

A TAXONOMIC STUDY OF THE GENUS CEUTORHYNCHUS
(COLEOPTERA, CURCULIONIDAE)

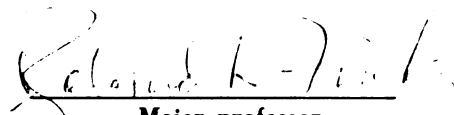
Thesis for the Degree of Ph. D.
MICHIGAN STATE UNIVERSITY
Rudolph A. Scheibner
1963



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thesis entitled
**A Taxonomic Study of the Genus Ceutorhynchus
(Coleoptera, Curculionidae).**

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Ph.D. degree in Entomology


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ABSTRACT

A TAXONOMIC STUDY OF THE GENUS
CEUTORHYNCHUS (COLEOPTERA, CURCULIONIDAE)

by Rudolph A. Scheibner

This work is a taxonomic study of the genus Ceutorhynchus Germar (Coleoptera, Curculionidae). Keys for the identification of, and descriptions of species are included. Two species are described as new. Distribution of species, location of types, hosts and parasites are given to the extent of the knowledge of them.

A TAXONOMIC STUDY OF THE GENUS
CEUTORHYNCHUS (COLEOPTERA, CURCULIONIDAE)

By

Rudolph A. Scheibner

A THESIS

Submitted to
Michigan State University
in partial fulfillment of the requirements
for the degree of

DOCTOR OF PHILOSOPHY

Department of Entomology

1963

ACKNOWLEDGEMENTS

Particular acknowledgement is made to Prof. Ray Hutson, former Head, Department of Entomology at Michigan State University for initially making facilities available and granting a teaching assistantship to the author. The author is also indebted to Prof. Gordon E. Guyer, Chairman, Department of Entomology for continuing the teaching assistantship, granting more facilities, and reading this manuscript.

To Dr. Roland L. Fischer, the author's major advisor, gratitude is expressed for his guidance in helping initiate the thesis problem and in guiding the compilation of and criticism of the manuscript. Gratitude is expressed to Dr. Roger Hoopingarner and Dr. John Beaman for evaluating the thesis problem and critically reading the thesis.

To Dr. W. J. Brown at the Canadian National Collection and to Dr. Rose Ella Spillman nee Warner at the U. S. National Museum, the author is especially indebted for their advice, encouragement and use of their facilities. For advice, specific information, and use of their facilities, the author is appreciative of Dr. P. J. Darlington at the Museum of Comparative Zoology and to Dr. Harold Grant at the Philadelphia Academy of Science. Appreciation is also expressed to Dr. George Wallace at the Carnegie Museum for the use of facilities there.

To Dr. Julius R. Hoffman, Entomology Department at Michigan State University, the author is appreciative for advice in rectifying drawings to make them suitable for photographing and for other specific advice. To my fellow students Mr. Richard Snider, Mr. Francis Giles

and Mr. David Crockett, the author wishes to express his appreciation for their interest in the thesis and for their enlightening philosophical conversations.

The author especially acknowledges his wife, Donna, for her patiences during the writing of this thesis.

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INTRODUCTION

The purpose of this study is to re-examine the species of Ceutorhynchus occurring in America north of Mexico. Since the time of Dietz's revision (1896) and Blatchley and Leng's work (1916), many new or introduced species have been added to the genus in North America. Also several species which had been synonymized have been reinstated, and synonymies have occurred in other instances.

As in most taxonomic works, nomenclatural problems become an important aspect of accurate identification. Some species names in the literature with inadequate descriptions have not been recorded except in catalogues, and the necessary knowledge of the organism to apply the name seems to be lost or not available. Catalogues or faunal lists often do not cite the authority upon which they base the inclusion of species in their lists and corrections based on subsequent revisions are difficult. Orthographic errors also lead to confusion.

The genus is relatively large, involving over 90 nominal species in North America. Biological knowledge of many of the species is unknown, so the arrangement of species in this work relies on morphological criteria. Combinations of three criteria primarily; seven versus six funicular segments, mutic versus toothed femora, and toothed versus simple claws were used to divide the genus into convenient groups. Although some of the groups seemed to be natural arrangements, some apparently closely related species fall into different groups. It was not possible with easily discernible characters to put the

discordant species in the artificial groupings into a grouping which indicated the presumed phylogenetic affinities. Nevertheless, the artificial system was maintained as the most efficacious for separating the species involved.

HISTORY OF THE GENUS CEUTORHYNCHUS

Schuppel compiled in manuscript form a list of 50 species with their synonymies, applying the generic cheironym Ceutorhynchus. This list he derived primarily from the genera Rhynchaenus Clairville and Curculio Linnaeus. Germar (1824) supplemented Schuppel's unpublished list with 29 species, 27 of which were new species, and published for the first time the two lists along with the description of the genus Ceutorhynchus. The list of 29 new and redescribed species was further divided into three groups: "Familia I. Longirostres, thorace postice profunde bisinuato, scutello distincto," "Familia II. Longirostres, thorace postice bisinuato, scutello vix conspicuo," and "Familia III. Brevirostres."

According to K. v. Dalla Torre and A. Hustache (1930), the genus Ceutorhynchus as Germar delimited it has since been subdivided and its parts relegated to various taxa. The nine species in Germar's 'Familia II' have been distributed to various genera of Barinae, and the two species in 'Familia III' are now in the genus Phytobius (Ceuthorrhynchinae). The present limits of Ceutorhynchus fall within what Germar designated as 'Familia II'. However, some of the 18 species in 'Familia II' have been reassigned to at least four other genera, primarily in Ceuthorrhynchinae.

The genus Ceutorhynchus, as American authors have delimited it, is a composite of two genera, Ceutorhynchus Germar (1824) and Ceuthorrhynchidius duVal (1854), as used by many current European

authors. According to Hoffmann (1954), Ceuthorrhynchidius is differentiated from Ceutorhynchus by the following combination of characters: six segmented funicle, claws toothed, and the venter and legs red or brown usually, rarely black. One or more of these characters may occur among various species of Ceutorhynchus, but not all are manifested in a single species. Those species of Ceutorhynchus with six funicular segments fall into the subgenus Calosirus Thomson (1865).

The difference in spelling between Ceutorhynchus and Ceuthorrhynchus also seems to be a point upon which European and American authors differ. Americans choose to use 'Ceutorhynchus' as it was spelled originally by Germar, and the European preference is the end result of the orthographic emendations 'Ceuthorrhynchus' per Agassiz (1846) and 'Ceuthorrhynchus' per Gemminger and Harold (1871).

Europeans have also authored and applied a number of subgenera which Americans as yet either have not accepted or have not found convenient to use.

For about 50 years after its conception, the genus was accorded little attention in America. Only four species, C. rubidus Schönherr, C. umbellae Fabricius, C. zimmermanni Gyllenhal and C. septentrionalis Gyllenhal were described in Schönherr (1837) as occurring in America. Whether many specimens of Ceutorhynchus were encountered that did not fit existing descriptions was apparently not problematic during this period. However, it may be assumed that unidentified material had accumulated to an extent that Leconte (Leconte and Horn, 1876) was able to describe 14 species as new to science from the United States. Twenty years later Dietz (1896) monographed the American Ceutorhynchini with 47 species in the genus Ceutorhynchus as occurring in America. Of

these, 29 were described as new species. However, subsequent work has shown some of Dietz's species to be in synonymy.

Since the time of Dietz's paper, more interest from the standpoint of descriptive taxonomy, has been accorded the genus. Notable authors of species have been Fall (1901, 1907, 1917, 1926) and Brown (1931, 1940). Dr. W. J. Brown, of the Canadian National Collection, also has been concerned with the detection of foreign coleopterous introductions for many years. Several of these introductions have been species of Ceutorhynchus. Other writers who have authored one or two species are Pierce (1910), Blatchley (1916), Buchanan (1937a), Champion (1907) and Sleeper (1957).

The biological knowledge of many of the species is scanty primarily because many of the species are apparently uncommon, and are poorly represented in collections. Error in identification has in some cases also confused information. Biological knowledge is more nearly complete for the species which occur more commonly, among which are those of economic importance.

MATERIALS

Collections

The majority of the specimens used in this study were borrowed from the collections of several institutions and from a few private collections. Only a few species were collected in any number by the author. In many cases specimens were examined at the institutions in which they were deposited.

Abbreviations used in this work for the various collections from which material was examined are:

CM-----Carnegie Museum; Pittsburg, Penna.

CNC-----Canadian National Collection; Ottawa, Canada

H&H-----H. and A. Howden; Ottawa, Canada

KU-----Kansas University; Lawrence, Kansas

MCZ-----Museum of Comparative Zoology; Cambridge, Mass.

MSU-----Michigan State University; East Lansing, Mich.

PAS-----Philadelphia Academy of Science; Philadelphia, Penna.

TAM-----Texas A. and M., College Station, Texas

UC-----University of California; Berkely, Calif.

UM-----University of Minnesota; St. Paul, Minn.

USNM-----United States National Museum; Washington, D.C.

Type Specimens

Except in a few cases, type specimens of the species of Ceutorhynchus were available for examination. In the case of the type

specimens of Dietz's species, some confusion exists as to where they are deposited. According to the literature (W. Horn, 1926; Batchelor, 1932) the Dietz material is at the Museum of Comparative Zoology, or principally there. However, the Philadelphia Academy of Science also possesses a substantial representation of Dietz type material. Although I can find no record of Dietz's collection being given in part to the Philadelphia Academy of Science, Dr. H. J. Grant, of the Philadelphia Academy of Science, communicated to me the essence of his conversations with Mr. Rehn on this subject, and it was maintained that much of Dietz's Coleoptera collection was given to the Academy prior to Dietz's death. There is evidence from comparing data given in Dietz's monograph and specimen labels that at least a few specimens that were once in the Dietz collection are now deposited in the Academy. The majority of the species which are represented by type material in the Philadelphia Academy of Science are species for which the Horn collection made up part or the total of some of Dietz's type series. Horn's collection was willed to the Academy, and I suspect that it is from his collection that the Academy attained much of Dietz's type material. Also, the longer type series are at the Museum of Comparative Zoology, so I believe the literature is correct in stating that the majority of Dietz's Coleoptera are there.

As far as I can determine the lectotype labels on the Philadelphia Academy of Science specimens were improperly attached, not having been validated by publication. Most of these specimens are not considered lectotypes in this paper. If lectotypes were to be erected, it would seem efficacious to choose from the Dietz material at the Museum of Comparative Zoology, when feasible, where authorities in the field

would expect to find the bulk of Dietz's material.

My personal opinion is that no particular advantage is gained in selecting lectotypes except to clarify some confusing taxonomic issue. In two cases I have recognized lectotypes where the type series involved were variable and only one representative of each species agreed with Dietz's description and figures. In cases where both the Museum of Comparative Zoology and the Philadelphia Academy of Science, as well as the U. S. National Museum sometimes, included Dietz type material from which no single specimen was clearly indicated as the one from which Dietz described, I have recognized the specimens to be of equal rank, or syntypes. I feel that in the event that should any of the collections be damaged or destroyed, the others would be available with less nomenclatural problems.

MORPHOLOGICAL CHARACTERS OF TAXONOMIC IMPORTANCE

Body Regions and Appendages

The head of Ceutorhynchus is punctured and vestitured to various degrees among the species, and the vertex usually shows varying degrees of development of a longitudinal carina. The interocular area varies from flat to concave. However, I have not found these characters of much importance. The beak is always relatively long and narrow, but variations exist among the species and the sexes. The female beak is frequently slightly longer than that of the male. Beak length (Fig. 1) in this paper is measured in a straight line from the apex of the beak to the middle of the eye, and is expressed as a ratio of the pronotal length and pronotal width. The scape is usually inserted midway between the apex and the base of the beak, but this position may vary somewhat depending upon the sex and the species. The distance of the scape insertion from the beak apex is expressed as a ratio of the scape length. The beak is usually more densely vestitured and more noticeably punctate or striate on its basal half, but this may vary from smooth and naked to punctate and scaly throughout. The antennal club is nearly always ovoidal, but the size, globosity and acuteness of the apex vary. The number of funicular segments has been accorded major importance in the keys, although its importance as a phylogenetic character is dubious.

A pair of tubercles or cusps (Fig. 2), one on each of the medio-lateral borders of the pronotal disc, shows considerable variation in the genus. They may be large, small or obsolete, and transverse, acute

or obtuse. A medio-longitudinal sulcus (Fig. 2) of the pronotum is also notable in its variation. It may be wide or narrow, and deep, shallow or obsolescent, or incomplete so only basal and apical impressions remain. In many cases the vestiture of the sulcus area is differentiated from that of the rest of the disc. In most cases the pronotal disc vestiture is also differentiated from vestiture on the sides of the pronotum.

The apex of the pronotum is constricted into a more or less developed tubular portion. In lateral view the discal portion of the pronotum presents a more or less horizontal dorsal outline but sloping anteriorly to the constricted apex which is on a lower plane. If the planes of the disc and of the apex are parallel, the apex is said to be not elevated. If the planes of the disc and of the constricted apex are not parallel due to an apical upward slope of the plane of the apex, the apex is said to be elevated. The measurements of the prothorax are expressed as a ratio of width to length. The width is measured at the widest part and the length is measured from the apical margin to the scutellum. In addition to the nature of the elytral vestiture, the sculpture, convexity and relative width of the intervals (interstriae) often manifest useful characteristics. The striae are frequently distinct furrows sharply delimited from the interstriae, but at other times are represented only by a row of punctures with no distinct limit between striae and interstriae. The interstriae may vary from flat to noticeably convex. Their texture may be nearly smooth, rugulose, or beset with tubercles or murications. In most cases murications are confined to a pair of calli on the subapical portion of the elytra. In dorsal view the elytra have an oval to

oblong outline. In this work the ratio of elytral length to pronotal length, and eltral length to elytral width are used. Elytral width is measured at the widest part and length is measured from the anterior limit of the scutellum to the apices of the elytra.

Several characters of the legs have been used to separate the genus into groups. They include the presence or absence of a tooth (Fig. 2), on the ventral face of the femora, and the presence or absence of teeth on the tarsal claws. The femoral tooth when present may be large or small or manifested only apparently by a tuft of scales. The tarsal claw teeth when present also show variation in development. The relative length of the tarsal segments to each other have been useful at times for separating species (Fig. 3). The comparisons made were the length of tarsal segment four in relation to the combined length of two and three, and the degree that four projects beyond the lobes of three.

Color and Vestiture

Color here is intended to mean integumental color. In combination with vestitural color the species may have an entirely different aspect.

The pronotum and venter of nearly all American species of Ceutorhynchus are black. However, the venter of a few species are brownish to reddish. Also the dorso-anterior margin and ocular lobes of the pronotum of several species exhibit a definitely paler color than that of the disc. The head is almost always blackish and concolorous with the beak. The various antennal colors among the species may be black, piceous, brownish, reddish or yellow. The scape is

usually a darker shade than the funicle when the antenna is not unicolorous. The color of the legs show variations similar to the antennal colors, although the two are not correlated. The tarsi most often are paler than the remainder of the leg. The elytra of most species are shades of black or piceous, but brownish, reddish or paler shades are not uncommon. In a few species, dark metallic blue or green is encountered. Also in a few species the apices or the majority of the elytra may be definitely lighter in color than the base of the elytra.

The vestiture varies among the species from almost naked to densely scaly. When the species seem to be naked, fine setae may be seen in the punctures of the head, pronotum and the elytral interstriae. Some setae are very flat intergrading in form with narrow scales. Scales vary in shape from oblong, oval, nearly round to cuneiform. The arrangement may be in uniform series on the elytral intervals, or the scales may be irregularly scattered or condensed in patterns, post-scutellar spots or sutural vittae. Scattered pale scales against a dark integument may give a salt and pepper effect. The usual color of scales is white or yellowish. Setae may be white, yellowish, brown or black. At the pronotal-elytral angle, the mesepimeron is usually visible in dorsal view and covered with a pale squamose vestiture.

Characters for Sex Determination

The males of Ceutorhynchus differ from the females in that the fifth abdominal segment is foveate. In those few cases where the females also have a foveate fifth abdominal segment, the female fovea is usually decidedly smaller or less distinct. The hind and middle tibiae are generally unguiculate at the outer apical angle (Fig. 2),

CHARACTERISTICS OF THE GENUS CEUTORHYNCHUS

Species of the genus Ceutorhynchus represented in America are small specimens varying from 1.5 to 3.5 mm. The form varies from globose to elongate oval, although broadly oval is most common. Excluding vestitural color, almost all are dark colored. Most are black or piceous, a few rufous at least in part, and a few possess a dark metallic blue or green luster.

The beak is slender, not thickened at the base, slightly curved, and nearly half the length of the body. The beak in repose is received in a pectoral groove of the prosternum. In related groups the pectoral groove may extend into the meso- or metasternum, or the beak is stout and generally short. A lateral sulcus or scrobe directed against the eye receives the scape of the geniculate antenna. The antennal funicle is six or seven segmented, and the ovoidal club is annulated, pubescent and more or less acuminate in most cases. The eyes are rounded, situated laterally on the head, widely separated above and more or less covered in repose by ocular lobes of the prothorax. A longitudinal carina extending from the vertex of the head to about eye level is more or less evident in most species. The pronotum may or may not have a median longitudinal sulcus, and a pair of tubercles on the basal half of the disc. The scutellum is always small, and glabrous or scaly. The elytra are punctate in the striae and the interstriae are variously sculptured.

The prothoracic sternum is deeply emarginate anteriorly, and

whereas the female tibiae are not. In Group A, neither the males nor the females have unguiculate tibiae. A more subtle and less reliable character is the tendency for the first abdominal segment of the males to be slightly concave in contrast to a slightly convex segment among the females. There is also a tendency for the female beak to be longer and the antennal insertion to be more basal among the females. A judicial weighing of the aforementioned characters will usually establish which are the males in a series of specimens without necessitating dissection.

External Male Genitalia

The morphology of the external male genitalia of Rhynchophora is not entirely settled, so descriptive taxonomic terms are generally applied to these sclerotized parts to avoid confusion. I have included here my interpretation as well as the taxonomic terms of reference.

