19

*Apion idiaestes* Kissinger, 1968:47 (holotype, Clementon, N.J.; USNM); O'Brien and Wibmer 1982:24.

**Description.** Length 2.1–2.7 mm. Body moderately elongate, dark reddish brown. Pubescence conspicuous, consisting of white, off-white, yellow, to dark scales; scales on basal and apical regions of elytra lighter, separated by transverse bands of finer, darker scales appearing as dark band near middle; scales on metepisternum dense at base, thinning out to more or less single row in apical half. Frons wider than dorsal tip of rostrum. Rostrum about 1.5 times longer than pronotum in males, slightly longer in females, both with sparse, fairly coarse round punctures; rostrum not deeply sulcate or carinate at base. Rostrum of males with scales distal to antennal insertion as coarse as

scales on base; surface shining or moderately to densely alutaceous to near tip. Rostrum of female finely alutaceous distal to antennal insertion, with scales distinctly finer than those on base. Antennae inserted in front of eye at distance less than length of eye. Pronotum at base about 1.1 times wider than long, slightly wider at base; sides arcuate, rounded to constricted apex; disc slightly convex, with deep punctures bearing narrow scales; interpuncture spaces finely alutaceous. Elytra about 1.3 times longer than wide; striae moderately deep; interstriae about twice as wide as striae, convex to nearly flat, mostly very finely reticulate, each interstria with a few fine scales. Legs of male lacking specialized characters.

**Distribution.** Ontario and Quebec, south through the northeastern United States. Ontario: Arnprior, Constance Bay, Ottawa, Prince Edward County, and Rainy River District. Quebec: Aylmer.

**Comments.** This species is one of two in Canada that belong to the subgenus *Ixapion*. Adults of *A. idiaestes* are distinguished from those of the other species, *A. frosti*, by the small but distinct punctures on the rostrum (the rostrum of *A. frosti* is impunctate) and by the less abundant scales on the posterior portion of the metepisternum. Other characters useful for distinguishing the two species are summarized in the key. Nothing is known of the biology or life history of this species except for the host plant, withe-rod (*Viburnum cassinoides*).

### *Apion impeditum* Fall

Figs. 53, 102, 103

*Apion impeditum* Fall, 1898:113 (lectotype, Peekskill, N.Y.; MCZ): Kissinger 1968:138; O'Brien and Wibmer 1982:24.

**Description.** Length 1.8–2.2 mm. Body slender, black; legs and antennae reddish brown. Pubescence consisting of white, sparse, very fine setae. Frons 1.0–1.2 times wider than dorsal tip of rostrum. Rostrum of male moderately curved, 1.3 times longer than pronotum; sides, in dorsal view, nearly parallel in apical half, slightly expanded at antennal insertion, slightly expanded toward apex; basal two-thirds coarsely alutaceous, the tip smoother with small punctures. Rostrum of female moderately curved, 1.4–1.6 times longer than pronotum; otherwise similar to male, except tip smoother with fine punctures. Antennae inserted between basal 0.2 and 0.3 of rostrum. Eyes moderately convex. Pronotum at base 1.0–1.1 times wider than long; sides nearly parallel throughout, slightly constricted at apex; disc slightly convex, with deep punctures bearing fine scales; interpuncture spaces alutaceous. Elytra 1.5–1.6 times longer than wide; striae deep, moderately finely punctured;

interstriae about twice as wide as striae, narrowed basally, with sparse, transverse rugae and with median row of minute punctures, each puncture bearing a fine scale similar to those on dorsal surface of pronotum. Femora of male forelegs moderately swollen, with striated polished area about one-third as long as femur; striae strong, very sparse; lateral limiting carina of area reduced, somewhat acute, nearly straight (Fig. 53). Tibiae of middle and hind legs mucronate. Abdominal sternites coarsely and deeply punctured.

**Distribution.** Quebec; in the United States known from Alabama to New York, west to Illinois. Quebec: Kirks Ferry.

**Comments.** This species is a member of the subgenus *Fallapion* and is distinguished by the coarsely and deeply punctured abdominal sternites. Nothing is known of its life history or habits. Kissinger (1968) designated the lectotype of this species.

*Apion longirostre* Olivier

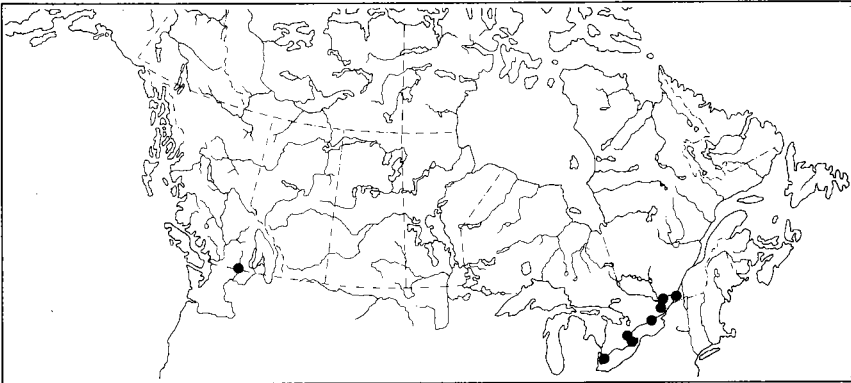
Figs. 104, 105; Map 20

*Apion longirostre* Olivier, 1807:35 (type destroyed); Kissinger 1968:126; Hatch 1971:328; O'Brien and Wibmer 1982:24; White 1983:316, 317.

**Description.** Length 2.6–3.2 mm. Body slender, black; femora and tibiae pale reddish yellow. Pubescence consisting of white, fine, moderately dense setae. Frons not narrower than tip of rostrum. Rostrum of male slightly curved, about 1.4 times longer than pronotum; sides, in dorsal view, converging to apex, nearly parallel on apical fifth; basal three-quarters with moderately coarse dense punctures bearing fine scales. Rostrum of female slightly curved, very long, 2.7–2.8 times longer than pronotum; sides, in dorsal view, nearly parallel on apical third, slightly expanded at antennal insertions, and distinctly expanded at tip; surface polished, with fine punctures, and nearly glabrous. Antennae inserted between basal 0.2 and 0.3 of rostrum. Eyes slightly prominent. Pronotum at base 0.9 times wider than long in female, distinctly longer than wide at base in male; sides nearly parallel for short distance at base and rounded near middle; apex slightly constricted; disc moderately convex, with several punctures frequently merging to form an elongate, impressed line bearing fine scales; interpuncture spaces narrow, subcariniform, smooth. Elytra 1.6–1.8 times longer than wide; striae fine, deep; interstriae flat, at middle about as wide as striae, each interstria with deep, coarse, sparse, transverse striae and 2 or 3 rows of fine punctures bearing scales similar to those on

dorsal surface of pronotum. Femora of forelegs stout, about 2.7 times longer than wide. Tibiae of male legs all mucronate.

**Distribution.** Ontario, Quebec, Saskatchewan, and British Columbia, south throughout the United States. Introduced to North America; native to southern and southeastern Europe and Asia Minor. British Columbia: Oliver and Osoyoos. Ontario: Belleville, Chatham, Guelph, Niagara Falls, Ottawa, Prince Edward County, Richmond Hill, St. Davids, and Vineland. Quebec: Dorval and Montreal. Saskatchewan: Tompkins (not on map).



Map 20. Collection localities of *Apion longirostre*.

**Comments.** This species is the only member of the subgenus *Rhopalapion* in North America. Adults are easily recognized by the characters in the key. In addition, the following features are characteristic: the pronotum lacks a basal flange; the rostrum is strongly sexually dimorphic; the elytral striae are joined at the apex as follows: 1-2-9, 3-4, 5-6, 7-8; the elytra lack deep pits on the apex; and interstria 9 bears 1 long specialized seta. This species was first collected in the United States in Georgia in 1914 and is now widespread. It was first taken in the Pacific Northwest in 1966 in eastern Washington, later at McMinnville, in 1967. It is abundant in hollyhock (*Althea rosea*) and has been given the common name hollyhock weevil. The species overwinters as adults or larvae in hollyhock seeds. Adults emerge in the spring and feed on unopened flower buds. Apparently, the adults chew through the calyx and feed on the developing flower petals and on other parts. After mating (July to August), the female bores holes deep into the flower buds, using her extremely long proboscis. After laying eggs at the bottom of the holes, she pushes them into place with her proboscis. Larvae feed briefly on the flower parts and eventually enter the seeds. Only one larva is found per seed, and it consumes the entire seed

contents. Larval development extends over 4–6 weeks. Pupation occurs in the seeds (Tuttle 1954). Adults may be extremely abundant; hundreds of specimens have been seen to emerge from only a few flower heads. The Olivier collection has evidently been destroyed, and a neotype has not been designated. The concept of this species follows that of Schoenherr (1833).

*Apion melanarium* Gerstaecker

Figs. 54, 106, 107

*Apion melanarium* Gerstaecker, 1854:261 (holotype, "Nordamerika"; Humboldt University); Kissinger 1968:139; O'Brien and Wibmer 1982:24.

**Description.** Length 2.0–2.5 mm. Body slender, black; antennae slightly paler. Pubescence consisting of white, very fine, sparse scales. Frons 1.0–1.3 times wider than tip of rostrum. Rostrum of male moderately curved, 1.3–1.4 times longer than pronotum; sides, in dorsal view, nearly parallel on apical half, depressed at apex, expanded at antennal insertion; basal two-thirds finely alutaceous and finely punctured; tip smooth, with minute scales distal to antennal insertion. Rostrum of female moderately curved, 1.5–2.0 times as long as pronotum; sides, in dorsal view, nearly parallel on apical half; surface on basal five-sixths finely alutaceous, finely punctured; tip smooth, minutely punctured. Antennae inserted between basal 0.2 and 0.3 of rostrum. Eyes moderately prominent. Pronotum at base 1.0–1.1 times wider than long; sides slightly converging basally, rounded towards middle; apex moderately constricted; disc slightly convex, with deep punctures and very fine scales; interpuncture spaces finely alutaceous. Elytra 1.4–1.6 times longer than wide; striae deep, with fine punctures; interstriae more than twice as wide as striae, flat to slightly convex, each interstria with 1 row of minute punctures bearing scales similar to those on pronotum. Femora of male forelegs swollen; polished area lacking distinct striae (Fig. 54); area with limiting lateral ridge evident. Tibiae of male middle and hind legs mucronate.

**Distribution.** Ontario, south through the eastern United States to Texas and Georgia, west to North Dakota. Ontario: Grimsby Beach, Leamington, and Point Pelee.

**Comments.** This species is in the subgenus *Fallapion*. Adults are distinguished by the characters in the key and in the diagnosis. The biology of this species was studied by Tuttle (1954) in east central Illinois. His observations are probably valid for southern Ontario. All stages of development were found in stems of devil's beggarticks (*Bidens frondosa*) and nodding beggarticks (*B. cernua*). These plants grow either

in water or in very moist situations. Adults feed on the leaves of the host plant, riddling the leaves with holes. Mating occurs on the leaves during July. The female bores a hole in the stem and lays one or more eggs in the hole, often pushing the eggs further into the stem with her proboscis and putting plant fibers over the opening. The larvae feed in the stem tissue, forming very short tunnels throughout it. Stems may be heavily infested; either more than one egg may be deposited in a hole or the oviposition punctures are close together. The entire stem, which averages 25 cm in length, is inhabited except toward the tip and near ground level. Pupation occurs at the upper end of the larval tunnel and very close to the outside of the stem. The pupal period lasts 7–11 days. The insects probably overwinter as larvae.

*Apion nigrum* Herbst

Figs. 108, 109

*Apion nigrum* Herbst, 1797:112 (type material unknown); Kissinger 1968:88; O'Brien and Wibmer 1982:25.

**Description.** Length 1.8–2.6 mm. Body moderately robust, black. Pubescence consisting of white, fine, sparse scales, these coarser and more conspicuous on lateral areas. Frons 1.3–1.5 times wider than dorsal tip of rostrum, with median smooth area flanked by 2 lateral rows of punctures. Rostrum of male slightly curved, 1.2–1.3 times longer than pronotum; sides, in dorsal view, converging from antennal insertion to apex, moderately expanded at antennal insertion; basal two-thirds dull, punctured, with sparse pubescence; apical third smoother, moderately shining. Rostrum of female slightly curved, 1.4–1.6 times longer than pronotum; sides, in dorsal view, narrowing beyond basal one-third to middle, nearly cylindrical from middle to apex; surface anterior to antennal insertion glabrous, alutaceous, moderately punctured. Antennae inserted between basal 0.3–0.4 (male) or at basal 0.3 (female) of rostrum; scrobe with dorsal margin oblique anteriorly. Eyes convex, slightly wider than long. Pronotum at base 1.1–1.3 times wider than long; sides moderately expanded at base, arcuately expanded to middle, rounding to constricted apex; disc slightly convex, flattened basally and apically, with moderately deep punctures; interpuncture spaces nearly flat, variable in width, alutaceous. Elytra 1.2–1.5 times longer than wide; striae deeply impressed; interstriae twice as wide as striae, moderately convex, each with 1 or 2 rows of punctures bearing fine scales; interstria 9 with 1 long specialized seta. Tibiae of male middle and hind legs mucronate. Tarsi of male forelegs dilated, with long pubescence on ventral surface.

**Distribution.** Central New York to central Wisconsin, south through the eastern United States to Mississippi and Louisiana. Not recorded in Canada but probably occurs in southern Ontario.

**Comments.** This species is in the subgenus *Trichapion* and belongs to the same group as *A. procline*, *A. rostrum*, and *A. simile*, but is not closely related to any of them. Adults are most easily recognized by the dense, long, moderately abundant setae on the ventral surface of the front tarsi and by the middle of the pronotum being distinctly wider than the base. Adults are often found feeding on the leaves of black locust (*Robinia pseudoacacia*); the larvae mine immature seed pods but do not feed on the seeds. Nothing else is known of the biology or life history of this species.

*Apion occidentale* Fall

Figs. 110, 111

*Apion occidentale* Fall, 1898:123 (lectotype, Arizona; MCZ); Kissinger 1968:142; O'Brien and Wibmer 1982:25.

**Description.** Length 2.2–2.8 mm. Body slender, black; antennae and legs paler. Pubescence consisting of fine, sparse, white scales. Frons 1.0–1.1 (male) or 1.1–1.3 (female) times wider than tip of rostrum. Rostrum of male slightly curved, 1.3 times as long as pronotum; sides, in dorsal view, slightly expanded at antennal insertions, narrowing to apical third, very slightly expanded at apex; surface alutaceous to apical fifth, with fine, sparse, minute punctures; pubescence minute beyond antennal insertions. Rostrum of female about twice as long as pronotum, similar to that of male except basal four-fifths alutaceous, finely punctured, smoother, and apex more finely and sparsely punctured. Antennae inserted at basal third of rostrum. Eyes moderately convex. Pronotum at base about as wide as long; sides nearly parallel; apex slightly constricted; disc slightly convex, flattened basally and apically with deep punctures bearing minute scales; interpuncture spaces alutaceous. Elytra 1.6–1.7 times longer than wide; striae moderately deeply impressed, with fine punctures; interstriae about twice as wide as striae, flat to slightly convex, each with 1 or 2 rows of minute punctures bearing fine scales similar to those on dorsal surface of pronotum. Femora of male forelegs slightly swollen; polished area on ventral-lateral portion distinct, with fine striae separated by about five times their width; area with acute limiting carina. Tibiae of male middle and hind legs mucronate.



**Distribution.** Alberta, south through the central and western United States to Arizona and Texas, east to Missouri and Minnesota. Alberta: Scandia.

**Comments.** This species is a member of the subgenus *Fallapion*. Adults are distinguished from other members of the subgenus by the fine striae on the polished area on the male front femora, by the comparatively slender elytra, and by the relative length of the rostrum compared to the length of the pronotum. In addition, the elytral humeri are prominent and the legs are generally reddish. Adults have recently been implicated in the transmission of a fungal disease, black stem of sunflowers. Spores of fungus have been found on the antennae and mesothoracic and metathoracic legs of both wild and laboratory adults. Fungal hyphae were observed on the rostrum of adult weevils (Gaudet and Schulz 1984). In North Dakota and Minnesota, *Apion occidentale* overwinters as an adult and begins feeding on sunflowers (*Helianthus* species) as soon as the plants emerge in the spring. Adults feed on the leaves and stems from early spring to late July. Females deposit their eggs under the epidermis of the stem; larvae tunnel in the pith area of the stem, pupate, and emerge as adults in late July or early August. The insects are mostly or wholly inactive for a period of about 2 weeks in late July or early August. Adults emerging in August feed on the leaves and stems of the plant, but as the plant matures and the leaves become senescent, the adults move under the involucral bracts of the sunflower head, where they remain feeding until winter or until the plants are harvested (Gaudet and Schulz 1981). The feeding of adults and larvae does not cause significant mechanical damage to cultivated sunflowers, but the transmission of black stem of sunflowers may make this species economically important. In addition to sunflowers, adults have also been taken on *Haplopappus* species and *Coreopsis* species (Salisbury 1984). Kissinger (1968) designated the lectotype of this species.

*Apion opacicolle* Smith

Figs. 112, 113, 142, 143

*Apion opacicolle* Smith, 1884:51 (lectotype, "Rey Co."; USNM); Kissinger 1968:13; Hatch 1971:327; O'Brien and Wibmer 1982:25.

**Description.** Length 1.6–2.5 mm. Body moderately slender, black. Pubescence consisting of yellowish, very fine, very sparse scales. Frons 1.0–1.2 times wider than tip of rostrum. Rostrum of male slightly curved, 1.2–1.3 times longer than pronotum; sides, in dorsal view, nearly parallel in apical third, slightly expanded at antennal insertion; surface alutaceous, with fine, short scales to near tip; punctures shallow, fairly sparse. Rostrum of female slightly curved, 1.5–1.6 times longer than

pronotum; sides, in dorsal view, as in male, except distinctly expanded toward apex; basal two-thirds alutaceous; apex polished, with fine punctures bearing minute scales extending to tip. Antennae inserted between basal 0.3–0.4 (female) or at basal 0.4 (male) of rostrum. Eyes slightly prominent, nearly round. Pronotum 1.1–1.2 times wider than long; sides nearly parallel, slightly narrowed and constricted toward apex; disc slightly convex, with moderately deep punctures; interpuncture spaces alutaceous. Elytra 1.4–1.5 times longer than wide; striae moderately coarse, moderately deep; interstriae flat to slightly convex, twice as wide as striae at middle, each interstria with 1 or 2 rows of fine punctures bearing fine scales; interstria 9 with 1 specialized seta. Tibiae of male forelegs and middle legs mucronate. Metasternum of male with 1 pair of acute tubercles on posterior margin.

**Distribution.** California to Washington. Not recorded in Canada, but probably occurs in southern British Columbia.

**Comments.** This species belongs in the subgenus *Trichapion*. It and the closely related *A. hatchi* are distinguished from other species in the subgenus by the presence of a pair of acute tubercles near the middle of the posterior margin of the male metasternum. *A. opacicolle* is distinguished from *A. hatchi* by the characters of the aedeagus (Figs. 142, 143), as given in the key. Kissinger (1968) stated that adults have been collected feeding on the upper surface of alder (*Alnus* species) leaves and by sweeping near an ocean beach. Kissinger (1968) designated the lectotype. The locality on the lectotype is given simply as "Rey Co." and may refer to Point Reyes National Seashore, Marin County, Calif.

#### *Apion parallelum* Smith

Figs. 114, 115

*Apion parallelum* Smith, 1884:47 (lectotype, Washington, D.C.; MCZ); Kissinger 1968:219; O'Brien and Wibmer 1982:25.

**Description.** Length 1.4–2.0 mm. Body moderately slender, black; elytra with greenish luster; antennae with bases paler than body; legs sometimes paler than body. Pubescence consisting of white, sparse, coarse scales, these denser on sides of metepisternum and mesothorax. Frons 1.2–1.3 times wider than tip of rostrum (dorsal view). Rostrum of male moderately curved, 1.3–1.4 times longer than pronotum; sides, in dorsal view, nearly parallel in apical half, slightly expanded over antennal insertion; apex with sides nearly parallel or slightly expanded; surface moderately coarsely alutaceous, smooth at apex, with sparse, small punctures extending to apex; pubescence at base consisting of

sparse scales, these minute beyond antennal insertion. Rostrum of female 1.4–1.5 times longer than pronotum, similar to that of male, but finely alutaceous throughout. Antennae inserted between basal 0.2–0.3 of rostrum. Pronotum at base about as long as wide; sides slightly expanded to middle; apex distinctly constricted; basal flange absent; disc slightly to distinctly (especially in female) convex, with deep punctures bearing fine scales; interpuncture spaces finely alutaceous. Elytra 1.5–1.7 times longer than wide; striae deeply impressed, with coarse punctures and with scales generally coarser than those on adjacent interstriae; interstriae more than twice as wide as striae, convex, nearly smooth, each interstria with 1 row of minute punctures bearing scales similar to those on dorsal surface of pronotum; interstria 7 with 1 long specialized seta. Femora of male middle legs slightly stouter than femora of hind legs. Segment 1 of mesotarsus with inner apical margin produced into spine.

**Distribution.** Eastern and midwestern United States as far north as Detroit, Mich. Not recorded in Canada but probably occurs in southern Ontario.

**Comments.** This species belongs in the subgenus *Ceratapion* and is not close to any Canadian species in the subgenus. It is distinguished by the characters given in the key. Adults have been collected from May through September. They have been taken on species of tick trefoil (*Desmodium* species); Kissinger (1963) records finding larvae, presumably of this species, boring in the pith of stems of *Desmodium* species. Kissinger (1968) designated the lectotype.

*Apion pennsylvanicum* Boheman

Figs. 50, 116, 117; Map 21

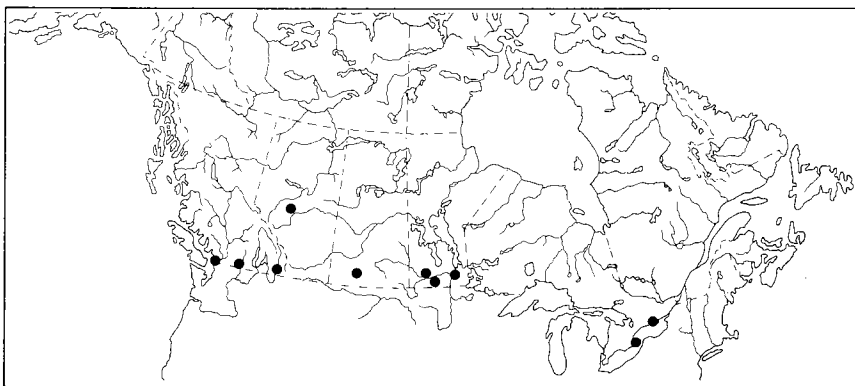
*Apion pennsylvanicum* Boheman, 1839:417 (lectotype, "Amer. Bor."; NHRM); Kissinger 1968:143; Hatch 1971:329; O'Brien and Wibmer 1982:26.

*Apion erythrocerum* Smith, 1884:44 (lectotype, New Jersey; USNM).

**Description.** Length 1.8–2.3 mm. Body moderately slender, black, with light metallic luster. Pubescence consisting of white, very fine, sparse scales. Frons 1.1–1.4 times wider than tip of rostrum, with fine, irregular, longitudinal sulci. Rostrum of male slightly curved, 1.5 times longer than pronotum; sides, in dorsal view, parallel on apical third, very slightly expanded at antennal insertion, very slightly expanded at tip; surface finely alutaceous, punctured in basal two-thirds, polished in apical third. Rostrum of female moderately curved, 1.6–2.4 times longer than pronotum; sides, in dorsal view,

parallel on apical quarter, slightly expanded at antennal insertion; surface of basal three-quarters finely alutaceous, with fine, sparse, elongate punctures. Antennae inserted between basal 0.2–0.3 of rostrum. Eyes moderately prominent. Pronotum at base about as wide as long; sides slightly converging at base, rounded near middle; apex moderately constricted; disc slightly convex, flattened basally and apically, with moderately deep punctures bearing minute scales; interpuncture spaces finely alutaceous. Elytra 1.3–1.4 times longer than wide; striae moderately fine, moderately deep; interstriae about twice as wide as striae, flat to slightly convex, each with 1 or 2 rows of minute punctures bearing scales similar to those on pronotum. Femora of male forelegs slightly swollen near apical third, with polished area; area with limiting carina distinct, acute, straight; area generally not striate, rarely with 3 or 4 very fine indistinct striae (Fig. 50). Tibiae of male middle and hind legs mucronate.

**Distribution.** Ontario to British Columbia, south throughout the United States. Alberta: Edmonton. British Columbia: Cawston, Cranbrook, and Saanich District. Manitoba: "Magnus," Shilo, and Winnipeg. Ontario: Brant and Prince Edward County. Saskatchewan: Redfield and Waldeck.



Map 21. Collection localities of *Apion pennsylvanicum*.

**Comments.** This species is a member of the subgenus *Fallapion* and may be distinguished from other Canadian members of the subgenus by the presence of a distinct limiting carina on the unstriated or faintly striated polished area on the front femur of the male, by the stout elytra, and by the length of the rostrum compared with the pronotal length. Larvae have been found in stems of water hemlock (*Cicuta maculata*) and wild parsnip. Large numbers of adults have

also been taken from water-cress (*Nasturtium officinale*), but no feeding was observed (Salsbury 1984). Nothing else is recorded concerning the biology or life history of this species. Kissinger (1968) designated the lectotypes of *A. pennsylvanicum* and *A. erythrocerum*.

### *Apion porcatum* Boheman

Figs. 118, 119

*Apion porcatum* Boheman, 1839:374 (holotype, Massachusetts; NHRM); Kissinger 1968:99; O'Brien and Wibmer 1982:26.

**Description.** Length 2.5–3.0 mm. Body robust, black. Pubescence consisting of inconspicuous, very fine white scales. Frons 1.1–1.2 times wider than dorsal tip of rostrum; median area wide, bearing a shallow depression and 1 lateral line of punctures. Rostrum of male slightly curved, 1.2–1.4 times longer than pronotum; sides, in dorsal view, moderately expanded at antennal insertion, narrowing to middle; apical half nearly cylindrical; surface moderately punctured throughout, finely alutaceous. Rostrum of female 1.4–1.5 times longer than pronotum, similar to male rostrum but more slender and with sparser and finer punctures. Antennae inserted between basal 0.2 and 0.3 of rostrum. Eyes prominent, nearly round. Pronotum at base 1.2–1.4 times as wide as long; sides moderately expanded at base, slightly arcuate to middle, rounded to constricted apex; disc slightly and evenly convex, with deep punctures; interpuncture spaces irregular, alutaceous. Elytra 1.2–1.3 times longer than wide; striae deep, with coarse punctures; interstriae strongly convex, slightly wider than striae, each interstria with 1 row of moderate punctures bearing inconspicuous scales; interstria 9 with 1 long specialized seta. Tibiae of male middle and hind legs with slender dentate mucrones.

**Distribution.** Ontario, south through the eastern United States to northern Mississippi, and east to Iowa. Ontario: Prince Edward County.

**Comments.** This species belongs to the subgenus *Trichapion*; adults are similar to those of *A. reconditum* and *A. centrale*, but they differ by the strongly convex elytral interstriae and the deeply impressed striae. Nothing is known of the life history or biology, except that adults are most frequently found in May and June and occur on black locust (*Robinia pseudoacacia*). The larval host is unknown.

*Apion proclive* LeConte

Figs. 49, 120, 121

*Apion proclive* LeConte, 1857:53 (lectotype, California; MCZ); Kissinger 1968:56; Hatch 1971:283; O'Brien and Wibmer 1982:26.

*Apion crassinasum* LeConte, 1857:53 (lectotype, Oregon; MCZ).

*Apion numenmacheri* Wagner, 1912:97 (types probably lost).