The male genitalia and terminal segments of Ceutorhynchus (Figs. 4 and 5) show modifications toward desclerification which further occludes establishing homologies. In more typical curculionids the eighth abdominal sternite is well developed but invaginated, so that it lies internal and parallel to the seventh, or last visible sternite. In Ceutorhynchus the eighth sternite is vestigial or entirely absent. Posterior to the eighth sternite, the ninth sternite is represented by a poorly defined sclerite which is made conspicuous by a single assymetrical apodeme (spiculum gastrale). The membranous tube with its sclerotized parts, which extends posterior to the ninth sternite, comprises the male external genitalia proper. The most basal sclerotization of the genitalia consists of a narrow ring with a single medio-ventral apodeme. These have been interpreted as the gonobase and

gonobasic apodeme. They have been referred to by others as the tegmen and tegminal strut (Bruhn, 1947; Sharp and Muir, 1912; Anderson, 1962). In other curculionids a pair of ear-like posteriorly directed tabs representing gonoforceps occur on the dorsal aspect of the gonobase. In still other curculionids the gonoforceps are fused, forming a large dorsal shield extending over the penis valves. No vestiges of the gonoforceps occur in Ceutorhynchus.

The most conspicuous sclerotization is the ligulate fused pair of penis valves or aedeagus (median lobe), which serves as the intromittent organ. A pair of latero-ventral apodemes on the penis valves serve for muscles insertion to retract the valves into the gonobase. The gonobase and segment nine are in turn retracted into the body cavity by their apodemes. Near the tip on the dorsal face of the valves, the membranous penis may be exerted through the phallotreme. The penis is often beset with minor sclerotizations or asperities.

Within the genus the penis valves exhibit some variation in size, shape and curvature. Variations also exist in the gonobase and ninth abdominal sternal apodeme.

the median sulcus, which does not extend past the front coxae, is bordered laterally by ridges extending cephalad from the coxal cavities. The anterior coxae are conical, the middle ones more globose, and the hind coxae transverse. The femora are slightly sinuate, and the middle and hind femora of many species are toothed on the underside. The tibiae are usually slender and usually slightly widened apically. The tibial apex is crowned with a ring of coarse setae. The tarsus is inserted at the apex of the tibia. Tarsal segment three is bilobed, usually broadly, and the last tarsal segment extends well beyond the lobes of the third (Fig. 3). The last tarsal segment is referred to as the fourth in taxonomic literature, as it is in this paper, but actually the fourth is minute, fused to the base of the last segment, and hidden between the lobes of the third segment. Among many species the tarsal claws are toothed on the inner faces.

The first and second ventral abdominal segments are inflexed to form the posterior wall of the coxal cavity, and are not visible without dissection. The first and second exposed ventral abdominal segments are each about as long as the third and fourth combined. The posterior margin of the second abdominal sternum is broadly concave so that the third sternum appears longer medially than at the sides. The fifth exposed sternum is longer than either of the preceding two segments. The pygidium is nearly vertical and with a transverse dorsal elevated line against which the elytra abut.

The venter is usually well vestitured with scales, and the dorsum varies in vestiture from very sparsely setate to very densely scaly.

KEY TO GROUPS OF CEUTORHYNCHUS

Some of the American species of Ceutorhynchus seem to fall into natural groupings that are separable by relatively easily discernible characteristics. On the other hand, similar characteristics fail to be of value in establishing natural relationships among the remainder of the species. Groups A, B, C, D and E each seem to be composed of related forms, whereas groups F and G are composed of species that could be either placed in groups D or E or some other group not established. These discrepancies were not resolvable by easily evaluated characters, so a perfected key to groups was abandoned, although an artificial grouping was maintained. The rationale of establishing groups at all, especially the separation of groups F and G, is merely one of expedition in keying the species.

1. Hind femora toothed, or at least the tooth area marked
by a tuft of scales 2.
- Hind femora entirely mutic 5.
2. Funicle 6-segmented 3.
- Funicle 7-segmented 4.
3. Claws simple Group A.
- Claws toothed 9.
4. Elytra distinctly muricate or tuberculate or the apical
calli binodal 8.

- Elytra at most rugose, not muricate or tuberculate. . . . Group D.
- 5. Funicle 6-segmented, claws not toothed. Group E.
- Funicle 7-segmented, or if 6-segmented claws with a
 - weak tooth 6.
- 6. Elytra distinctly tuberculate at least on the humeri. . . Group B.
- Elytra not tuberculate, at most muricate on the
 - apical calli 7.
- 7. Claws toothed Group G.
- Claws simple Group F.
- 8. Elytra densely squamose, apical calli
 - binodal in part, Group B.
- Elytra naked except for a postscutellar spot;
 - intervals tuberculate in part, Group C.
- 9. Elytra nearly naked and usually tuberculate . . . in part, Group C.
- Elytra moderately clothed with narrow scales . . in part, Group D.

GROUP A

Included in this group are those species with dentate femora, 6-segmented funicle and untoothed claws. The postocular lobes are well developed, and with the exception of C. pollinosus Dietz, all have the elytra ornamented with patterns of condensed white scales. The male tibiae are not mucronate and the fovea of the 5th abdominal segment is usually broadly oval. The group corresponds to Dietz's 'angulatus' group with the exception that C. pollinosus has been transferred from his 'sulcipennis' group.

Key to Species of Group A

1. Elytra without a postscutellar pattern or lateral bands pollinosus
---Elytra with either a postscutellar pattern or lateral bands or both 2
2. No lateral spot; globose, elytral width greater than length; pronotal width greater than 1.5 times pronotal length ovipennis
---Lateral band present; elytra longer than wide; pronotal width less than 1.5 times length 3
3. White postscutellar scales forming a diffuse patch . . disturbatus
---White postscutellar scales arranged in a more or less definite pattern 4

4. Fascia extends obliquely back from the pronotal area to interval 6 and then obliquely forward to interval 9, may be slightly interrupted on interval 5; tubercles very large, prominent; sulcus widened basally angulatus
 ---Fascia of a different configuration 5
5. Fascia extends obliquely back from postscutellar area to interval 4, broadly discontinuous with the lateral fascia on intervals 6-9; tubercles moderate; sulcus not widened basally obliquus
 ---Fascia extends directly caudad on intervals 1 and 2, a little farther on 2, and then directly laterad onto intervals 3 and 4; broadly discontinuous with the lateral fascia 6
6. Sulcus wide basally, clothed with dense, oval, white scales; postscutellar white scales extend about 3/4 as far back on interval 1 as on 2; integument black tau
 ---Sulcus not widened basally, without conspicuous white scales; postscutellar white scales on interval 1 extending less than half as far back as on interval 2 consanguineus

C. pollinosus Dietz

(Figs. 6, 32)

C. pollinosus Dietz. 1896. Trans. Am. Ent. Soc. XXIII: 434

Length 2.2-2.3 mm.; width 1.4 mm. Body entirely black. Head deeply punctate and a little striolate; a recumbent brownish seta per punct; vertex with a vague median carina; interocular area flat. Beak punctate to strio-punctate throughout with a brown seta per punct; rather stout, length (♀) .85 times pronotal width or 1.19 times pronotal length. Antenna brownish, scape (♀) inserted about 1.4 times its length from beak apex; funicle 6-segmented, first segment very stout; club broad oval, acute. Pronotum coarsely punctate with a brownish seta per punct; sulcus entire, with a few dirty white lanceolate scales; tubercles distinct; apical constriction elevated; ocular lobes moderate; width 1.35 times length. Elytral intervals flat, 4-5 times stria width; striae narrow, distinct; vestiture of ovate, whitish, nearly imbricate stria scales and similar 2-seriate scales plus brown recumbent ligulate scales on the intervals; apical calli distinct, muricate; length 1.21 times width. Thoracic sterna with large shallow puncts each with a dirty white, spaced broadly lanceolate scale. Abdominal vestiture slightly less dense than on sternum; fovea of 5th abdominal segment (♀) barely perceptible; pygidium deeply punctate, concave to flat, clothed with short setaceous hairs. Legs orange-brown, femoral tooth not distinct but its position well marked on all legs by a tuft of white scales; tibiae not unguiculate; Tarsal segment 4 less than the combined length of 2 & 3; 4 projects beyond 3 less than 3's length; tarsal claws edentate.

TYPES. A single male specimen from California in the Ulke collection at the Carnegie Museum; also, a single female specimen from California in the Philadelphia Academy of Science.

DISTRIBUTION. CALIFORNIA: Newcastle, Vancouver.

Dietz placed this species with his sulcipennis group, but it seems to have more affinities to the angulatus group.

C. ovipennis Dietz

(Fig. 33)

C. ovipennis Dietz. 1896. Trans. Am. Ent. Soc. XXIII: 428.

Length 2.2 mm.; width 1.68 mm. Body entirely black. Head with large, deep, dense puncts; vertex not carinate; interocular area flat; clothed with brownish, ligulate setae. Beak stout, evenly curved, punctate and finely setate throughout. Antenna piceous; funicle 6-segmented; club oval. Pronotum with large, deep, dense puncts; sulcus not deep, shallower medially; tubercles relatively distinct, acute, transverse; apical constriction not elevated; ocular lobes moderate; scutellum small, rounded, glabrous; long oval, white scales in sulcus, wide lanceolate, white scales on sides and brown ligulate setae on disc; width 1.62 times length. Elytral intervals slightly convex, very rough; striae deep punctate with fine brown setae; general vestiture of 2-seriate, brown, ligulate scales; a postscutellar pattern of lanceolate white scales forming a pair of right angles on the 2nd, 3rd and 4th intervals, and a small spot of the 6th; length .94 times width. Venter deeply punctate; clothed with round-oval, not very dense scales, narrower on the abdomen; (♂) fovea of the 5th abdominal segment large, broad-oval, shallow, slightly elevated laterally, clothed as abdomen;

pygidium slightly convex, clothed with curved hairs and a few medial scales. Legs piceous, tarsi orange; femoral teeth obsolete except on hind legs; femora clothed primarily with flat setae; tibiae not mucronate; tarsal segment 4 less than the combined length of 2 & 3; 4 projects beyond 3 about equal to 3's length; tarsal claws edentate.

TYPES. One specimen in the Philadelphia Academy of Science from Dunsmuir, California, and bearing a lectotype label no. 2764. Also a single dubious type in the Museum of Comparative Zoology from British Columbia.

DISTRIBUTION. CALIFORNIA: Dunsmuir; BRITISH COLUMBIA.

The only specimens known to me are the two types. However, the lectotype in the PAS collection matches much better the markings and shape of the figure depicted by Dietz. For this reason I have recognized the PAS specimen as the lectotype, which I have not done for many of the other specimens labeled as lectotypes in the PAS collection. Dietz also described the fovea of the fifth abdominal sternite as large and well defined, which fits that of the PAS specimen. Because of the absence of a fovea in the MCZ specimen, I have recorded in my notes that this specimen is probably a female. Since both of the specimens on which Dietz based his description were males, there is some doubt that the MCZ specimen is authentically labeled as a type.

C. disturbatus Dietz

(Fig. 34)

C. disturbatus Dietz. 1896. Trans. Amer. Ent. Soc. XXIII: 426

C. angulatus Leconte in Leconte and Horn. 1876. Proc. Amer. Phil. Soc. XV: 277, in part.

Length 2.0 mm.; width 1.25 mm. Body entirely black. Head with

large, dense, deep puncts; vertex with a short carina; setae the color of the integument; eyes slightly elevated, flat between. Beak (♂) stout, .95 times pronotal width or 1.32 times pronotal length; distinctly punctate throughout; bronzy, ligulate scales throughout. Antenna piceous, the scape black; funicle 6-segmented; club ovate; (♂) scape inserted .87 times its length from beak apex. Pronotum with moderately large, deep, dense puncts; lanceolate white scales on sides and sparsely along sulcus, flat brown setae on disc; sulcus complete, moderately deep; tubercles transverse, moderately sized; scutellum small, oval, glabrous; ocular lobes moderate; width 1.4 times length. Elytral intervals flat, rugose; striae well impressed, distinctly punctate; oval, white scales form a vague, diffuse post-scutellar patch on interval 1, 2 and 4, an oblique lateral band from interval 6 to 9 and a sparse scattering on posterior elytral half; bronzy, ligulate scales, 2-3-seriate elsewhere on intervals and flattened, translucent, white setae in striae; apical calli well developed, muricate; length 1.08 times width. Venter with wide, oval, white moderately dense scales; (♂) fovea of 5th abdominal segment broad oval, moderately impressed, clothed as abdomen, occupying the entire length and about 1/3 the width of the segment, slightly elevated laterally; pygidium roughly punctate, slightly convex, clothed with mixed setae and white scales. Legs dark piceous to light piceous apically; femoral tooth vague but marked by white scales; femora clothed with pale flattened setae; tibiae not mucronate; tarsal segment 4 less 3's length beyond 3; tarsal claws edentate.

TYPES. A single specimen in the Philadelphia Academy of Science from Vancouver; a single specimen in the U. S. National Museum from

Los Angeles Co., California; bearing the type label no. 1374; and a series in the Museum of Comparative Zoology bearing type labels no. 3015. The date-locality information on the MCZ specimens is: one from Pomona Mountains California, Sep.; one from Yosemite Valley, California, 10-V-79; three from Portland, Oregon; one from the Western Territory; one from Victoria, Vancouver.

DISTRIBUTION. BRITISH COLUMBIA: Victoria, Vancouver; CALIFORNIA: Pomona Mountains, Yosemite Valley; OREGON: Portland; UTAH: WASHINGTON: Puyallup.

Part of the series from which Dietz described this species included part of Leconte's type series of C. angulatus. C. disturbatus however, is smaller, less robust, and without the angulate fascia on the elytra.

C. angulatus Leconte

(Fig. 35)

C. angulatus Leconte in Leconte and Horn. 1876. Rhynchophora of America North of Mexico, Proc. Amer. Phil. Soc. XV: 277.

Length 2.5 mm.; width 1.55 mm. Pitchy black dorsally, black ventrally. Head coarsely punctate; vertex with a fine median carina; puncts near carina with narrow white scales, other puncts with lanceolate bronze scales; interocular area slightly convex; eyes slightly elevated. Beak coarsely punctate and sulcate basally, punctulate apicad of scape insertion; length (♂) 1.16 times pronotal width or 1.47 times pronotal length. Antenna piceous; funicle 6-segmented; club ovate; (♂) scape inserted 1.2 times its length from beak apex. Pronotum coarsely punctate; sulcus complete, wide; tubercles prominent,

acute; apical constriction elevated, deeply emarginate; ocular lobes distinct; vestiture of oval, dirty white, scales on sides and basally in sulcus, elsewhere with brown ligulate scales; width 1.29 times length. Elytral intervals slightly convex, rugose; striae narrow, well impressed; apical calli distinctly muricate; an angulate band of imbricate, oval white scales extending obliquely backward from the scutellum to the 6th interval and then obliquely forward to the 9th interval; similar scales forming an anteapical patch between and behind the apical calli, and a diffuse patch anterior to the callus; brown, ligulate, 2-3-seriate scales elsewhere on the elytra; length 1.11 times width. Sternum clothed with dense, oval, white scales; (σ) fovea of 5th abdominal segment large, broad, shallow, clothed as the rest of the abdomen, slightly elevated laterally; Pygidium convex, very coarsely punctate, obscurely clothed with fine short setae. Legs red-brown, tarsi orangish; femoral tooth area marked by a tuft of white scales; femora clothed with lanceolate white scales and ligulate white and brown setae; tibiae not unguiculate; tarsal segment 4 equal to the combined length of 2 and 3; 4 projects beyond 3 equal to 3's length; tarsal claws edentate.

TYPES. Four specimens from California in the Museum of Comparative Zoology, bearing type labels no. 3035.

DISTRIBUTION. CALIFORNIA: Camp Baldy, Los Angeles Co., Kings River, Pasadena, Pomona Mountains; ONTARIO: Huntington.

Leconte listed Vancouver Island (British Columbia) as a type locality, but such specimens are not now in his collection. Apparently these specimens formed part of the series upon which Dietz based the species description of C. disturbatus.

C. angulatus differs from C. disturbatus in being larger and with an angulate fascia on the elytra.

C. obliquus Leconte

(Figs. 7, 36)

C. obliquus Leconte in Leconte and Horn. 1876. Rhynchophora of America North of Mexico, Proc. Amer. Phil. Soc. XV: 278.

Length 2.3 mm.; width 1.45 mm. Body black. Head coarsely punctate; vertex carinate; clothed with moderately dense, yellowish, ligulate scales. Beak stout, clothed with ligulate scales to scape insertion and narrow setae apically; length about equal to pronotal length or .83 times pronotal width. Antenna yellow-brown; funicle 6-segmented; club ovate; scape inserted .75 times its length from beak apex. Pronotum black with ferruginous anterior border; disc with large, deep, contiguous, rough puncts; sulcus wide, shallow and vague medially; tubercles oblique, distinct; scutellum nearly hidden, not glabrous; ocular lobes well developed; apical constriction not elevated; wide lanceolate, yellowish scales on sides and less dense in sulcus, ligulate scales elsewhere; width 1.2 times length. Elytral striae well impressed and punctate; intervals flat, rugulose, width twice strial width; apical calli prominent, slightly muricate; brassy 3-seriate, ligulate scales on intervals 1.5 times the width of the flat, white, strial setae; wide ovate, white scales form an inverted-V mark behind the scutellum and an oblique lateral band from interval 6 to 9; length 1.1 times width. Venter clothed with large, oval, imbricate to contiguous, creamy white scales; fovea of 5th abdominal segment broad oval, occupying the full length of the segment, elevated each side, scaled

like the abdomen plus a few long hairs; pygidium convex, with large deep puncts and mixed oval scales and long hairs. Legs rufous; femoral tooth marked by tuft of oval scales, indistinct on front legs; front femora stout; clothed with wide ligulate scales; all tibiae stout and widened apically, not mucronate; tarsal segment 4 about equal to the combined length of 2 & 3; 4 projects beyond 3 equal to 3's length; claws edentate.

TYPES. A single specimen from San Mateo, California, in the Museum of Comparative Zoology, bearing the type label no. 3036.

DISTRIBUTION. CALIFORNIA: San Mateo; ARIZONA: TEXAS: UTAH.

Of the three specimens from which Leconte described this species, only one specimen is now in his collection. The only other specimens that I have seen are two specimens from California in the U. S. National Museum. The localities other than California listed above are according to Dietz (1896), but none of these specimens remain in his collection. Dietz considered the Utah and Texas specimens to be variants, which he designated simply as A and B respectively.

C. obliquus resembles C. angulatus, but differs in its smaller size and more distinct interruption of the angulate fascia of the elytra.

C. tau Leconte

(Figs. 8, 37)

C. tau Leconte in Leconte and Horn. 1876. Rhynchophora of America North of Mexico, Proc. Amer. Phil. Soc. XV: 278.

Length 2.5 mm.; width 1.6 mm. Piceous black above, black below. Head with large, deep, puncts; clothed with bronzy, wide, ligulate

scales, oval off-white scales along carina and at posterior of head; interocular area flat. Beak deeply punctate and setate throughout; length (♂) about equal to pronotal width or 1.33 times pronotal length. Antenna piceous; funicle 6-segmented; club acute oval; scape (♂) inserted 1.28 times its length from beak apex. Pronotum with large, dense, deep puncts; sulcus complete, deepest basally; tubercles moderate, transverse; apical constriction slightly elevated, emarginate medially; ocular lobes well developed; wide, oval, white scales along sulcus and on sides, integument-colored, inconspicuous setae on disc; width 1.40 times length. Elytral intervals slightly convex, densely punctate; striae well defined and impressed; apical calli well developed, densely muricate; large, round-oval, white scales form an oblique lateral band from interval 6 to 9 and a split inverted T pattern (JL) on intervals 1 to 4 behind the scutellum; off-white to pinkish, similar, dense scales along interval 1 and generally posterior to the lateral bands; iridescent, brassy, wide ligulate scales elsewhere and also some mixed with posterior vestiture; strial vestiture off-white, lanceolate scales narrower than white scales on intervals; length 1.12 times width. Venter with dense, imbricate, white, round-oval scales; (♂) fovea of 5th abdominal segment shallow, round, clothed as abdomen, with a diameter equal to the segment's length; pygidium flat, punctate, densely clothed with oval, whitish scales. Legs reddish brown; femoral tooth marked on all legs by white scale tufts; femora clothed with wide, brassy, ligulate scales laterally and dense, oval, white scales basally and dorsally near the tooth; tibiae not mucronate; tarsal segment 4 slightly less than the combined length of 2 and 3; 4 projects beyond 3 equal to 3's length; tarsal claws edentate.

YPES. A single specimen from Texas in the Museum of Comparative Zoology bearing the type label no. 3037.

DISTRIBUTION. TEXAS: Belfrage, Mouton; NORTH DAKOTA: McVille.

Leconte states that the single specimen from which he described this species was from Belfrage, Texas, but the specimen in the MCZ collection bears only the locality label, "Tex." This species is very close to C. consanguineus, but differs primarily in the configuration of the white scales behind the scutellum described in the key. The widened tibiae of C. consanguineus described by Dietz, is not very evident in most specimens and does not serve as a good character to separate it from C. tau.

Smith (1932) and Alstatt and Smith (1942) report C. tau as a pest on onions and garlic in Texas.

C. consanguineus Dietz

(Fig. 38)

C. consanguineus Dietz. 1896. Trans. Am. Ent. Soc. XXIII: 426

Length 2.3 mm.; width 1.5 mm. Dark reddish-brown dorsally and black ventrally. Head coarsely punctate; vestiture of flattened setae; vertex carinate; interocular area flat to concave. Beak punctate to scape insertion, punctulate apically; glabrous with only a few fine hairs apically; length (♀) a little less than the pronotal width or 1.28 times pronotal length. Antenna dark red-brown; funicle 6-segmented; club broadly oval; (♀) scape inserted 1.0 times its length from beak apex or slightly apicad of beak middle. Pronotum with dense, moderately deep puncts; sulcus complete but less deep medially; tubercles distinct, transverse; scutellum small, glabrous; apical constriction slightly

elevated, not emarginate medially; ocular lobes distinct; vestiture of broad, white scales along sulcus and laterad of tubercular area, and narrow brown scales on disc; width 1.43 times length. Elytral intervals flat to slightly convex; striae seep, distinct; apical calli indistinctly muricate; vestiture of 2-3-seriate, narrow brown scales on intervals and slightly narrower, white, setaceous scales in striae; broad, white, imbricate scales forming a somewhat omega-shaped post-scutellar pattern and a lateral band from interval 6 to 10; length 1.0 times width. Venter with oval, white, moderately dense scales; puncts large, shallow; (♀) fovea of 5th abdominal segment absent; pygidium flat to convex with few small oval scales and hairs. Legs reddish-brown, paler than elytra; femoral teeth indistinct; front and middle tibiae short, stout; not unguiculate; tarsal segment 4 less than the combined length of 3 & 2; 4 projects beyond 3 slightly more than 3's length; tarsal claws edentate.

TYPES. A single specimen from Nevada in the Museum of Comparative Zoology bearing the type label no. 3014; and a single specimen in the Philadelphia Academy of Science collection with no collection data label, bearing the lectotype label no. 2762.

DISTRIBUTION. ALBERTA: Brooks, Cypress Hills, Tilley;
CALIFORNIA: MANITOBA: Aweme; NEVADA: OREGON: SASKATCHEWAN:
Saskatoon.

Dietz described this species from three Nevada specimens in Dr. Horn's collection. The type in the MCZ collection bears a Nevada label, but the lectotype in the PAS collection bears no collection data label. However, the PAS specimen fits Dietz's description of the species much better, especially in the character of the widened tibiae

of the forelegs. This particular character is not distinct in any other specimens of C. consanguineus examined.

Dietz remarks on the similarity of this species to C. angulatus and C. disturbatus, but it is more likely to be confused with C. tau, a species Dietz did not see at the time of his writing.

A specimen from Brooks, Alberta in the Canadian National Collection bears the label "alfalfa".

GROUP B

The species of this group are black, with a 7-segmented funicle, more or less distinctly toothed claws, large pronotal tubercles, tubular apical constriction with a distinctly elevated anterior margin and mutic femora except in C. pervestitus. The elytra are distinctly tuberculate at least on the humeri and apical calli except in C. pervestitus in which case the apical calli are binodal. Dense, imbricate, pale, oval scales cover the integument except in C. horni in which case the scales are confined to the venter and to a sutural vitta. The general shape is quadrate and the fovea of the 5th abdominal male segment is oval and usually shallow. Male tibiae mucronate.

Key to Species of Group B

1. Femora toothed, apical calli binodal pervestitus
---Femora not toothed, apical calli tuberculate 2
2. Glabrous except for a sutural vitta, claw
tooth short horni
---Densely scaly, claw tooth long 3
3. Tubercles in rows on interspaces nodipennis
---Tubercles confined to humeri and apical calli adjunctus

C. pervestitus Fall

(Fig. 39)

C. pervestitus Fall. 1901. Occ. Papers, Cal. Ac. Sci. VIII: 267

Length 2.6 mm.; width 1.5 mm. Sculpture and color of integument hidden by dense vestiture. Head densely scaled; vertex carinate. Beak striate to scape insertion, punctulate apically; densely scaled basally with prone and suberect scales; beak length (σ) about equal to pronotal width or 1.2 times pronotal length. Antenna piceous; (σ) scape inserted 1.67 times its length from beak apex; funicle 7-segmented; club oval, acuminate. Pronotum entirely scaled with pale tan, oval imbricate scales except for erect, ligulate scales at posterior sulcus border; apical constriction tubular, distinctly elevated, a transverse ridge between the tubercles divides the pronotum in halves at different levels; sulcus very wide, entire; tubercles prominent; width 1.27 times length. Elytra with imbricate, dirty white to pale tan, oval scales; erect to suberect, flat, dark brown setae occurring singly and in tufts on intervals; striae vestiture elongate, narrow, ligulate, white scales; sutural interval with rusty white, slightly lifted, imbricate scales forming a vague vitta; apical calli distinct, binodal; length 1.16 times width. Venter with dense, pearly tan and white imbricate, oval scales; (σ) fovea of 5th abdominal segment shallow, oval, not distinct; pygidium flat to concave, with dense oval white scales. Legs light piceous apically; femoral vestiture as on sternum, tooth position marked by tufts of scales on all legs; tibiae distinctly mucronate; tarsal segment 4 equal to or slightly greater than the combined length of 2 & 3; 4 projects beyond 3 about twice 3's length; tarsal claws divergent with small, acute; distinct, basal tooth.

TYPES. One specimen from Kern Co., California in the Museum of Comparative Zoology bearing the type label no. 25225.

DISTRIBUTION. CALIFORNIA: Kern Co.

Fall recorded his single specimen from Bakersfield, California, but the type is labeled only "Kern Co., California". He referred this species to Dietz's 'subpubescens group', but it seems to be in a group by itself or more similar to Dietz's 'tuberculipennis' (horni) group.

C. horni Dietz

(Figs. 9, 40)

C. horni Dietz. 1896. Trans. Am. Ent. Soc. XXIII: 435

Length 2.7 mm.; width 1.75 mm. Body and head black. Head distinctly carinate, roughly punctate, finely setate, concave between eyes. Beak setate basally; striate and punctate to scape insertion, naked and less sculptured apically; (♂) beak longer than pronotal width, about 1.39 times pronotal length. Antenna piceous; (♂) scape inserted 1.11 times its length from beak apex; funicle 7-segmented; club ovate, acuminate. Pronotum roughly punctate; finely setate; sulcus moderately deep at extremities, obsolescent medially; apical constriction tubular, elevated; ocular lobes indistinct; tubercles large, transverse, concave on anterior face; width 1.46 length. Elytra very distinctly tuberculate; narrow white scales forming a sutural vitta and long, fine, suberect setae on disc; length 1.06 times width. Venter clothed with moderately dense scales, denser on side pieces. (♂) fovea of 5th abdominal segment oval, not very deep. Legs black to piceous; femora mutic, clothed with mixed setae and narrow, white scales; tibiae mucronate; tarsal segment 4 less than the combined length of 2 & 3;

4 projects beyond 3 about equal to 3's length; tarsal claws with a distinct basal tooth.

TYPES. A single specimen from Southern California bearing the type label no. 3019 in the Museum of Comparative Zoology; and a single specimen from Southern California, type no. 2767, in the Philadelphia Academy of Science.

DISTRIBUTION. SOUTHERN CALIFORNIA.

This species is easily recognized by its glabrous, strongly tuberculate elytra and sutural vitta of white scales.

C. nodipennis Dietz

(Fig. 41)

C. nodipennis Dietz. 1896. Trans. Am. Ent. Soc. XXIII: 435

Length 2.1 mm.; width 1.33 mm. Body and head black. Head with distinct, longitudinal, carina on vertex; covered with dense, imbricate, oval, white scales; concave between eyes. Beak deeply stria-punctate to scape insertion, less so apically; glabrous except for scales at base; length (σ) 1.3 times pronotal length, about equal to its width. Antenna piceous; (σ) scape inserted 1.45 times its length from beak apex; funicle 7-segmented; club long oval, acuminate. Pronotum covered with dense, oval, white, imbricate scales occluding the sculpturing; sulcus not evident; tubercles large, prominent, similar to elytral tubercles; width 1.23 times length; apical margin tubular, elevated. Elytra covered with dense, oval, white, imbricate scales; flattened setae in striae; distinct tubercles on humeri, apical calli, 3, 5, 6, 7 intervals and apically on 4; length 1.01 times width. Venter clothed as dorsum. (σ) fovea of 5th abdominal segment round-oval, deep,

scaled. Pygidium with wide lanceolate and few small white scales. Legs rufo-piceous, clothed with oval, white, imbricate scales; middle and hind tibiae mucronate; tarsal segment 4 about equal to the combined length of 2 & 3; 4 projects beyond 3 more than 3's length; tarsal claws with a long tooth, nearly bifid.

TYPES. All the types are from Los Angeles, California. The specimen in the Museum of Comparative Zoology bears the type label no. 3020, and those in the U. S. National Museum the type label no. 1375.

DISTRIBUTION. CALIFORNIA: Los Angeles.

Dietz described this species from ten USNM specimens, all from Los Angeles, California. No other specimens seem to be in other collections.

This species most closely resembles C. adjunctus, but differs particularly in the presence of tubercles on the elytral disc.

C. adjunctus Dietz

(Figs. 10, 42)

C. adjunctus Dietz. 1896. Trans. Am. Ent. Soc. XXIII: 436.

C. stanleyi Leng. 1920. Cat. of the Coleo. of Amer., North of Mexico.

Length 2.25 mm.; width 1.25 mm. Venter, pronotum, head and thorax black. Head very distinctly carinate; densely covered with oval, white, imbricate scales; slightly concave between eyes. Beak smooth, naked, moderately curved; (♂) beak length 1.31 times pronotal length or slightly less than the pronotal width. Antenna piceous; (♂) scape inserted about 2 times its length from beak apex; funicle 7-segmented; club broad oval, acuminate. Pronotum covered with dense, imbricate,

oval, white scales occluding the sculpturing; sulcus shallow, partly occluded by vestiture; tubercles large, transverse, concave on anterior face; apical margin tubular, elevated, crenulo-emarginate; ocular lobes well developed; width 1.36 times length. Elytra covered by dense, imbricate, broad oval, white scales, narrow in the striae; scales occlude most of the sculpture; humeri, apical calli and declivity distinctly tuberculate; length 1.16 times width. Venter clothed as dorsum; (σ) fovea absent from 5th abdominal segment; pygidium densely clothed with oval, white scales. Legs reddish-brown, femora mutic, clothed with dense, white, oval white scales; tibial unguis absent; tarsal segment 4 equal to the combined length of 2 & 3; 4 projects beyond 3 about twice the length of 3; tarsal claws with a very long tooth.

TYPE. A single specimen from Am. Fk. Can., Utah; type no. 2768, in the Philadelphia Academy of Science collection.

DISTRIBUTION. CALIFORNIA: IDAHO: NEVADA: Hawthorne; UTAH: American Fork.

According to Dietz (1896), the types of C. adjunctus were from Horn's and Ulke's collections. The specimen in the Ulke collection at the Carnegie Museum does not bear a type label however.

According to Chittenden (1900), this species has been collected from Stanleya sp. It was probably collected from Stanleya by Schwarz also who applied the cheironym C. stanleyi to the beetle. Since the name stanleyi was first published by Leng (1920) as a synonym of adjunctus, Leng must receive authorship of the name.

GROUP C

This group corresponds to the European genus Ceuthorrhynchidius except for C. sulcipennis which has a 7-segmented funicle. The femora and claws are toothed. The elytra are hispid, muricate to tuberculate (except in C. armatus), and with a postscutellar spot (except C. armatus). The male tibiae are mucronate except in C. decipiens, and tarsal segment 4 is equal to the combined length of 2 and 3. The general shape is short oval, the PN tubercles obsolescent.

Key to Species of Group C

- 1. Antenna 7-segmented sulcipennis
---Antenna 6-segmented 2
- 2. Elytral intervals not muricate, no postscutellar
spot armatus
---Elytral intervals muricate, postscutellar spot
present 3
- 3. Setae long, fine, recurved near apex echinatus
---Setae short, flattened, not greatly curved. decipiens

C. sulcipennis Leconte

(Figs. 11, 43)

C. sulcipennis Leconte in Leconte and Horn. 1876. Rhynchophora of America North of **Mexico**, Proc. Amer. Phil. Soc. XV: 274.

Length 2.5 mm.; width 1.65 mm. Head and body black. Head

rugose; clothed with white setae; vertex carinate; interocular area flat. Beak punctate to scape insertion, punctulate apically; white setae to scape insertion, a few scales in front of and many behind eyes; (σ) beak length about equal to pronotal width or 1.25 times pronotal length. Antenna piceous; (σ) scape inserted 1.11 times its length from beak apex; funicle 7-segmented; club oval, acuminate. Pronotum with large, deep, distinct puncts; sulcus distinct basally, obsolete elsewhere; tubercles small, acute; apical constriction not elevated, broadly and shallowly emarginate; ocular lobes weak; recumbent, white setae on disc and narrow, white scales basally in sulcus and laterad of the tubercles; width 1.37 times length. Elytra distinctly tuberculate; naked except for postscutel spot of white scales and small strial setae; striae deeply punctate; intervals appear highly convex because of tubercles; apical calli obsolete; length 1.06 times width. Sternum with large, shallow, distinct puncts, clothed with relatively dense, long oval, white scales; abdominal scales white, distinct, lanceolate; (σ) fovea of 5th abdominal segment round, shallow, about $3/4$ the 5th sternum's length; pygidium convex, distinctly punctate, sparsely setiferous. Legs black with piceous tarsi; femora tooth distinct on meso- and metafemora, vague on front femora, clothed with white, narrow, setaceous scales; tibiae unguiculate; tarsal segment 4 equal to the combined length of 2 & 3; 4 projecting slightly more than 3's length beyond 3; tarsal claws with long, distinct tooth.

TYPES. A series from Illinois, Kansas, Nebraska, and Detroit, Michigan, bearing the type label no. 3038 in the Museum of Comparative Zoology.

DISTRIBUTION. ALABAMA: ARKANSAS: COLORADO: D.C.: IOWA:

Riverbow; ILLINOIS: INDIANA: KANSAS: Lawrence, Orange; LOUISIANA: Winnfield; MANITOBA: Aweme, Pierson, Tresbank; MARYLAND: MASSACHUSETTS: MICHIGAN: Detroit; MINNESOTA: MISSISSIPPI: MISSOURI: NEBRASKA: NEW JERSEY: NEW MEXICO: Los Vegas; NEW YORK: Long Island; OKALHOMA: PENNSYLVANIA: Rockville; QUEBEC: Montreal; SOUTH DAKOTA: Volgo; VERMONT: VIRGINIA: Potomac Creek; WASHINGTON: WYOMING: YUKON TERRITORY: Dawson.

Despite its wide distribution, nothing has been published or recorded on the biology of this beetle. It is easily recognized by its naked, muricate elytra with a distinct postscutellar spot.

C. armatus Dietz

(Fig. 44)

C. armatus Dietz. 1896. Trans. Am. Ent. Soc. XXIII: 433.

Length 2.5 mm.; width 1.45 mm. Entirely rufous. Head with large, deep puncts; scales ligulate and spaced; carina on vertex not distinct; interocular area flat. Beak striate laterally and dorso-laterally, deep puncts on mesad border of dorsal striae; sparse setae on basal half; (♀) beak length about equal to pronotal width or 1.6 times pronotal length. Antenna orangish; (♀) scape inserted 1.0 times its length from beak apex; funicle 7-segmented; club oval, acuminate. Pronotum roughly and closely punctate; sulcus shallow, obsolete medially; tubercles obsolete; apical constriction finely notched on apical margin; ocular lobes moderately developed; white scales broad oval and ligulate along sulcus and on sides, disc with ligulate scales blending with integumental color; width 1.47 times length. Elytral striae not very deep, coarsely punctate; intervals convex, smooth; intervals with nearly

erect, ligulate scales, the striae apparently with no vestiture; apical calli tuberculate; length 1.17 times width. Venter with spaced, oval, white scales; (♀) fovea of 5th abdominal segment absent. Legs rufous; femoral teeth large, distinct, femoral vestiture of white ligulate scales; tibiae not mucronate; tarsal segment 4 equal to the combined length of 2 & 3; 4 projects beyond 3 equal to 3's length; tarsal claws each with a long distinct tooth, nearly bifid.