**Description.** Length 1.7–2.8 mm. Body moderately robust, black. Pubescence consisting of conspicuous, white, sparse, fine scales, these coarser on sides of mesothorax and metathorax. Frons declivitous above posterior margin of eye, with deep, median impression and with 2 lateral rows of punctures; frons of male as wide as dorsal tip of rostrum; frons of female wider than rostrum tip. Rostrum of male evenly, slightly curved, 1.3–1.4 times longer than pronotum; sides, in dorsal view, expanded at antennal insertion, narrowing to apical third; basal two-thirds punctured, scaly; apex smoother, glabrous, shining. Rostrum of female evenly, moderately curved, 1.7–2.0 times longer than pronotum; sides, in dorsal view, slightly expanded at antennal insertion, narrowed to apical third, slightly expanded at apex; surface finely punctured, alutaceous, nearly glabrous in front of antennal insertion. Antennae inserted between basal 0.2 and 0.3 of rostrum; scrobe with dorsal margin subangulate. Eyes slightly prominent, nearly round. Pronotum at base 1.1–1.2 times wider than long, as wide at middle as at base; sides nearly parallel to middle, rounded to constricted apex; disc slightly convex, flattened at apex and base, with deep punctures; interpuncture spaces alutaceous. Elytra 1.2–1.3 times longer than wide; striae nearly flat, each with 1 or 2 rows of punctures bearing fine scales; interstriae 7 and 9 each with 1 long specialized seta (Fig. 49); interstria 3 with several small setae. Tibiae of male middle and hind legs mucronate.

**Distribution.** British Columbia, south through the western United States to northern Mexico. British Columbia: Merritt, 7 miles north of Oliver, Robson, and Westwold.

**Comments.** This species is a member of the subgenus *Trichapion*. It is abundant and is easily recognized by the dentate mucrones on the middle and hind tibiae of the male, by the narrow frons, and by the abruptly declivitous dorsal margin of the head above the posterior margin of the eyes. The only member of this subgenus in the area with which it could be confused is *A. cordatum*, but in *A. cordatum* all three tibiae of the male are mucronate, the male frons is broader, and the dorsal margin of the head is nearly flat above the eyes. Larvae of *A. proclive* mine seed pods of lupine (*Lupinus* species); the late larval instars attack the seeds. Pupation occurs in the pod. Kissinger (1968) designated the lectotypes of *A. proclive* and *A. crassinasum*. The type

material of *A. numenmacheri* is probably lost; the concept of this species is based on specimens in the Field Museum of Natural History, Chicago, Ill., identified as this species by Wagner.

*Apion punctinasum* Smith

Figs. 122, 123; Map 22

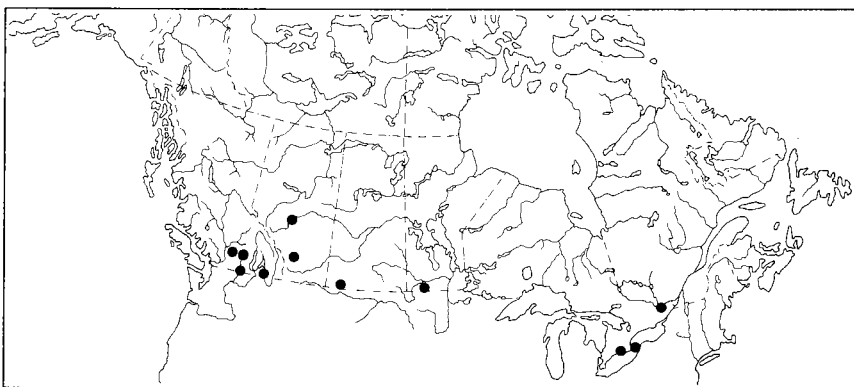
*Apion punctinasum* Smith, 1884:46 (lectotype, Wyoming; USNM); Kissinger 1960:88; O'Brien and Wibmer 1982:26.

*Perapion punctinasum*: Kissinger 1968:21.

**Description.** Length 1.7–2.5 mm. Body slender, black. Pubescence consisting of fine, sparse white scales. Elytra with small spot of dense scales at base of interstriae 2 and 3 and an elongate spot immediately behind scutellum. Frons slightly narrower than dorsal tip of rostrum. Rostrum of male shorter than that of female, stout, subcylindrical, about as long as pronotum; sides, in dorsal view, slightly expanded at antennal insertion; surface alutaceous, finely and moderately densely punctured throughout, with scales coarser beyond antennal insertion. Rostrum of female 1.1–1.2 times longer than pronotum, otherwise similar to that of male. Antennae inserted between basal 0.3 and 0.4 of rostrum. Eyes slightly convex. Pronotum at base 1.0–1.1 times wider than long; sides slightly diverging to middle, slightly arcuate to weakly constricted apex; disc slightly convex, with deep punctures; interpuncture spaces narrow, alutaceous. Elytra 1.5–1.6 times longer than wide; striae moderately deep, with coarse punctures; interstriae twice as wide as striae, flat or nearly so, each interstria with 1 or 2 rows of minute punctures bearing scales, and lacking specialized setae. Legs of male lacking special characters.

**Distribution.** Ontario to British Columbia, south through the United States to California, Illinois, and Ohio. Alberta: Calgary and Edmonton. British Columbia: Creston, Nicola, Oliver, Osoyoos, Riske Creek, and Vernon. Manitoba: Aweme, Deloraine, Forrest, and Ninette. Ontario: Brittania, Delhi, Mer Bleue, and Prince Edward County. Saskatchewan: Cutbank, Ogema, and Val Marie.

**Comments.** This species is similar to *A. wickhami*, but adults are distinguished by the conspicuous postscutellar spot of vestiture, in which the scales are much denser and stouter; by the fine, sparse scales on the remainder of the elytra; and by the elytral interstriae, which bear only 1 or 2 rows of scales, not 3 or 4 rows as in the adults of *A. wickhami*. Nothing is known of the habits or life history of this species, except that adults were collected in August on dock (*Rumex* species), including golden dock (*Rumex persicarioides*). Kissinger (1960) designated the lectotype.



Map 22. Collection localities of *Apion punctinasum*.

### *Apion reconditum* Gyllenhal

Figs. 124, 125; Map 23

*Apion reconditum* Gyllenhal, 1839:132 (lectotype, Pennsylvania; NHRM); Kissinger 1968:100; O'Brien and Wibmer 1982:26.

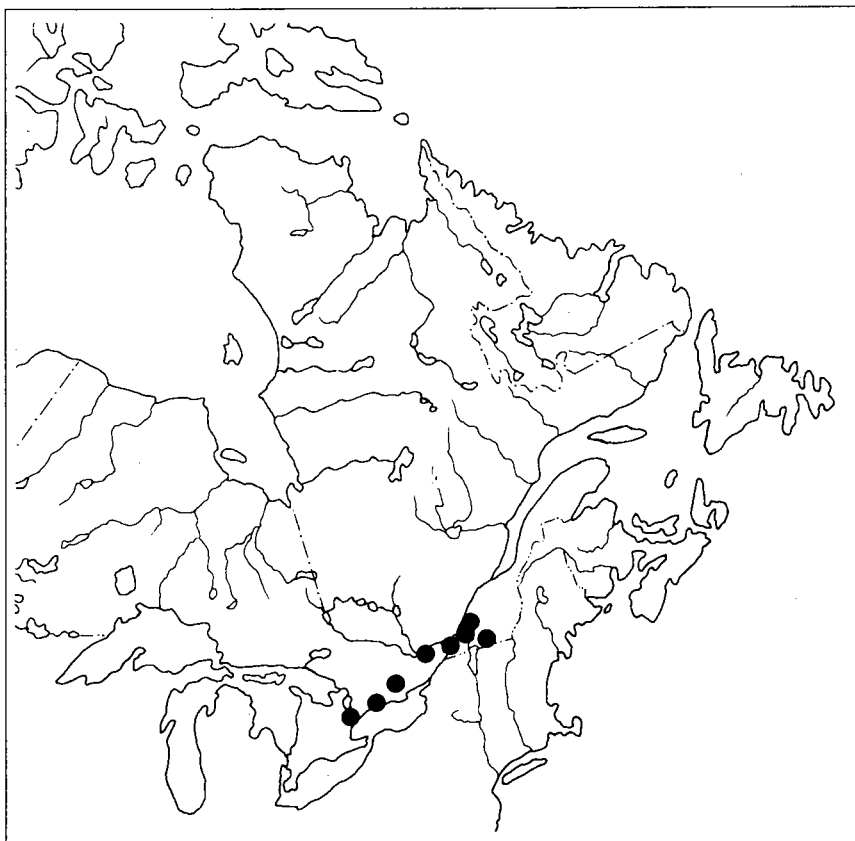
*Apion turbulentum* Smith, 1884:56 (lectotype, District of Columbia; USNM).

**Description.** Length 1.5–2.1 mm. Body moderately robust, black, with slight metallic sheen. Pubescence consisting of white, fine, sparse scales, these denser on sides of mesothorax and metepisternum. Frons 1.0–1.3 times wider than dorsal tip of rostrum; surface of rostrum with a broad, median V-shaped sulcus and with 1 lateral row of deep, confluent punctures. Rostrum of male evenly, moderately curved, 1.4–1.6 times longer than pronotum; sides, in dorsal view, slightly dilated laterally and ventrally at antennal insertion, narrowing to middle; apical half nearly cylindrical; surface with lateral rows of strong punctures and fine, sparse dorsal punctures; tip smoother. Rostrum of female evenly, moderately curved, 1.5–1.7 times longer than pronotum; sides, in dorsal view, slightly dilated laterally at antennal insertion; apical two-thirds nearly cylindrical; surface finely punctured and shining beyond antennal insertion. Antennae inserted between basal 0.2–0.3 of rostrum; scrobe with dorsal margin evenly descending. Eyes slightly prominent. Pronotum at base 1.2–1.3 times wider than long; sides moderately expanded at base, nearly parallel to middle, rounded to constricted apex; disc nearly flat, with deep irregular punctures; interpuncture spaces flat, shining, alutaceous. Elytra 1.2–1.3 times longer than wide; striae deep, each with 1 row of conspicuous scales; interstriae wider than striae, flat, smooth, with 1 row of fine punctures



bearing inconspicuous scales; interstria 9 with 1 specialized seta. Tibiae of male middle and hind legs mucronate.

**Distribution.** Ontario and Quebec, south through the eastern United States to Florida and Texas. Ontario: Chapleau, "Fisher Glen," Fonthill, Marmora, Ottawa, and Toronto. Quebec: Farnham, Montreal, Richelieu, Sainte-Clothilde, and Saint-Hilaire.



Map 23. Collection localities of *Apion reconditum*.

**Comments.** This species belongs to the subgenus *Trichapion*. Adults are distinguished from other representatives of the subgenus by the following combination of characters: middle and hind tibiae of male mucronate; frons as wide as or wider than dorsal tip or rostrum, with broad median sulcus; and dorsal margin of scrobe evenly descending. Adults have been found most commonly from May through August and

have been reared from tick trefoil (*Desmodium marilandicum*) and collected from paper birch (*Betula papyrifera*). Kissinger (1959) designated the lectotypes of *A. reconditum* and *A. turbulentum*.

### *Apion robustum* Smith

Figs. 126, 127

*Apion robustum* Smith, 1884:45 (lectotype, Lavaca County, Tex.; USNM); Kissinger 1968:145; O'Brien and Wibmer 1982:27.

*Apion obesum* Smith, 1884:49 (lectotype, Lavaca County, Tex.; USNM).

**Description.** Length 2.0–3.0 mm. Body moderately slender, black; antennae paler. Pubescence consisting of white, very fine, sparse scales. Frons 1.0–1.2 times wider than tip of rostrum. Rostrum of male moderately curved, 1.3–1.4 times longer than pronotum; sides, in dorsal view, nearly parallel on apical third, slightly expanded at antennal insertions; surface of basal four-fifths alutaceous, with fine, dense, deep punctures; surface of apical fifth of rostrum smooth, with minute but distinct scales beyond antennal insertion. Rostrum of female moderately curved, 1.6–1.9 times longer than pronotum; sides, in dorsal view, tapering from antennal insertion to apical half, nearly parallel beyond; rostrum otherwise similar to that of male. Antennae inserted at basal 0.3 of rostrum. Eyes prominent, distinctly longer than wide. Pronotum at base slightly longer than wide; sides parallel but expanded near middle; disc slightly convex, flattened basally and apically, with deep punctures bearing fine scales; interpuncture spaces alutaceous. Elytra 1.3–1.4 (female) or 1.5–1.6 (male) times longer than wide; striae fine, with moderately deep punctures; interstriae flat, twice as wide as striae, each interstria with 1 or 2 rows of minute punctures bearing scales similar to those on pronotum. Femora of male forelegs swollen, with polished area; area with lateral limiting carina reduced, broad, flat, somewhat crescent-shaped; area with 4 or 5 distinct, separated striae. Tibiae of male middle and hind legs mucronate.

**Distribution.** Saskatchewan and Alberta, south through the western United States to northern Mexico. Alberta: Medicine Hat. Saskatchewan: Bienfait.

**Comments.** This species is in the subgenus *Fallapion*. It is distinguished from other Canadian representatives of the subgenus by the protuberant tubercle on the apical third of the front femur of the male, by the presence of a distinct but reduced limiting lateral ridge on the polished area on the front femur of the male, and by the presence of distinct, separated striae on the polished area of the front femur of the

male. Females cannot be easily separated from those of related species. Label data indicate that cockleburs (*Xanthium* species) may be possible hosts of this species. *Xanthium strumarium* is listed as a host by Salsbury (1984). Nothing else is known of the life history or biology of this species. Kissinger (1968) designated the lectotypes for *A. robustum* and *A. obesum*.

### *Apion rostrum* Say

Figs. 128, 129

*Apion rostrum* Say, 1826:253 (neotype, Stony Creek Mills, Berks County, Pa; USNM); Kissinger 1968:90; O'Brien and Wibmer 1982:27.

*Apion scabicolle* Gyllenhal, 1839:374 (lectotype, "Anglia"; NHRM).

**Description.** Length 3.0–3.5 mm. Body robust, black. Pubescence consisting of white, fine, sparse scales, these more conspicuous on sides of mesothorax and metathorax. Frons 1.2–1.4 times wider than dorsal tip of rostrum, with deep, median impression and 1 lateral line of coalesced punctures. Rostrum of male evenly, slightly curved, 1.1–1.4 times longer than pronotum; sides, in dorsal view, moderately expanded over antennal insertion, narrowed to apical third; surface sculpture shallow, moderately punctured throughout; tip more shining; scales sparse. Rostrum of female moderately curved, 1.4–1.6 times longer than pronotum; sides, in dorsal view, narrowing from antennal insertion to middle; punctures in basal two-thirds shallow, moderate in size; apical third smoother, alutaceous. Antennae inserted at basal 0.3 (male) or between 0.2 and 0.3 (female) of rostrum; scrobe with dorsal margin nearly evenly descending. Eyes prominent, nearly round to slightly oval. Pronotum at base 1.2–1.3 times wider than long; sides slightly expanded at base, arcuate to middle, converging to slightly constricted apex; disc moderately convex, with deep punctures; interpuncture spaces cariniform, alutaceous, convex. Elytra 1.3–1.4 times longer than wide; striae deeply impressed; interstriae flat, about twice as wide as striae, each interstria with 1 row of fine punctures bearing fine scales; interstria 9 with 1 long specialized seta. Tibiae of male middle and hind legs mucronate.

**Distribution.** Northeastern United States, south to West Virginia and Illinois, west to Iowa, and north to central New York, Michigan (Detroit), and southern Wisconsin. Not recorded in Canada but may occur in southern Ontario or Quebec.

**Remarks.** This species belongs to the subgenus *Trichapion*. Adults are easily distinguished from those of similar species by the characters mentioned in the key. Adults are found from April through

September on the foliage of wild indigo (*Baptisia tinctoria*) and prairie false indigo (*B. leucantha*). The larvae develop in the seed pods, and adults are often found there in the fall. Kissinger (1968) designated the neotype of *A. rostrum* and the lectotype of *A. scrobicollis*, and van Emden (1938) briefly described the larva in a key.

### *Apion segnipes* Say

Figs. 130, 131

*Apion segnipes* Say, 1831:6 (neotype, Fayetteville, N.C.; USNM); Kissinger 1968:166; O'Brien and Wibmer 1982:27.

**Description.** Length 2.2–2.9 mm. Body robust, black; femora, tibiae, and antennal bases reddish; antennae and tarsi with apical portions light brown. Pubescence consisting of white, conspicuous, coarse scales, these coarser on sides of elytra and denser at base of interstria 3, on mesothorax, and on metepisternum. Frons 1.3–1.7 times wider than tip of rostrum. Rostrum of male slightly curved, 1.2–1.3 times longer than pronotum; sides, in dorsal view, nearly parallel in apical third, not expanded at antennal insertion; sides sometimes narrowed at apical quarter, then expanded at apex; scales on rostrum confined to area below antennal insertion; apex of rostrum glabrous, with coarse, dense punctures. Rostrum of female slightly curved, 1.6–1.9 times longer than pronotum; sides, in dorsal view, slightly converging from antennal insertion to apex, not expanded at antennal insertion; surface with moderately coarse and dense punctures, these becoming finer and sparser toward apex; scales on base of rostrum fine, sparse, absent beyond antennal insertion. Antennae inserted at basal 0.3 (male) or 0.2–0.3 (female) of rostrum. Eyes slightly prominent or flat. Pronotum at base 1.2–1.4 times wider than long; sides with distinct basal expansion, nearly parallel at basal third, rounding to distinctly constricted apex; disc moderately convex, with deep, dense punctures; interpuncture spaces convex, polished, or finely alutaceous. Elytra 1.3–1.4 times longer than wide; striae deeply impressed, with moderately fine punctures; interstriae nearly flat, more than twice as wide as striae; punctures on interstriae in 2 rows, randomly placed, with scales; scales on punctures sometimes appearing as 3 rows; interstriae 7 and 9 each with 1 specialized seta; interstria 3 with short, erect specialized setae along its length. Legs of male not mucronate.

**Distribution.** Ontario, south throughout the eastern United States to Florida and Texas. Ontario: Turkey Point.

**Comments.** This species belongs to the subgenus *Coelocephalapion*. It is distinguished from other Canadian members of

the subgenus by the conspicuous scales, which are denser on the base of interstriae 3, and by the distinctly sexually dimorphic rostrum. Tuttle (1954) collected specimens of this species from goat's-rue (*Tephrosia virginiana*) near Urbana, Ill. Larvae inhabit the seeds of this plant. Mating pairs were observed on the flowers in mid July and pupae were found in ripening pods in September. Kissinger (1968) designated the neotype, and van Emden (1938) briefly described the larva in a key.

*Apion simile* Kirby

Figs. 132, 133; Map 24

*Apion simile* Kirby, 1811:351 (type material unknown, in BMNH?); Kissinger 1968:58; Hatch 1971:328; O'Brien and Wibmer 1982:27.

*Apion lanuginosum* Walsh, 1867:269 (not Gerstaecker 1854:245) (type material not known to exist).

*Apion walshii* Smith, 1884:57 (lectotype, White Mountains, N.H.; USNM).

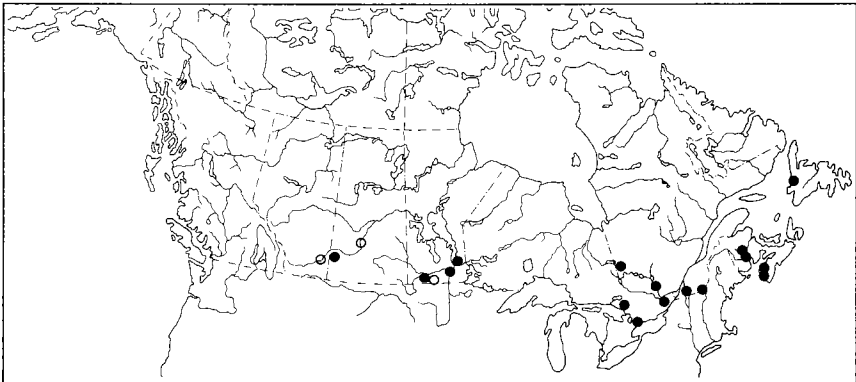
*Apion vicinum* Smith, 1884:58 (lectotype, Garland, Colo.; USNM).

**Description.** Length 1.7–2.2 mm. Body elongate, moderately slender, black. Pubescence conspicuous, consisting of whitish to yellowish white, sparse, fine, long scales. Frons alutaceous, wider than dorsal tip of rostrum, with median sulcus more or less distinct and with lateral row of shallow punctures. Rostrum of male slightly curved, 1.2–1.3 times longer than pronotum; sides, in dorsal view, more or less parallel, slightly expanded over antennal insertion; basal two-thirds of rostrum moderately densely punctured, with sparse, long, curved scales; apex smooth, shining. Rostrum of female slightly curved, 1.5–2.0 times longer than pronotum; sides, in dorsal view, nearly parallel; apex slightly expanded; surface finely punctured throughout; tip more shining. Antennae inserted at basal 0.4 (male) or at basal 0.3 (female) of rostrum. Eyes moderately prominent. Pronotum at base 1.1–1.3 times wider than long; sides with slight lateral expansion at base, diverging slightly to middle, rounded to slightly constricted apex; disc slightly convex, flattened at base and apex, with moderately deep punctures; interpuncture spaces variable in width. Elytra 1.6–1.7 times longer than wide; striae deeply impressed, with fine scales; interstriae about twice as wide as striae, usually convex, sometimes flat, each interstria with 1 row, or more commonly 2 rows, of fine punctures bearing fine scales; interstria 9 with 1 specialized seta at posterior one-fourth. Tibiae of male middle hind legs equally mucronate.

**Distribution.** Newfoundland to British Columbia, south through the northeastern United States to North Carolina, and west to Utah and Washington; also Europe, Algeria, Asia Minor, and Siberia. Alberta:

"Tp. 21, Pge. 12, W. 4 Mer." British Columbia: Radium Hot Springs (not on map). Manitoba: Aweme, Ninette, Stonewall, and Victoria Beach. New Brunswick: Boiestown Island and French Lake. Newfoundland: Lomond. Nova Scotia: Annapolis Royal and Digby County. Ontario: Merivale, Norway Point, and Toronto. Quebec: Compton (Mount Megantic), Duparquet, Kazabazua, Knowlton, Mascanin, and North Hatley. Saskatchewan: 2 miles north of "Burstall Dunes."

**Comments.** This species is in the subgenus *Trichapion*. Adults may be distinguished by characters given in the key. The larvae of this species are known to complete their development in the flower clusters of paper birch (*Betula papyrifera*) within approximately 1 month of hatching and pupate within the clusters. Adults feed on the leaves of birch. Kissinger (1959) designated the lectotypes of *A. walshii* and *A. vicinum*.



Map 24. Collection localities of *Apion simile* (●) and *A. speculiferum* (○).

### *Apion speculiferum* Fall

Fig. 134; Map 24

*Apion speculiferum* Fall, 1927:140 (holotype, Medicine Hat, Alta.; MCZ); Kissinger 1968:146; O'Brien and Wibmer 1982:27.

**Description.** Length 1.8–2.3 mm. Body slender, very dark reddish black; legs and antenna slighter lighter. Pubescence consisting of white, very fine, moderately long, sparse scales. Frons 1.0 (female) to 1.3 (male) times wider than dorsal tip of rostrum, with numerous, shallow, fine, longitudinal sulci. Rostrum of male moderately curved, 1.2 times longer than pronotum; sides, in dorsal view, slightly converging in apical third, rather strongly expanded at antennal insertion, distinctly

expanded toward apex; basal two-thirds coarsely alutaceous, with coarse, moderately deep, somewhat elongate punctures; tip smoother with finer punctures. Rostrum of female strongly curved, 1.6 times longer than pronotum; otherwise similar to male. Antennae inserted in basal 0.2 (male) or 0.17 (female) of rostrum. Eyes slightly convex. Pronotum at base 0.9–1.0 times wider than long; sides nearly parallel near base, slightly expanded toward middle, arcuate to anterior margin; disc moderately convex, flattened anteriorly and basally, with very deep, close punctures bearing fine scales; interpuncture spaces finely alutaceous, much narrower than diameter of punctures. Elytra 1.6–1.8 times longer than wide; striae moderately wide and deep; interstriae nearly flat, about twice as wide as striae on disc, with 1 or 2 rows of fine punctures bearing fine scales, these usually distinctly longer than those on dorsal surface of pronotum. Femora of male forelegs strongly swollen near distal third; polished area on ventral surface extremely finely and densely striate, without limiting carina. Tibiae of male middle and hind legs mucronate.

**Distribution.** Known only from Manitoba to Alberta. Not known in the United States. Alberta: Medicine Hat. Manitoba: Aweme. Saskatchewan: Pike Lake.

**Comments.** This species is a member of the subgenus *Fallapion*. It is distinguished by the greatly swollen front femur of the male and by the lack of a limiting carina near the polished area on the ventral surface of the front femur of the male. Nothing is known of its life history or habits.

*Apion tenuirostrum* Smith

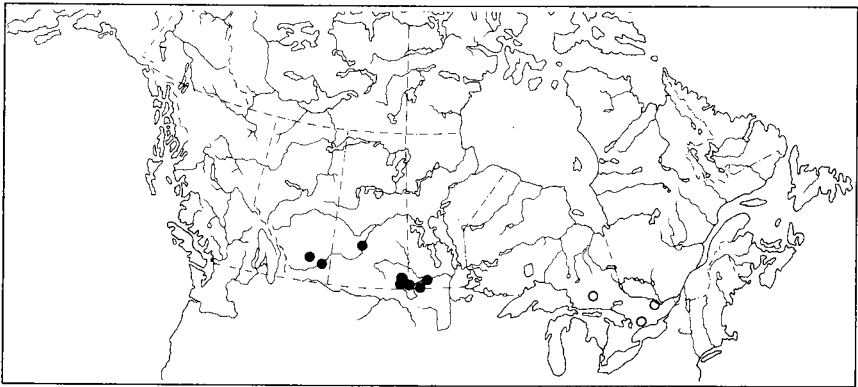
Figs. 135, 136; Map 25

*Apion tenuirostrum* Smith, 1884:62 (lectotype, Texas; USNM); Kissinger 1968:15; O'Brien and Wibmer 1982:28.

**Description.** Length 1.5–2.3 mm. Body moderately slender, black; elytra with metallic luster. Pubescence conspicuous, consisting of coarse, white scales arranged in more or less distinct pattern on elytra. Frons 1.0–1.2 times wider than tip of rostrum. Rostrum slightly curved, 1.2 (male) or 1.3 (female) times longer than pronotum; sides, in dorsal view, nearly parallel in apical third, very slightly expanded at antennal insertion; male rostrum alutaceous at base, with coarse scales; apex polished, nearly glabrous, with deep, elongate punctures. Antennae inserted at basal 0.3 (male) or 0.2 (female) of rostrum. Eyes slightly prominent. Pronotum at base very slightly longer than wide to slightly wider than long; sides weakly arcuate from base to near middle, rounded

to slightly constricted apex, without basal flange; disc slightly convex, with deep punctures bearing coarse scales; interpuncture spaces smooth, much narrower than diameter of punctures. Elytra 1.6 times longer than wide; striae fine, moderately deep; interstriae variable in width, narrowed toward base, convex, smooth; interstriae 1 and 2 with 1 irregular row of fine scales; interstria 3 with 2 or 3 rows of coarse scales; interstriae otherwise generally with 1 row of moderately coarse scales; interstria 9 with 1 long specialized seta. Tibiae of male all mucronate.

**Distribution.** Manitoba to Alberta, south through the central and southwestern United States to Baja California and Texas. Alberta: Medicine Hat and Scandia. Manitoba: Boissevain, Onah, and Pierson. Saskatchewan: Oxbow, Pike Lake, and Roche Percee.



Map 25. Collection localities of *Apion tenuirostrum* (●) and *Podapion gallicola* (○).