TYPES. A single specimen from Texas in the Ulke collection at the Carnegie Museum.

DISTRIBUTION: TEXAS.

Because of the small pygidium not visible from below, and the scarcely prominent anterior coxae, Dietz was inclined toward a generic separation of this species, but because the single specimen before him was a female, he declined to do so.

The only specimens seen, other than the type, were two specimens from Texas in the U. S. National Museum.

C. echinatus Fall

(Fig. 45)

C. echinatus Fall. 1917. Canad. Ent. XLIX: 386-387.

Length 2.4 mm.; width 1.5 mm. Entirely piceous brown. Head deeply contiguously punctate; hirsute; vertex with a short carina. Beak deeply punctate throughout, slightly striate basally; with long recurved hairs throughout; (♂) beak thick, .9 times the pronotal width or 1.2 times pronotal length. Antenna light brown to yellowish; (♂) scape inserted 1.0 times its length from beak apex; funicle 6-segmented; club long oval, acuminate. Pronotum with moderately large,

deep puncts, sometimes contiguous; sulcus complete, shallow; tubercles small, obtuse, not prominent; apical constriction slightly elevated; ocular lobes normally developed; vestiture of very long fine curved hairs and also a few narrow white scales at sulcus base and at hind angles; width 1.33 times length. Elytra with a postscutellar spot of lanceolate, white scales, the remainder with only long curved hairs; disc very tuberculate to muricate laterally; striae wide, shallow, deeply punctate; intervals flat except for tubercles; apical obsolete; length equal to width. Venter with elongate, lanceolate, white scales not dense except on side pieces; (σ) fovea of 5th abdominal segment shallow, a vague cusp laterally, equal to the length of the segment; pygidium concave, pilose. Legs piceous; femoral tooth on each leg small, acute, marked by tufts of hair; tibiae mucronate on all legs; tarsal segment 4 equal to the combined length of 2 & 3; 4 projects beyond 3 equal to 3's length; tarsal claws dentate.

TYPES. From Aweme, Manitoba, bearing the type label no. 25219, in the Museum of Comparative Zoology.

DISTRIBUTION. MANITOBA: Aweme.

All the specimens in the Museum of Comparative Zoology, the Canadian National Collection and the U.S. National Museum are from Aweme, Manitoba. The single specimen in the USNM bears a note in Buchanan's hand saying, "really 7 ant. segs. but the 7th ant. seg. seems part of the club".

The species is easily recognized by its muricate elytra bearing very long recurved setae.

Fall records Heuchera hispida (Criddle) as a host plant, and a specimen in the CNC also bears such a label.

C. decipiens Leconte

(Figs. 12, 46)

C. decipiens Leconte in Leconte and Horn. 1876. Rhynchophora of America North of Mexico, Proc. Amer. Phil. Soc. XV: 275.

Length 2.0 mm.; width 1.3 mm. Venter and head black, pronotum and elytra piceous black. Head coarsely punctate; vertex carinate; setate; interocular area flat. Beak punctate throughout, striate laterally from base to scape insertion, setate; (σ) beak length 1.25 times pronotal width or 1.49 times pronotal length. Antenna dark reddish brown; (σ) scape inserted .78 times its length from beak apex; funicle 6-segmented; club oval, acuminate. Pronotum with coarse, relatively deep, spaced puncts; sulcus obsolete except basally; tubercles vague, acute; apical margin not elevated; ocular lobes distinct; vestiture of brown, flat setae with a few broader white scales in the sulcus base; width 1.19 times length. Elytra shiny, with hair-like setae 1-2-seriate on intervals and white scales forming a distinct post-scutellar spot and vague apical spots; intervals convex, elevated, slightly tuberculate; apical calli obsolete; length 1.08 times width. Venter with ovate, white scales sparse except on sidepieces; (σ) fovea of 5th abdominal segment transversely oval, occupying about 1/2 the segment's length and 1/3 its width; pygidium punctate, with hair-like and slightly broader white scales. Legs reddish brown; femoral teeth small, evident; femoral vestiture of narrow, white scales; tibiae not mucronate; tarsal segment 4 equal to the combined length of 2 & 3; 4 projects beyond 3 equal to 3's length; tarsal claws with a small, acute, basal tooth.

TYPES. Two specimens in the Museum of Comparative Zoology

bearing the type label no. 3034; one from Michigan and one with no data.

DISTRIBUTION. ALBERTA: Lundbreck; COLORADO: MICHIGAN: Marquette; MANITOBA: Aweme, Broomhill; NEW YORK: ONTARIO: Britania, Mer Bleue, Ottawa, Sudbury, Trenton; SASKATCHEWAN: UTAH: WYOMING.

Dietz (1896) and Blatchley (1916) record California and North Carolina also.

Leconte described this species from two specimens, one from Michigan and one from Kansas. The type specimen without data is undoubtedly the Kansas specimen.

A specimen in the Canadian National Collection bears a label, "from willow", Aweme, Manitoba. Dr. W. J. Brown felt that perhaps the willow label was erroneous, because Cruciferae and willow grow together as low plants in this area, and perhaps the specimen was actually swept from a cruciferous plant instead of willow.

GROUP D

These species seem to form a fairly natural grouping. They are medium to large sized, exceeding 2.0 mm., usually by a noticeable margin. They all have toothed femora, and, with the exception of C. sericans, 7-segmented funicles. The toothed femora and 7-segmented funicle distinguish this group from all other American Ceutorhynchus species, except C. pervestitus, which is much more densely vestitured than members of this group, and C. sulcipennis in group C, which has distinctly muricate or tuberculate elytra.

Key to Species of Group D

1. Funicle 6-segmented sericans
 ---Funicle 7-segmented 2
2. Claws simple 3
 ---Claws toothed 4
3. Black, frons limited on each side by a row of erect
 scales, frons slightly concave isolatus
 ---Steel blue, head with coarse pubescence bolteri
4. Claw teeth long, sometimes nearly bifid 5
 ---Claw teeth short, acute 9
5. Pygidium with a deep narrow sulcus, pronotal
 tubercles obsolete punctiger

- Pygidium and pronotal tubercles normal 6
- 6. Scutellar spot present, elytral setae long, tarsi
 - and antennae red-brown quadridens
- Scutellar spot absent, elytra without long setae,
 - tarsi and antennae black 7
- 7. Vestiture of uniform narrow scales rapae
- Vestiture with some squamiform scales on elytra 8
- 8. Narrower vestiture of the elytra white squamosulus
- Narrower vestiture of the elytra brown subpubescens
- 9. Elytra metallic blue or green 10
- Elytra not metallic blue or green, black. 11
- 10. Interval 6 with 1-seriate setae, 1-2-seriate
 - elsewhere aeratus
- Interval 6 with partly 2-seriate setae, 2-3-seriate
 - elsewhere americanus
- 11. Without a postscutellar spot, general appearance
 - scurfy, diffuse interocular patch of white
 - scales, antennae yellow-brown rudis
- A postscutellar spot distinct or not, antennae
 - piceous 12
- 12. Postscutellar spot distinct on interstriae 1 and 2 . . . notatulus
- Postscutellar spot vague invisus

C. sericans Leconte

(Fig. 47, 17)

C. sericans Leconte in Leconte and Horn. 1876. Rhynchophora of America North of Mexico, Proc. Amer. Phil. Soc. XV: 275.

C. solitarius Fall. 1907. Trans. Am. Ent. Soc. XXXIII: 269. NEW SYNONYMY

Length 2.5 mm.; width 1.5 mm. Entirely black. Head with setaceous scales directed centrad; vertex with a short carina; interocular area slightly concave. Beak deeply punctate to scape insertion, striate laterally; narrow scales basally becoming narrower apically until they are mere hairs at apex; (♂) beak length .86 times pronotal width or 1.2 times pronotal length. Antenna piceous; (♂) scape inserted 1.14 times its length from beak apex; funicle 6-segmented; club long, oval, acuminate. Pronotum densely punctate; sulcus very deep basally, obsolete elsewhere; tubercles distinct, obtuse; apical constriction elevated; ocular lobes normally developed; narrow brown scales of disc directed cephalad on basal half and caudad on apical half, oval white scales on sides and a few along median line; width 1.4 times length. Elytra with well impressed, deeply punctate striae; intervals flat, rugulo-punctate; scales brownish, iridescent, ligulate, 3-4-seriate on intervals; scattered, narrow, white scales and fine setae in striae; postscutellar spot of white scales on interval 1; apical calli muricate; length 1.17 times width. Venter with moderately dense, white, variously shaped scales; (♂) fovea of 5th abdominal segment broad-oval, with vague lateral elevations, hairy within the depression; pygidium flat to concave with dense oval scales. Legs black with piceous tarsi; femoral tooth distinctly marked on all legs by tufted, white scales; femoral vestiture of narrow, ligulate scales slightly narrower than those on

the elytra, and scattered, wide-lanceolate scales similar to those on the abdomen; tibiae mucronate; tarsal segment 4 less than the combined length of 2 & 3; 4 projects beyond 3 equal to 3's length; tarsal claws each with a small, acute, basal tooth.

TYPES. A single specimen from California bearing the type label no. 3034 in the Museum of Comparative Zoology.

DISTRIBUTION. ARKANSAS: CALIFORNIA: Calaveras; COLORADO: Boulder, Gunnison, Veta Pass; IDAHO: MANITOBA: Aweme; NEW MEXICO: ONTARIO: Ottawa.

The confusion between C. sericans Leconte and C. solitarius Fall undoubtedly arose with Leconte's description stating that C. sericans was with 7-segmented funicles, when it really possesses 6-segmented funicles. When it is recognized that C. sericans has 6-segmented funicles it falls into Dietz's 'angulatus' group where it is apparently out of place, or very obviously different from other members of that group. It was apparently this trap that caused Fall to think that he had a new species in C. solitarius. A USNM specimen has the label attached, 'C. sericans Lec. with 6 fun. segs.', indicating that it had been recognized that certain specimens resembled C. sericans in every respect except the number of funicular segments stated by Leconte. Prior to seeing this note I had relaxed the type of C. sericans to examine the obscured antennae, and found that the funicle is really 6-segmented.

Fall's type of C. solitarius from Gunnison, Colo., bearing the type label no. 25226 is in the Museum of Comparative Zoology.

C. isolatus Dietz

(Fig. 16)

C. isolatus Dietz. 1896. Trans. Am. Ent. Soc. XXIII: 422.

Length 2.4 mm.; width 1.4 mm. Entirely black. Head deeply punctate; clothed with narrow, white scales and brownish setae; vertex with a short carina; interocular area concave. Beak striate, with erect setae and scales basally to scape insertion; length (σ) .895 times pronotal width or 1.21 times pronotal length. Antenna brownish black; (σ) scape inserted near beak middle or 1.43 times its length from beak apex; funicle 7-segmented; club ovate, acuminate. Pronotum deeply, distinctly, punctate; sulcus distinct except for median obsolescence; tubercles distinct, transverse; apical constriction very slightly elevated; ocular lobes moderately developed; narrow white scales in sulcus extremities and sparse on disc; brown, fine erect setae elsewhere; width 1.36 times length. Elytra with a salt and pepper effect due to white scales against black integument; scales very narrow, white, generally not densely distributed; a short postscutellar spot on interval 1 of long, oval, white scales; fine brown setae 1-seriate on intervals; intervals flat, rugulose; striae with a narrow white scale per each vague punct; apical calli muricate; length 1.18 times width. Venter with dense, lanceolate, white scales; punctation distinct; (σ) fovea of 5th abdominal segment oval, slightly elevated laterally, occupying the entire segment length and about 1/3 its width. Femora black, with large tooth on all legs, clothed with mixed narrow white scales and brown setae; tibiae brown, mucronate; tarsi brown, segment 4 equal to the combined length of 2 & 3; 4 projects beyond 3 equal to 3's length; tarsal claws edentate.

TYPES. A single specimen from Nevada in the Museum of Comparative Zoology bearing the type label no. 3013; and a single specimen from California, type no. 2761, in the Philadelphia Academy of Science.

DISTRIBUTION. IDAHO: Castleford, Hollister; MONTANA: NEVADA: Elko; CALIFORNIA: WASHINGTON: Yakima.

Dietz described this species from three specimens, one each from California, Montana and Nevada from his own and Ulke's collection. A specimen of C. isolatus in the Ulke collection at the Carnegie Museum does not bear a type label, but it possibly could be a type. A specimen in the USNM bears a label 'S. filipes' for which I cannot determine a significance.

C. bolteri Dietz

(Fig. 48)

C. bolteri Dietz. 1896. Trans. Am. Ent. Soc. XXIII: 432.

C. hirticollis Dietz. 1896. l.c., p. 433.

C. cyanipennis Julich. 1889. Ent. Am. V: 56-57.

C. erysimi (auct.)

Length 2.4 mm.; width 1.42 mm. Entirely black, the elytra bluish-black. Head with moderately large, deep spaced puncts and an indistinct, brown seta per punct; vertex finely carinate; interocular area flat and clothed with flat, brassy setae forming a very vague patch. Beak strio-punctate, sparsely setulate to scape insertion, weakly punctulate and naked apically; length (♀) about equal to pronotal width or 1.33 times pronotal length. Antenna black; (♀) scape inserted 1.25 times its length from beak apex; funicle 7-segmented; club broadly oval, acuminate. Pronotum with moderately coarse, deep, dense puncts;

vestiture of narrow white scales, not dense on sides and in sulcus; sulcus wide, moderately deep at extremities, obsolescent and narrower medially; tubercles distinct, acute; apical constriction not elevated; ocular lobes normally developed; width 1.27 times width. Elytra with broad, flat, rugulose intervals with small, recumbent, brown, 1-2-seriate setae; striae well impressed, distinct, punctate; apical calli distinct, muricate; a postscutellar spot of small, narrow, white scales; length 1.13 times width. Venter with lanceolate, white, spaced scales; (♀) fovea of 5th abdominal segment a shallow, round vague depression; pygidium concave, roughly punctate, sparsely setulate. Legs black; femora clothed with brassy, ligulate scales, tooth distinct on middle and hind femora, smaller on front femora; tibiae not mucronate; tarsal segment 4 equal to or slightly less than the combined length of 2 & 3; 4 projects beyond 3 equal to 3's length; tarsal claws edentate.

TYPES. A single specimen from Northern Illinois, type no. 3017, in the Museum of Comparative Zoology; and a single specimen in the Philadelphia Academy of Science also from Northern Illinois, type no. 2765, and bearing the label 'C. cyanipennis (Jullich test)'.

DISTRIBUTION. BRITISH COLUMBIA: Creston; ILLINOIS: INDIANA: MAINE: Isle-au-Haut; MASSACHUSETTS: MICHIGAN: NEW JERSEY: WISCONSIN.

Although the majority of the references to C. cyanipennis in American literature deal with C. americanus, the C. cyanipennis of Jullich is equal to C. bolteri, judging from the label on the C. bolteri type specimen in the PAS collection. C. hirticollis Dietz was placed in synonymy with C. bolteri by Blatchley (1916), a decision with which I have dubiously concurred. Dalla Torre and Hustache (1930) state C. hirtellus [C. hirticollis] is valid. The more predominant

form is the dark form, hirticollis, and are identified as such in collections. The only typical specimens of C. bolteri seen were the two types.

The specimen in the Canadian National Collection from Creston, British Columbia was collected from Cicuta occidentalis.

C. punctiger Gyllenhal

(Fig. 49, 14)

C. punctiger Gyllenhal. 1837. In Schoenherr, Gen. Sp. Curc. IV: 538.

C. punctiger var. rufitarsis Gyllenhal. 1837. l.c. p. 539.

C. marginatus (Amer. auct. nec Paykull)

Length 2.4 mm.; width 1.6 mm. Entirely black. Head roughly punctate; flattened, coppery setae generally, wide-lanceolate, white scales on posterior; carina on vertex distinct; interocular area concave. Beak punctate and setate throughout, more strongly so basally; length (σ) nearly as long as the pronotal width or 1.26 times the pronotal length. Antenna dark piceous to black; funicle 7-segmented; club long, acute, oval; (σ) scape inserted .75 times its length from beak apex. Pronotum with moderately coarse, dense puncts; sulcus deep basally, obsolete medially, shallow apically; tubercles obsolete; scutellum small, glabrous; apical constriction distinctly elevated; ocular lobes moderately developed; flattened, coppery setae generally, wide lanceolate, white scales on sides and in sulcal extremities; width 1.58 times length. Elytral striae well impressed, narrow; intervals flat, wide, rugulose; apical calli indistinctly muricate; coppery-bronze, 3-4-seriate, flat setae on intervals, white in striae; short, distinct postscutellar patch on interval 1 of oval white scales;

length 1.0 times width. Venter with dense, large, oval, white scales; (σ) fovea of the 5th abdominal segment large, oval, moderately impressed, well elevated laterally, occupying entire segment length; pygidium longitudinally, deeply sulcate, convex, coarsely punctate. Legs black with piceous tarsi; femora toothed on all legs, clothed with white, ligulate and wide-lanceolate scales; tibiae not mucronate; tarsal segment 4 equal to the combined length of 2 & 3; 4 projects beyond 3 equal to 3's length; tarsal claws each with a long tooth, nearly bifid.

TYPES. Types are unknown.

DISTRIBUTION. ALBERTA: BRITISH COLUMBIA: Vernon; ILLINOIS: INDIANA: IOWA: MANITOBA: Norden; MARYLAND: MASSACHUSETTS: Framingham, Watertown; MICHIGAN: East Lansing, Bath; MONTANA: NEW BRUNSWICK: Fredericton; NEWFOUNDLAND: Harmon Field, St. Johns; NEW JERSEY: NEW YORK: Ithaca, Ringwood, Wallface; NOVA SCOTIA: ONTARIO: Black Rapids, Moose Factory, Prince Edward Co.; OHIO: PENNSYLVANIA: QUEBEC: Aylmer, Fairy Lake, Kazubazua, Knowlton, Laprairie, Rimouski, St. Lambert; WASHINGTON.

Very close to C. marginatus Paykull, the species with which C. punctiger was confused by American authors until Buchanan (1937b) rectified the situation.

C. punctiger is very common on dandelion (Taraxacum officinale) but it also has been reported from lettuce (Proctor, 1938; Blatchley and Leng, 1916).

Hoffmann (1954) records Bracon maculiger Wsm. (Giraud) as a parasite.

C. quadridens Panzer

(Fig. 50)

C. quadridens Panzer. 1795. Deutschl. Ins.-Fn. p. 302.Rhynchaenus borraginis Gyllenhal. 1813. Ins. Suec. I: 227.Curculio calcar Panzer. 1800. Fn. Ins. Germ. ed. 2, 36, t. 13.Curculio pallidactylus Marsham. 1802. Ent. Brit. I: 259.Curculio quericola Marsham. l.c., p. 280.Ceutorhynchus seriesetosus Dietz. 1896. Trans. Am. Ent. Soc. XXIII: 442.

Length 2.8 mm.; width 1.6 mm. Entirely black. Head coarsely punctate; vertex carinate; yellowish scales near pronotal margin and a white interocular patch; interocular area flat to concave. Beak striate to scape insertion; naked; length (♀) equal to pronotal width or 1.38 times pronotal length. Antennal (♀) scape inserted 1.22 times its length from beak apex; funicle 7-segmented; club oval, acute. Pronotum with large, dense puncts; sulcus deep at extremities, interrupted a short distance medially; tubercles large distinct, transverse; apical constriction distinct; ocular lobes large; vestiture rather dense, of dirty-white, lanceolate scales; width 1.38 times length. Elytra with narrow striae and flat, faintly rugulose intervals; apical calli distinctly muricate; vestiture of lanceolate, dirty-white, very dense but irregular scales, those in the striae slightly narrower, setae long but not conspicuous except on declivity where they are more dense, scales a little condensed behind scutellum; length 1.19 times width. Venter with lanceolate scales a little wider than dorsal scales; (♀) fovea of 5th abdominal segment very vague; pygidium coarsely punctate and with dense scales similar to those on dorsum and few setae. Legs black with orange tarsi; femora with small, acute,

indistinct teeth, vestiture similar to that of dorsum; tibiae not mucronate; tarsal segment 4 less than the combined length of 2 & 3; 4 projects beyond 3 less than 3's length; each tarsal claw with a long slender tooth.

TYPES. Location of the types is unknown.

DISTRIBUTION. MASSACHUSETTS: Nantucket; NEW YORK: Cutchogue, Long Island; RHODE ISLAND.

Chittenden (1900) first mentioned C. seriesetosus Dietz as a synonym of C. quadridens Panzer, and further cites references to its host plants in Europe.

The first recorded account of the biology of C. quadridens is given by Goureau (1866, p. 171), who stated that the larvae feed in the roots or collars of Navette (rape) and Choux (all varieties of cabbage) where they are often found in company with Baris chlorizans. Perris (1877, p. 408) extends the host list to include cress and mustard. Bargagli (1885), according to Chittenden (1900) lists the flowers of Cochlearia armoracia (horse-radish) as a host also. Hoffmann (1954) lists as European hosts Brassica oleracea L., B. oleifera D. C., Sinapis arvensis L., Raphanus raphanistrum L., and R. maritimum Sm. for the larvae; and Sinapis alba L., S. pubescens L., Sisymbrium strictissimum L., S. officinale L. and S. austriacum Jacq. for the adults.

A specimen in the USNM bears the label 'red clover sweeps'.

Hoffmann (1954) lists as parasites Thersilochus triangularis Gr. (Ichneumonidae) and Diopilus affinis Wsm. (Braconidae).

C. rapae Gyllenhal

(Figs. 13, 51)

C. rapae Gyllenhal. 1837. In Schoenherr Gen. Sp. Curc. IV: 547.C. inaeffectus Crotch. 1865. Entomol. II: 260.C. sulcicollis Blatchley and Leng. 1916. Rhynchophora of N.E. America. p. 443.C. affluentus Dietz. 1896. Trans. Am. Ent. Soc. XXIII: 421.C. napi of Murtfeldt. 1888. Ann. Rept. State Hort. Soc. Mo. p. 123-128.

Length 3.0 mm.; width 1.75 mm. Entirely black. Head coarsely punctate, each punct with a pale, flat setae, broader white scales behind eyes; vertex distinctly carinate; interocular area flat. Beak striate past the scape insertion, smooth apically; setate to scape insertion, glabrous apically; length (♂) a little more than pronotal width or 1.37 times pronotal length. Antenna piceous; (♂) scape inserted 1.39 times its length from beak apex or at beak middle; funicle 7-segmented; club ovate, acute. Pronotum densely punctate; sulcus complete, distinct, shallower medially; tubercles low, obtuse, transverse; apical constriction slightly elevated; ocular lobes distinct; disc setate; sulcus and sides with white, broad lanceolate scales; width 1.3 times length. Elytra distinctly muricate on apical calli; intervals wide, flat, rugulose; striae well impressed; vestiture of 3-4-seriate, yellow-white, flat setae on intervals, a little wider, whiter and denser in striae; length 1.2 times width. Venter with dense, ovate to lanceolate, white scales; (♂) fovea oval, moderately deep, clothed like the abdomen, elevated laterally; pygidium with long setae and few lateral white scales, convex but slightly concave medially, punctate. Femora black, toothed but weakly so on fore legs, clothed

with yellow-white ligulate scales; tibiae mucronate; tarsi piceous, segment 4 equal to the combined length of 2 & 3; 4 projects beyond 3 equal to 3's length; tarsal claws each with a long tooth, nearly bifid.

TYPE: Location of the primary type is unknown.

DISTRIBUTION. ALBERTA: ARIZONA: ARKANSAS: CALIFORNIA: COLORADO: D.C.: GEORGIA: IDAHO: ILLINOIS: IOWA: KANSAS: KENTUCKY: MANITOBA: MARYLAND: MASSACHUSETTS: MICHIGAN: MINNESOTA: MISSOURI: MONTANA: NEBRASKA: NEW JERSEY: NEW MEXICO: NEW YORK: NORTH CAROLINA: NORTH DAKOTA: OHIO: ONTARIO: OREGON: PENNSYLVANIA: SASKATEWAN: SOUTH CAROLINA: UTAH: VIRGINIA: WASHINGTON: WEST VIRGINIA: WISCONSIN.

According to Blatchley and Leng (1916) C. rapae, the cabbage curculio, was introduced into New England about 1855. The present records show the beetle to be present in nearly all states except those of the Southeast. What Dietz considered C. rapae when he described C. affluens was apparently a misidentified specimen of C. assimilis thus leading him to believe that C. rapae of previous American authors was misapplied. Dietz's error was rectified by Chittenden (1900).

Recorded host plants for C. rapae are: kale, turnips, cabbage, horse-radish, cauliflower, Sisymbrium officinale, Lepidium virginicum, and Nasturtium.

A primary parasite is Omphale livida Ashmead (Chalcidae), (Chittenden, 1900; Pierce, 1907).

The vestiture color of C. rapae is more yellow in newly emerged specimens, and it was probably such specimens that Blatchley (1916) called C. sulcicollis Paykull, for which C. cyanipennis Germar is a synonym.

C. squamosulus Sleeper

C. squamosulus Sleeper. 1957. Pan-Pacific Ent. 33: 127-128.

MALE:- Oval, robust; black throughout; very densely clothed with coarse prominent white setae and broad, flat, oblong, white scales; the white scales on flanks of prothorax and ventral side, a few scattered ones on elytra. Rostrum longer than head and pronotum, slender, cylindrical, strongly curved, with a sharp, narrow, median carina and two lateral carina in basal two-thirds, inferior carina forming upper margin of scrope; sulci between the carinae deeply, finely and confluent punctured in basal two-thirds; apical third smooth, shining and finely punctured; base to insertion of antennae densely clothed with setae. Antennal insertion just beyond middle, scape attaining eyes; funicle 7-segmented, first segment robust and elongate, as long as the third and fourth combined, second elongate, one-half longer than third, third and fourth segments subequal. Club oval, robust, finely pubescent. Head coarsely, deeply and densely punctured. Eyes flat, completely hidden in repose. Prothorax one-fourth wider than long, the sides convergent to apex, the basal constriction very feeble; pronotum coarsely, deeply and densely punctured, sparsely clothed with white setae which are longer and finer than those of elytra; an entire median channel present, much deeper basally and apically. Scutellum small, narrow, linear, densely punctured, clothed with a few white scales. Elytra about one-fifth longer than wide, the sides feebly arcuate in basal three-fourths, then strongly convergent to apex; striae punctures deep, rounded, and close-set, each with a recumbent white seta; intervals flat, coarsely and closely punctured, each puncture with white seta, a few with broad white scales. Ventral side densely clothed with white

scales; abdominal segments coarsely and closely punctured, first abdominal segment feebly, longitudinally impressed at middle, fifth with a large, deep, transverse fovea which is limited laterally by prominent tubercles which are clothed with very fine erect setae; pygidium feebly concave, densely clothed with fine, long, erect setae. Legs densely clothed with coarse white setae and white scales, the white scales very few on tibiae, apical third of tibiae clothed with much finer and longer setae, femora armed with an obtuse tooth. Middle and posterior tibiae unguiculate. Fourth tarsal segment shorter than second and third combined. Claws divergent, armed with a long tooth. Length 3.4 mm., width 1.8 mm.

FEMALE:- Differs from the male in that the first abdominal segment is convex and not impressed, the fovea lacking from the fifth segment and the rostrum is more slender and smoother. Length 3.5 mm., width 1.9 mm.

HOLOTYPE, (♂), Creston, British Columbia, V-13-53, G. Stace Smith and allotype (♀), Creston, B.C., V-6-53, G. Stace Smith in the author's collection. Several paratypes as follows 1, V-10-54, 1, V-12-52 in the author's [Sleeper] collection; 2, V-10-54, 1, V-16-54, 1, V-11-53 in G. Stace Smith Collection. All material from Creston, B.C., G. Stace Smith collector. Length of paratypes 3.2-3.5 mm., width 1.7-1.9 mm. Swept from Thlaspi arvense.

The above description and data are transcribed from Sleeper (1957). I have not seen this species, but Sleeper states that it is very close to C. subpubescens Leconte, from which it differs in the much coarser and whiter pubescence, and the absence of a limiting ridge on the lateral margins of the fovea on the fifth abdominal segment.

C. subpubescens Leconte

(Fig. 52)

C. subpubescens Leconte in Leconte and Horn. 1876. Proc. Amer. Phil. Soc. XV: 273-274.

Length 3.1 mm.; width 1.85 mm. Body pitchy black. Head deeply punctate; setulose; vertex finely carinate; interocular area flat to slightly concave. Beak 3-carinate, strio-punctate to scape insertion, punctulate apically; sparsely setate throughout; length (σ) 1.17 times pronotal width or 1.52 times pronotal length. Antenna piceous; (σ) scape inserted 1.0 times its length from beak apex; funicle 7-segmented; club broad-oval, acuminate. Pronotum with deep, distinct, nearly contiguous puncts; sulcus complete, obsolescent medially; tubercles obtuse, not prominent; ocular lobes large; apical constriction not elevated; vestiture of setaceous hairs and a few narrow white scales basally and apically in the sulcus; width 1.29 times length. Elytral striae moderately deep, distinctly punctate; intervals flat, rugo-punctate; apical calli muricate; brown, 3-4-seriate, setaceous hairs and few, scattered, narrow-oval white scales on intervals; striae with regular squamiform setae; length 1.19 times width. Venter with oval dirty, yellow-white dense scales; (σ) fovea of 5th abdominal segment a distinct but shallow depression occupying the entire segment's length and about 1/2 its width, a cusp at the postero-lateral corner; Pygidium flat to concave, with long hairs generally and a few lateral lanceolate white scales. Legs black, tarsi piceous; femoral tooth present on all legs and marked by a tuft of scales, femoral vestiture of mixed large oval and setaceous scales; tibiae mucronate; tarsal segment 4 equal to the combined length of 2 & 3; 4 projects beyond 3 greater than 3's length;

tarsal claws with a long tooth, nearly bifid.

TYPES. Two specimens from California, type no. 3032, in the Museum of Comparative Zoology.

DISTRIBUTION. CALIFORNIA: N. Fork Lewis Creek; MANITOBA: Aweme, Baldur, Rocklake; UTAH.

Although the type specimens are labelled only 'Cala.', Leconte more specifically gives the type localities as Los Angeles and Tejon, California.

The species is somewhat variable, the pubescence of the elytra varying in coarseness and the white scales being more dense in some. The fovea of the fifth abdominal segment is bordered at the posterio-lateral corners by a cusp and not a ridge as stated by Dietz (1896). In this regard it does not differ from the very closely related species C. squamosulus Sleeper contrary to this distinction made by Sleeper (1957). The only other distinction seems to be that C. squamosulus is with coarser and whiter pubescence. C. squamosulus may be only a variant of C. subpubescens, but I have not seen any types of C. squamosulus to make such a judgement.

C. aeratus Dietz

C. aeratus Dietz. 1896. Trans. Am. Ent. Soc. XXIII: 431.

Length 2.5 mm.; width 1.47 mm. Pronotum and venter black, elytra bronzy-black. Head with large distinct puncts, a small seta per punct, nearly naked, vertex without a carina. Beak striopunctate to scape insertion, sparsely setate; length (σ) a little more than the pronotal width or 1.63 times pronotal length. Antenna light piceous; funicle 7-segmented; (σ) scape inserted .89 times its length from the

beak apex. Pronotum with large, close, deep puncts; sulcus shallow, moderately deep basally; tubercles small, distinct; scutellum long oval, glabrous; thinly clothed with short setae, with lanceolate, white scales in sulcus; width 1.52 times length; ocular lobes prominent. Elytral striae well impressed, distinctly punctate; intervals slightly convex, not much wider than striae, shiny; a postscutellar spot of white scales; apical calli obsolete; length 1.25 times width. Venter sparsely clothed, except sidepieces with white scales; (σ) fovea of 5th abdominal segment large, round-oval, occupying apical half of segment, laterally elevated; pygidium not coarsely punctate. Legs black; femora of middle and hind leg with a rather large tooth; tibiae not unguiculate; tarsal segment 4 less than the combined length of 2 & 3; 4 projects beyond 3 less than 3's length; tarsal claws with a short, acute, basal tooth.

TYPE. A single specimen from Ohio in the Ulke collection at the Carnegie Museum.

DISTRIBUTION. OHIO.

The only specimen of C. aeratus known to me is the Ulke specimen, which is not designated as a type in the Carnegie Museum.

Buchanan (1937a) contrasts this species with C. americanus finding it very similar.

C. americanus Buchanan

(Figs. 15, 53)

C. americanus Buchanan, 1937. Bul. Bkln. Ent. Soc. XXXII: 205-207.

C. cyanipennis (Amer. auct.)

Length 2.1-3 mm.; width 1.1-1.6 mm. Blackish aeneous, elytra metallic blue or green. Head coarsely punctate, each punct with a fine

seta; vertex carinate; interocular area flat to slightly concave. Beak punctate and striolate to scape insertion, very finely punctulate apically; each punct with a fine seta; length () about equal to pronotal width or 1.6 times pronotal length. Antenna piceous; male scape inserted 1.0 times its length from beak apex; funicle 7-segmented; club oval, acuminate. Pronotum coarsely punctate; sulcus distinct at extremities, shallow medially; tubercles feeble; apical constriction moderately elevated and faintly emarginate; ocular lobes normally developed; fine seta per punct on disc and narrow white scales along sulcus; width 1.43 times length. Elytra with a postscutellar patch of white scales; intervals flat, shiny, with fine, short, 2-3-seriate setae; apical calli obsolescent, slightly muricate; length 1.2 times width. Venter with dense, ovoid, white scales continuing onto pronotal sides; abdominal scales less dense; male fovea of fifth abdominal segment deep, round, diameter about equal to $1/3$ the segment's length; pygidium slightly concave, punctate, finely setate. Legs piceous black; middle and hind femora distinctly toothed; femora clothed with white, ligulate scales; tibiae unguiculate; tarsal segment 4 less than the combined length of 2 and 3; 4 projects beyond 3 equal to 3's length; tarsal claws with an acute basal tooth.

TYPES. The holotype is from Iowa City, Iowa, type no. 52214, in the U. S. National Museum. Numerous paratypes in the USNM are from: ARKANSAS: Fayetteville; COLORADO: Greeley, Rocky Ford; IDAHO: Pocatello; ILLINOIS: (Southern); INDIANA: Knox; IOWA: Estherville, Guttenburg, Independence, Iowa City, Lake Okoboji, Sibley, Spirit Lake, Williamsburg; KANSAS: Wellington; LOUISIANA: Baton Rouge, Tallulah; MARYLAND: Plummer Island; MISSISSIPPI: Natchez; MISSOURI: St. Louis;

NEW JERSEY: Hillsdale; NEW YORK: Buffalo, Ilion, Thaca, Orangeburg;
 NORTH DAKOTA: University; TEXAS: Dallas, Gainsville, Mesquite;
 WISCONSIN: Madison; ALBERTA: Edmonton; BRITISH COLUMBIA: Salmon Arm;
 MANITOBA: Aweme; ONTARIO: Toronto; QUEBEC: Montreal.

DISTRIBUTION. Besides the substantial distribution records for the type material, additional records include ALASKA: CALIFORNIA: MASSACHUSETTS: MICHIGAN: MINNESOTA: NOVA SCOTIA: SASKATCHEWAN.

This species is not uncommon on mustard in Michigan.