**Comments.** This species is a member of the subgenus *Trichapion*. It is distinguished from other members of the subgenus by the lack of a distinct basal flange on the pronotum and by the coarse white scales on the elytra, which are denser on interstriae 3. This species consists of at least three distinct populations, all of which occur in southwestern Manitoba. In the typical *A. tenuirostrum*, the pronotum at the base is very slightly longer than wide, and specimens range in size from 2.1 to 2.3 mm. In a second population, the pronotum at the base is as wide as or slightly wider than long, and the specimens are slightly smaller than those of typical *A. tenuirostrum*, ranging in length from 1.9 to 2.3 mm. A third population differs in that the pronotum at the base ranges from 1.1 times to 1.2 times as wide as long and adults are distinctly smaller, ranging from 1.5 to 1.8 mm in length. The exact status of these three populations is as yet unknown; determination must wait for detailed biological studies. Adults have been collected from purple



prairie-clover (*Petalostemon purpureus*) and white prairie-clover (*P. candidus*). The species has also been recorded in *Dalea leporina*, in Kansas (Salsbury 1984). Nothing else is known of its biology. Kissinger (1968) designated the lectotype of this species.

*Apion troglodytes* Mannerheim

Figs. 137, 138

*Apion troglodytes* Mannerheim, 1843:289 (syntypes, San Diego, Calif.; MCZ); Kissinger 1968:80; Hatch 1971:328; O'Brien and Wibmer 1982:28.

**Description.** Length 1.2–2.1 mm. Body moderately robust, black; elytra and pronotum with faint metallic luster. Pubescence conspicuous, consisting of white, fine scales, these slightly coarser on lateral areas of body, denser on sides of mesothorax. Frons 1.1–1.6 times wider than tip of rostrum, nearly smooth, with shallow punctures. Rostrum of male evenly, moderately curved, about as long as pronotum; sides, in dorsal view, moderately prominent at antennal insertion, nearly parallel on apical two-thirds; surface alutaceous at base, polished, nearly glabrous, with sparse, elongate punctures beyond antennal insertion; tip nearly impunctate. Rostrum of female 1.2–1.4 times longer than pronotum, similar to male rostrum, except scales at base finer and surface finely alutaceous for a distance beyond antennal insertion. Antennae inserted between basal 0.1 and 0.2 (male) or between 0.2 and 0.4 (female) of rostrum. Eyes moderately prominent, longer than wide. Pronotum at base 1.1–1.2 times longer than wide; sides parallel or slightly divergent to middle, converging to weakly constricted apex, with basal flange absent; disc slightly convex, with deep punctures; interpuncture spaces alutaceous. Elytra 1.2–1.4 times longer than wide; striae deeply impressed, with fine scales sometimes slightly coarser than those on adjacent interstriae; interstriae twice as wide as striae, each interstria with 1 or 2 irregular rows of fine scales. Legs of male lacking special characters.

**Distribution.** Washington to California, east to Idaho. Not recorded in Canada but may occur in southern British Columbia.

**Comments.** This species is in the subgenus *Trichapion*. It is distinguished from the other species by the dentiform process on the dorsal margin of the scrobe, by the insertion of the antennae on the rostrum at a distance from the eye equal to or greater than the width of the frons, and by the lack of a distinct basal flange on the pronotum. Adults have been collected from March through August. No confirmed host record has been reported; Kissinger (1968) gives one record from

sagebrush (*Artemisia heterophylla*). Nothing else is known of the biology or life history of this species.

*Apion wickhami* Kissinger

Figs. 48, 139

*Apion wickhami* Kissinger, 1960:87 (holotype, Laramie, Wyo.; USNM); O'Brien and Wibmer 1982:28.

*Perapion wickhami*: Kissinger 1968:22.

**Description.** Length 2.4 mm. Body elongate, moderately robust, black. Pubescence conspicuous, consisting of dense, white scales, these not concealing integument, uniformly placed except slightly denser on a short sutural stripe immediately behind scutellum. Frons as wide as dorsal tip of rostrum, irregularly punctured. Rostrum, in both sexes, slightly curved, subcylindrical, as long as pronotum; sides, in dorsal view, slightly expanded over antennal insertion; surface dull, punctured, with scales to near tip; tip glabrous, shining. Antennae inserted at basal 0.3 of rostrum. Eyes slightly convex, nearly round. Pronotum subcylindrical, as wide as long at base; sides nearly parallel in basal two-thirds, slightly narrowed to apex; disc slightly convex, with fine deep punctures; interpuncture spaces much narrower than diameter of punctures. Elytra 1.7 times longer than wide; striae deeply impressed, moderately broad, each with 1 row of scales, these usually slightly coarser than scales on adjacent interstriae; interstriae slightly convex, about twice as wide as striae, each interstria with 3 or 4 rows of minute punctures bearing fine, elongate scales.

**Distribution.** Known only in Saskatchewan and Wyoming. Saskatchewan: Hatton.

**Comments.** This species is known from only two specimens. Adults are similar to those of *A. punctinasum* but may be distinguished by the characters summarized in the key to species and in the comments under *A. punctinasum*. Nothing is known of the life history or habits of this species.

Genus *Podapion* Riley

*Podapion* Riley, 1883:61; Kissinger 1968:22.

This genus contains only one species in the world, *P. gallicola* Riley. *Podapion* is related to *Apion* and in addition to the characters mentioned

in the key to genera, it can be distinguished by the fact that the middle coxae are not separated by the junction of the mesosternal process and the intercoxal process of the metasternum (as in Fig. 48).

**Description.** Rostrum cylindrical, not expanded at antennal insertion, showing little sexual dimorphism. Antennae straight; funicle with 7 segments; club short, not longer than last 3 funicular segments combined. Eyes strongly convex. Prothorax cylindrical, laterally rounded, constricted apically. Elytra oval, convex, wider than prothorax; sides distinctly rounded to apex; striae in 9 regularly punctured rows; interstriae without specialized setae; pygidium covered by elytra. Coxae of middle legs contiguous. Legs in male without special characters; tarsal claw simple; tarsal segment 1 about as wide as long.

**Type species.** *Podapion gallicola* Riley, monotypic.

*Podapion gallicola* Riley

Fig. 144; Map 25

*Podapion gallicola* Riley, 1883:61 (syntypes, Washington, D.C., Lake Superior, and Massachusetts; MCZ, USNM); Kissinger 1968:22; O'Brien and Wibmer 1982:19.

*Podapion alexanderi* Sleeper, 1955:87 (holotypes Glacier Point Bog, Yosemite National Park, Calif.; Sleeper collection); Kissinger 1968:22.

**Description.** Length 3.1–4.8 mm. Body moderately slender, dark to black; antennae with base sometimes slightly lighter. Pubescence consisting of fine, white, moderately sparse scales. Frons 1.2–1.6 times wider than dorsal tip of rostrum, with lateral edge sometimes more prominent near middle of eye. Rostrum of male 1.1–1.2 times longer than pronotum, fairly strongly curved; sides, in dorsal view, nearly parallel throughout; surface dull, finely alutaceous throughout, with fine, sparse, elongate punctures, nearly glabrous beyond antennal insertion. Rostrum of female 1.1–1.4 times longer than pronotum, similar to male rostrum, except surface largely shining, slightly alutaceous, with sparse, elongate punctures, these sparser toward apex. Antennae inserted between basal 0.1 and 0.2 of rostrum. Pronotum about 0.9–1.1 times as wide as long; sides arcuate, distinctly constricted at apex; disc slightly convex, flattened apically, with deep punctures and moderately fine scales; interpuncture spaces coarsely alutaceous, generally narrower than diameter of puncture. Elytra 1.5–1.8 times longer than wide; striae deeply impressed, with coarse punctures; interstriae about 1.5 times wider than striae, flat, with dense, moderately coarse, the transverse rugae and each interstria with 1 or

2 rows of fine punctures bearing scales similar to those on dorsal surface of pronotum.

**Distribution.** Ontario, south throughout the eastern United States to Florida, west to Oregon and California, and south to Durango, Mexico. Ontario: Arnprior, Biscotasing, Chiefs Point, and Fenella.

**Comments.** Adults of this species are easily recognized by the characters given in the key to genera and in the generic and species descriptions. The species is not closely related or similar to any North American species. The Oregon-California population of this species was given the name *P. alexanderi* by Sleeper (1955). Sleeper stated that the adults were easily distinguished from those of *P. gallicola* by the shorter pubescence, by the near absence of a pronotal constriction, and by the coarse punctures of the abdominal sternites. An analysis of these and other characters by Kissinger (1968) showed that these characters were simply variations within the species and that two species could not be recognized. However, Kissinger's specimens were limited at the time of his study, and his conclusions may not reflect the actual situation. For the present, it seems best to follow Kissinger, keeping in mind that the status of the western populations may change after further study. Adults have been found from April through August; larvae develop in ovoid galls on 2-year-old pine twigs. Recorded hosts are red pine (*P. resinosa*), pitch pine (*P. rigida*), Virginia pine (*P. virginiana*), and cooper pine (*P. cooperi*). Nothing else is known of the biology or life cycle. The larva was illustrated by Boving and Craighead (1930) and briefly described in a key by van Emden (1938).

## Family Rhynchitidae

This is a moderate-sized family containing several hundred species around the world. Approximately 52 species in eight genera occur in North America. Eleven species in seven genera occur or may occur in Canada. The species in the family are often included in Curculionidae as the subfamilies Rhynchitinae and Pterocolinae (Blatchley and Leng 1916; Arnett 1960; Hatch 1971); however, Hamilton (1969) and O'Brien and Wibmer (1982) followed LeConte (1876) and retain family status for the group.

Members of this family are most easily distinguished by the mandibles, which have teeth on both inner and outer sides and can be spread wide apart (Fig. 22). In addition, adults do not have a labrum and have distinct elytral epipleura.

Some members of this family (*Pterocolus*) enter the leaf rolls of *Attelabus* species, destroy the *Attelabus* egg, and oviposit; others deposit their eggs in young fruit; some place their eggs in young buds of trees,

which are then destroyed by the larvae; others feed on blossoms or on foliage.

**Description.** Body elongate or pear-shaped, glabrous or setose. Head with single gular suture; pregular sutures absent; rostrum elongate, stout, with parallel sides, not distinctly widened at apex, not strongly sexually dimorphic. Maxillary palpus rigid; maxilla without distinct lacinia; labrum absent; mandible toothed on inner and outer sides. Antennae straight, moniliform; club indistinct, not enlarged, with 3 segments. Legs with trochanter short, triangular, the femur attached to the side. Abdomen with sternites 1 and 2 connate.

**Comments.** Hamilton (1969) revised the family and gives keys and descriptions for all species in the United States.

### Key to genera of Rhynchitidae in Canada

1. Pronotum with acute lateral margins. Body small, robust, metallic blue or green ..... ***Pterocolus* Say** (p. 145)  
     Pronotum without lateral margins. Body size and color variable ..... 2
2. Scutellar striae present ..... 3  
     Scutellar striae absent ..... 5
3. Pygidium covered by elytra. Mandible with 1 (male) or 2 (female) teeth on outside margin .... ***Eugnampus* Schoenherr** (p. 148)  
     Pygidium not covered by elytra (except *Pselaphorhynchites cyanellus*). Mandible similarly toothed in both sexes ..... 4
4. Strial punctures deeply impressed, quadrate; interstriae usually narrower than striae. Pubescence inconspicuous, more or less appressed. Proepimeral apex contiguous. Male without pubescent patch on mesal procoxal apices. Body less than 4.0 mm long, dark, often with weak metallic luster ..... ***Pselaphorhynchites* Schilsky** (p. 152)  
     Strial punctures shallow, sometimes indiscernible; interstriae usually wider than striae. Pubescence conspicuous, erect to semierect. Proepimeral apex separated by central sternal piece. Male with pubescent patch on mesal procoxal apex. Body longer than 4.0 mm, usually reddish orange and black, without metallic luster ..... ***Merhynchites* Sharp** (p. 155)
5. Elytra with punctures arranged in even longitudinal rows on striae ..... 6

Elytra with punctures randomly placed (except in even rows in *A. cassandrae*) ..... **Auletobius Desbrochers** (p. 162)

6. Head constricted behind eyes. Tarsi of hind legs with segment 1 longer than segments 2 and 3 combined. Elytra short, exposing 2 abdominal tergites and pygidium ..... **Deporaus Samouelle** (p. 167)

Head not constricted behind eyes. Tarsi of hind legs with segment 1 not longer than segments 2 and 3 combined. Elytra covering all but apex of pygidium ..... **Haplorhynchites Voss** (p. 168)

## Clé des genres des Rhynchitidae du Canada

1. Pronotum ayant des marges latérales aiguës. Corps petit, robuste, bleu ou vert métallique ..... **Pterocolus Say** (p. 145)

Pronotum sans marges latérales. Taille et coloration du corps variables ..... 2

2. Écusson strié ..... 3
- Écusson non strié ..... 5

3. Pygidium couvert par les élytres. Mandibule armée d'une (mâle) ou de deux (femelle) dents sur sa marge extérieure ..... **Eugnamptus Schoenherr** (p. 148)

Pygidium non couvert par les élytres (sauf chez *Pselaphorhynchites cyanellus*). Mandibule portant le même nombre de dents chez les deux sexes ..... 4

4. Perforations profondes au niveau des stries, carrées; interstries habituellement plus étroits que les stries. Pubescence discrète, plus ou moins apprimée. Apex du proépimère contigu. Chez le mâle, pas de pubescence sur l'apex médian du procoxa. Corps de moins de 4,0 mm de longueur, foncé, souvent à lustre métallique faible ..... **Pselaphorhynchites Schilsky** (p. 152)

Perforations peu profondes au niveau des stries, parfois indiscernables; interstries habituellement plus larges que les stries. Pubescence remarquable, dressée à semi-dressée. Apex du proépimère séparé par une pièce sternale centrale. Chez le mâle, pubescence sur l'apex médian du procoxa. Corps de plus de 4,0 mm de longueur, habituellement orange rougeâtre et noir, sans lustre métallique ..... **Merhynchites Sharp** (p. 155)

5. Perforations des stries élytrales formant des rangées longitudinales égales ..... 6

Perforations aléatoires de l'élytre (en rangées égales cependant chez *A. cassandrae*) ..... **Auletobius Desbrochers** (p. 162)

6. Tête comprimée derrière les yeux. Article 1 du métatarse plus long que les articles 2 et 3 réunis. Élytres courts, exposant deux tergites abdominaux et le pygidium ..... **Deporaus Samouelle** (p. 167)

Tête non comprimée derrière les yeux. Article 1 du métatarse pas plus long que les articles 2 et 3 réunis. Élytres n'exposant que l'apex du pygidium ..... **Haplorhynchites Voss** (p. 168)

## Genus *Pterocolus* Say

*Pterocolus* Say, 1831:5; Schoenherr 1833:238; Hamilton 1969:132; O'Brien and Wibmer 1982:17.

*Apotomus* Kirby, 1837:205.

This genus is represented in North America by only one species; three additional species occur in Mexico and Central America.

**Description.** Body short, rounded, very robust. Pubescence consisting of sparse hair-like setae. Rostrum very short (Fig. 145). Mandible broad, blunt (Fig. 146). Antennae (Figs. 145, 146) inserted immediately in front of eyes; terminal 3 segments enlarged into loose club; scape very short, similar to segment 1 of funicle; funicle 7-segmented. Eyes oval, weakly emarginate anteriorly, moderately convex. Pronotum with acute lateral margin, strongly extended basal margin, and recurved anterior margin. Elytra short; apex of each elytron separately rounded, exposing 3 terminal abdominal tergites; striae punctured in even rows. Mesepimeron strongly extended, distinctly visible in front of elytral humeral angle. Procoxae and mesocoxae small, widely separated; metacoxae transversely oblong, widely separated.

**Type species.** *Attelabus ovatus* Fabricius, monotypic.

**Comments.** This genus is easily distinguished from other genera in the family by the acutely margined pronotum, by the insertion of the antennae close to the eyes, and by the elytra, which are short, separately rounded, and widely separated at the tips, exposing 2 abdominal tergites and the pygidium. Other differences are summarized in the above description.

*Pterocolus ovatus* (Fabricius)

Figs. 7, 145, 146

*Attelabus ovatus* Fabricius, 1801:426 (neotype, Balsam, N.C.; OSU).

*Pterocolus ovatus*: Blatchley and Leng 1916:65; Kissinger 1964:50; Hamilton 1969:133; O'Brien and Wibmer 1982:18.

**Description.** Length 2.8–3.2 mm. Body bright metallic blue or green; antennae, rostrum, and legs somewhat darker. Frons much narrower than dorsal tip of rostrum. Rostrum with sides constricted at antennal insertion, diverging to broad apex; surface shining, with 2 longitudinal rows of close punctures near lateral margin; area between rows very finely, sparsely punctured. Head densely punctured on vertex. Pronotum about 1.3 times wider than long, widest at junction of elytral humeral angles; disc strongly convex, with dense, evenly spaced punctures, each with 1 short, recumbent hair-like seta; interpuncture spaces shining, smooth, much narrower than diameter of puncture. Elytra (measured at longest and widest points) 1.2 times wider than long; striae moderately impressed, with moderate-sized deeply impressed punctures; interstriae about twice as wide as striae, shining, smooth, with 1 irregular row of medium-sized punctures, these similar to those in striae, each interstria with 1 recumbent, fine, hair-like seta. Visible abdominal tergites with large, strong, dense punctures.

**Distribution.** Southern Ontario, south through the eastern United States to Florida, Iowa, and Arizona. Ontario: Ojibway and Walsingham.

**Comments.** Adults of this species are easily recognized by the characters summarized above and by the accompanying illustration (Fig. 7). The species cannot be confused with any other Canadian weevil. Kissinger (1964) records that the female *Pterocolus* enters the leaf roll of *Attelabus* species and destroys the *Attelabus* egg before ovipositing. The unique body shape of *P. ovatus* is evidently an adaptation to allow the female to push through the leaf roll to reach the host egg. Adults occur on foliage of oak (*Quercus* species), plum and peach (*Prunus* species), and wild grape (*Vitis* species). Hamilton (1983b) designated the neotype of this species.



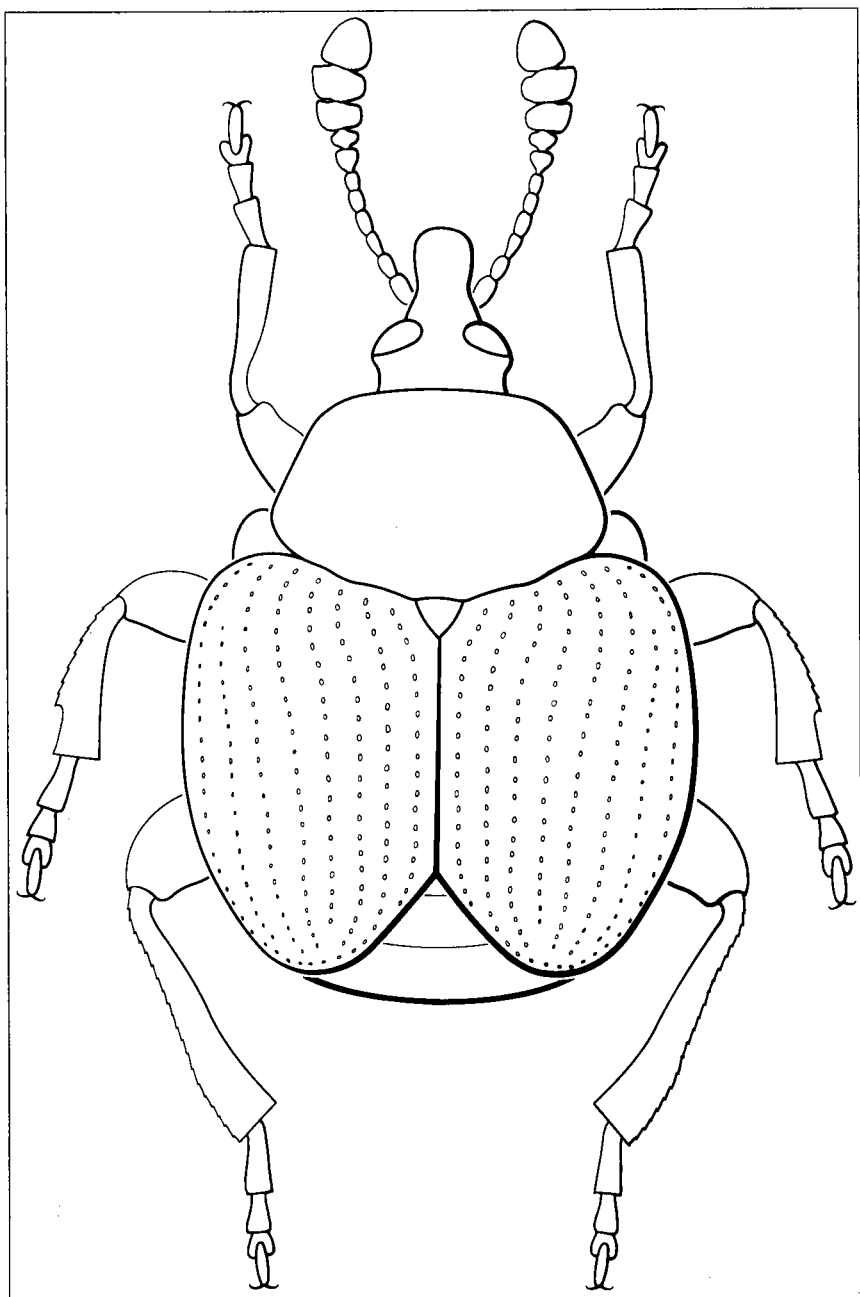


Fig. 7. *Pterocolus ovatus*

## Genus *Eugnampthus* Schoenherr

*Eugnampthus* Schoenherr, 1839:339; Pierce 1930:366; Voss 1941:127; O'Brien and Wibmer 1982:14; Hamilton, 1990:475–502.

This is a relatively large genus, with most species occurring in Mexico and Central America. One species occurs in Canada. Some species in this genus mine leaves of various hardwoods; others feed in buds, fruits, and nuts.

**Description.** Body small (3.7 mm long or less), dark. Legs usually lighter than body. Pubescence conspicuous; setae fine, erect, hair-like. Head elongate, widest across eyes, constricted behind eyes; surface shining, finely punctured. Rostrum elongate, longer in female, quadrate between eyes and antennal insertion; apex weakly expanded; mandible with 1 (male) or 2 (female) teeth on outer margin. Eyes strongly convex, protuberant (Fig. 149). Antennae (Fig. 149) inserted midway between eye and apex of rostrum, with terminal 3 segments much longer than other segments. Pronotum longer than wide, narrower than base of elytra; disc shining, moderately punctured. Elytra with sides parallel; apex broadly rounded; striae in distinct rows, with distinct punctures; interstriae minutely punctured. Abdomen not noticeably sexually dimorphic.

**Type species.** *Anthribus collaris* Fabricius, monotypic.

**Comments.** Hamilton (1969, 1990) revised the North American species of this genus.

### *Eugnampthus angustatus* (Herbst)

Figs. 8, 147–149; Map 26

*Rhynchites angustatus* Herbst, 1797:140 (type, North America; ZMHU or lost?).

*Eugnampthus angustatus*: Blatchley and Leng 1916:56; O'Brien and Wibmer 1982:14; Hamilton 1990:486.

*Anthribus collaris* Fabricius, 1801:410 (neotype, Forked Run State Park, Meigs County, Ohio; OSU).

*Eugnampthus collaris*: Blatchley and Leng 1916:56; Pierce 1930:368; Dillon and Dillon 1961:746; Hamilton 1969:172; Hamilton 1979:30; Hamilton 1980:227–236.

*Anthribus nigripennis* Fabricius, 1801:410 (type, "Carolina"; UZMC).

*Rhynchites rubricollis* Say, 1824:288 (type, United States; type destroyed).

*Rhynchites ruficollis* Germar, 1824:188 (type, "America boreali"; Zool. Mus, Halle).

*Eugnamptus sulcifrons* Gyllenhal, 1839:343 (type, "Carolina"; type lost).

*Eugnamptus collaris fuscipes* Pierce, 1913:368 (type, Detroit, Mich.; USNM).

*Eugnamptus collaris nigripes* Pierce, 1913:368 (no type material mentioned).

*Eugnamptus collaris ruficeps* Pierce, 1913:369 (type, Texas; USNM).

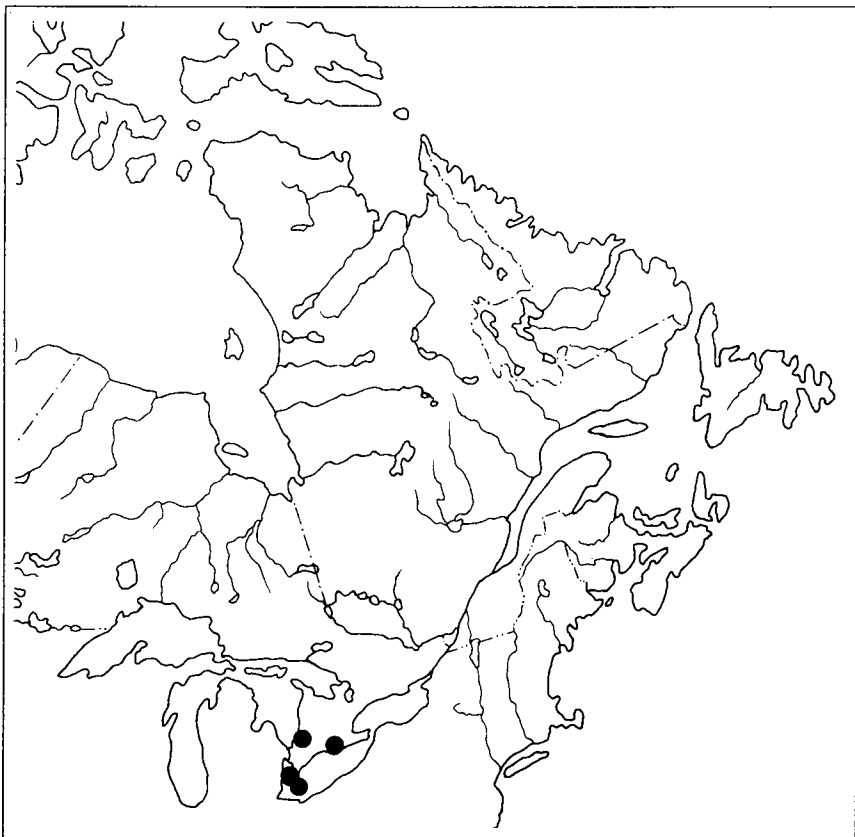
*Eugnamptus collaris abdominalis* Voss, 1941:147 (type, "Carolina"; ZMHU).

**Description.** Length 2.5–4.4 mm (head excluded). Body reddish brown to black; pronotum sometimes light red or reddish brown; legs light brown or reddish. Head convex at upper level of eyes; surface punctured, the punctures widely separated, very small, and weakly impressed. Rostrum arcuate, about as long as pronotum (female) or shorter than pronotum (male); rostrum, in dorsal view, with sides parallel from eyes to antennal insertion, diverging beyond; surface as on head, except more pubescent beyond antennal insertion. Pronotum 1.1 times longer than wide, widest at middle; sides moderately arcuate, converging to truncate apex; disc with fairly large, shallow, round punctures; interpuncture spaces smooth, shining. Elytra 1.8 times longer than wide, about twice as wide as pronotum; striae distinct, not impressed, with round, moderate-sized, impressed punctures; interstriae much wider than striae, flat; strial and interstrial punctures each with 1 long, erect hair-like seta.

**Distribution.** Southern Ontario, south through the eastern United States to Florida and Texas, west to Kansas, Nebraska, and South Dakota. Ontario: Grand Bend, La Salle, Leamington, Pelee Island, Port Rowan, and Walsingham.