C. rudis Leconte

(Fig. 54)

C. rudis Leconte in Leconte and Horn. 1876. Proc. Amer. Phil. Soc. XV: 275.

Length 2.5 mm.; width 1.6 mm. Head and body black; scurfy looking. Head with distinct, round, deep puncts, vertex carinate; fine setae generally and a diffuse interocular patch of narrow white scales. Beak coarsely punctate and striate to scape insertion, weakly punctulate apically; setiferous to scape insertion, glabrous apically; length (♀) about equal to pronotal width or 1.38 times pronotal length. Antenna yellow-brown with piceous club; (♀) scape inserted 1.17 times its length from beak apex; funicle 7-segmented; club ovate. Pronotum with deep, coarse puncts; sulcus distinct, deeper at extremities; tubercles obsolete; apical constriction abrupt, elevated; ocular lobes not well developed; vestiture of narrow, ligulate scales with lanceolate scales along sulcus; with 1.5 times length. Elytra with well impressed, deep puncted striae; intervals convex, rugulose, about equal to stria width; apical calli slightly muricate; narrow, yellow, 2-4-seriate, ligulate

scales and diffuse, translucent, round-oval scales on intervals; strial setae similar to narrower interval vestiture; length 1.3 times width. Venter with oval, white, dense scales, scattered areas of brownish, ligulate setae on abdomen; (♀) fovea absent on 5th abdominal segment. Legs rufous-brown; all femora toothed, clothed with narrow, ligulate scales and an oblique ring of narrow oval scales just basad of tooth; tibiae not mucronate; tarsal segment 4 about equal to the combined length of 2 & 3; 4 project beyond 3 a little greater than 3's length; tarsal claws with a short, distinct tooth.

TYPES. A single specimen from Kansas, type no. 3033, in the Museum of Comparative Zoology.

DISTRIBUTION. IDAHO: Hagerman Valley; KANSAS.

The type is a female according to Leconte, and badly damaged. In its present condition it is without an abdomen. A specimen in the U. S. National Museum bears the label 'S. altissimum', undoubtedly Sisymbrium altissimum.

C. notatulus Fall

(Fig. 55)

C. notatulus Fall. 1907. Trans. Am. Ent. Soc. XXXIII: 269.

Length 2.8 mm.; width 1.7 mm. Head and body black. Head densely, deeply punctate; suberect setae generally and narrow oval scales near pronotal border; vertex carinate to eye level. Beak strio-punctate to scape insertion, finely punctate apically; suberect flat setae basally, otherwise glabrous; length (♀) about equal to pronotal width or 1.37 times pronotal length. Antenna piceous; (♀) scape inserted 1.5 times its length from beak apex; funicle 7-segmented; club broad oval,

acuminate. Pronotum with moderate sized, deep puncts; sulcus complete, less deep medially; tubercles obtuse, not prominent; apical constriction distinct, not elevated; ocular lobes moderately large; vestiture of flat, brown setae generally; narrow oval, white scales along sulcus and scattered, broad, oval, white scales on disc; width 1.44 times length. Elytra with flat, rugo-punctate intervals; striae wide, deeply punctate with a flat, white seta per punct; scale-like setae brown and general on the disc, broad oval white scales sparsely scattered and also forming a distinct postscutellar patch on intervals 1 and 2; length 1.12 times width. Venter with dense, broadly oval, off-white scales; (♀) fovea absent from 5th abdominal segment; pygidium concave and with mixed hairs and oval scales. Legs reddish brown; femoral tooth marked on all legs by a tuft of scales, general vestiture of mixed broad oval and ligulate scales; tibiae not mucronate; tarsal segment 4 equal to the combined length of 2 & 3; 4 projects beyond 3 more than 3's length; tarsal claw with a long distinct tooth.

TYPE. A single female specimen from Pecos, New Mexico, type no. 25223, in the Museum of Comparative Zoology. This is the only known specimen of the species.

C. invisus Fall

(Fig. 56)

C. invisus Fall. 1917. Canad. Ent. XLIX: 388.

Length 2.35 mm.; width 1.45 mm. Head and body black. Head deeply punctate; intermixed, brown and white, setaceous scales; vertex carinate; interocular flat. Beak striate and punctate to scape insertion, remotely punctulate apically, setulose to scape insertion;

length (♀) .85 times pronotal width or 1.13 times pronotal length. Antenna piceous; (♀) scape inserted 1.71 times its length from beak apex; funicle 7-segmented; club long-oval, acuminate. Pronotum with large, deep, distinct puncts; sulcus vague but more distinct at extremities; tubercles acute, not distinct; apical constriction not elevated; ocular lobes distinct; vestiture of general, brown setae and of narrow, white scales in sulcus extremities; width 1.33 times length. Elytra nearly entirely setaceous, neither dense nor sparse, brown and white, the brown setae 2-seriate on intervals, a vague postscutellar patch; intervals flat to slightly convex; striae deeply punctate; length 1.11 times width. Venter with large, shallow, distinct puncts; scales white, lanceolate, relatively dense; (♀) fovea absent from 5th abdominal segment; pygidium punctate, flat, erect white setae and small round white scales. Legs black, tarsi brown; femora all toothed but vague on front legs, clothed with very narrow white scales; tibiae not mucronate; tarsal segment 4 equal to the combined length of 2 & 3; 4 projects beyond 3 slightly less than 3's length; tarsal claws with a short basal tooth.

TYPE. A single specimen from Aweme, Manitoba, type no. 25221, in the Museum of Comparative Zoology.

DISTRIBUTION. MANITOBA: Aweme, Baldur, Onah, Tresbank;
SASKATCHEWAN: Saskatoon; ARIZONA: Grand Canyon.

A specimen from Aweme, Manitoba in the Canadian National Collection bears the host label, 'Erysimum naperum.'

GROUP E

This group is composed of primarily small species, usually less than 2.0 mm. in length. The combination of characters of mutic femora, 6-segmented funicle and simple claws distinguishes this group from other species of American Ceutorhynchus. The pronotal punctation is relatively coarse, the tubercles are small to obsolete, and the apical margin is not elevated.

Key to Species of Group E

1. A distinct sutural vitta formed of scales distinct
 in form and color from disc scales 2
---No distinct sutural vitta 3
2. Elytra dark reddish brown, pronotal disc vestiture
 of flattened setae medialis
---Elytra bicolorous, ferruginous apically, pronotal
 disc vestiture of fine setae and few scattered
 white scales semirufus
3. Elytra piceous black or black, vestiture of flat
 setae 4
---Elytra red-brown, or if rarely black with scattered
 broad oval, white scales 6

4. Elytra piceous black, vestiture sub-erect puberulus
 ---Elytra black, vestiture prone 5
5. Antenna yellowish, sutural vitta rarely
 present septentrionalis
 ---Antenna piceous, a vague sutural vitta floralis
6. Elytra bicolorous, paler apically floridanus
 ---Elytra unicolorous 7
7. Antenna yellowish atriculus
 ---Antenna piceous to reddish. 8
8. Length 1.5 mm., head vestiture white zimmermanni
 ---Length 2.0 mm., head vestiture yellowish,
 elytra shiny 9
9. Elytra black, tibiae and tarsi piceous morosus
 ---Elytra reddish, tibiae and tarsi reddish erythropus

C. medialis Leconte

C. medialis Leconte in Leconte and Horn. 1876. Proc. Amer. Phil. Soc. XV: 279.

Length 1.9 mm.; width 1.2 mm. Venter and pronotum black, apical margin of the pronotum lighter, elytra dark reddish brown. Head clothed all over and down onto the beak base with white, flattened setae; vertex not carinate; interocular area flat. Beak punctate to scape insertion and very weakly so beyond; glabrous on apical three-fourths; length (♂) about equal to pronotal width or 1.5 times pronotal length. Antenna yellow; funicle 6-segmented; club long-oval, acuminate; (♂)

scape inserted 1.77 times its length from beak apex or at beak middle. Pronotum with moderately coarse puncts; sulcus deep, shallow at middle; tubercles obsolescent; scutellum small, glabrous; apical margin straight, hardly elevated; ocular lobes normally developed; vestiture of sparse, hair-like, pale setae, a few broader ones along basal pronotal margin and in sulcus base, more dense on sides; width 1.5 times length. Elytra with flat intervals twice the strial width; striae with inconspicuous setae; apical calli obsolescent; interval vestiture 2-3-seriate, pale, narrow-ligulate scales, a postscutellar and sutural vitta of broader, but still narrow, white scales, similar scales on intervals 10 and 11; length 1.2 times width. Venter with oval, white, moderately dense scales; narrower and less dense scales on abdomen; (♂) fovea of 5th abdominal segment broad, moderately deep, nearly as long as the segment, open posteriorly; pygidium shiny, pubescent, punctate. Legs light reddish brown, tarsi yellowish; femora mutic, clothed with narrow ligulate scales; tarsal segment 4 less than the combined length of 2 & 3; 4 projects beyond 3 about equal to 3's length; tarsal claws edentate.

TYPES. A single specimen in the Museum of Comparative Zoology, type no. 3044, no other data.

DISTRIBUTION. ILLINOIS: LOUISIANA: Bayou Sara, New Orleans; MISSISSIPPI: MISSOURI: TENNESSEE.

Blatchley and Leng (1916) record this species from Clark Co., Indiana also. The type is without data, but Leconte gives 'Lake Superior' as the type locality. Glick (1939) lists C. medialis from an aerial collection taken from 200 feet over Tallulah, Louisiana.

This species is somewhat variable in size and vestiture, but in general is consistent with descriptions of it.

C. semirufus Leconte

(Fig. 58)

C. semirufus Leconte in Leconte and Horn. 1876. Proc. Amer. Phil. Soc. XV: 278.

Length 1.75 mm.; width 1.05 mm. Venter, pronotum and head black; elytra piceous-black basally, ferruginous apically. Head deeply distinctly punctate; vertex finely carinate; oval, white scales near pronotal margin, fine setae on front. Beak deeply punctate to scape insertion, smooth apically; naked; length (♀) equal to pronotal width or 1.49 times pronotal length. Antenna piceous; (♀) scape inserted 1.1 times its length from beak apex; funicle 6-segmented; club oval, acuminate. Pronotum with large, deep, distinct puncts; sulcus complete, shallow, obsolescent medially; tubercles moderately distinct; apical constriction not elevated; ocular lobes well developed; oval, white scales on sides and anteriorly and posteriorly in the sulcus; disc with fine, inconspicuous setae; width 1.49 times length. Elytral intervals convex; striae shallow except basally, deeply punctate; round-oval, white scales forming a postscutellar patch, sutural vitta and lateral patches; diffuse on elytral bases; fine, short strial setae; length 1.13 times width. Venter with large, oval, white, dense scales, smaller and more spaced on abdomen; (♀) fovea absent on 5th abdominal segment; pygidium convex, punctate and inconspicuously setulate. Legs golden-yellow; femora mutic, clothed with ligulate, white scales and few wider scales basally; tibiae not mucronate; tarsal segment 4 about equal to the combined length of 2 & 3; 4 projects beyond 3 about equal to 3's length; tarsal claws edentate.

TYPES. A single specimen from Michigan, type no. 3043, in the

Museum of Comparative Zoology.

DISTRIBUTION. ILLINOIS: Edgebrook; INDIANA: Lake Co., Steuben Co.; IOWA: MASSACHUSETTS: MICHIGAN: Detroit; NEW HAMPSHIRE: NEW JERSEY: NEW YORK: Batavia, Buffalo, Newport, Portage, Poughkeepsie, Suffern, Windsor; ONTARIO: Ottawa; QUEBEC: Kazubazua, Knowlton. (The New York localities Newport, Poughkeepsie, Suffern, and Windsor are according to Leonard (1926). Leconte gives Detroit, Michigan as the type locality, but the type reads Michigan only.

Blatchley and Leng (1916) record this species as taken from Vaccinium corymbosum. L.

C. semirufus is easily recognized by its bicolorous elytra with a distinct sutural vitta of white scales.

C. puberulus Leconte

(Fig. 57)

C. puberulus Leconte in Leconte and Horn. 1876. Proc. Amer. Phil. Soc. XV: 279.

Length 1.45 mm.; width .85 mm. Head and body piceous-black. Vertex of head not carinate; interocular area flat. Beak striolate to scape insertion, smooth apically; naked; length (♀) about equal to pronotal width or 1.5 times pronotal length. Antenna yellowish; (♀) scape inserted 1.33 times its length from beak apex; funicle 6-segmented, the first segment very stout; club ovate. Pronotum rugo-punctate; sulcus complete, shallow; tubercles obsolescent; apical constriction not elevated; ocular lobes weak; clothed with yellowish, ligulate setae; width 1.56 times length. Elytra a little shiny, intervals slightly convex, striae moderately impressed; intervals with 2-seriate, yellowish,

sub-erect, ligulate setae; apical calli muricate; length 1.11 times width. Venter with relatively deep, large puncts; clothed with well spaced, wide-lanceolate, white scales; (♀) fovea absent from 5th abdominal segment; pygidium with large, dense puncts, few hairs, flat to slightly convex, vertical. Legs piceous; femora mutic, clothed with iridescent, ligulate scales; tibiae not mucronate; tarsal segment 4 less than the combined length of 2 & 3; 4 projects beyond 3 less than 3's length; tarsal claws edentate.

TYPE. Two specimens with no data, type no. 3045, in the Museum of Comparative Zoology.

DISTRIBUTION. CALIFORNIA: Alameda Co., Bent Co.; D.C.: ILLINOIS: INDIANA: Starke Co.; IOWA: KANSAS: MAINE: MASSACHUSETTS: MICHIGAN: NEW JERSEY: NEW MEXICO: NEW YORK: Clayville, Nassau, Newport, Orangeburg, Poughkeepsie, Schorharie, West Point; ONTARIO: Ottawa; PENNSYLVANIA: QUEBEC: Montreal; WISCONSIN.

The New York localities are according to Leonard (1926).

This species resembles very closely C. septentrionalis, but differs in the smaller size, suberect elytral vestiture, and the beak slightly longer and more slender.

C. septentrionalis Gyllenhal

(Figs. 18, 59)

C. septentrionalis Gyllenhal. 1837. In Schoenherr, Genera Sp. Curc. IV: 492.

Length 1.8 mm.; width 1.1 mm. Integument entirely black. Head clothed generally with brassy, ligulate scales; densely punctate with moderately sized puncts; vertex with a short obscure carina;

interocular area flat. (♂) beak 1.45 times length of pronotum, about equal to its width; not strongly punctate and striate to scape insertion, shiny apically. Antenna yellow-brown; (♂) scape length equal to its distance from the beak apex; funicle 6-segmented, the first segment thickened and longest, the remainder progressively shorter; club elliptical. Pronotum rugo-punctate; sulcus complete but very shallow medially; tubercles low obtuse; vestiture of evident, brassy, ligulate scales with a few oval, white scales basally in the sulcus and in front of the tubercular area; width about 1.5 times length; apical constriction not elevated; ocular lobes weak; scutellum small, glabrous. Elytra with regular 2-seriate, brassy, ligulate scales and oval, white scales forming a weak postscutellar condensation and a suggestion of a sutural vitta; short hair-like setae in the striae; striae well defined, moderately impressed; intervals flat, rugulose; apical calli muricate, not very prominent; length about 1.2 times width. Venter with broad, oval, white, nearly contiguous scales; (♂) fovea of 5th abdominal segment broad, oval, not deep, slightly elevated laterally; pygidium coarsely punctate, slightly convex, setaceous. Femora mutic, clothed with brassy, ligulate scales; tibial mucros distinct; legs black with piceous tarsi; segment 4 less than the combined length of 2 & 3, and projecting beyond 3 less than 3's length; tarsal claws edentate.

TYPES. Location of type is unknown. Gyllenhal gives Boston as the type locality.

DISTRIBUTION. COLORADO: D.C.: GEORGIA: ILLINOIS: IOWA: KENTUCKY: LOUISIANA: MAINE: Bar Harbor, Mount Desert; MARYLAND: MASSACHUSETTS: MICHIGAN: E. Lansing, Bath, Wayne; NEW BRUNSWICK: Chatham; NEW JERSEY: NEW YORK: Nassau, New York City, Newport,

Orangeburg, Poughkeepsie, Rochester, West Point; ONTARIO: Brittania, Mer Bleue, Ottawa, Trenton; PENNSYLVANIA: QUEBEC: Ft. Coulonge, Hakefield, Kazubazua; TENNESSEE: VIRGINIA: WISCONSIN.

C. septentrionalis is very similar in appearance and distribution to C. puberulus, and is often confused with it. It differs in its larger size, appressed elytral vestiture, and slightly shorter beak.

C. septentrionalis has been collected from Armoracia lapathifolia (Horse-radish), Barbarea barbarea, B. vulgaris (yellow rocket), Brassica spp. Cornus flowers, Lepidium virginicum, and Sisymbrium officinale (hedgemustard) (Pierce, 1907; Proctor, 1938; Blatchley and Leng, 1916).

C. floralis (Paykull)

(Fig. 19)

Curculio floralis Paykull. 1792. Monogr. Curc. p. 73.

Rhynchaenus floralis Fabricius. 1801. Syst. El. II: 450.

Ceutorhynchus floralis Gyllenhal. 1837. In Schoenherr, Genera Sp. Curc. IV: 493.

Curculio typhae Herbst. 1795. Kaf. VI: 415, t. 42, f. 11.

Cryptorhynchus typhae Illiger. 1807. Mag. Ins. VI: 331.

Curculio sulculus Marsham. 1802. Ent. Brit. I; 258.*

Curculio monostigma Marsham. l.c., p. 257.

This species greatly resembles C. septentrionalis in most respects except the antennae are piceous instead of yellow-brown. The series of white scales along the elytral suture is more conspicuous, but occasionally this character appears among specimens of C. septentrionalis

*A. Hoffmann (1954, p. 890) gives C. sulcatus Marsham as the synonym for C. floralis Paykull, but the citation by Dalla Torre and Hustache (1935) is followed here although it may be the wrong spelling.

also. The legs and elytra of C. floralis are shiny black, and are piceous-black in C. septentrionalis; the female scape length in relation to its distance from the beak apex is less in C. floralis than in C. septentrionalis; and the 5th abdominal segment is almost imperceptibly flattened medially whereas it is evenly convex in C. septentrionalis.

TYPES. Location of the Paykull types is unknown.

DISTRIBUTION. NEWFOUNDLAND: Marmon Field; NOVA SCOTIA: Dartmouth, Kentville, Tusket; ONTARIO: Ottawa.

This species is generally distributed throughout Europe. It was first detected in America by Dr. W. J. Brown from collections made in Nova Scotia in 1947. The identification was verified as Sirocalus floralis by Balfour-Brown of the British Museum.

Hoffmann (1954) lists as host plants: Lepidium draba L., Nasturtium silvestre R. Br., Barbarea praecox R. Br., Capsella bursa-pastoris Moench, Erysimum cheiranthoides L., Sisymbrium thalianum Gay, S. sophia L., Arabis alpina L., Lepidium sativum L., Thlaspi arvense L., Cakile maritima Scop. and Crambe maritima L.

Hoffmann (1954) distinguishes three races of C. floralis depending upon whether the elytral vestiture is arranged in two, three, or one series per interval. The typical form with the 2-seriate vestiture is the one found in America.

C. floridanus Leng

C. floridanus Leng. 1916. In Blatchley and Leng. Rhynch. N. E. Amer. p. 452

Broadly oval. Dark reddish-brown, somewhat paler and more evidently red at apex of elytra and beneath; with sparse rounded white

scales, condensed about the scutellum and along the apical third of the suture, and forming a vague spot toward apex, but involving neither apex, suture nor margin. Thorax coarsely, confluent punctate, median channel feebly impressed and abbreviated in front, sides arcuate, lateral tubercles of disc small but acute at summit. A few rounded white scales feebly indicate the lateral stripes seen in semirufus. Elytra deeply punctate, striate, intervals tuberculate toward apex, punctate; the rounded white scales are more thickly placed on the inflexed portion of the elytra and parts of the body beneath. Legs red and sprinkled with white scales. Resembles semirufus in form and size, but differs especially in the darker color and absence of the sutural line of white scales. Length 2 mm.

Enterprise, Fla., April 11. Kissimmee, Fla., Feb. 16. Specimens associated with the type from Enterprise, April 17, and Mobile, Ala., March 28 (Loding), differ only in having the markings of white scales less distinct.

I have not seen this species, and the above is transcribed from Blatchley and Leng (1916).

C. atriculus Dietz

C. atriculus Dietz. 1896. Trans. Am. Ent. Soc. XXIII: 451.

Length 1.75 mm. Head, thorax and venter; elytra dark red-brown. Head roughly punctate with an inconspicuous seta per punct; vertex obscurely carinate; interocular area flat to slightly convex. Beak weakly punctulate to scape insertion, weaker apically; entirely glabrous; length (♀) about equal to pronotal width or 1.47 times pronotal length. Antenna yellowish; funicle 6-segmented; (♀) scape inserted 1.5 times

its length from beak apex; club acuminate oval. Pronotum with large, close, rough puncts; sulcus shallow, obsolete medially; tubercles very small, obsolescent; scutellum small, glabrous; apical constriction not elevated; ocular lobes weak; vestiture of very sparse, yellowish, ligulate setae, nearly naked, more evident on sides; width 1.42 times length. Elytral intervals convex; striae moderately impressed and with moderately deep puncts with an inconspicuous hair per punct; intervals with flat, yellowish, sparse, 2-seriate setae; small oval scales form a very vague postscutellar spot, a very vague sutural vitta, and scatterings on the sides; apical calli with few distinct murications; length 1.12 times width. Venter with large, oval, moderately dense, white scales; (♀) fovea absent from 5th abdominal segment; pygidium punctate, convex, sparsely vestitured. Legs reddish brown with paler tarsi; femora mutic, clothed with flat, yellowish, not very dense hairs; tibiae not mucronate; tarsal segment 4 less than the combined length of 2 & 3; 4 projects beyond 3 less than 3's length; tarsal claws edentate.

TYPES. A single female specimen from Pennsylvania in the Ulke collection at the Carnegie Museum.

DISTRIBUTION. PENNSYLVANIA: D. C.

The D. C. locality is according to Blatchley and Leng (1916).

C. zimmermanni Gyllenhal

(Figs. 20, 60)

C. zimmermanni Gyllenhal. 1837. In Schönherr, Genera Sp. Curc. IV: 492.

Length 1.5 mm.; width .95 mm. Pronotum and venter black, elytra and legs reddish brown. Head clothed with narrow oval, white scales; punctation not distinct; vertex with a very weak carina; interocular

area slightly convex. (σ) beak about 1.3 times the pronotal length or about equal to the pronotal width; naked; slightly striate above scrobe; other sculpturing indistinct. Antenna piceous; (σ) scape inserted 1.0 times its length from beak apex; funicle 6-segmented; club elliptical. Pronotum with moderately sized, deep, close puncts; sulcus not deep basally, obsolete elsewhere; tubercles small, indistinct, obtuse; few oval, white scales in the sulcus extremities and on the sides at the hind angles; small ligulate scales elsewhere; apical margin broad, not elevated; width about 1.4 times length. Elytra with oval white scales forming a vague postscutellar patch and sparsely scattered on disc; white, ligulate, 2-seriate on intervals; intervals wide, flat, rugulose; striae sharply delimited, well impressed; apical calli slightly muricate; length about 1.2 times width. Venter with large, rounded, contiguous to imbricate scales, spaced on abdomen. Pygidium densely and finely punctate. (σ) fovea of 5th abdominal segment oval, shallow. Legs reddish brown; femora mutic, clothed with spaced, white, ligulate scales; tibiae not mucronate; tarsal segment 4 about equal to the combined length of 2 & 3; 4 projects beyond 3 about equal to 3's length; tarsal claws edentate.

TYPES. According to Schoenherr (1837), the type locality is septentrional America, Pennsylvania; and the type at that time was in Schoenherr's collection.

DISTRIBUTION. FLORIDA: IOWA: INDIANA: MANITOBA: NORTH CAROLINA: ONTARIO: PENNSYLVANIA: TEXAS: VIRGINIA.

Blatchley and Leng (1916) list Colorado in the range of C. zimmermanni, with the habitat as herbage in low damp places.

C. morosus Dietz

C. morosus Dietz. 1896. Trans. Am. Ent. Soc. XXIII: 451.

Very closely resembles rufipes*, with which it agrees in all particulars, except the following: Black, tibiae and tarsi piceous, antennae reddish brown, inserted two-fifths from the base (♀), joints 1-3 of funicle elongate, slender, 4-6 short; prothorax very densely punctured in its basal half. Elytra shining; tibiae slender, parallel, not at all widened to the apex, fourth tarsal joint shorter, projecting less than the length of the third joint. Length 2.25 mm.; 0.09 inch.

Hab.--Virginia

A female specimen in Mr. Bolter's coll. It is with some hesitation that I consider this as distinct from erythropus. The single specimen is very much abraded, but what is left of the pubescence would seem to indicate that it is finer than in rufipes*, the hair-like scales are bistriate under high amplification, a character not observed in rufipes*. The difference in the insertion of antennae is very marked, both type specimens being females, likewise the relative length of the fourth tarsal joint.

I have not seen this species and the above description and information is transcribed directly from Dietz (1896).

TYPES: A single specimen from Virginia in the Bolter collection according to Dietz (1896) and Blatchley and Leng (1916). The Bolter collection is supposedly at Urbana, Illinois.

C. erythropus Dietz

C. erythropus Dietz. 1896. Trans. Am. Ent. Soc. XXIII: 450.

Length 2.0 mm. Head, pronotum and venter black; elytra reddish. Head coarsely punctate; with moderately dense, yellowish, ligulate setae; interocular area flat to moderately convex. Beak reddish; distinctly punctate to scape insertion; entirely naked; length (♀) .89 times pronotal width or 1.04 times pronotal length. Antennal scape

*Apparently in error for C. erythropus.

and first funicular segment reddish, the remainder piceous; funicle 6-segmented; club acute, oval; (♀) scape inserted 1.25 times its length from beak apex. Pronotum with dense, deep, moderately large, close puncts; sulcus shallow, obsolete medially; tubercles small, acute; apical constriction not elevated; ocular lobes small; vestiture of yellowish, ligulate setae and a cluster of oval, white scales in sulcus extremities; width 1.16 times length. Elytral striae moderately impressed, distinctly punctate; intervals moderately rough, shiny; apical calli with few distinct murications; broad, oval, white scales generally scattered, condensed in a vague diffuse postscutellar spot; smaller, yellowish, 2-3-seriate, narrow-oval scales generally; length 1.18 times width. Venter with moderately dense, oval, white scales; (♀) fovea absent from 5th abdominal segment; pygidium flat, roughly punctate, clothed with yellowish, ligulate setae. Legs reddish; femora mutic, clothed with moderately dense, ligulate setae; tibial mucros absent; tarsal claw edentate.

TYPES. A single female specimen from D. C. in the Ulke collection at the Carnegie Museum.

DISTRIBUTION. D.C.

Blatchley and Leng (1916) recorded Plummers Island, Maryland as a locality from a specimen in the U.S. National Museum, but such a specimen does not seem to be in that collection now. In his discussion of C. morosus, Dietz (1916) refers to this species as rufipes.

GROUP F

Group F is an artificial assemblage united by the common characters of 7-segmented funicle, untoothed tarsal claws and mutic femora. Most members of this group are 2.0 mm. or less in length, but a few exceed this by a good margin. The group is quite heterogenous with some species more closely related to members of groups G or D.

Key to Species of Group F

1. Elytra metallic green erysimi
 ---Elytra black to red-brown, but not metallic 2
2. Elytra bicolorous, apices paler 3
 ---Elytra unicolorous 4
3. Length 1.6 mm., elytra rufous only at the very
 apex hearnei
 ---Length 2.0 mm., elytra rufous on part of the disc pusio
4. Length exceeding 2.2 mm. 13
 ---Length less than 2.0 mm. 5
5. Elytra obscurely muricate, more distinctly on the
 sides albopilosus
 ---Elytra muricate on the apical calli at most 6
6. Scales condensed behind the scutellum to form a
 more or less distinct spot 7

- No postscutellar spot 9
7. Postscutellar spot T-shaped, a lateral band of
white scales present, femora piceous siculus
- Postscutellar spot not T-shaped, no lateral band
of white scales, legs ferruginous 8
8. Tarsal segment four projects beyond the lobes of
three greater than three's length, male fovea of
fifth abdominal segment shallow, apical margin of
pronotum notched oregonensis
- Tarsal segment four projects less than the length
of three, male fovea deep, pronotal apex not
notched squamatus
9. Scales condensed to form a very vague vitta, elytra
obscurely muricate on interval seven persimilis
- No vitta evident, no large oval scales 10
10. Elytral interval vestiture of ligulate setae and
few oval scales handfordi
- Elytral interval vestiture of fine setae 11
11. Interval setae 1-seriate, interval and striae
vestiture similar convexipennis
- Interval setae 1-2-seriate 12
12. Head vestiture white, apical margin of the
pronotum elevated lesquerellae

- Head vestiture yellowish, apical margin of the
 pronotum not elevated munki
13. Elytra red-brown, a distinct postscutellar
 patch anthonomoides
- Elytra black, a postscutellar patch or not. 14
14. Elytra finely pubescent except for an indistinct
 postscutellar spot. transversus
- Elytral vestiture with regular ligulate or diffuse
 oval scales 15
15. Elytral vestiture of regular 2-3-seriate, yellowish
 flattened setae assimilis
- Elytral vestiture of diffuse, scattered, large oval
 and small round, white scales, plus scattered,
 suberect brown, flat setae; tarsal segment four
 projects noticeably more than three's length
 beyond three opertus

C. erysimi (Fabricius)

(Fig. 62, 24)

Curculio erysimi Fabricius. 1787. Mant. Ins. I: 101.

Rhynchaenus ersimi Fabricius. 1792. Syst. El. II: 452.

var. chloropterus Stephens. 1831. Ill. Brit. Mandib. IV: 29.

var. cyaneus Weise. 1883. Deutsche ent. Zeitschr. XXVII: 329.

var. subniger Gerh. 1902. Zeitschr. Ent. XXVII: 22.

var. viridicollis Schultze. 1903. Deutsche ent. Zeitschr. p. 294.

var. resplendens Schultze. 1903. l.c., p. 294.

Length 2.0 mm.; width 1.1 mm. Venter and pronotum black, elytra blue-black to greenish. Head moderately punctate; glabrous, vertex with a very fine carina. Beak clearly punctate to scape insertion, feebly so apically; glabrous; length (σ) about equal to pronotal width or 1.87 times pronotal length. Antenna piceous; (σ) scape inserted 1.0 times its length from the beak apex; funicle 7-segmented; club elliptical, acute. Pronotum coarsely punctate; sulcus represented by a basal and apical moderately impressed fovea; tubercles small, transverse; apical constriction slightly elevated; ocular lobes obsolescent; vestiture inconspicuous setae; width 2.0 times length. Elytra with flat intervals twice the stria width; apical calli sparsely muricate; vestiture of fine, pale, sparse, 1-seriate, setaceous hairs on intervals; length 1.36 times width. Venter with narrow, white scales, not very dense on sternum and spaced on abdomen; (σ) fovea of 5th abdominal segment shallow, rounded; pygidium convex, coarsely punctate, piliferous. Legs dark piceous; femora mutic, clothed with pale hairs; tibiae mucronate; tarsal segment 4 about equal to the combined length of 2 & 3; 4 projects beyond 3 less than 3's length; tarsal claws edentate.

TYPES. Location of the types of erysimi are unknown.

DISTRIBUTION. MASSACHUSETTS: MICHIGAN: E. Lansing; NEW JERSEY: Hadden Heights, Seaside Heights; NEW YORK: Hartsdale; NORTH CAROLINA: ONTARIO: Richmond Hill, St. Catherine, Uxbridge, Vineland Station; OREGON: SOUTH CAROLINA: VIRGINIA.

Among the identified specimens in the USNM collection are some labeled 'Schonbeck, Hustache' which serve as homotypical specimens. The first authenticated records of the species in America is on cabbage from Hartsdale, Westchester Co., New York, on 22 Jun. 1927, recorded by

Chapman (1927). The determination was made by L. L. Buchanan. The C. erysimi of Henshaw's list (1895) is dubious.

American host plants are cabbage, mustard, kale, and Trifolium pratensis (Chapman, 1927; Milliron, 1953; USNM specimen data). Hoffmann (1954) recorded the European host plants as; Capsella bursapastoris L., Cheiranthus, Matthiola, Alliaria officinalis Andrz., Sinapis nigra L., S. alba L., Nasturtium officinale R. Br., Brassica cheiranthus Vill., Lepidium ruderae L., and L. latifolium L.

C. hearnei Brown

(Fig. 63)

C. hearnei Brown. 1940. Canad. Ent. LXXII: 186-187.

Length 1.6 mm. Black with the apices of the pronotum and elytra fuscous. Head with moderately large, deep puncts; clothed with moderately dense, pale, hair-like setae; vertex with a very fine carina; interocular area flat. Beak distinctly punctate and striate to scape insertion, strio-punctate apically; vestiture of sparse basal hairs; length (σ) a little stout, .78 times pronotal width or 1.21 times pronotal length. Antenna piceous; funicle 7-segmented; club oval; (σ) scape inserted 1.35 times its length from beak apex. Pronotum with moderately large, deep, dense puncts; sulcus shallow, obsolete medially; tubercles small, acute; apical constriction not elevated; ocular lobes obsolescent; vestiture of yellowish, semi-prostrate hairs, few, oval, white scales at sulcus base and moderately dense on sides; width 1.56 times length. Elytral intervals convex, rugulose, wide; striae well impressed, punctate, not sharply delimited; apical calli distinctly muricate; vestiture of 1-2-seriate hairs similar to those on

pronotum, a few lanceolate-oval white scales form a more or less evident postscutellar spot; length 1.1 times width. Venter with moderately dense, oval, white scales; puncts large, shallow, spaced; (σ) fovea of 5th abdominal segment broad-oval, moderately impressed, clothed as abdomen plus fine hairs; pygidium slightly convex, deeply and densely punctate, clothed with hairs. Legs rufous; femora mutic, clothed with white setae; tibiae mucronate; tarsal segment 4 slightly less than the combined length of 2 & 3; 4 projects beyond 3 slightly more than 3's length; tarsal claws edentate.

TYPES. Two specimens, type no. 4282, in the Canadian National Collection. The male holotype is from Churchill, Manitoba, collected by W. J. Brown, 3-VII-1957; and the female allotype, also from Churchill, collected by W. J. Brown 15-VII-1957.

DISTRIBUTION. MANITOBA: Churchill, (the types).

This species resembles more or less C. pusio Mannerheim, but the elytral striae are finer, the elytra are rufous at the very apex only, and the size is smaller. The small rufous patch on the coxal prominences of the pronotum are present as in C. pusio.

C. pusio Mannerheim

(Fig. 27, 68)

C. pusio Mannerheim. 1852. Bul. Soc. Nat. Moscou XXV: 355.

C. fulvotertius Fall. 1926. Pan-Pacific Ent. II: 206-207. NEW SYNONYMY

C. hamiltoni Blatchley and Leng. 1916. Rynch. N. E. Amer. p. 446.

Length 2.0 mm.; width 1.25 mm. Black with the apices of the pronotum and elytra fuscous; ocular lobes and coxal prominences of the pronotum also fuscous. Head with moderately sized and spaced puncts,

each with a flat, orange-brown, flat seta; interocular flat; carina on vertex short, not prominent. Beak strio-punctate, less so apically; setae similar to those on the head basally, remainder glabrous; length (σ) equal to pronotal width or 1.4 times pronotal length. Antenna piceous; funicle 7-segmented; club oval, acute; (σ) scape inserted 1.25 times its length from beak apex. Pronotum with moderately dense, medium sized puncts; sulcus shallow at extremities, obsolete medially; tubercles moderate, acute; scutellum oval, punctate; apical constriction not elevated, anterior margin with a broad, shallow emargination; ocular lobes not developed; vestiture of flattened, orange-brown setae on disc, and oval, white scales on sides and in sulcus extremities; width 1.4 times length. Elytral striae moderately impressed; intervals convex, distinctly rugulose, clothed with irregularly, 2-3-seriate, flattened, brownish orange setae, and scattered, small, oval, white scales, condensed behind the scutellum to form a more or less distinct triangular spot; apical calli distinctly muricate; length 1.1 times width. Venter with moderately dense to spaced, white, rounded to lanceolate scales; (σ) fovea of 5th abdominal segment deep, transverse, oval, with a glabrous posterior margin; pygidium punctate, with long, brownish hairs medially and short ones laterally. Legs fuscous, matching the apical elytral color; femora mutic, clothed with pale yellow, not dense, flattened setae; tibiae mucronate; tarsal segment 4 equal to the combined length of 2 & 3; 4 projects beyond 3 equal to 3's length; tarsal claws edentate.

TYPE. Presumably in the Mannerheim collection, Helsinki; Sitkha, Alaska.

DISTRIBUTION. ALASKA: Sitka; BRITISH COLUMBIA: Copper Mountain;

ALBERTA: Lethbridge, Medicine Hat; MANITOBA: Churchill; NORTHWEST
TERRITORY: MacKenzie Delta, Reindeer Depot.

C. pusio Mannerheim has been the center of considerable nomenclatorial confusion in America. Blatchley (1916) considered the C. pusio of Dietz (1896) to be a new species, C. neglectus, and that C. hamiltoni Dietz was but a variant of the true C. pusio. On the belief that C. pusio Mannerheim has small basal teeth on the claws, Fall (1926) described as new C. fulvotertius, which is with simple claws.