**Comments.** This species is unique in the Canadian fauna and can be easily recognized by the characters given above and by the illustration (Fig. 8). In recent literature this species is treated under the name *E. collaris*. O'Brien and Wibmer (1982) resurrected the name *E. angustatus*, which is usually listed in synonymy under *E. collaris*. Pierce (1913) proposed a number of color varieties of this species, all of which are now regarded as synonyms. Hamilton (1980) gives notes on the biology of this species in Ohio. His observations are probably valid for Canadian conditions. Males and females emerge in late May or early June. They feed and mate on mature sassafras trees, feeding by preference on young developing leaves. After mating, females move to the ground and lay eggs in dead sassafras leaves. In the field, dead sassafras leaves seem to be the only kind used, but in the laboratory,

females oviposit in dead leaves of red oak (*Quercus rubra*) and sweet-fern (*Comptonia peregrina*). Larval development proceeded normally in these other leaf types. Eggs hatch in 8–10 days in the laboratory, and larvae develop to the fourth instar in 3–4 months. The mesophyll layer of an average leaf was completely consumed by two or three larvae. Fourth-instar larvae leave the leaf and enter the soil to pupate and overwinter. Larvae mine dead leaves of oak (*Quercus* species), walnut (*Juglans* species), dogwood (*Cornus* species), hickory (*Carya* species), and black gum (*Nyssa* species). Adults feed on sassafras (*Sassafras* species) and have been swept from low vegetation.



Map 26. Collection localities of *Eugnamptus angustatus*.

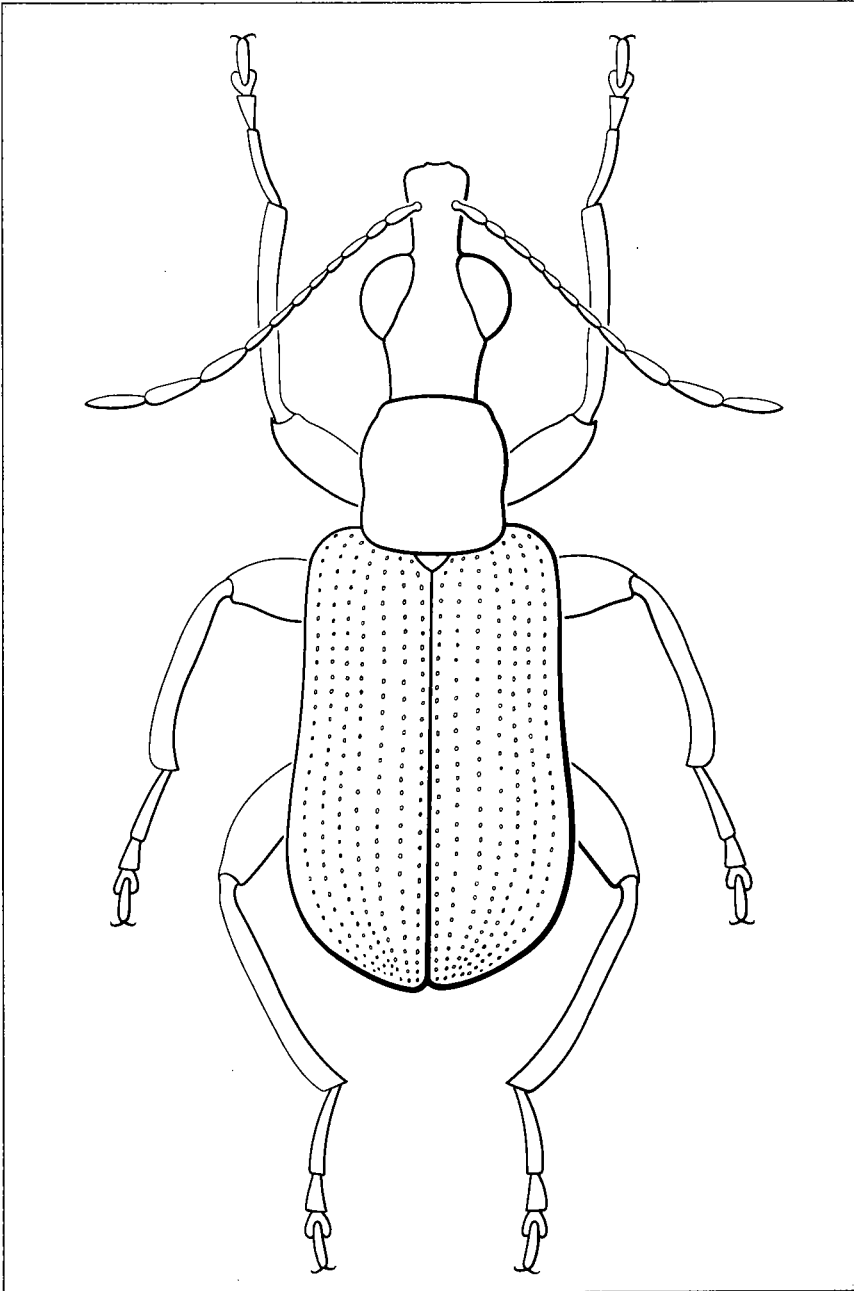


Fig. 8. *Eugnamptus angustatus*

## Genus *Pselaphorhynchites* Schlisky

*Rhynchites* (*Pselaphorhynchites*) Schilsky, 1903:40, ff. (in key).

*Coenorhynchus* (*Pselaphorhynchites*) Voss, 1932:170.

*Pselaphorhynchites*: Hamilton 1969:193; Hamilton 1971:982–996; O'Brien and Wibmer 1982:16.

This genus contains about 25 species around the world, with 14 occurring in North America north of Mexico. Two species occur in Canada. The habits of the species in this genus are practically unknown.

**Description.** Body small (4 mm or less), dark, often with metallic reflections. Vestiture inconspicuous; setae very small, fine, appressed, white. Head more or less broadly quadrate; distance across eyes usually as wide as or wider than base of head; surface between punctures on head and pronotum usually with bead-like granulations. Rostrum broad (Figs. 151, 154, 155). Antennae inserted at or before middle of rostrum; antennal club small, elongate (Figs. 150–155). Pronotum about as wide as long, weakly constricted anteriorly; disc punctured. Elytra somewhat swollen behind middle; striae in distinct rows, with punctures quadrate, deeply impressed; interstriae with small setiferous punctures; a short scutellar stria evident adjacent to scutellum. Abdomen of male weakly concave; abdomen of female convex; at least apex of pygidium exposed.

**Type species.** *Curculio nanus* Paykull, by subsequent designation.

**Comments.** Hamilton (1971) revised this genus. His paper should be referred to for more information. Members of the genus are distinguished by the presence of a scutellar stria, by the more or less exposed pygidium, and by the deeply impressed stria punctures.

### Key to species of *Pselaphorhynchites* in Canada

1. Body shining black with bluish, brassy, or purplish sheen. Pygidium largely covered by elytra, with apex exposed. Length 2.3–3.5 mm. Nova Scotia to Alberta and Northwest Territories ..... ***cyanellus* (LeConte)** (p. 153)  
Body shining black, without bluish sheen. Pygidium almost completely visible, covered only at extreme base. Length 1.7–2.7 mm. Prince Edward Island to Ontario ..... ***perplexus* (Blatchley)** (p. 154)

## Clé des espèces du genre *Pselaphorhynchites* du Canada

1. Corps noir brillant à lustre bleuâtre, cuivré ou violacé. Pygidium en grande partie couvert par l'élytre, l'apex étant découvert. Longueur : de 2,3 à 3,5 mm. De la Nouvelle-Écosse à l'Alberta et aux Territoires du Nord-Ouest ..... ***cyanellus* (LeConte)** (p. 153)

Corps noir brillant, sans lustre bleuâtre. Pygidium presque complètement visible, couvert uniquement au tout début de sa partie proximale. Longueur : de 1,7 à 2,7 mm. De l'Île-du-Prince-Édouard à l'Ontario ..... ***perplexus* (Blatchley)** (p. 154)

### *Pselaphorhynchites cyanellus* (LeConte)

Figs. 150, 151; Map 27

*Rhynchites cyanellus* LeConte, 1876:8 (syntypes, Massachusetts; MCZ); Blatchley and Leng 1916:59.

*Rhynchites (Pselaphorhynchites) cyanellus*: Hatch 1971:334.

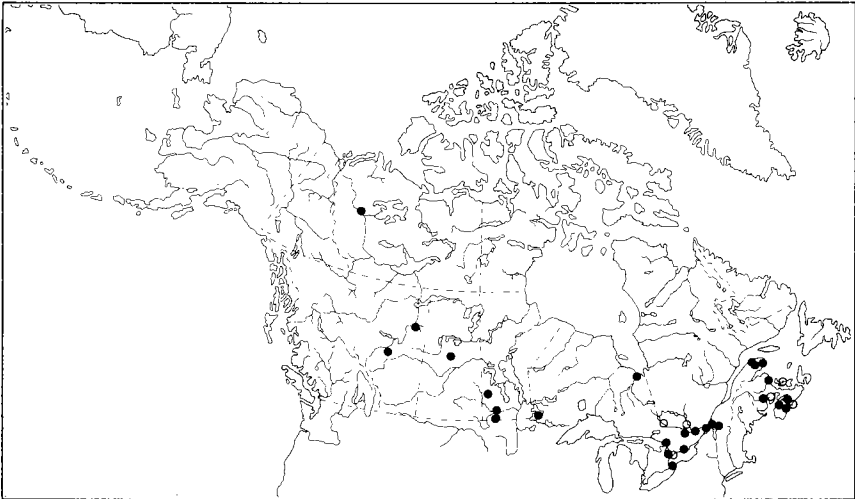
*Pselaphorhynchites cyanellus*: Hamilton 1969:237; Hamilton 1971:988; O'Brien and Wibmer 1982:17.

**Description.** Length 2.3–3.5 mm. Body black, with bluish, brassy, or purplish reflections; antennae and legs somewhat lighter. Head quadrate, with dense, round setiferous punctures; interpuncture spaces minutely granulose, becoming longitudinally rugose in front. Rostrum slightly arcuate, as wide as frons, about 1.6 times longer than pronotum (female), or rostrum as long as or only slightly longer than pronotum (male); sides, in dorsal view, nearly parallel, widening rather abruptly in apical quarter. Antennae inserted at basal 0.3 (female) or midway between 0.5 and basal 0.2 (male). Pronotum 1.1 times wider than long, widest behind middle; sides narrowed anteriorly; disc with round, shallow, setiferous punctures; interpuncture spaces finely grooved, minutely granulose. Elytra three times longer than pronotum, twice as wide as pronotum; striae not impressed, with deep, quadrate to oval punctures; interstriae about half (or less) as wide as striae, each interstria with 1 row of fine, round, setiferous punctures. Pygidium largely covered by elytra.

**Distribution.** Nova Scotia to Alberta and Northwest Territories, south through the northeastern United States to Illinois, and west to Oregon. Blatchley and Leng (1916) record the species from Newfoundland with no further data. Alberta: Edmonton and McMurray. Manitoba: Berens River, Ninette, Onah, Riding Mountains National Park, and Shilo. New Brunswick: Fredericton, Tabusintac, and Tracadie.

Northwest Territories: Norman Wells. Nova Scotia: Annapolis County, Mount Uniacke, and Petite Rivière. Ontario: Arnprior, "Blackburn Springs," Huntsville, Kearney, Merivale, Moosenee, Port Credit, Prince Edward County, Roseland, 24 km north of Sioux Lookout, Toronto, and Walsingham. Quebec: Brome, Cap Chat, Cascapedia, Duparquet, 40 km west of Gaspé, Montreal, Mont-Albert, Mont-Saint-Hilaire, Potter Springs, Rouville, and Ville-Marie. Saskatchewan: Great Deer and Waskesieu.

**Comments.** Adults of this species are easily distinguished from *P. perplexus*, the only other Canadian representative of this genus, by the color as summarized in the key and by the largely concealed pygidium. This species has been recorded from willow (*Salix* species) in Canada and from birch (*Betula* species) and oak (*Quercus* species) elsewhere.



Map 27. Collection localities of *Pselaphorhynchites cyanellus* (●) and *P. perplexus* (○).

*Pselaphorhynchites perplexus* (Blatchley)

Figs. 152, 153, 154, 155; Map 27

*Rhynchites perplexus* Blatchley, 1916:95 (holotype, Crawford County, Ind.; Purdue University); Blatchley and Leng 1916:60.

*Pselaphorhynchites perplexus*: Hamilton 1969:229; Hamilton 1971:990; O'Brien and Wibmer 1982:17; Hamilton 1983a:511–522.



**Description.** Length 1.7–2.7 mm. Body black, without bluish reflection; antennae, legs, and tip of rostrum somewhat lighter. Head quadrate, slightly longer than wide, with round, evenly spaced, setiferous punctures; interpuncture spaces with dense, shining, minute granules. Rostrum distinctly arcuate, about one-third longer than head and pronotum; sides, in dorsal view, gradually diverging from antennal insertion to apex, narrower at apex than frons; apex weakly flattened. Antennae inserted near basal 0.2 (female) or just in front of basal 0.2 (male) of rostrum. Pronotum slightly longer than wide, widest behind middle; sides slightly converging anteriorly; disc with round to irregular, dense, setiferous punctures; interpuncture spaces with a few granules. Elytra more than twice as long as wide, twice as wide as pronotum; striae not impressed, with deep, quadrate punctures; interstriae about half as wide (or less) as striae, weakly convex, each with 1 row of small, round, setiferous punctures. Pygidium nearly completely visible, covered by elytra only at extreme base.

**Distribution.** Prince Edward Island to Ontario, south through the northeastern United States to Georgia, west to Kansas. New Brunswick: Penobsquis. Nova Scotia: Halifax. Ontario: Toronto. Prince Edward Island: Brackley Beach. Quebec: Kazabazua and Laniel.

**Comments.** See the key for characters to distinguish adults of this species from those of *P. cyanellus*. The two Canadian representatives of this genus are so dissimilar that further comparisons are unnecessary. Hamilton (1983a) provides the following data on the life history of this species in Ohio. His observations are probably valid for southern Ontario. Adults feed on the leaves of sweet fern (*Comptonia peregrina*) by scraping off strips of the upper epidermis. Larvae feed and develop in leaf primordia, which have been cut from the host plant by the females. Adults emerge in late May and do not live much beyond the end of June. Females oviposit in and cut leaf primordia throughout June. Eggs hatch in about 10 days, and larvae develop slowly, not reaching the fourth instar until September. Winter is passed in the fourth-instar larval stage. Spring pupation occurs within the hollowed-out leaf primordia in mid to late May. One generation occurs each year. Hamilton (1983a) provides illustrations and descriptions for the larvae and pupae of this species.

## Genus *Merhynchites* Sharp

*Merhynchites* Sharp, 1889:57; Hamilton 1969:255; O'Brien and Wibmer 1982:16; Hamilton 1985:49–64.

This genus contains four species in North America (Hamilton 1985; O'Brien and Wibmer 1982). Two of them, *M. bicolor* (Fabricius) and *M. wickhami* (Cockerell), have been consistently confused in the North American literature, being regarded either as synonyms or as separate species by various authors. Hamilton (1985) revised the genus, characterized each species, and designated a number of subspecies. Subspecies are not used in the following treatment because I do not agree with Hamilton's (1985) interpretation. In my view, subspecies are geographically defined segregates of a population. Only one subspecies can exist in a breeding condition in any one area. In Hamilton's analysis, several subspecies of both *M. bicolor* and *M. wickhami* coexist in one area.

**Description.** Body moderate in size (up to 8.2 mm); integument varying from completely black to red on dorsal surfaces and black on head and ventrally. Pubescence inconspicuous, the setae abundant, fine, erect, hair-like. Head conical, narrowed toward rostrum, widest at base; surface dull or shining, moderately densely punctured. Rostrum straight, slightly widened at apex. Antennae (Fig. 156) inserted midway between eye and apex of rostrum. Pronotum as wide as or slightly wider than long, narrower than elytral bases, weakly constricted anteriorly; disc moderately punctured. Elytra stout, robust, wider than pronotum; striae moderately to weakly impressed in distinct to indistinct rows, with round impressed punctures; interstriae varying from smooth to densely and minutely rugose. Pygidium visible, vertical, convex. Tarsi with claws deeply cleft; inner teeth connate. Procoxae in males with round to oval and densely setose pits on apex.

**Type species.** *Curculio bicolor* Fabricius, by subsequent designation.

### Key to species of *Merhynchites* in Canada

1. Eyes, in dorsal view, strongly convex, forming almost 90° angle with rostrum at anterior margin of eye (Fig. 9, 160). Rostrum of both sexes more or less straight, more so in females (Figs. 158, 159). Elytra with striae moderately impressed; interstriae smooth. Ontario to British Columbia . . . . . ***bicolor* (Fabricius)** (p. 157)  
 Eyes, in dorsal view, very weakly convex, forming 45° angle with rostrum at anterior margin of eye (Fig. 165). Rostrum of female slightly, evenly arcuate; rostrum of male obviously arcuate beyond antennal insertions (Figs. 163, 164). Elytra with striae weakly impressed, indistinct; interstriae minutely rugose. Alberta, British Columbia, Northwest Territories, Saskatchewan . . . . . ***wickhami* (Cockerell)** (p. 160)

## Clé des espèces du genre *Merhynchites* du Canada

1. Oeil fortement convexe, en vue dorsale, formant à sa marge antérieure un angle de presque 90 % avec le rostre (fig. 9, 160). Rostre des deux sexes plus ou moins rectiligne, davantage chez les femelles (fig. 158, 159). Stries de l'élytre modérément creusées; interstries lisses. De l'Ontario à la Colombie-Britannique . . . . . ***bicolor* (Fabricius)** (p. 157)  
  
Oeil très faiblement convexe, en vue dorsale, formant à sa marge antérieure un angle de presque 45 % avec le rostre (fig. 165). Rostre de la femelle légèrement et régulièrement arqué; rostre du mâle manifestement arqué derrière les fovéas antennaires (fig. 163, 164). Stries de l'élytre faiblement creusées, indistinctes; interstries à rugosité minuscule. Alberta, Colombie-Britannique, Territoires du Nord-Ouest, Saskatchewan . . . . . ***wickhami* (Cockerell)** (p. 160)

### *Merhynchites bicolor* (Fabricius)

Figs. 9, 22, 156–160; Map 28

*Curculio bicolor* Fabricius, 1775:131 (lectotype, "America"; University of Glasgow, Scotland).

*Rhynchites bicolor*: Blatchley and Leng 1916:58; Dillon and Dillon 1961:746; White 1983:318.

*Merhynchites bicolor*: Pierce 1913:370; Hamilton 1969:284; Hamilton 1979:31; O'Brien and Wibmer 1982:16; Hamilton 1983b:21.

*Rhynchites* (*Merhynchites*) *bicolor*: Hatch 1971:334.

*Merhynchites bicolor* var. *cockerelli* Pierce, 1913:371 (holotype, San Francisco County, Calif.; USNM); Hamilton 1985:57.

*Merhynchites bicolor* var. *ventralis* Pierce, 1913:371 (holotype, Volga, S.D.; USNM).

*Rhynchites bicolor erythrosoma* Cockerell and Harris, 1924:144 (type, Boulder, Colo.; USNM).

*Coenorrhinus* (*Merhynchites*) *bicolor* f. *antennalis* Voss, 1932:176 (no type data given).

*Coenorrhinus* (*Merhynchites*) *cerdonis* Voss, 1932:176 (type, California; ZMHU).

*Coenorrhinus* (*Merhynchites*) *intermedius* Voss, 1932:176 (type, California; ZMHU).

*Merhynchites bicolor niger* Hamilton, 1985:57 (holotype, Charleston, Coos County, Ore.; USNM).

*Merhynchites bicolor nigricephalus* Hamilton, 1985:58 (holotype, Corvallis, Benton County, Ore.; USNM).

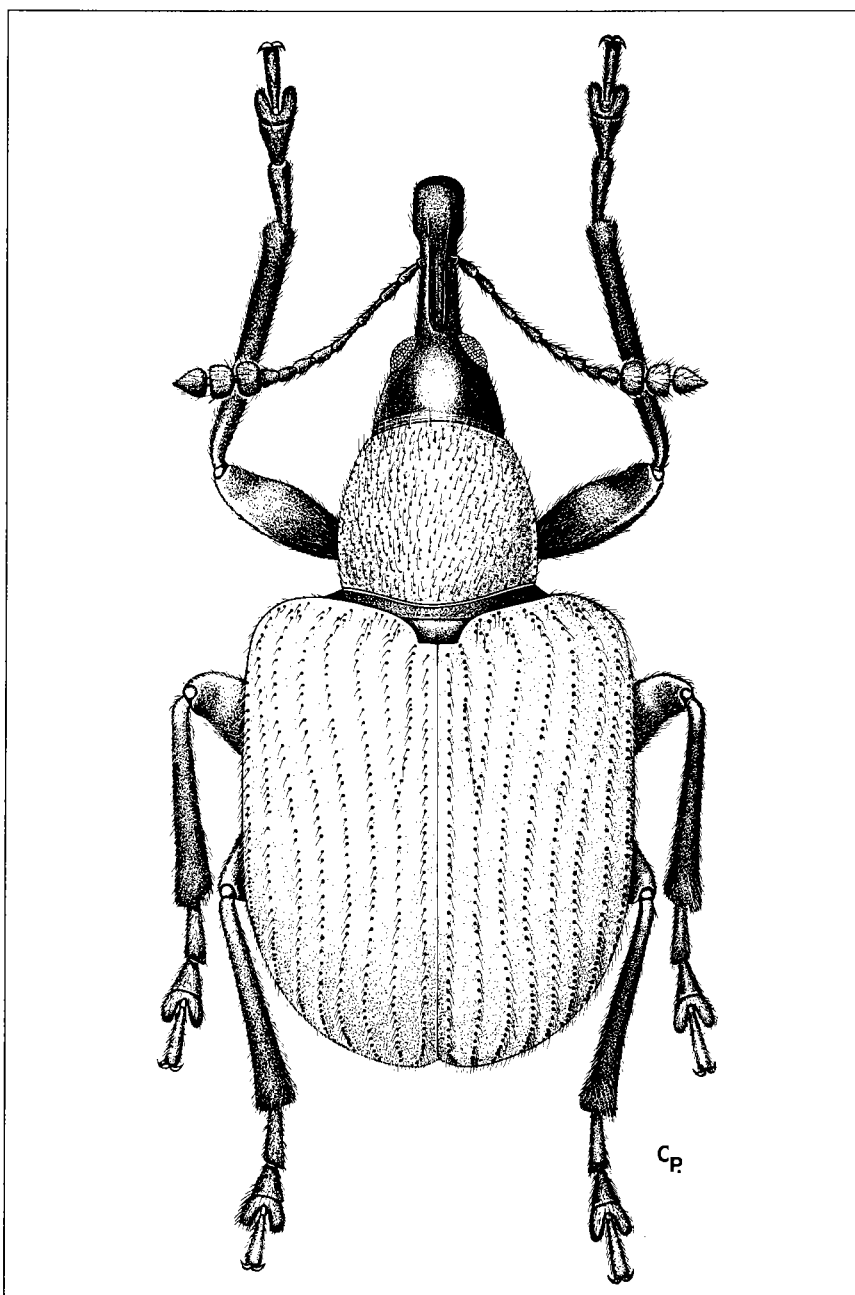
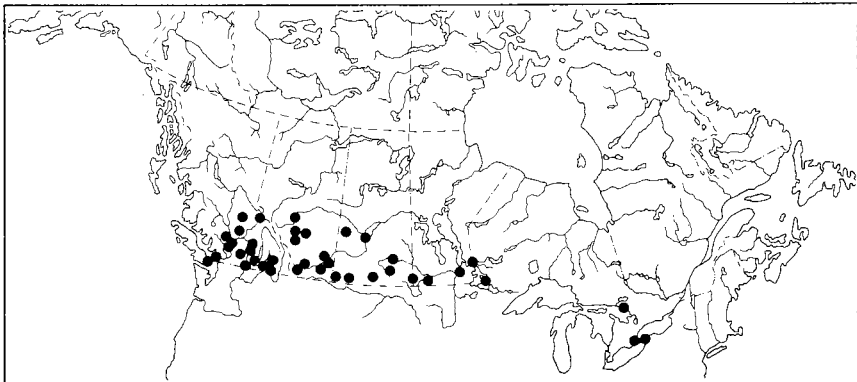


Fig. 9. *Merhynchites bicolor*

**Description.** Length 4.5–5.5 mm (head excluded). Body with ventral surface, legs, and rostrum black; elytra and dorsal surface of pronotum red or reddish brown to light yellow; head dull or shining, usually black, sometimes red behind eyes. Surface of head with elongate punctures between eyes; interpuncture spaces weakly elevated, carinate at base of rostrum. Eyes strongly convex. Rostrum of both sexes straight, more so in female, distinctly punctured, with 1 weakly elevated, longitudinal median ridge; base longitudinally impressed in front of eyes. Pronotum 1.1 times wider than long, widest at middle; sides broadly arcuate, strongly converging to broadly rounded apex; disc distinctly convex, with moderate, impressed punctures; interpuncture spaces moderately shining, smooth. Elytra 1.3 times longer than wide, at base 1.5–1.6 times wider than pronotum; stria punctures large; interstriae 1.5–2.0 times wider than striae, smooth, with fine, erect, scattered setae. Pygidium densely punctured.

**Distribution.** Ontario to British Columbia, south throughout the United States to South Carolina in the east and Arizona and California in the west. Evidently more common in the west. Alberta: Calgary, Irving, Lethbridge, McMurray, Medicine Hat, Orion, Pincher Creek, and Red Deer. British Columbia: Agassiz, Ashcroft, Boswell, Bowser, Cawston, Colwood, Cottonwood, Courtenay, Cowichan Lake, Creston, Elko, Galiano Island, Goldenstream, Kamloops, Langley, Lillooet, Merritt, Mission, Mission Flats, Nelson, Nicola, Osoyoos, Pavilion Lake, Peachland, Robson, Rolla, Royston, Saanich, Salmon Arm, Sicamous, Soda Creek, Squamish, Steelhead, Summerland, Trinity Valley, Vancouver, Vernon, Victoria, and Wellington. Manitoba: Birds Hill, Carberry, 21 km north of Glenboro, Ninette, Onah, Pierson, and Stockton. Ontario: Fort Erie, Ingolf, Nestor Falls, Ojibway, and St. Catharines. Saskatchewan: Cut Knife, Cypress Hills, Fort Walsh, Lebret, Oxbow, Pike Lake, Saskatoon, St. Victor, Val Marie, and Weyburn.

**Comments.** This species is commonly known as the rose curculio and is an occasional pest of cultivated roses (*Rosa* species) as well as blackberries and raspberries (*Rubus* species). The adults damage roses by puncturing numerous holes in the flower buds, causing the blooms to fail to develop. The larvae develop in the hips, feeding on the achenes. Adults also puncture ripe blackberries and raspberries, causing them to rot. Specimens of this species so strongly resemble those of *M. wickhami* that identification is difficult if not impossible, unless one examines the spiculum gastrale (Figs. 157 and 162). In *M. bicolor*, the lateral margin of the spiculum gastrale (just at the expansion into the bifid process) bears an acute, tooth-like process; the process is absent in *M. wickhami*. Other characters given in the key to species are quite variable. (See discussion under *M. wickhami*.) The lectotype of *M. bicolor* was designated by Hamilton (1983b).



Map 28. Collection localities of *Merhynchites bicolor*.

*Merhynchites wickhami* (Cockerell)

Figs. 161–165; Map 29

*Rhynchites bicolor wickhami* Cockerell, 1912:82 (holotype, Boulder, Colo.; USNM).

*Merhynchites bicolor wickhami*: Pierce 1913:371.

*Merhynchites bicolor* var. *piceus* Pierce, 1913:372 (holotype, Oregon; USNM).

*Merhynchites bicolor* var. *viridilustrans* Pierce, 1913:372 (holotype, Bright Angel Trail, Colorado Canyon, Ariz.; USNM).

*Rhynchites pullatus* Ewing, 1915:228 (no type designated).

*Coenorrhinus* (*Merhynchites*) *mandibularis* Voss, 1932:176 (type, California; ZMHU).

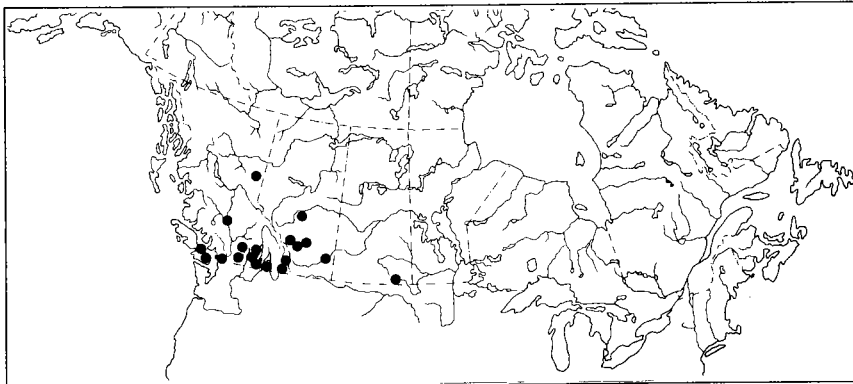
*Coenorrhinus* (*Merhynchites*) *homocidae* Voss, 1932:177 (type, western North America; ZMHU).

*Coenorrhinus* (*Merhynchites*) *homocidae* f. *luctuosa* Voss, 1932:117 (type, western North America; ZMHU).

**Diagnosis.** Very similar to *M. bicolor*. Differs in having flatter eyes, a more strongly arcuate rostrum, weakly impressed elytral striae, and minutely rugose elytral interstriae. Hamilton (1985) mentions differences in pronotal shape, but I am unable to detect valid differences in this character.

**Distribution.** Alberta, British Columbia, Northwest Territories, Saskatchewan, south throughout the western United States, east to Minnesota and Texas (?). Alberta: Banff, Calgary, Drumheller, Edmonton, and Medicine Hat. British Columbia: Aspen Grove, Canal Flats, Creston, Dutch Creek, Fort St. John, Hatzic, Hope, Lytton, Merritt, Mission, Nicola, Okanagan Falls, Oliver, Penticton, Port Kells, Princeton,

Royston, Salmon Arm, Summerland, Trail, Trinity Valley, Vancouver, Vernon, Victoria, Walhachin, Wardner, Wellington, and Williams Lake. Northwest Territories: (no site recorded). Saskatchewan: Roche Percee.



Map 29. Collection localities of *Merhynchites wickhami*.

**Comments.** Like *M. bicolor*, this species damages roses (*Rosa* species). There appears, however, to be a difference in ovipositional behavior between the two species. Hoerner (1936) stated that females of *M. wickhami* deposit eggs in developing rose buds and then puncture the stem, providing a dead or dying bud for larval development. Early larval stages probably feed on pollen. Hamilton (1985) reports that second- and third-instar larvae were found feeding on the anthers within the stunted and dead rosebuds. As stated previously, larvae of *M. bicolor* feed entirely in rose hips. Specimens of *M. bicolor* and *M. wickhami* can be distinguished fairly easily when the eye character (see key) is at its extreme expression. Within the entire population, however, a number of intermediate forms occur that are difficult to place in either of the two species. For example, S.D. Hicks collected 70 specimens from roses on 3–17 June 1953, in Mission Flat, B.C. Of these specimens, 28 were clearly *M. bicolor* (strongly convex eyes), 17 were clearly *M. wickhami* (weakly convex eyes), and 25 were difficult to place in either species. An analysis of eye width (dorsal view) showed that those specimens that were clearly *M. wickhami* had eyes from 0.07 to 0.10 mm wide, whereas those that were clearly *M. bicolor* had eyes from 0.12 to 0.14 mm wide. The intermediate specimens had eyes that ranged slightly more or less than 0.10 mm wide. Considered as a whole population, the eye width varied more or less evenly from 0.07 to 0.14 mm, with no distinct breaks. Other characters listed in the key could not be correlated with the above data. This is not the place to attempt a detailed analysis of the various character states of these species. The above examples are offered so that

users of this work will be cautious when applying names to species in this genus.

## Genus *Auletobius* Desbrochers

*Auletobius* Desbrochers, 1869:396; Voss 1922:27, 29; Voss 1933:110, 113; Hamilton 1969:356; O'Brien and Wibmer 1982:13.

*Metopon* Waterhouse, 1842:8.

This genus contains 16 species in North America, mostly in the southern United States, Mexico, or Central America. Three species occur in the southern regions of Canada, one in the west, and two in the east. The distinctive characteristic of this genus is the randomly punctured elytra (except in *A. cassandrae*). In addition, the rostrum is very slender; the pygidium is covered by the elytra, and the scutellar striae are not evident.

**Description.** Body stout, pear-shaped. Pubescence consisting of short, hair-like, inconspicuous setae. Head conical, widest across eyes; surface punctured. Rostrum slender, weakly curved; apex weakly expanded. Eyes strongly convex, protuberant. Antennae (Figs. 157, 158) inserted in basal quarter of rostrum (Fig. 157) or in middle of rostrum (Fig. 158); terminal 3 segments distinctly larger than other segments. Pronotum narrower than elytra; disc shining, punctured. Elytra inflated on posterior half, broadly rounded at apex; surface not striated; punctures randomly scattered (except *A. cassandrae*); interpuncture space shiny. Abdomen not sexually modified. Pygidium concealed by elytra.

**Type species.** *Involvulus sanguisorbae* Schrank, by subsequent designation.

**Comments.** Hamilton (1969) gives a key to the species occurring in the United States, as well as descriptions, distributions, and other essential information.

### Key to species of *Auletobius* in Canada

1. Body 1.8–2.2 mm long, dark reddish brown. Pubescence bicolored, yellowish and white. Elytra with irregular white crossbands and striae punctured in rows. Newfoundland to Ontario ..... *cassandrae* (LeConte) (p. 163)



- Body more than 2.5 mm long, black. Pubescence monochrome white to light brown. Elytra without striae, with random punctures ..... 2
2. Antennae inserted near base of rostrum (Fig. 157). Body finely punctured. Pubescence light brown. Length 2.5–3.8 mm. Manitoba to British Columbia ..... **congruus (Walker)** (p. 165)
- Antennae inserted at middle of rostrum (Fig. 158). Body coarsely punctured. Pubescence white. Length 3.3–3.8 mm. Ontario, Manitoba ..... **ater (LeConte)** (p. 166)

## Clé des espèces du genre *Auletobius* du Canada

1. Corps de 1,8 à 2,2 mm de longueur, brun rougeâtre foncé. Pubescence bicolore, jaunâtre et blanc. Élytre barré de bandes transversales blanches, irrégulières et sillonné de stries perforées en rangées. De Terre-Neuve à l'Ontario ..... **cassandrae (LeConte)** (p. 163)
- Corps de plus de 2,5 mm de longueur, noir. Pubescence monochrome, blanche à brun pâle. Élytre non strié, percé de perforations disséminées au hasard ..... 2
2. Antennes insérées près de la base du rostre (fig. 157). Corps finement perforé. Pubescence brun pâle. Longueur : de 2,5 à 3,8 mm. Du Manitoba à la Colombie-Britannique ..... **congruus (Walker)** (p. 165)
- Antennes insérées au milieu du rostre (fig. 158). Corps percé de perforations grossières. Pubescence blanche. Longueur : de 3,3 à 3,8 mm. Ontario, Manitoba ..... **ater (LeConte)** (p. 166)

### *Auletobius cassandrae* (LeConte)

Map 30

*Auletobius cassandrae* LeConte, 1876:5 (syntypes, Fort Capron, Saint Lucia County, Fla.; MCZ); Blatchley and Leng 1916:53.

*Auletobius cassandrae*: Hamilton 1979:31; O'Brien and Wibmer 1982:13; Hamilton 1983a:511–522.

*Auletobius (Mesauletobius) cassandrae*: Hamilton 1969:368.

*Auletobius albovestita* Blatchley, 1916:54 (holotype, Tyngsboro, Mass.; Purdue University).

*Auletobius (Mesauletobius) albovestita*: Hamilton 1969:371.

*Auletobius minor* Blatchley, 1922:98 (not Lea 1899).

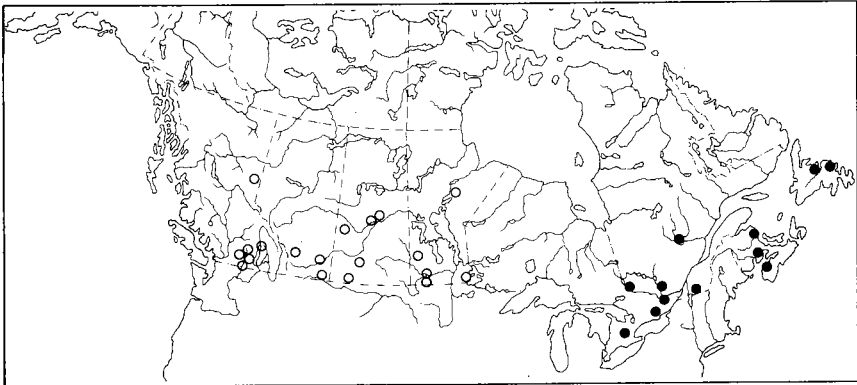
*Auletobius blatchleyi* Voss, 1935:240 (unnecessary replacement name).

**Description.** Length 1.8–2.2 mm. Integument dark reddish brown; head and pronotum usually darker than elytra. Pubescence on elytra consisting of yellowish and white setae, the white setae forming irregular crossbands. Head and pronotum with setae all white or intermixed with yellow. Head strongly convex, transversely impressed behind eyes; surface with small, close, rather weakly impressed punctures. Rostrum glabrous, minutely reticulate, with scattered, fine, shallow punctures. Antennae inserted in basal quarter of rostrum. Pronotum very slightly longer than wide, widest at middle; sides weakly arcuate, very weakly constricted before anterior margin; disc convex, with large, deeply impressed, close punctures; interpuncture space shining. Elytra 1.4 times longer than wide, at base 1.6 times wider than pronotum; stria punctures large, deeply impressed, placed in even rows; interstriae as wide as or slightly narrower than striae, shining, with scattered minute points; disc weakly impressed on basal quarter, somewhat inflated behind.

**Distribution.** Newfoundland to Ontario, south through the eastern United States to Florida and Texas. New Brunswick: Penobsquis, Pokemouche, and Tabusintac. Newfoundland: Gander and Terra Nova National Park. Nova Scotia: Annapolis Royal, Bridgetown, and Tusket. Ontario: 8 km east of Arthur, Constance Bay, Marmora, and Mer Bleue. Quebec: Covey Hill, Kazabazua, Laniel, Mistosimi, and Schwarz.

**Comments.** Adults of this species are readily recognized by the evenly punctured stria rows. Adults are also the smallest of any species in this genus in Canada. This species is evidently not closely related to any other Canadian species and cannot be confused with any other weevil. Adults of *A. cassandrae* feed exclusively on the leaves of sweet-fern, *Comptonia peregrina*. Adults have also collected on bayberry (*Myrica cerifera*) and leatherleaf (*Chamaedaphne calyculata*) and were swept from flowers of huckleberry (*Rubus* species). Adults eat holes completely through the leaf. Females oviposit in the leaf and then cut the terminal leaf primordia of the host plant. The leaf falls to the ground and slowly decays, providing food and protection for the larvae. Two generations are produced every year. In Wisconsin, adults emerge in early June, and the females oviposit in and cut many leaf primordia in the latter half of the month. Eggs hatch in about 10 days, and larval development is rapid. Pupation occurs in mid July, and adults begin emerging about mid to late July. Females of this first generation oviposit in and cut leaf primordia throughout the latter half of July and most of August. Larvae of this second generation reach the fourth instar by the end of September. The insects overwinter in the fourth-instar larval

state; spring pupation occurs in late May to early June within the hollowed-out leaf primordia (Hamilton, 1983a). Hamilton (1983a) provides illustrations and descriptions of the larvae and pupae of this species.



Map 30. Collection localities of *Auletobius cassandre* (●) and *A. congruus* (○).

### *Auletobius congruus* (Walker)

Fig. 157; Map 30

*Rhynchites congruus* Walker, 1866:331 (lectotype, British Columbia; BMNH).

*Auletobius congruus*: Hatch 1971:333; Hamilton 1979:31; O'Brien and Wibmer 1982:13; Hamilton 1983b:21.

*Auletobius* (*Auletobius*) *congruus*: Hamilton 1969:375.

*Auletes subcoeruleus* LeConte, 1876:4 (holotype, Nebraska; MCZ).

**Description.** Length 2.5–3.8 mm. Head, pronotum, and elytra black. Pubescence consisting of light brown setae. Head strongly convex, narrowly transversely impressed behind eyes; surface with fairly large, close, moderately deeply impressed punctures. Rostrum shining, with scattered oval, shallow punctures. Antennae inserted in basal quarter of rostrum. Pronotum 1.2 times wider than long, widest at middle; sides strongly arcuate, weakly constricted before anterior margin; disc convex with large, deeply impressed, close punctures; interpuncture space shining. Elytra 1.3 times longer than wide, at base about 1.2–1.3 times wider than pronotum; surface finely punctured, with moderately impressed, large, very close punctures, these arranged in no apparent order; interpuncture space shining; disc not noticeably impressed on basal quarter.

**Distribution.** Manitoba to British Columbia, south in the western United States to Wyoming and Idaho. Alberta: Calgary, "Cariboo," Cypress Hills, Dawson, Elkwater, "Gillan," and Medicine Hat. British Columbia: Aspen Grove, Copper Mountain, Elko, Kamloops, Merritt, Nicola, Oliver, Rock Creek, Salmon Arm, and Vernon. Manitoba: Aweme, mile 332 of the Hudson Bay Railway, Reynolds, Riding Mountain National Park, and Turtle Mountain Forest Reserve. Saskatchewan: Cut Knife, "Nortlach," Prince Albert, Snowden, and Val Marie.

**Comments.** This is the only western species in this genus. Adults are easily recognized by the black color, by the insertion of the antenna close to the rostrum base (Fig. 157), by the randomly punctured elytra, by the light brown setae on the pronotum and elytra, and by the distribution. Nothing is known of the life history or habits of this species. Larvae have been reported injuring strawberry blossoms at Salmon Arm, B.C. Hamilton (1983b) designated the lectotype of this species.

*Auletobius ater* (LeConte)

Fig. 158

*Auletobius ater* LeConte, 1876:4 (lectotype, Maryland; MCZ); Blatchley and Leng 1916:53.

*Auletobius (Aletinus) ater*: Hamilton 1969:363.

*Auletobius ater*: Hamilton 1979:31; O'Brien and Wibmer 1982:13; Hamilton 1983b:21.

**Description.** Length 3.3–3.8 mm. Head, pronotum, and elytra black. Pubescence consisting of white setae. Head weakly convex, with a transverse, very weak, generally not noticeable impression behind eye; surface with large, close, deeply impressed punctures. Rostrum stouter than in *A. cassandrae* or *A. congruus*; surface shining, with close, elongate, deep punctures forming longitudinal ridges; setae on rostrum sparse. Antennae inserted in middle of rostrum. Pronotum as long as wide, widest on basal half; sides weakly arcuate, very weakly constricted before anterior margin; disc convex, with large, close, deeply impressed punctures; interpuncture space weakly shining, minutely reticulate. Elytra 1.2 times longer than wide, at base 1.4 times wider than pronotum; surface with deeply impressed, very large, close punctures, these arranged in no apparent order; interpuncture space slightly shining, smooth; disc not noticeably impressed on basal quarter.

**Distribution.** Ontario and Manitoba, south through the eastern United States to Texas and South Carolina. Manitoba: Stonewall and Winnipeg. Ontario: Toronto.

**Comments.** Adults of this species are distinguished from those of *A. cassandrae*, the other eastern species in this genus, by their much larger size, by the black color of the integument, by the white setae, and by the different placement of the antenna on the rostrum (Fig. 158). Adults are readily distinguished from those of *A. congruus*, a species of similar size and color, by the more easterly distribution, by the white setae (not light brown as on *A. congruus*) and by the location of the antennal insertion on the rostrum (Fig. 158). Nothing is known about the habits or life history of this species, except that it occurs on sweet-fern (*Comptonia* species) and bayberry (*Myrica* species). Adults have been taken on oak (*Quercus* species). The larval host has not been definitely established. Hamilton (1983b) designated the lectotype of this species.

## Genus *Deporaus* Samouelle

*Deporaus* Samouelle, 1819:201; Hamilton 1969:388; O'Brien and Wibmer 1982:17.

This genus contains only one North American species, which ranges throughout the west as far north as western Washington. Because it may occur in southern British Columbia it is included here.

**Description.** Body elongate, rather stout. Pubescence consisting of short, hair-like setae. Head conical, widest at base; surface punctured. Rostrum (Figs. 159, 160) constricted in middle, slightly expanded at apex. Mandible with 2 acute teeth on outer margin. Eye moderately convex, protuberant. Antennae straight, 11-segmented, inserted on basal half of rostrum. Pronotum about as long as wide, narrower than elytra; disc shining, punctured. Elytra broadly rounded at apex; surface with strial punctures in even rows; interstriae shining. Abdomen not sexually dimorphic. Pygidium and 2 abdominal tergites exposed.

**Type species.** *Attelabus betulae* Linnaeus, monotypic.

**Comments.** Hamilton (1969, 1979) and Hatch (1971) treat this genus. The authorship of this genus has been incorrectly attributed to Leach; O'Brien and Wibmer (1982) corrected the error.

## *Deporaus glastinus* (LeConte)

Figs. 159, 160

*Rhynchites glastinus* LeConte, 1857:52 (lectotype, San Francisco, Calif.; MCZ).

*Deporaus glastinus*: Arnett 1960:993; Hamilton 1969:390; Hatch 1971:333; Hamilton 1979:31; O'Brien and Wibmer 1982:17; Hamilton 1983b:21.

**Description.** Length 3.5–4.6 mm. Head, pronotum and elytra shining black; elytra with steel-blue reflections. Pubescence consisting of fine, erect, brown setae. Head with sides behind eyes nearly parallel or weakly arcuate; surface of head shining, with scattered fine, shallow punctures. Rostrum about as long as head, expanded at apex; surface shining, with 1 row of close punctures along lateral margins and several short elevated median ridges. Antennae inserted midway between eyes and apex of rostrum, with terminal 3 antennal segments more densely pubescent than other segments. Pronotum shorter than head; sides weakly arcuate; surface with large, close, deeply impressed punctures; interpuncture spaces smooth, shining. Elytra about 1.3 times longer than wide, at base 1.7 times wider than pronotum; apex of each elytron separately rounded; striae with large, deeply impressed punctures; interstriae narrower than striae, each interstria with 1 row of small, shallow punctures. Abdomen with last 2 tergites exposed beyond elytral apex. Pygidium convex, finely punctured.

**Distribution.** Western Washington, south through the western United States to Mexico. Not recorded in Canada, but may occur in southern British Columbia.

**Comments.** Adults are easily recognized by the characters given above and by the illustrations (Figs. 159, 160). Nothing is known of the biology or life history, except that adults occur on oak (*Quercus*) species. Hamilton (1983b) designated the lectotype of this species.

## Genus *Haplorhynchites* Voss

*Rhynchites* (*Haplorhynchites*) Voss, 1938:135.

*Haplorhynchites*: Hamilton 1969:302–339; Hamilton 1974:787–794; O'Brien and Wibmer 1982:16.

This small genus contains six species from America north of Mexico, only one of which occurs in Canada. *Haplorhynchites* was initially described as a subgenus of *Rhynchites*. Hamilton (1974) revised the

group and elevated it to the generic level. Members of this genus are widespread, occurring in North and Central America, Europe to Siberia, Japan, China, and India.

**Description.** Body small (7.0 mm or less). Integument dark, with green or blue metallic reflections. Pubescence abundant; setae long, erect to semierect, dark. Head weakly conical in female, slightly quadrate in male, not constricted behind eyes; surface sparsely to moderately punctured, the interpuncture spaces forming longitudinal ridges. Rostrum (Figs. 161, 162) with sides slightly arcuate to straight; apex slightly broadened. Antennae (Fig. 162) inserted before middle of rostrum; antennal club densely pubescent. Pronotum slightly wider than long; sides arcuate; disc punctured. Elytra stout, broad; striae punctured in even longitudinal rows, except randomly punctured in *H. aeneus*; scutellar striae absent. Abdomen in male unmodified. Pygidium with apex exposed beyond elytra.

**Type species.** *Rhynchites aeneus* Boheman, subsequent designation by Hamilton (1974).

**Comments.** Members of this genus are easily distinguished from those of other genera by the absence of scutellar striae and by the long elytra, which expose only the tip of the pygidium.

#### *Haplorhynchites aeneus* (Boheman)

Figs. 161, 162; Map 31

*Rhynchites aeneus* Boheman, 1829:122 (lectotype, "America"; NHRM); Blatchley and Leng 1916:58.

*Haplorhynchites aeneus*: Hamilton 1969:323; Hamilton 1973:83; Hamilton 1974:792; O'Brien and Wibmer 1982:16.

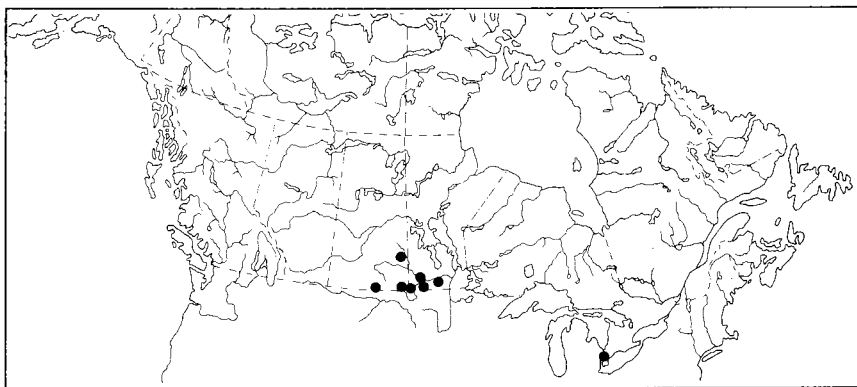
*Rhynchites (Involvulus) consobrinus* Voss, 1938:159.

*Involvulus consobrinus*: Voss 1969:247.

**Description.** Length 3.9–6.6 mm. Body black throughout; venter and tip of rostrum with faint greenish luster. Head conical, with moderate punctures; interpuncture spaces forming irregular longitudinal ridges. Rostrum slightly arcuate (Fig. 161), as long as head and pronotum combined (female) or only 0.3 times longer than pronotum (male); sides, in dorsal view, expanded in apical fifth; apex about 0.25 times wider than frons (Fig. 162). Antennae inserted in, or just in front of, basal third of rostrum (both sexes) (Fig. 162). Pronotum about 1.2 times wider than long, widest behind middle; sides distinctly arcuate; disc with shallow, close punctures; interpuncture spaces shining, smooth, with rather coarse, erect, brown setae. Elytra about 1.2

times longer than wide, twice as wide as pronotum; surface randomly punctured, the punctures close and deep, with coarse, erect setae; striae and interstriae inconspicuous.

**Distribution.** Saskatchewan to southern Ontario, south throughout the entire United States. Manitoba: Aweme, Baldur, Boissevain, Brandon, Onah, Pierson, St. Claude, and Whitewater. Ontario: Windsor. Saskatchewan: Minton, Roche Percee, and Stockholm.



Map 31. Collection localities of *Haplorhynchites aeneus*.

**Comments.** Adults of this species are easily recognized by the generic characters summarized above; by the abundant, erect pubescence; and by the dense, random punctures on the elytra. Hamilton (1973) investigated the biology of this species in northern Illinois. His observations are probably valid in Canada. Male and female weevils are usually observed together on sunflower heads shortly after their appearance in July. Copulation takes place on these developing heads. After (and even during) copulation the female weevils cut the stem just below the developing heads. The cut is not complete and the flower head is left hanging. Eggs are deposited within the base of the disk flowers of the cut heads. Eggs hatch in about a week. The time between larval instars is 20–30 days. The first-instar larvae feed on the pollen within one disk flower. As the larvae grow to second and third instars, they consume adjacent disk flowers. Up to three larvae may be found in a single head. When mature, the larvae leave the cut heads and enter the soil to a depth of about 30 cm. One generation occurs every year. In the spring and early summer, larvae are found in the soil around the host plants. Pupae are found in dirt cells in and around the roots in the first week of July. Pupation takes about 10 days. Hosts include sunflower (*Helianthus* species), rosinwood (*Silphium* species), *Heliopsis* species,



and scruf pea (*Psoralea* species). Hamilton (1974) designated the lectotype of this species.

## Family Ithyceridae

This family contains only one species. Its taxonomic position has been uncertain for a long time. Sanborn (1981), in a thorough study of larval and adult morphology and biology, concluded that it should be given family status.

**Description.** Body large, stout. Pubescence distinct. Head with single gular suture; preular sutures absent. Rostrum broad, stout, not sexually dimorphic. Maxilla without lacinia; maxillary palpus rigid; labrum absent; mandible stout. Antennae straight, moniliform; antennal club compact, 3-segmented. Legs with trochanter short, triangular; femur attached to side of trochanter. Abdomen with sternites 1 and 2 connate.

### Genus *Ithycerus* Schoenherr

*Ithycerus* Schoenherr, 1823: column 1136; Kissinger 1960:10; Sanborne 1981:1-80; O'Brien and Wibmer 1982:28.

*Pachyrhynchus* Kirby, 1837:35.

**Description.** Rostrum half as long as head. Mandibles emarginate at tip, with 1 inferior cusp. Mentum large, quadrate, supported on short, broad gular peduncle. Eyes small, round. Antennae with first 2 segments almost equal in length, segment 3 distinctly longer than segment 2; club small, oval, pointed at apex. Legs with procoxae contiguous; tibiae truncate at apex. Tarsi 5-segmented; tarsal segments broad, pubescent beneath; tarsal segment 4 small, hidden in bilobed tarsal segment 3; tarsal claws free, armed at middle, each with 1 small, acute tooth.

**Type species.** *Curculio noveboracensis* Forster, monotypic.

*Ithycerus noveboracensis* (Forster)

Fig. 10; Map 32

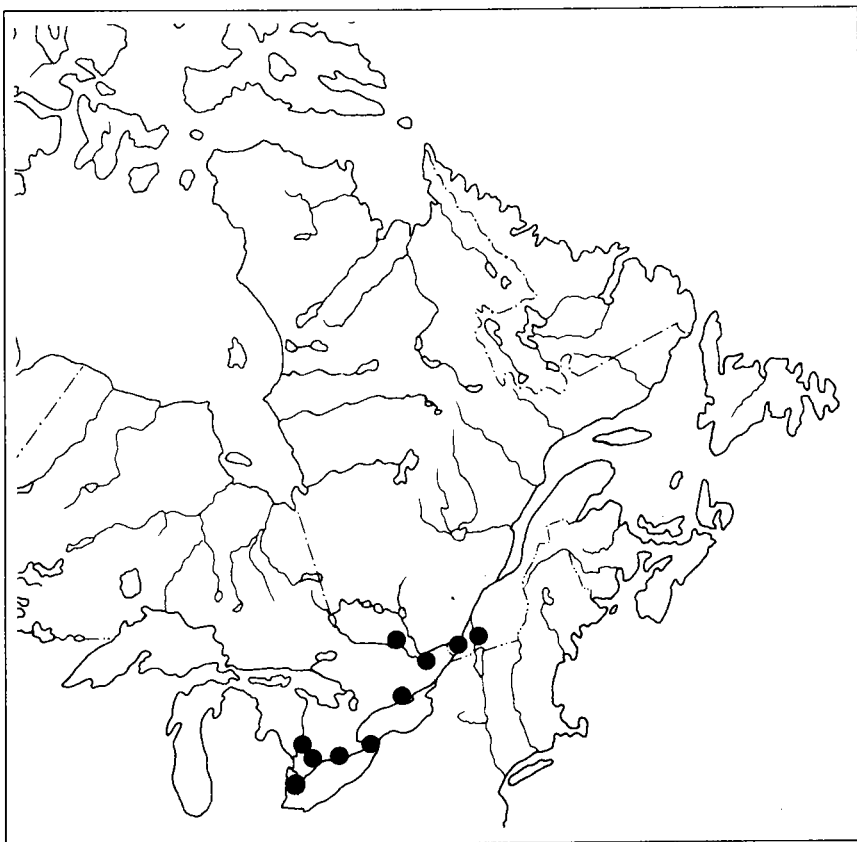
*Curculio noveboracensis* Forster, 1771:35 (type material unknown).

*Ithycerus noveboracensis*: Horn 1873:447; Blatchley and Leng 1916:92; Kissinger 1960:10; Dillon and Dillon 1961:743; Sanborne 1981:1-80; O'Brien and Wibmer 1982:28; White 1983:316-317.

*Curculio punctatulus* Fabricius, 1781:187 (type, "Terra nova Americae"; UZMC).

*Rhynchites curculionoides* Herbst, 1797:136 (type material unknown).

*Pachyrhynchus schoenherri* Kirby, 1837:203 (type, Canada; BMNH).



Map 32. Collection localities of *Ithycerus noveboracensis*.

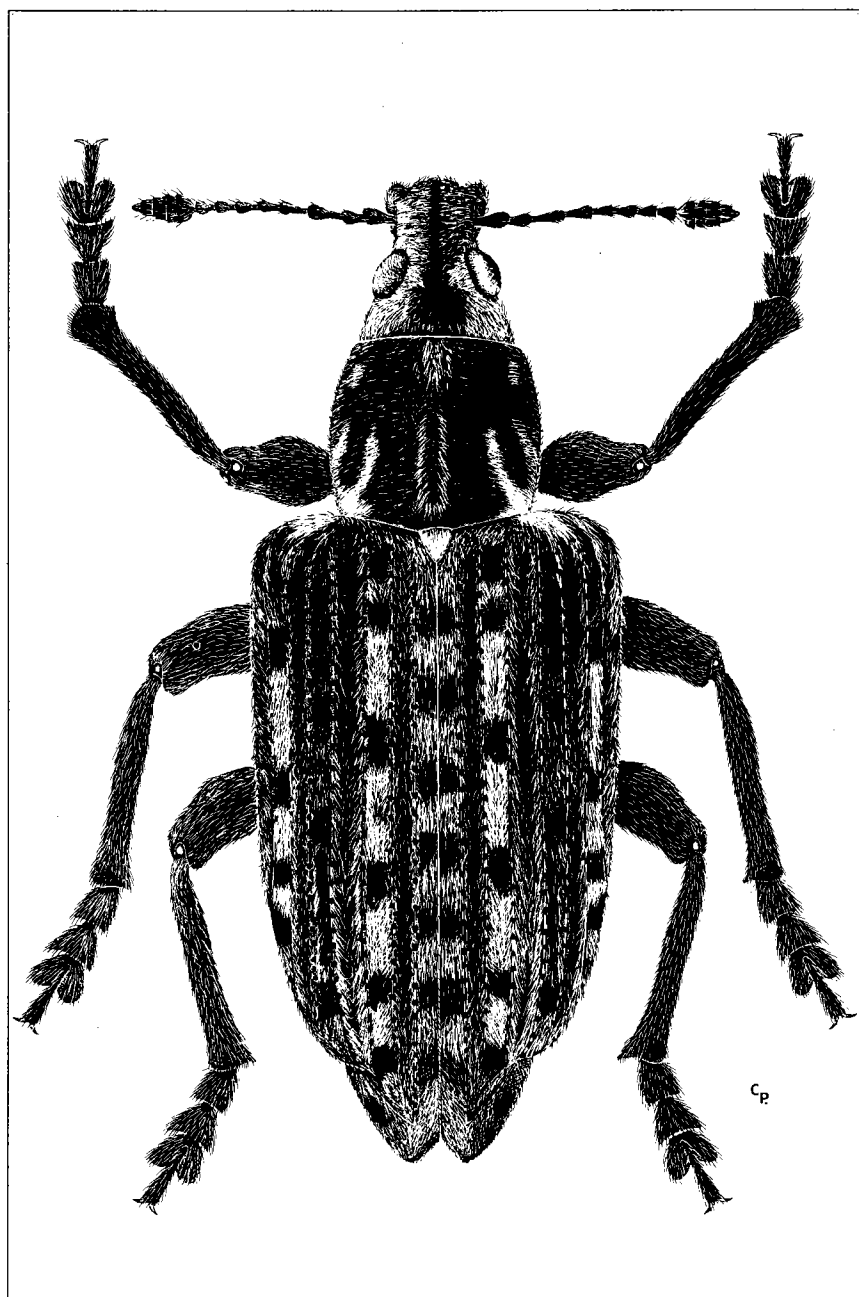


Fig. 10. *Ithycerus noveboracensis*

**Description.** Length 12–18 mm. Body elongate oblong, robust, black, shining. Pubescence sparse; setae prostrate, ash gray and pale brown; gray setae forming 1 narrow median and 2 wider lateral stripes on pronotum and 1 narrow pale stripe along every second elytral interstriae; interstitial gray strips broken by 3 or 4 small rounded tufts of black hairs. Scutellum white. Head and rostrum together slightly longer than pronotum. Rostrum carinate along middle; surface densely rugose-punctate. Pronotum subcylindrical, about as long as wide; apex and base truncate; sides weakly arcuate; disc densely rugose-punctate. Elytra at base nearly twice as wide as pronotum; sides parallel for four-fifths of length, then suddenly converging to obtuse apex; striae indistinct, coarsely punctured; interstriae weakly convex, densely rugose. Abdomen in male with last visible ventral tergite strongly convex, visible from beneath. Pygidium deeply grooved in both sexes, projecting slightly beyond elytra.

**Distribution.** Ontario and Quebec, south through the eastern United States to Texas and Georgia, west to Wisconsin and Nebraska, Ontario: Grand Bend, Jockvale, Marmora, Merivale, Ojibway, Parkhill, Prince Edward County, Simcoe, Strathroy, and Walsingham. Quebec: Beech Grove, Lac Bernard, Montreal, Old Chelsea, and Saint-Hilaire.

**Comments.** This species is commonly known as the New York weevil. It is occasionally a serious pest in orchards. Sanborne (1981) reports two distinct color forms in three separate geographical areas. A northern gray form occurs throughout northeastern United States and southern Canada; in this form, little contrast is found between the light and dark patches of pubescence. Two southern melanic forms, which occur primarily in the southeastern United States, have highly contrasting light and dark patches of pubescence. Structural differences among the three populations suggest that these forms are discrete geographical populations that could be given subspecies status. More study is required, especially of the southern forms, before such a distinction is made. Larvae feed on roots of American hornbeam (*Carpinus caroliniana*), gray birch (*Betula populifolia*), butternut (*Juglans cinerea*), butternut hickory (*Carya cordiformis*), shagbark hickory (*C. ovata*), American beech (*Fagus grandifolia*), American chestnut (*Castanea dentata*), and oak (*Quercus* species). Adults are occasionally taken on cultivated fruit trees such as apple, plum, and peach. Adults feed on the new season's growth of shoots, leaf petioles, leaf buds, and acorn buds. The females lay eggs in the summer in small depressions in the soil around the bases of trees or saplings or other vegetation. Larvae develop on the roots of the host plants by feeding on the vascular cambium and phloem. They completely remove the outer bark. The larvae feed primarily on the lower surfaces of lateral roots. The insects spend most of the summer and subsequent year in the larval stage. Pupation occurs in May or June of the second year, and adults

emerge in late May, June, and part of July. The species has, therefore, a 2-year life cycle (Sanborne 1981). Sanborne (1981) has described and illustrated the larva and pupa.

## Family Attelabidae

This family contains only about 200 species worldwide, most of which occur in the tropical regions. About 76 species in four genera occur in North America, mostly in the southern areas. Three species in three genera extend into Canada.

Members of the family are known as leaf-rolling weevils. The larvae live in compact thimble-shaped rolls made of leaves. These rolls are made by the female beetle and are often found hanging by a narrow strip from the leaf from which they were made. The female lays a single egg in each roll. The larva feeds on the inner part of the roll and, when mature, enters the ground to pupate.

**Description.** Body stout, oval; usually glabrous. Head with 1 gular suture; preular sutures absent. Rostrum short, stout, wider at apex, not sexually dimorphic. Maxilla without lacinia; maxillary palpus rigid; labrum not distinct. Antennae straight, moniliform; antennal club distinct, 3-segmented. Legs with trochanter short, triangular; femur attached to side. Abdomen with sternites 1–4 connate.

### Key to genera of Attelabidae in Canada

1. Body glabrous ..... 2  
    Body pubescent ..... *Himatolabus* Jekel (p. 176)
2. Dorsum entirely reddish orange. Femora of forelegs not toothed.  
    Submental area with 2 teeth in male and without teeth in female  
    ..... *Homoeolabus* Jekel (p. 178)  
    Dorsum black; elytra with humeral area reddish. Femora of forelegs  
    toothed ventrally. Submental area with blunt tooth or swelling,  
    more prominent in female ..... *Attelabus* Linnaeus (p. 180)

### Clé des genres des Attelabidae du Canada

1. Corps glabre ..... 2  
    Corps pubescent ..... *Himatolabus* Jekel (p. 176)

2. Dos entièrement orange rougeâtre. Profémur non dentelé. Submentum armé de deux dents chez le mâle, édenté chez la femelle ..... ***Homoeolabus* Jekel** (p. 178)  
 Dos noir, région humérale de l'élytre rougeâtre. Profémur dentelé sur sa face ventrale. Submentum portant une dent émoussée ou une protubérance, plus proéminente chez la femelle ..... ***Attelabus* Linné** (p. 180)

## Genus *Himatolabus* Jekel

*Attelabus* (*Himatolabus*) Jekel, 1860:189.

*Himatolabus*: Voss 1925:242; Hamilton 1969:70; Hamilton 1979:29; O'Brien and Wibmer 1982:12.

*Himatolabus* contains six species in North America. Four species occur exclusively in Mexico or Central America; one occurs in the southwestern United States, Mexico, and Central America; and one is found in eastern North America, including Canada. This genus is usually listed in North American literature as a subgenus or synonym of *Attelabus*. Voss (1925, 1929) elevated *Himatolabus* and *Homoeolabus* to generic level, but this practice was not followed by later American authors until Hamilton (1969, 1979) reconfirmed their status.

**Description.** Pubescence conspicuous. Head elongate, conical, quadrate; sides of head weakly converging. Eyes large, slightly convex. Rostrum broadly expanded at apex. Antennae inserted slightly before middle of rostrum; terminal 3 segments more densely pubescent than other segments. Pronotum wider than long, narrower than elytra. Elytra stout, slightly longer than wide. Femora toothed or unarmed.

**Comments.** Hamilton (1969) revised the genus and presents a key to species and descriptions.

### *Himatolabus pubescens* (Say)

Map 33

*Attelabus pubescens* Say, 1826:252 (neotype, Hocking County, Ohio; OSU).

*Himatolabus* (*Himatolabus*) *pubescens*: Voss 1929:209; Hamilton 1969:75.

*Himatolabus pubescens*: Hamilton 1979:30; O'Brien and Wibmer 1982:12.

*Attelabus rhois* Boheman, 1829:121 (type, "America"; NHRM); Blatchley and Leng 1916:64.

*Himatolabus (Himatolabus) rhois*: Voss 1925:243, 247.

*Attelabus maculatus* Provancher, 1877:521 (type, Quebec; Laval University, Quebec).

*Attelabus rhois maculatus*: Leng 1920:309.

*Himatolabus (Himatolabus) coloradensis* Voss, 1925:244 (type, Colorado; ZMHU).

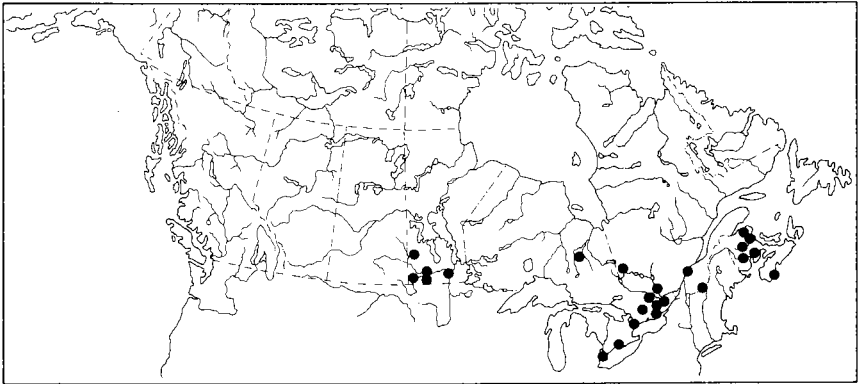
*Attelabus (Himatolabus) disparipes* Chittenden, 1926:164 (holotype, Arizona; USNM).

**Description.** Length 4.0–6.8 mm. Integument reddish brown, rarely dark reddish brown to nearly black. Pubescence consisting of abundant white to pale yellow setae. Head slightly narrowed from base to eyes; median carina slightly elevated, longitudinal, extending from vertex to level of middle of eye; surface of head strongly punctured below median carina. Rostrum shorter than head, constricted at antennal insertion; apex broadly expanded, about twice as wide as frons; lateral apical angles with a blunt tooth. Antennae inserted dorsolaterally at basal third of rostrum. Pronotum 1.3 times wider than long, widest at base; sides strongly arcuate, converging to recurved anterior margin; disc convex, with distinct, round impression on median lateral area; surface with large, dense, moderately deep punctures. Elytra (measured along suture) as long as wide, at base 1.3–1.4 times wider than pronotum; apex broadly rounded; striae shallowly impressed, inconspicuous, sometimes discernible laterally or toward apex, with moderately large, moderately deeply impressed punctures; interstriae rugose, weakly elevated, with scattered fine points; setae abundant, short, recumbent, curved.

**Distribution.** Nova Scotia to Manitoba, south through the eastern United States to Virginia and Tennessee, west to Wisconsin, Kansas, and Nebraska. A population thought to be this species occurs in the southwestern United States. Manitoba: Aweme, Baldur, Carberry, Horton, Ninette, Riding Mountain National Park, 8 km southwest of Shilo, and Winnipeg. New Brunswick: Bathurst, Boiestown, Fredericton, and Penobsquis. Nova Scotia: Port Medway. Ontario: Addington, Bobcaygeon, Gravenhurst, Hastings, Hearst (not on map), La Salle, Merivale, Ottawa, Paris, Renfrew, Roseland, South March, Tillsonberg, Toronto, Wagarville, and Walsingham. Quebec: Compton (Mount Megantic), Duparquet, Farm Point, Saint-Joseph-de-Kamouraska, and Trois-Rivières.

**Comments.** Adults of this species are easily recognized, since this is the only species in this family in Canada that is thoroughly pubescent. Nothing concerning the biology of this species has been recorded except that adults have been recorded rolling leaves of hazelnut (*Corylus*

*americana*), alder (*Alnus rugosa*), oak (*Quercus* species), and common yarrow (*Achillea millefolium*). Say's original type material has been destroyed. Hamilton (1983b) designated a neotype for this species. The larva was briefly described in a key by van Emden (1938).



Map 33. Collection localities of *Himatolabus pubescens*.

### Genus *Homoeolabus* Jekel

*Attelabus* (*Homoeolabus*) Jekel, 1860:187.

*Homoeolabus*: Voss 1925:262; Hamilton 1969:90; Hamilton 1979:29; O'Brien and Wibmer 1982:11.

This genus contains only one species, which is common throughout eastern North America, including eastern Canada. *Homoeolabus*, like *Himatolabus*, has often been considered a subgenus or a synonym of *Attelabus*. Voss (1925) and Hamilton (1969, 1979) have confirmed its generic status.

**Description.** Dorsal surface of body glabrous. Head in male rectangular, almost twice as long as wide, transversely impressed in front of base (Fig. 163); head in female slightly longer than wide, without transverse impression. Eyes large, slightly convex. Rostrum broadly expanded at apex. Antennae (Fig. 163) inserted before middle of rostrum, with terminal 3 segments elongate and more densely pubescent than other segments. Pronotum wider than long, narrower than elytra. Elytra stout, slightly longer than wide. Femora toothed.

**Type species.** *Attelabus analis* Illiger, monotypic.



**Comments.** Hamilton (1969) treated this genus, providing keys, descriptions, and other data.

*Homoeolabus analis* (Illiger)

Fig. 162; Map 34

*Attelabus analis* Illiger, 1794:616 (syntypes, Pennsylvania; Humboldt University, Berlin, Germany); Blatchley and Leng 1916:62; Dillon and Dillon 1961:747.

*Homoeolabus analis*: Voss 1925:263; Hamilton 1969:91; Hamilton 1979:30; O'Brien and Wibmer 1982:11.

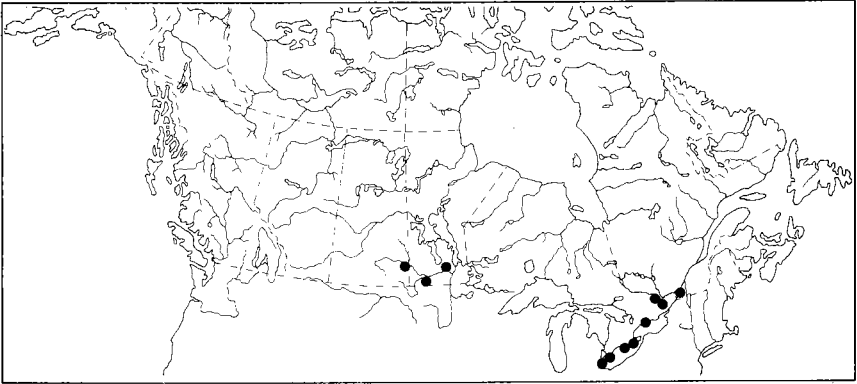
*Attelabus similis* Kirby, 1837:204 (type, Canada; BMNH).

**Description.** Length 3.2–6.7 mm. Pronotum, elytra, abdomen, and sometimes base of head usually reddish orange, varying from yellow orange to dark reddish brown; head, legs, and remaining ventral surface black to reddish black. Dorsal surface of body glabrous, except for head and lateral areas of elytra. Head with sides parallel from base to eyes; surface densely punctured, sculptured as follows: median groove flanked on each side by 1 impressed groove; grooves extending from area near antennal insertions to above eyes; area between grooves elevated into 2 divergent carinae. Rostrum about half as long as head, constricted at antennal insertions; apex expanded and inflated, nearly 1.7–1.8 times wider than frons, with lateral angles lacking conspicuous blunt tooth; submental area with 2 blunt teeth (male) or without teeth (female). Antennae inserted dorsolaterally on basal third of rostrum. Pronotum 1.3 times wider than long, widest at base; sides weakly arcuate, strongly converging to sinuate anterior margin; disc evenly convex, not impressed; surface shining, smooth, with widely scattered minute points. Elytra at base 1.2 times wider than pronotum; apex broadly rounded; striae not impressed, with large, shallowly impressed, widely separated punctures in nearly regular rows; interstriae smooth, shining, with obscure fine points and lines.

**Distribution.** Quebec to Saskatchewan, south in the eastern United States to Florida, west to Wisconsin, Iowa, Kansas, and Texas. Manitoba: Aweme, Ninette, and Stonewall. Ontario: Cayuga, Constance Bay, Fisher Glen, Leamington, Ojibway, Ottawa, Point Pelee, Roseland, Toronto, and Walsingham. Quebec: Montreal. Saskatchewan: Tantalton.

**Comments.** Adults of this species are easily recognized by the glabrous reddish upper surface of the body. Nothing is known of the life history or habits other than the species has been recorded on rolling leaves of oak (*Quercus* species). In his unpublished dissertation,

Hamilton (1969) designated a lectotype for *H. analis*. Until published, this designation has no validity. The larva was briefly described in a key by van Emden (1938).



Map 34. Collection localities of *Homoeolabus analis*.

## Genus *Attelabus* Linnaeus

*Attelabus* Linnaeus, 1758:387; Hamilton 1969:104; O'Brien and Wibmer 1982:11.

*Attelabus* contains two widely distributed species in eastern North America and one species confined to Hispaniola. Only one of the North American species occurs in Canada.

**Description.** Dorsal surface of body glabrous. Head stout, quadrate, rarely longer than wide. Eyes large, slightly convex. Rostrum broadly expanded at apex. Antennae (Fig. 164) inserted before middle of rostrum, with terminal 3 segments elongate and more densely pubescent than other segments. Pronotum wider than long, narrower than elytra. Elytra stout, slightly wider than long.

**Type species.** *Curculio nitens* Scopoli, subsequent designation by Voss 1925.

**Comments.** Hamilton (1969) gives keys, descriptions, and references for the two North American species.

*Attelabus bipustulatus* Fabricius

Figs. 11, 164; Map 35

*Attelabus 2-pustulatus* Fabricius, 1776:229 (lectotype, "America borealis"; UZMC).

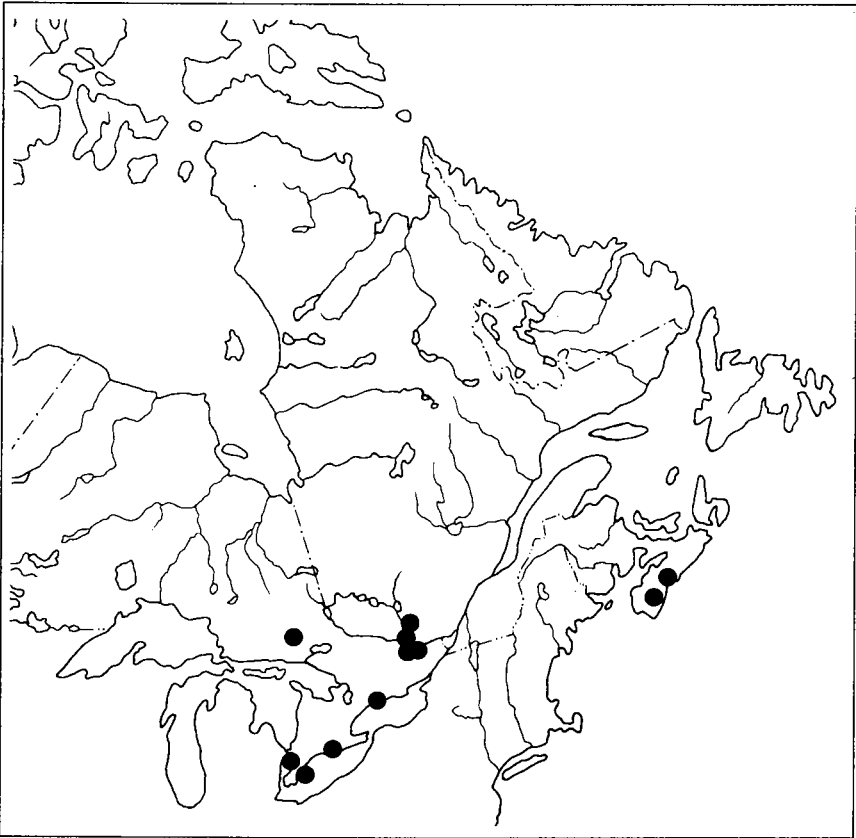
*Attelabus bipustulatus*: Blatchley and Leng 1916:63; Dillon and Dillon 1961:750; Hamilton 1969:107; Hamilton 1979:30; O'Brien and Wibmer 1982:11.

**Description.** Length 2.2–4.5 mm. Body black with reddish orange rectangular markings, these extending from humeri to midpoint of elytra, laterally to interstria 2 or 3 (variable); ventral surface with a few scattered setae. Head with sides arcuate from base to eyes; surface essentially smooth, with a few very small widely separated shallow points and with 2 deeply impressed arcuate grooves near each eye; median area impressed from area of antennal insertion to above upper level of eyes. Rostrum distinctly shorter than head; surface densely punctured, rugose; apex with lateral angles lacking conspicuous tooth; submental area with conspicuous median tooth (male) (Fig. 164) or swelling (female). Antennae inserted dorsolaterally near base of rostrum. Pronotum 1.4 times wider than long, widest at base; sides arcuate, converging to recurved anterior margin; disc evenly convex, with numerous small, impressed points; interpuncture spaces smooth, shining. Elytra at base 1.3–1.4 times wider than pronotum; apex broadly rounded; striae not impressed, with large, shallowly impressed punctures in regular rows; interstriae about 3.0–4.0 times (variable) wider than striae, with scattered, minute points. Femora of forelegs with 1 small, ventral, peg-like tooth.

**Distribution.** Nova Scotia to Ontario, south through the eastern United States to Florida, west to Wisconsin, Missouri, and Texas. Nova Scotia: Greenfield and Ingramport. Ontario: Blackburn, Constance Bay, Leamington, Normandale, Northumberland, Paris, Pembroke, Sarnia, Sudbury, Toronto, Tillsonburg, and Walsingham. Quebec: Beech Grove, Gatineau Park, and Kazabazua.

**Comments.** Adults of this species are easily recognized by the black body with red humeral areas on the elytra, by the small size, and by the other characters given above in the key and description. Girault (1904) provides some details on the biology. Females cut areas of leaves of various species, oviposit on the apex of the wilted portion, and finally roll it into a firm cylinder containing one egg in its centre. The leaf roll sometimes remains attached to the leaf for weeks. Early summer broods may develop to adults within the leaf rolls while they remain attached to the leaves. In other cases, the leaf roll may fall to the ground a few days

after its construction. The larva feeds on the leaf surface within the roll, eventually reducing the roll to a mere shell. Pupation evidently occurs at least partly in the leaf roll or perhaps in the ground. Broods have been reared to maturity entirely within the leaf roll. Adults have been recorded on rolling leaves of oak (*Quercus* species), American hornbeam (*Carpinus caroliniana*), alder (*Alnus* species), *Rubus* species, shagbark hickory (*Carya ovata*), black locust (*Robinia pseudoacacia*), goldenrod (*Solidago* species), and ironwood (*Ostrya* species). Hamilton (1983b) designated the lectotype of this species.



Map 35. Collection localities of *Attelabus bipustulatus*.

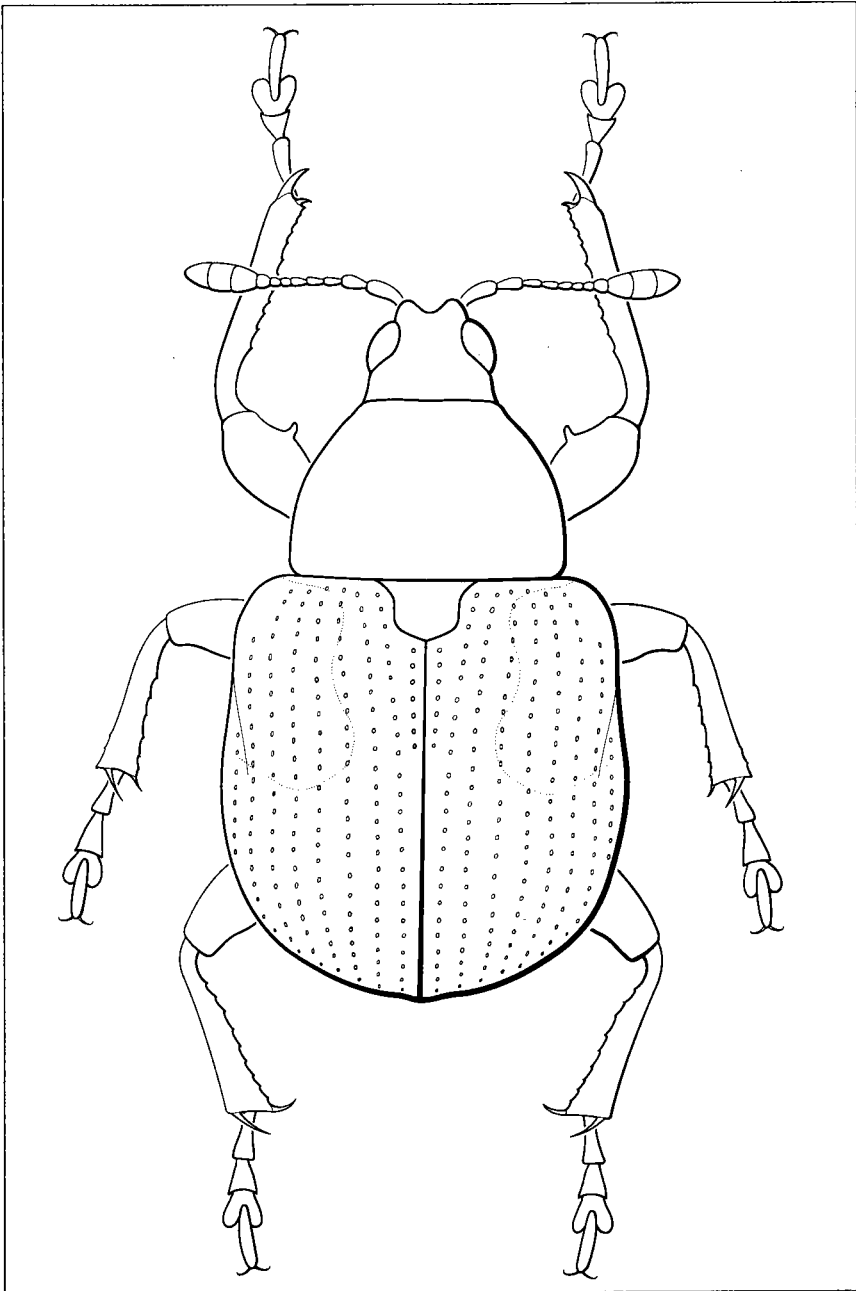


Fig. 11. *Attelabus bipustulatus*

## Family Platypodidae

The vast majority of the 1000 or more species in this family occur in the tropical regions of the world. Seven species, all in the genus *Platypus*, occur in North America, one of them in Canada.

The beetles in this family infest the wood of dying, broken, or recently cut trees. Their galleries extend deep into the wood and are stained black by the ambrosial fungi that grow on the gallery walls. The spores of the fungi serve as larval food. The black-stained holes adversely affect the value of wood products made from infested trees, and thus this species is of some economic importance.

**Description.** Body elongate, cylindrical, generally glabrous or with sparse pubescence; integument reddish to yellowish brown. Head with preular suture and preular sclerite; gular sutures single. Rostrum absent. Maxillary palpi rigid, 3-segmented; lacinia absent; labrum absent. Antennae geniculate; antennal club distinct. Legs with trochanter small; femur attached to side of trochanter. Abdomen with sternites 1 and 2 connate; sutures visible.

### Genus *Platypus* Herbst

*Platypus* Herbst, 1793:128; Chamberlin 1939:109; Schedl 1972:169; Wood 1979:1.

*Cylindra* Illiger, 1825:87.

*Stenoplatypus* Strohmeier, 1914:35.

*Platypinus* Schedl, 1939:397.

*Platyscapus* Schedl, 1939:397.

*Platyscapulus* Schedl, 1957:125.

*Costaroplatus* Nunberg, 1963:109.

**Description.** Body elongate, up to 9 mm long. Head large, broad, visible from above, flattened (male) or deeply excavated (female). Antennae with large scape; antennal club large, compressed, solid, without sutures (Figs. 12, 13). Pronotum (Figs. 12, 13) longer than wide, cylindrical; anterior margin truncate; posterior margin bisinuate; sides with lateral excavations at foreleg insertions. Prosternum moderately long in front of coxae. Mesosternum triangular; mesocoxae narrowly separated. Episternum large, quadrate. Metasternum very long; metacoxae narrowly separated. Abdomen with 5 sternites visible. Elytra elongate; apex truncate in female (Fig. 13), produced into elongate processes in male (Fig. 12). Tarsi long, slender; tarsal segment 1 as long as, or longer than, segments 2-4 (Figs. 12, 13).

**Type species.** *Bostrichus cylindrus* Fabricius, monotypic.

**Comments.** Wood (1979) has prepared a catalog of the North American species. A key to the North American species appears in Chamberlin (1939).

*Platypus wilsoni* Swaine

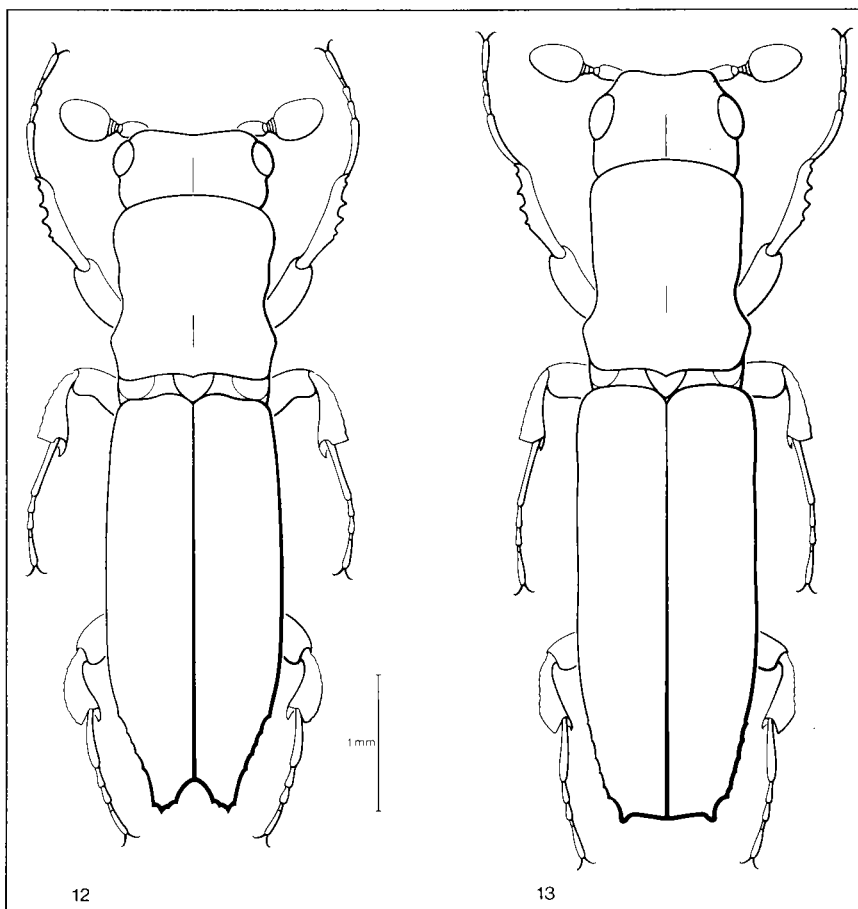
Figs. 12, 13

*Platypus wilsoni* Swaine, 1916:98 (holotype, Campbell River, B.C.; CNC); Chamberlin 1939:112; Keen 1952:183; Chamberlin 1958:24, 33-34; Arnett 1960:1029; Wood 1971:394; Furniss and Carolin 1977:338; Wood 1979:2.

**Description.** Length 5.0-5.7 mm. Head densely granulate-reticulate, with dense, erect setae. Pronotum 1.4 times longer than wide, widest just before base; surface smooth, with scattered, fine, impressed points; posterior half with a fine, impressed, longitudinal, median line in female, surrounded by a very densely punctured oval area, the punctured area absent in male. Elytra 2.5 times longer than wide; sides parallel on posterior three-quarters, gradually converging to apex; apex truncate, with lateral apical angles slightly dentate in female (Fig. 13) or strongly produced in male (Fig. 12); striae impressed in regular rows, with fine punctures; interstriae weakly convex, smooth.

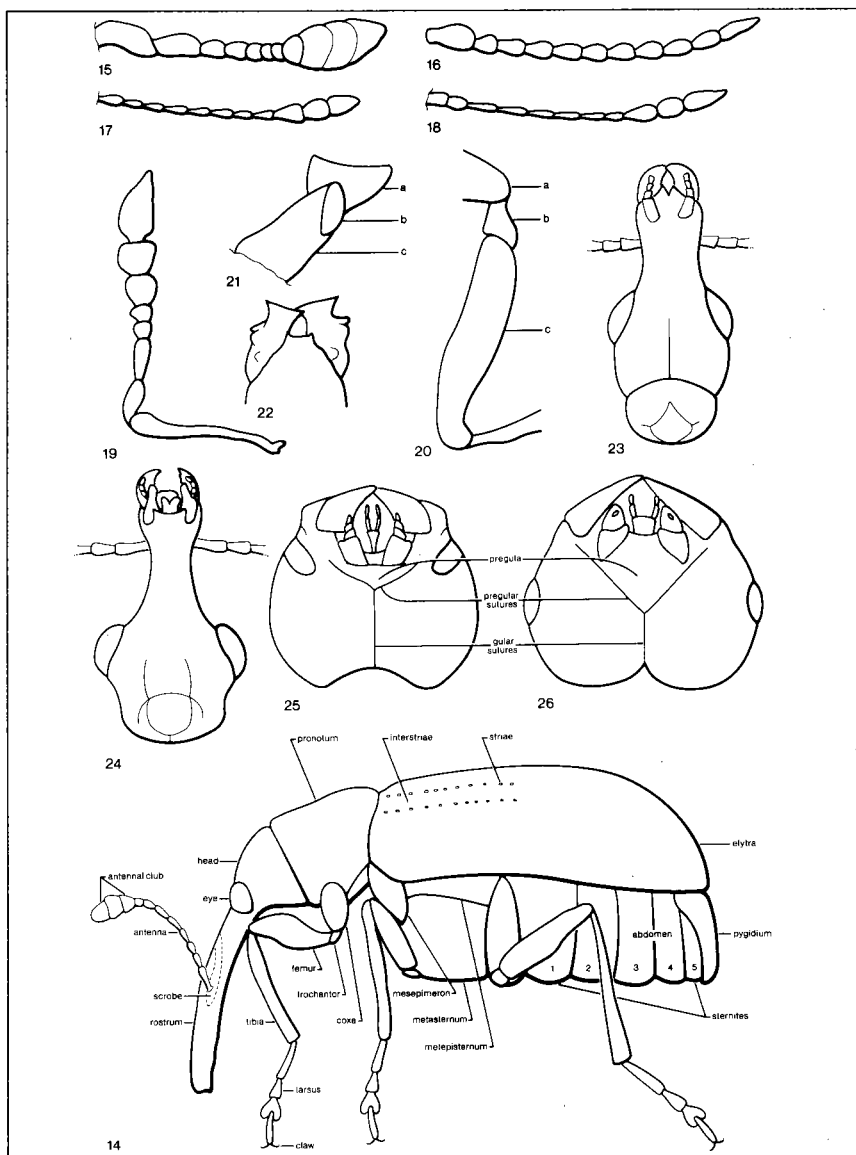
**Distribution.** Southern British Columbia, south to California and Idaho. British Columbia: Campbell River, Eberts, and Steelhead.

**Comments.** Adults of this unusual species are easily recognized by the illustrations (Figs. 12, 13) and by the characters given above. They cannot be confused with those of any other Canadian species of Coleoptera. In coastal British Columbia the adults attack timber from mid July to mid September. The male bores an entrance tunnel through the bark for a short distance into the wood. When a female approaches the entrance hole and identifies herself through chemical, auditory, and tactile signals, the male backs out of the entrance tunnel to admit her. Mating takes place while the male is on the bark surface and the female protrudes the tip of her abdomen from the hole. After mating, the female continues extending the gallery and lays eggs loosely in the tunnel in clusters of about 20-40. The larvae move freely in the mines and feed on the spores of an ambrosial fungus that the female has introduced into the galleries. Larvae and adults overwinter in the logs. Larval development requires a year or more. When full grown, the larvae excavate cells at right angles to the main gallery and parallel to the grain of the wood; pupation occurs in these cells. Young adults emerge from the parental entrance hole. All species of coniferous trees, except Cupressinae, may be attacked by this species. It is, however, rare in pine (*Pinus* spp.).

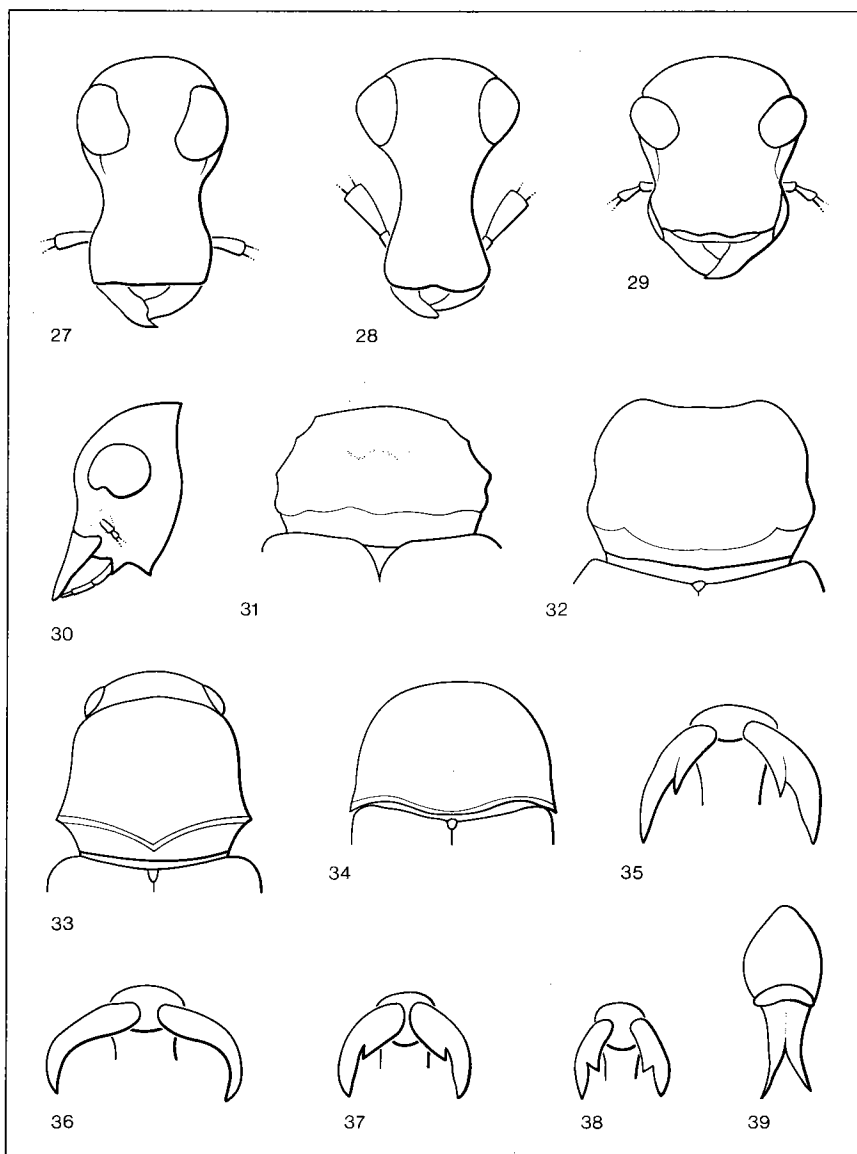


**Figs. 12, 13.** *Platypus wilsoni*. 12, ♂; 13, ♀.

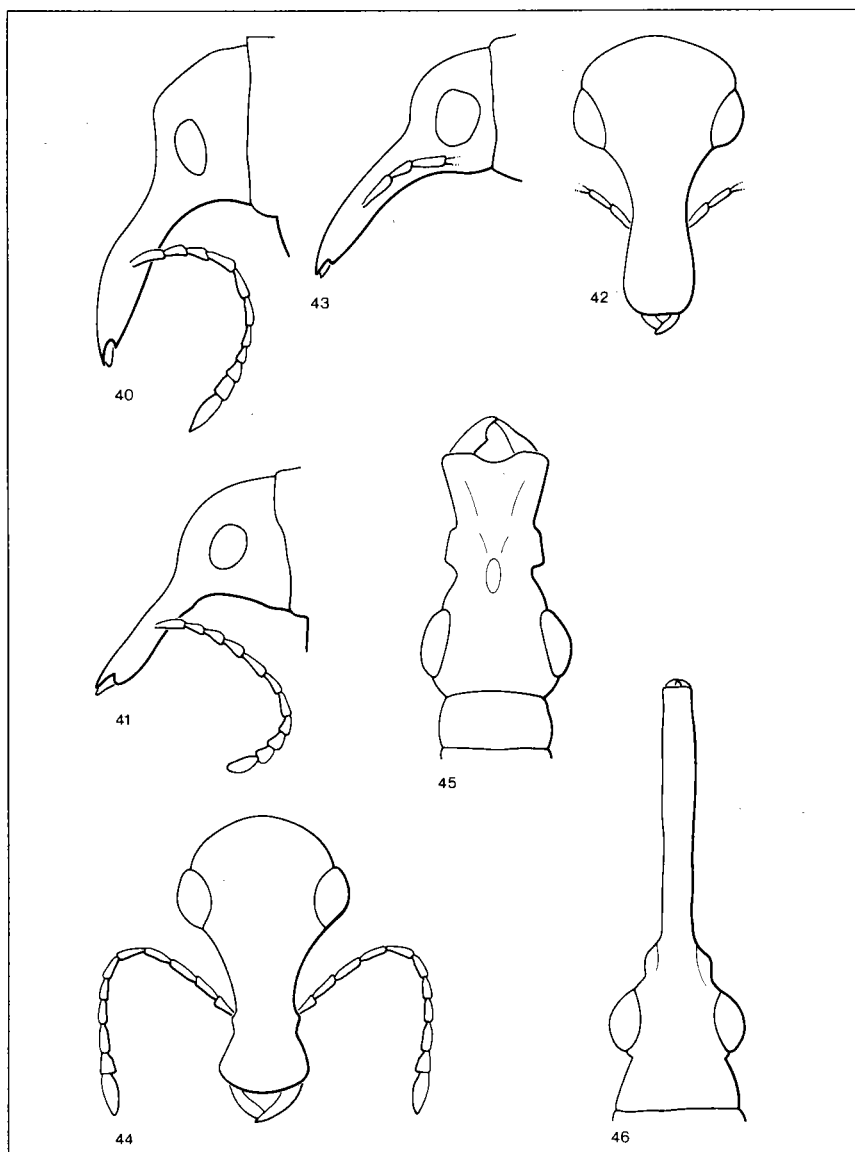




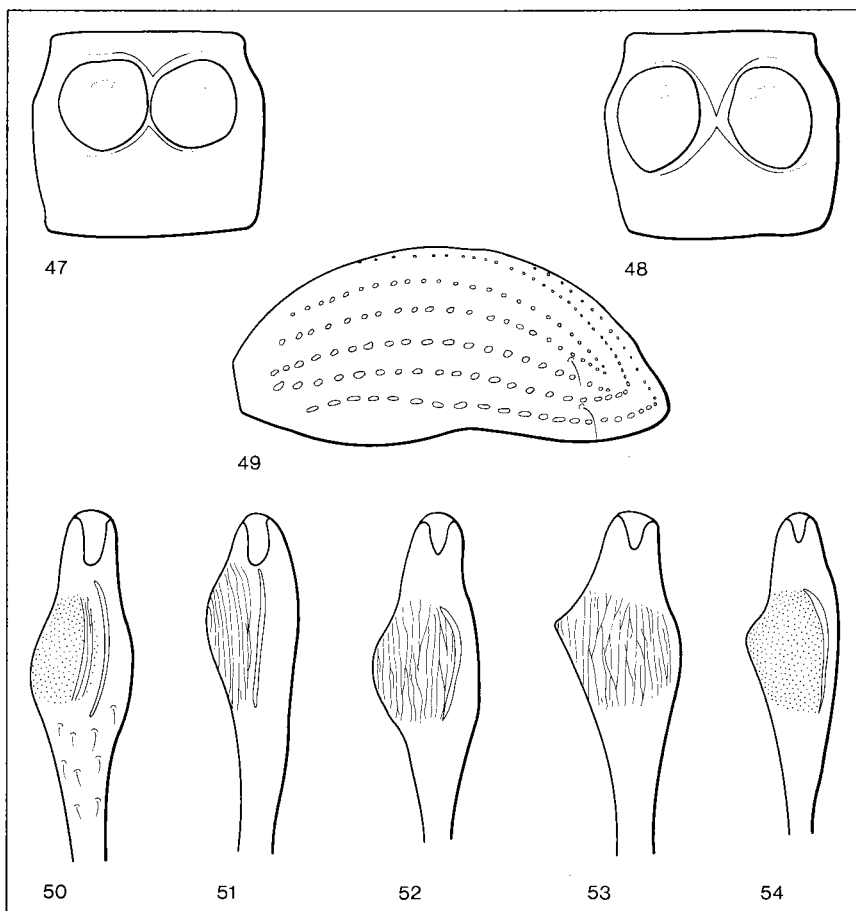
**Figs. 14–26.** 14, Lateral view of weevil illustrating various morphological features. 15–19, Antennae: 15, *Apion* species; 16, *Arrhenodes minutus*; 17, *Cimberis compta*; 18, *Euparius marmoreus*; 19, *Nanophyes canadensis*. 20–21, Leg insertions (*a* coxa, *b* trochanter, *c* femur): 20, *Apion* species; 21, Curculionidae species. 22, *Merhynchites bicolor*, dorsal view of apex of rostrum, showing details of mandibles. 23–26, Ventral view of heads, showing gular sutures, and other characters: 23, Attelabidae; 24, Nemonychidae; 25, Scolytidae; 26, Platypodidae.



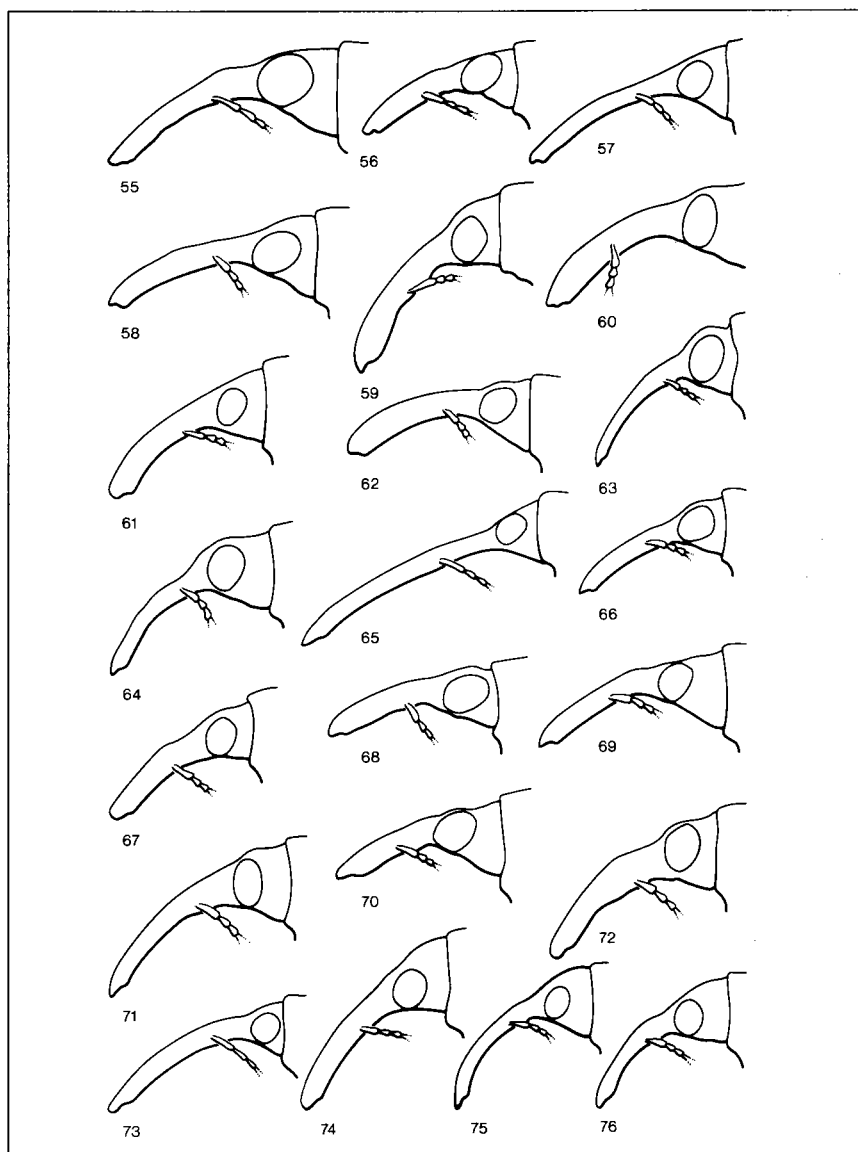
**Figs. 27-39.** Anthribidae. 27-29, Frontal views of heads: 27, *Tropideres tricarinatus*; 28, *Allandrus populi*; 29, *Ormiscus saltator*. 30, Lateral view of head of *Ormiscus saltator*. 31-34, Dorsal outline of pronota: 31, *Tropideres tricarinatus*; 32, *Allandrus populi*; 33, *Ormiscus saltator*; 34, *Ormiscus walshii*. 35-38, Tarsal claws: 35, *Tropideres tricarinatus*; 36, *Allandrus populi*; 37, *Allandrus bifasciatus*; 38, *Ormiscus saltator*. 39, Tarsal claws, illustrating connate condition.



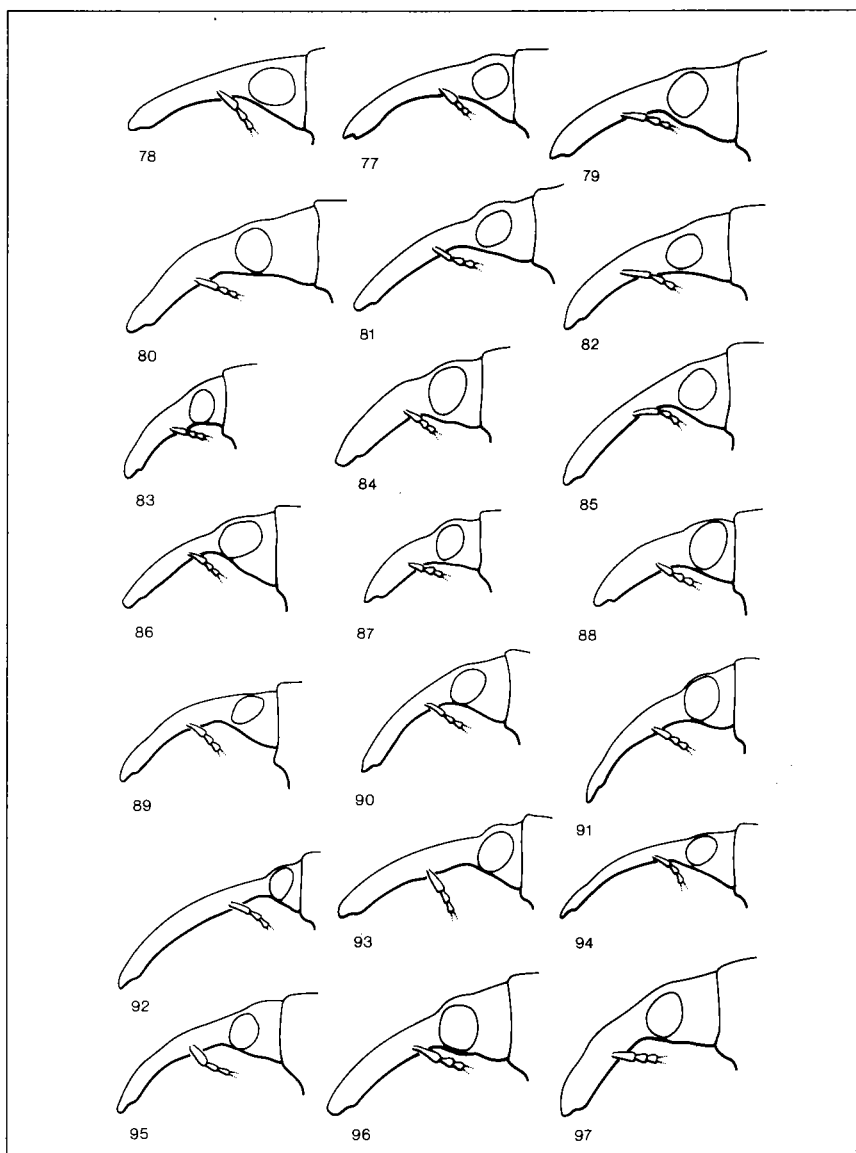
Figs. 40–46. Nemonychidae, Brentthidae, Apionidae. 40. *Acromacer bomifrons*, lateral view of head. 41–42, *Cimberis elongata*: 41, lateral view of head; 42, frontal view of head. 43–44, *Cimberis compta*: 43, lateral view of head; 44, frontal view of head. 45–46, *Arrhenodes minutus*, showing sexual dimorphism of rostrum: 45, ♂; 46, ♀.



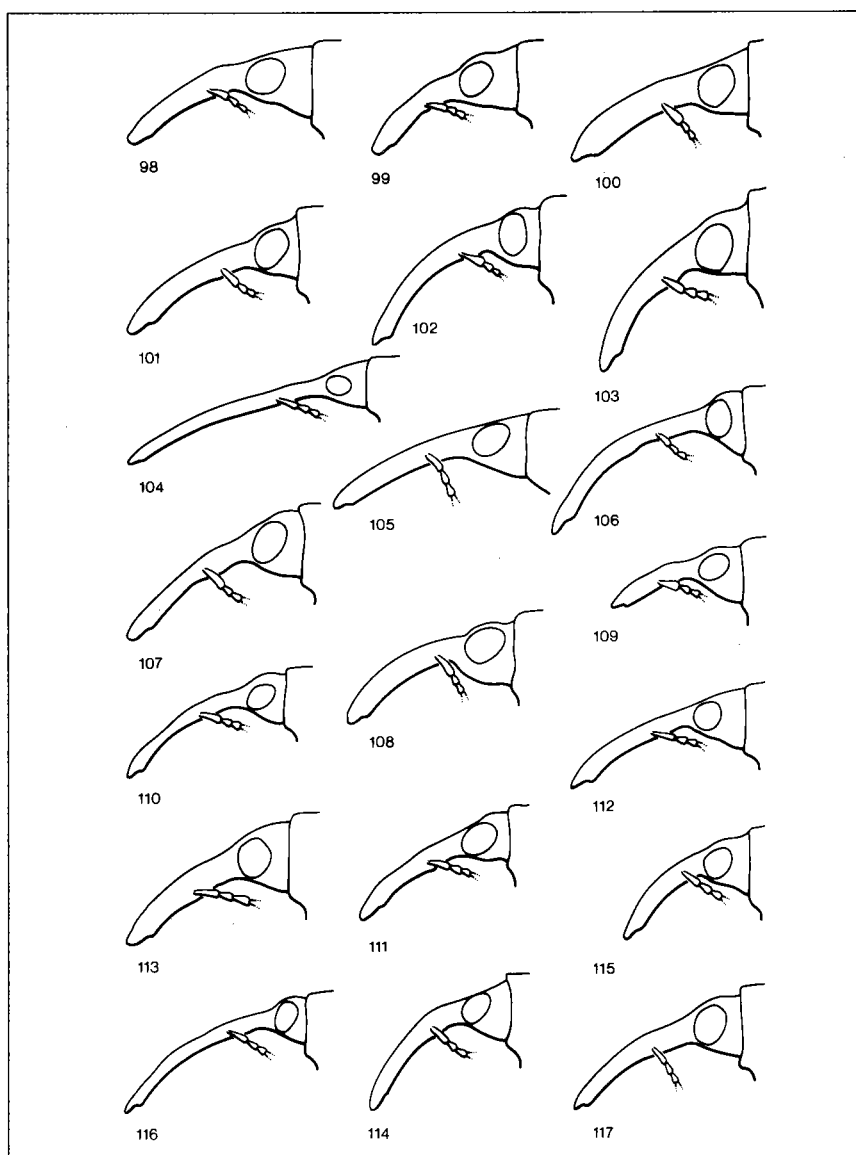
**Figs. 47–54.** Apionidae. 47, *Apion wickhami*, middle coxae contiguous; 48, *Apion alaskanum*, middle coxae separated; 49, *Apion proclive*, outline of elytron, showing placement of specialized setae; 50–54, Modified male femora: 50, *Apion pennsylvanicum*; 51, *Apion bischoffi*; 52, *Apion finitimum*; 53, *Apion impeditum*; 54, *Apion melanarium*.



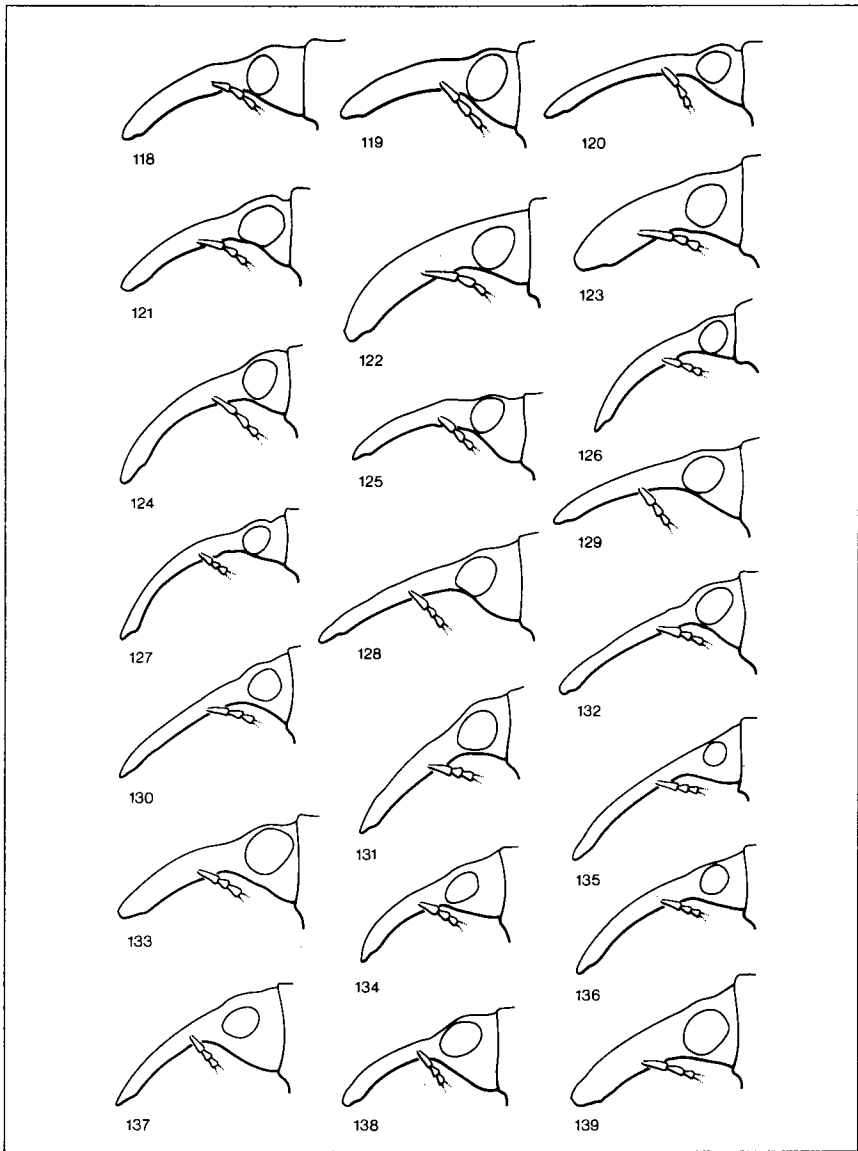
**Figs. 55–76.** Lateral views of head and rostrum of *Apion* species. 55, *alaskanum* ♀; 56, *alaskanum* ♂; 57, *amaurum* ♀; 58, *amaurum* ♂; 59, *antennatum* ♀; 60, *antennatum* ♂; 61, *attenuatum* ♀; 62, *attenuatum* ♂; 63, *bischoffi* ♀; 64, *bischoffi* ♂; 65, *capitone* ♀; 66, *capitone* ♂; 67, *carinatum* ♀; 68, *carinatum* ♂; 69, *cavifrons* ♀; 70, *cavifrons* ♂; 71, *centrale* ♀; 72, *centrale* ♂; 73, *commodum* ♀; 74, *commodum* ♂; 75, *contusum* ♀; 76, *contusum* ♂.



**Figs. 77–97. Lateral views of head and rostrum of *Apion* species. 77, *cordatum* ♀; 78, *cordatum* ♂; 79, *cribicolle* ♀; 80, *cribicolle* ♂; 81, *cyanitinctum* ♀; 82, *cyanitinctum* ♂; 83, *decoloratum* ♀; 84, *decoloratum* ♂; 85, *disparatum* ♀; 86, *disparatum* ♂; 87, *emaciipes* ♀; 88, *emaciipes* ♂; 89, *extensum* ♀; 90, *extensum* ♂; 91, *finitimum* ♀; 92, *frosti* ♀; 93, *frosti* ♂; 94, *funereum* ♀; 95, *funereum* ♂; 96, *hatchi* ♀; 97, *hatchi* ♂.**

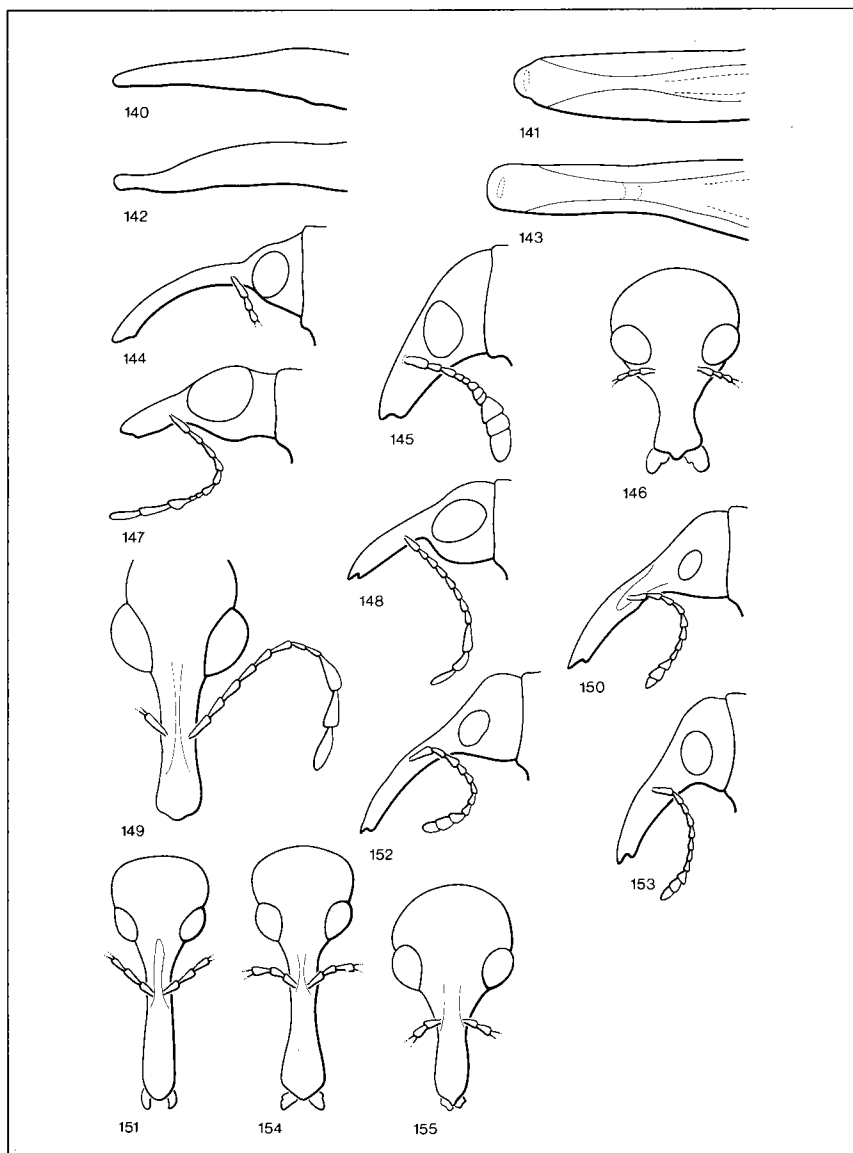


**Figs. 98–117.** Lateral views of head and rostrum of *Apion* species. 98, *huron* ♀; 99, *huron* ♂; 100, *idiastes* ♀; 101, *idiastes* ♂; 102, *impeditum* ♀; 103, *impeditum* ♂; 104, *longirostre* ♀; 105, *longirostre* ♂; 106, *melanarium* ♀; 107, *melanarium* ♂; 108, *nigrum* ♀; 109, *nigrum* ♂; 110, *occidentale* ♀; 111, *occidentale* ♂; 112, *opacicolle* ♀; 113, *opacicolle* ♂; 114, *parallelum* ♀; 115, *parallelum* ♂; 116, *pennsylvanicum* ♀; 117, *pennsylvanicum* ♂.

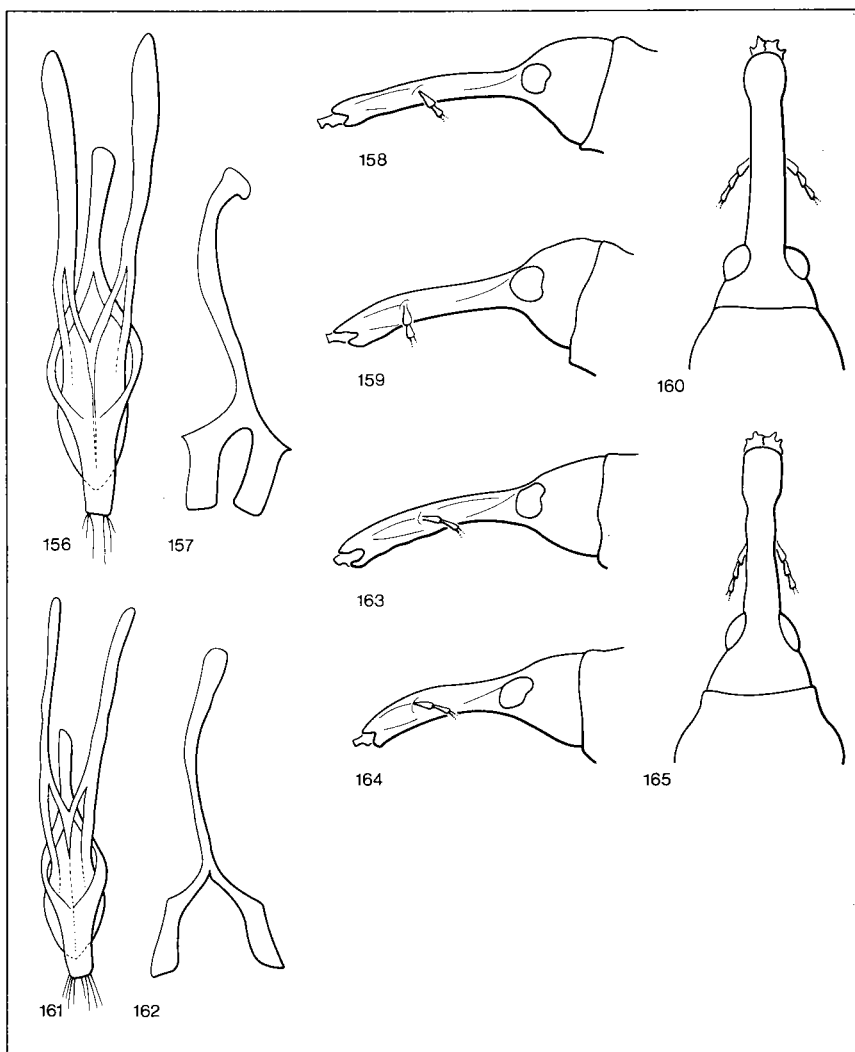


**Figs. 118–139.** Lateral views of head and rostrum of *Apion* species. 118, *porcatum* ♀; 119, *porcatum* ♂; 120, *proclive* ♀; 121, *proclive* ♂; 122, *punctinasum* ♀; 123, *punctinasum* ♂; 124, *reconditum* ♀; 125, *reconditum* ♂; 126, *robustum* ♀; 127, *robustum* ♂; 128, *rostrum* ♀; 129, *rostrum* ♂; 130, *segnipes* ♀; 131, *segnipes* ♂; 132, *simile* ♀; 133, *simile* ♂; 134, *speculiferum* ♂; 135, *tenuirostrum* ♀; 136, *tenuirostrum* ♂; 137, *trogodytes* ♀; 138, *trogodytes* ♂; 139, *wickhami* ♀.

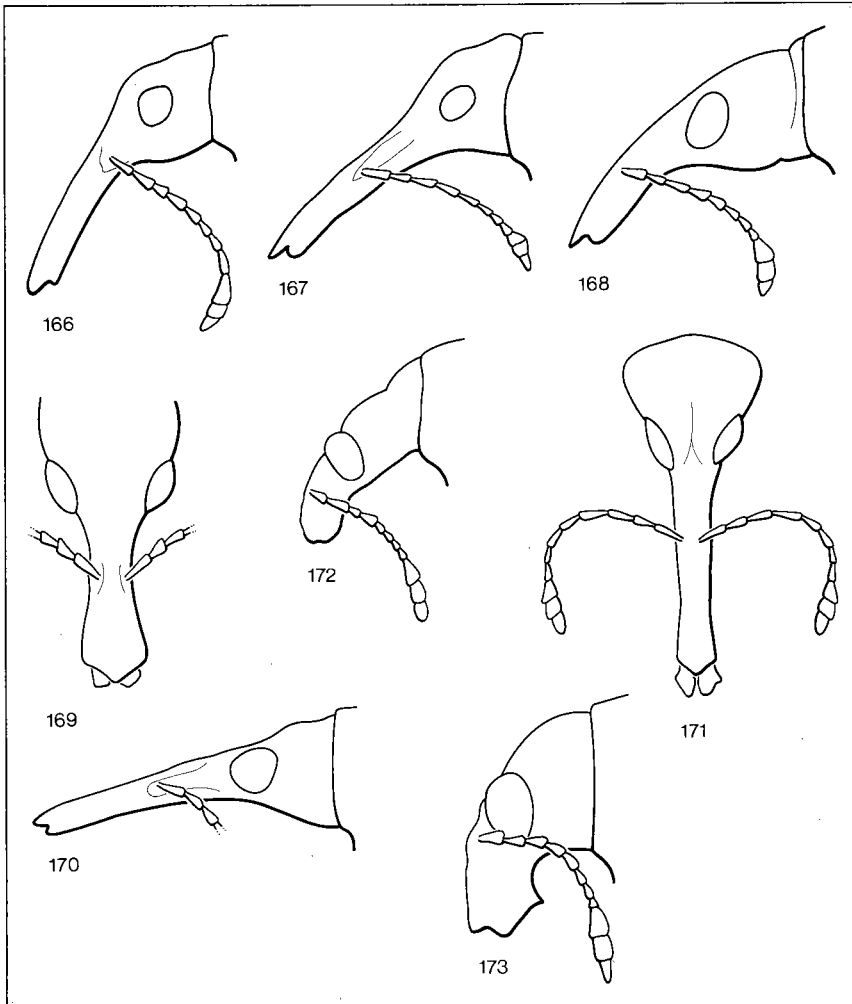




**Figs. 140–155.** 140–143, Aedeagus of *Apion* species. 140–141, *hatchi*: 140, lateral view; 141, dorsal view; 142–143, *opacicolle*: 142, lateral view; 143, dorsal view. 144, Lateral view of head and rostrum of *Podapion gallicola*. 145–146, Head of *Pterocolus ovatus*: 145, lateral view; 146, frontal view. 147–149, Head of *Eugnamptus angustatus*: 147, lateral view of ♂; 148, lateral view of ♀; 149, frontal view of ♀. 150–155, Heads of *Pselaphorhynchites* species: 150, lateral view of *cyanellus* ♀; 151, frontal view of *cyanellus* ♀; 152–153, lateral view of *perplexus*: 152, ♀; 153, ♂; 154–155, frontal view of *perplexus*: 154, female; 155, male.



**Figs. 156–165.** 156–160, *Merhynchites bicolor*: 156, aedeagus; 157, spiculum gastrale; 158, head and rostrum of ♀; 159, head and rostrum of ♂; 160, dorsal view of head, showing eye character. 161–165, *Merhynchites wickhami*: 161, aedeagus; 162, spiculum gastrale; 163, head and rostrum of ♀; 164, head and rostrum of ♂; 165, dorsal view of head, showing eye character.



**Figs. 166–173.** 166–167, Lateral view of heads of *Auletobius* species: 166, *congruus* ♀; 167, *ater* ♀. 168–169, Head of *Deporaus glastinus*: 168, lateral view of ♀; 169, frontal view of ♀. 170–171, Head of *Haplorhynchites aeneus*: 170, lateral view of ♀; 171, frontal view of ♀. 172, Lateral view of head of *Homoeolabus analis* ♂. 173, Lateral view of head of *Attelabus bipustulatus* ♂.

## Glossary

**antennae** The paired, segmented sensory organs, borne one on each side of the head or rostrum.

**antennal club** The terminal or distal segments (usually 3 and often enlarged) of the antenna.

**carina** (pl. **carinae**) An elevated ridge or keel; may be weakly to strongly elevated.

**coxa** (pl. **coxae**) The basal segment of the leg, by which it is attached to the body.

**disc** The central upper surface of any part; in Curculionoidea usually refers to the central portion of the pronotum or elytra.

**dorsum** Referring to the upper surface.

**elytra** The anterior chitinous wings of Coleoptera, serving as coverings to the hind wings and meeting in a straight line down the middle of the dorsum in repose.

**epipleura** (pl. **epipleuron**) The deflexed or inflexed portion of the elytra, immediately below the edge; the entire bent-under margin of the elytra.

**epipleural carina** An elevated ridge marking the margin of the epipleura.

**episternum** The anterior and larger thoracic sclerite between the sternum (ventral region) and the notum (dorsal region).

**epistomal margin** The usually elevated lower border of the head above the mandibles.

**femur** (pl. **femora**) The third major segment of the leg, usually the stoutest segment, bearing the tibia at its distal end.

**frons** That portion of the head generally between the eyes.

**geniculate** Abruptly bent in an obtuse angle.

**gular** Of or pertaining to the underside of the head or gula.

**gular suture(s)** A single or double line on the underside of the head in Curculionoidea, indicating the joining of the genae or cheeks.

**humerus** (pl. **humeri**) The basal exterior angle of the elytra, frequently elevated or produced, absent in wingless forms.

**integument** The cuticle of the insect body.

**interstria** (pl. **interstriae**) The longitudinal space between two stria.

**labrum** The upper lip, which covers the base of the mandible and forms the roof of the mouth.

**lacinia** (pl. **laciniae**) The inner lobe of the first maxilla, articulated to the stipes and bearing hairs or spines.

**mandibles** The first pair of jaws, stout and tooth-like in Curculionoidea.

**maxilla** (pl. **maxillae**) The second pair of jaws in a mandibulate insect.

**maxillary palpus** (pl. **palpi**) One- to several-jointed appendages of the insect maxilla, sensory in function.

**mesocoxa** (pl. **mesocoxae**) The middle pair of coxa.

**mesosternum** The ventral, or underside, portion of the mesothorax.

**mesothorax** The second thoracic segment; it bears the second or middle pair of legs and the elytral base.

**metacoxa** (pl. **metacoxae**) The hind pair of coxa.

**metasternum** The ventral, or underside, portion of the metathorax.

**metathorax** The third thoracic segment; it bears the hind pair of legs and the hind wings.

**pregular suture(s)** A line(s) on the underside of the head indicating the boundaries of the pregular sclerite.

**produced** Extended forward; drawn out; prolonged.

**pronotum** The upper or dorsal surface of the prothorax.

**prosternum** The sclerite between the fore legs.

**prothorax** The first thoracic segment; it bears the first pair of legs.

**protibia** The tibial segment on the first pair of legs.

**pygidium** The last segment of the abdomen; it is left exposed in some Curculionoidea.

**rostrum** A snout-like, rigid prolongation of the head.

**scape** The first or basal joint in geniculate antennae, often greatly elongated.

**scrobe** Grooves at the sides of the rostrum to receive the scape of the antennae.

**sternite** The ventral portion of the abdominal segments, often heavily chitinized, exposed below the elytra.

**stria** (pl. **striae**) A longitudinal impressed line or furrow, frequently punctured, extending from the base to the apex of the elytra.

**submentum** The basal sclerite of the insect labium, by which the labium is attached to the head.

**tarsus** (pl. **tarsi**) The jointed appendage attached to the apex of the tibia, consisting of five segments in the Curculionoidea, and bearing claws at its distal end.

**tibia** (pl. **tibiae**) The fourth major segment of the leg, generally slender, bearing the tarsi on the distal end.

**trochanter** The segment of the leg between the coxa and the femur.

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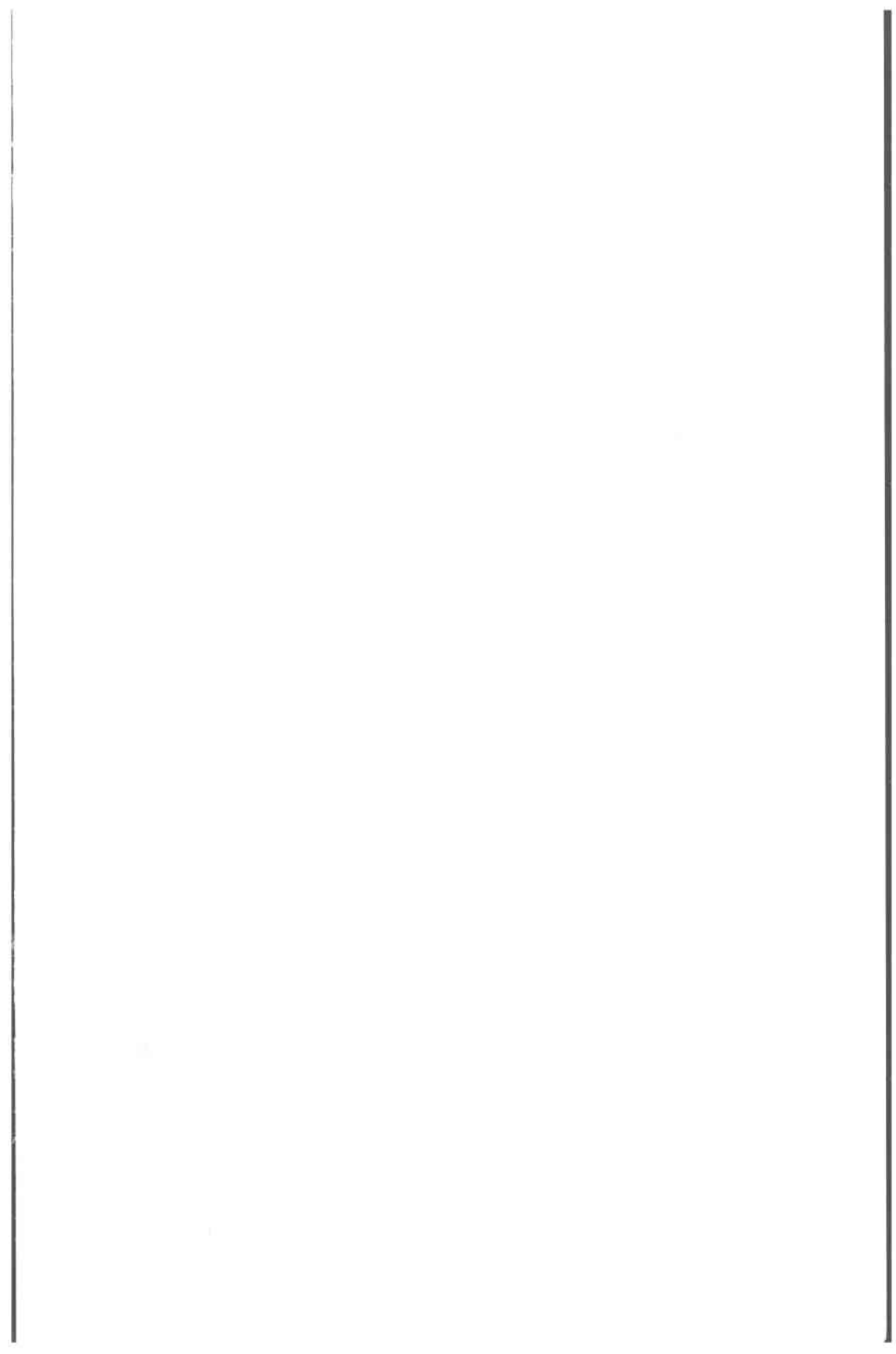






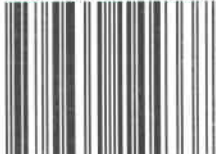
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