Notes in the USNM (Buchanan's) given to me through the courtesy of Drs. Rose Ella Spillman (nee Warner) and Anderson begin to shed a new light on the status of the species in this complex. They state:

Specimens of neglectus (eastern U.S.) have a small but distinct tooth on the tarsal claws.

fulvotertius Fall (Alaska) said to have simple claws.

Material in collection suggests that there are intergrades between neglectus and fulvotertius in structure of tarsal claws and in other ways--though the two would go in different groups by Dietz's key.

Fall (apparently considered western U.S. examples as pusio Mann. though (teste) Leng catalogue the pusio Mann. is same as (hamiltoni Dtz.) described from Mass., and the (pusio of Dtz. not Mann.) = neglectus Blatch.--hamiltoni Dtz. probably not a synonym of pusio Mann., though possibly a subspecies of it. fulvotertius Fall and neglectus Blatch. may also belong to the sp. complex pusio as subordinate forms. For present, the example with deep 5th ventral fovea and with distinct tooth on claws, chiefly eastern U.S. neglectus, Alaska example (not seen) fitting Fall's description fulvotertius Fall. Other western example with shallower fovea and feeble tooth. pusio Amer. authors.

The essence of these notes was given in the form of a key in a letter from Dr. Buchanan to Dr. Brown at the Canadian National Collection. The key is as follows:

Ceutorhynchus pusio complex

1. Claws simple, elytra red and black; habitus
of pusio fulvotertius Fall
Claws toothed 2
2. Rostrum more slender; front concave; elytral
scales broader; elytra uniform reddish
brown. Eastern U.S. hamiltoni Dietz
Rostrum shorter, stouter; elytra red and
black; elytral vestiture more hair-like,
or in part scale-like but then distributed
in spots 3
3. Eastern U.S.; pit on sternite 5
subcircular neglectus Blatchley
Western U.S. and Alaska; pit of sternite
5 transverse pusio Mannerheim

Subsequent to this letter, Dr. Brown visited Helsinki and made these observations from Mannerheim's collection.

Notes on the Mannerheim Collection, Helsinki, 1958.
Ceutorhynchus pusio. One specimen only, labelled 'Holmberg, Sitkha'. Determination label in Mannerheim's hand. No evidence of teeth on claws (but little in neglectus with same light and power). Pit of sternite 5 strongly transverse (circular in neglectus). Intervals of elytra with very few white scales, with many golden hairs, thus differing from neglectus.

Since Dr. Brown was aware of the identification problems in this complex, and made an especial effort to see tarsal claws on the C. pusio specimen in the Mannerheim collection, it may be accepted with confidence that that specimen was with simple claws as he stated. Dr. Brown received from Helsinki several other C. pusio specimens labelled 'Sitkha, Alaska; Holmberg', the same as the one identified in Mannerheim's hand. It was from these specimens that the description of C. pusio in this paper was based. Dr. Brown's opinion, with which I concur, is that the arrangement of the involved species should be:

CLAWS EDENTATE

C. pusio Mannerheim, 1852

Leconte 1876

fulvotertius Fall 1926

CLAWS DENTATE

- C. hamiltoni Dietz 1896
 pusio of Blatchley 1916
C. neglectus Blatchley 1916

C. oregonensis Dietz is perhaps part of this complex, but differs from the rest in being entirely pitchy black.

Specimens Reindeer Depot, N.W.T. in the Canadian National Collection were collected from Rorippa palustris.

C. albopilosus Dietz

(Fig. 61)

C. albopilosus Dietz. 1896. Trans. Am. Ent. Soc. XXIII: 448.

Length 1.7 mm.; width .9 mm. Entirely reddish brown. Head roughly punctate clothed with white, ligulate scales; vertex distinctly carinate; interocular area flat. Beak strio-punctate to scape insertion, smooth apically; glabrous; length (♀) 1.23 times pronotal width or 1.6 times pronotal length. Antenna reddish brown; (♀) scape inserted 1.33 times its length from beak apex; funicle 7-segmented; club oval, acuminate. Pronotum rugose, with a few asperities mesad of tubercles; sulcus wide anteriorly and narrowing to a point to the scutellum; tubercles large, acute; apical constriction elevated; ocular lobes weak; narrow lanceolate scales and few setae, both white and not very dense; width 1.3 times length. Elytra with broad, shallow, not well delimited striae; intervals slightly convex; obscurely and sparsely muricate on disc, more distinctly on humerus, sides and declivity; vestiture of diffuse long, narrow, white, ligulate scales slightly lifted on intervals and narrow, white, oval scales on intervals and in striae; length 1.22 times width. Venter with oval, white scales relatively dense; (♀) fovea of 5th abdominal segment obsolete. Legs red-brown, tarsi lighter; femora

mutic, clothed with narrow, white, ligulate scales; tibiae not mucronate; tarsal segment 4 equal to the combined length of 2 & 3; 4 projects beyond 3 about twice 3's length; tarsal claws edentate.

TYPES. A female specimen from Los Angeles Co., California, type no. 1382 in the U.S. National Museum.

DISTRIBUTION. CALIFORNIA: Los Angeles Co.

The only specimen known to me is the type. It closely resembles C. persimilis, from which it is differentiated according to Dietz, by its smaller size, long sparse pubescence, obsolete prothoracic lobes, the row of acute granules on the prothorax; and the larger granules on the elytral interspaces. The two species were not seen together for comparison, but it was noted that C. albopilosus is reddish brown instead of pitchy black as stated by Dietz. Also the vertex is distinctly carinate in C. albopilosus, whereas it is not carinate in C. persimilis.

C. sculus Dietz

(Fig. 23, 65)

C. sculus Dietz. 1896. Trans. Am. Ent. Soc. XXIII: 446.

Length 1.9 mm.; width 1.25 mm. Head and body black. Head roughly punctate; vestiture of mixed oval and ligulate scales; vertex carinate; eyes slightly elevated; interocular area flat to slightly concave. Beak with large, deep puncts to scape insertion; clothed with ligulate scales throughout; length (♂) about equal to pronotal width or 1.43 times pronotal length. Antenna red-orange; (♂) scape inserted 2.66 times its length from beak apex; funicle 7-segmented; club very long oval, length about 3 times width. Pronotum with large, deep, close puncts; sulcus shallow, obsolete medially; tubercles large, distinct;

apical constriction not elevated; ocular lobes well developed; flat setae generally on disc and oval, white scales on sides, in sulcus extremities, anterior to tubercles and sparsely on disc; width 1.53 times length. Elytra with striae not deeply impressed, distinctly punctate; intervals slightly convex, rugulose, about 4-5 times strial width; apical calli muricate; bronze, suberect, ligulate setae 2-3-seriate and oval, white scales in vague spots and lines tending toward a post-scutellar spot; narrow, pointed scales in striae; length 1.1 times width. Venter with oval, white, relatively dense scales; (♂) fovea of 5th abdominal segment broad, shallow, rectangular, occupying the entire length of the segment and about 1/3 its width, limited posteriorly by a carina; pygidium slightly convex, roughly and deeply punctate; clothed with moderately dense erect and suberect pointed scales. Femora mutic, piceous, clothed with flattened white scales and a vague band of oval, white scales on apical third; tibiae red-brown, mucronate; tarsi red-orange; tarsal segment 4 less than the combined length of 2 & 3; 4 projects beyond 3 about equal to 3's length; tarsal claws edentate.

TYPES. A single male specimen from Virginia, type no. 1381, in the U.S. National Museum.

DISTRIBUTION. VIRGINIA: D.C. (Additional localities according to Blatchley and Leng (1916) are: OHIO, and INDIANA: Dearborn Co.)

Dietz described this species from two males, one from the USNM collection and one from the Ulke collection. The specimen in the Ulke collection at the Carnegie Museum is undoubtedly a type but it is not labeled as such.

Dietz notes a similarity between C. sculus and C. obliquus, from which it differs by its 7-segmented funicle and its mutic femora.

C. oregonensis Dietz

(Fig. 28, 66)

C. oregonensis Dietz. 1896. Trans. Am. Ent. Soc. XXIII: 445.

Length 1.8 mm.; width 1.1 mm. Body entirely black. Head coarsely punctate with a flat, brassy-yellow, scale-like seta per punct; slightly concave between eyes; carina on vertex not distinct. Beak strio-punctate, weakly so apically; basal half of beak clothed similarly to head; length (σ) about equal to pronotal width or 1.36 times pronotal length. Antenna piceous; funicle 7-segmented; club acute, oval; (σ) scape inserted 1.5 times its length from beak apex. Pronotum densely punctate; median sulcus moderate at extremities, obsolete medially; tubercles moderate, acute; apical margin slightly elevated, broadly emarginate between two broad cusps; ocular lobes moderate; dirty white scales on sides and in sulcus extremities, and yellow-brown, flat, narrower than head setae, moderately dense setae; width 1.36 times length. Elytral striae moderately impressed; intervals moderately wide, rugulose; brown, flat, scale-like setae 2-3-seriate on intervals; oval, white scales on disc scattered, but condensed behind scutellum forming a diffuse patch; narrower white scales in a regular series in striae; apical calli muricate; length about 1.1 times width. Venter with moderately dense, oval, white scales; (σ) fovea of 5th abdominal segment shallow, round-oval; pygidium flat, moderately punctate and setate. Legs reddish-brown; femora mutic, clothed with setae similar to those on elytra; tibiae mucronate; tarsal segment 4 about equal to the combined length of 2 and 3; 4 projects beyond 3 a little more than 3's length; tarsal claws edentate.

TYPES. Four specimens in the Museum of Comparative Zoology, type

no. 3024. Two specimens are from Portland, Oregon and two are from Pocatello, Idaho.

DISTRIBUTION. IDAHO: Pocatello; MANITOBA: Aweme; OREGON: Portland.

Dictz (1896) notes that the Idaho specimens differ from his description somewhat in that the upper surface is more densely scaly, the scales more yellowish and intermixed with white scales, the dorsal channel is wider and more deeply impressed.

C. squamatus Leconte

(Fig. 67)

C. squamatus Leconte in Leconte and Horn. 1876. Proc. Amer. Phil. Soc. XV: 277.

Length 2.0 mm.; width 1.2 mm. Body piceous. Head with small, deep, distinct puncts; vertex with a relatively distinct carina; interocular area flat; white scales near pronotal area and also an interocular patch. Beak striate to scape insertion, stria-punctate apically; glabrous; length (σ) 1.13 times pronotal width or 1.5 times pronotal length. Antenna ferruginous, (σ) scape inserted 1.43 times its length from beak apex; funicle 7-segmented; club long oval, not acuminate. Pronotum with deep, distinct, moderate puncts; sulcus obsolete medially, not very deep at extremities; tubercles small, acute, not prominent; apical constriction not elevated; ocular lobes well developed; vestiture of fine setae with oval scales on sides and in the sulcus extremities; width 1.33 times length. Elytral striae distinct but not sharply delimited; intervals convex, shiny, very obscurely roughened; post-scutellar spot of oval scales on intervals 1 and 2, and scattered oval

scales on disc, densest posteriorly, forming an indistinct sutural vitta posteriorly; 1-2-seriate setae elsewhere on intervals, finer setae in striae; apical calli muricate; length 1.08 times width. Venter clothed with broad oval and broad lanceolate, white scales increasing in density from the median line to the sides; (♂) fovea of 5th abdominal segment large, oval, deep, occupying the entire segment's length and about 1/3 its width. Legs ferruginous; femora mutic, clothed with ligulate and few oval scales; tibiae mucronate; tarsal segment 4 less than the combined length of 2 & 3; 4 projects beyond 3 less than 3's length; tarsal claws edentate.

TYPES. Three specimens from Illinois, type no. 3042, in the Museum of Comparative Zoology.

DISTRIBUTION. ILLINOIS: IOWA: NEW YORK: Long Island; NORTH CAROLINA: MASSACHUSETTS: RHODE ISLAND. (According to Dietz 1896, and Blatchley and Leng, 1916, this species also occurs in Kentucky.)

C. persimilis Dietz

(Fig. 22)

C. persimilis Dietz. 1896. Trans. Am. Ent. Soc. XXIII: 447.

Length 2.0 mm. Entirely pitch black. Head roughly punctate; densely clothed with wide ligulate scales; vertex not carinate. Beak weakly punctate basally; scaly basally, very fine, short, sparse setae throughout. Antenna reddish brown; funicle 7-segmented; club long oval; (♀) scape inserted 1.5 times its length from beak apex. Pronotum with moderately sized, spaced puncts; sulcus complete, shallow, shallowest medially; tubercles distinct, transverse; scutellum oval, glabrous; apical constriction elevated; ocular lobes well developed;

large, oval, white scales along sulcus and on sides, yellowish ligulate setae on disc; width 1.39 times length. Elytral striae not very deep, narrow; intervals wide, flat, rough and obscurely tuberculate; apical calli and behind humeri on interval 7 muricate; diffuse, large, round-oval white scales, more dense along suture to form a very vague vitta; wide ligulate, pale, 2-3-seriate scales on intervals, much narrower in striae; length 1.22 times width. Venter with dense, broad-oval, white scales; (♀) fovea of 5th abdominal segment very shallow, rounded, not quite equalling in diameter the length of the segment, clothed as the abdomen; pygidium convex, clothed with dense, oval, white scales. Legs dark red-brown, tarsi and tibial apex red-orange; femora mutic, clothed with relatively dense, broad-ligulate, white scales; tibiae not mucronate; tarsal segment 4 about equal to the combined length of 2 & 3; 4 projects beyond 3 more than 3's length; tarsal claws edentate.

DISTRIBUTION. NEVADA.

Dietz described this species from a single female specimen from Ulke's collection. The specimen in the Ulke collection now is a male and not designated as a type. No other specimen of C. persimillis is known to me. Perhaps Dietz was mistaken in the sex determination of the Ulke specimen, and the specimen at the Carnegie Museum is perhaps the type.

C. handfordi Brown

(Fig. 64)

C. handfordi Brown. 1931. Canad. Ent. LXIII: 120.

Length 1.8-2 mm.; width 1-1.2 mm. Entirely black. Head with moderately large, deep, dense puncts; white, ligulate setae generally, oval near the pronotum; vertex with a more or less distinct carina;

interocular area flat. Beak striate and punctate basally; few basal setae; length (♀) a little more than the pronotal width or 1.5 times the pronotal length. Antenna piceous to ferruginous; funicle 7-segmented; club long-oval; (♀) scape inserted 1.33 times its length from beak apex. Pronotum with moderately large, deep, dense puncts; sulcus moderately impressed, obsolescent medially; tubercles small, acute; scutellum oval, glabrous; apical constriction moderately elevated; ocular lobes weak; vestiture sparse, long-oval nearly ligulate scales in sulcus and oval scales on sides and along basal margin; width 1.4 times length. Elytral striae moderately impressed, wide, deeply punctate; intervals flat, with large, shallow puncts; apical calli finely, distinctly muricate; vestiture of 2-seriate, ligulate, occasionally oval scales, a very vague post-scutellar spot on first intervals of scales similar to those in pronotal sulcus; striae scales slightly wider than interval scales; length 1.08 times width. Venter with moderately dense, oval, white scales; (♀) fovea of 5th abdominal segment round, deep, clothed as abdomen; pygidium flat, deeply punctate, with small, white, ligulate scales. Legs rufous; femora mutic, clothed with white, ligulate scales; tibiae not mucronate; tarsal segment 4 equal to the combined length of 2 & 3; 4 projects beyond 3 equal to 3's length; tarsal claws edentate.

TYPES. A single allotype from Onah, Manitoba, type no. 3146, in the Canadian National Collection.

DISTRIBUTION. MANITOBA, Aweme, Onah.

This species resembles C. septentrionalis and C. floralis, but it differs in having a 7-segmented funicle.

C. convexipennis Fall

(Fig. 69)

C. convexipennis Fall. 1917. Canad. Ent. XLIX: 390-391.

Length 1.7 mm.; width 1.0 mm. Head and body black. Head with large, deep, distinct puncts, each with a fine seta; vertex with a fine carina. Beak punctate to scape insertion, finely punctulate apically; glabrous except for a few setae basally; length (♀) 1.56 times pronotal length or about equal to pronotal width. Antenna dark piceous; (♀) scape inserted 1.2 times its length from beak apex; funicle 7-segmented; club long-oval, somewhat acuminate. Pronotum with large, deep, evident, nearly contiguous puncts; sulcus indistinct; tubercles small, acute, indistinct; ocular lobes relatively small; apical constriction slightly elevated; vestiture of fine, white, forwardly directed setae; width 1.46 times length. Elytra shiny; striae shallow but well marked by deep puncts; intervals somewhat convex, equal to strial width; apical calli muricate; vestiture of fine, white, 1-seriate, slightly appressed setae on intervals and wider, white setae in striae; length 1.2 times width. Venter with white, lanceolate, not very dense scales; no female fovea on 5th abdominal segment. Legs black, tarsi dark piceous; femora mutic, clothed with white setae and few ligulate scales; tibial mucros absent; tarsal segment 4 less than the combined length of 2 & 3; 4 projects beyond 3 about equal to 3's length; tarsal claws edentate.

TYPES. A single specimen from Aweme, Manitoba, Sep. 8, type no. 25218, in the Museum of Comparative Zoology.

DISTRIBUTION. MANITOBA: Aweme.

Brown (1940) states in his description of C. munki that in C. convexipennis, the species with which C. munki is most likely to be

confused, the vestiture of the head and thorax is white and quite distinct, and the vestiture of the elytral intervals scarcely differs from that of the striae.

C. lesquerellae Pierce

(Figs. 25, 70)

C. lesquerellae Pierce. 1910. Journ. Econ. Ent. III: 366.

Length 2.0 mm.; width 1.2 mm. Entirely black. Head coarsely punctate; vertex finely carinate; interocular area flat; vestiture of fine, white setae. Beak distinctly punctate to scape insertion, more finely so apically; slightly setate at the base; length (♂) .88 times pronotal width or 1.25 times pronotal length. Antenna piceous; (♂) scape inserted 1.37 times its length from beak apex; funicle 7-segmented; club short-oval, acuminate. Pronotum coarsely punctate; sulcus shallow at extremities, obsolescent medially; tubercles obtuse; apical constriction elevated; ocular lobes normally developed; vestiture of fine, white setae per punct; width 1.41 times length. Elytral striae well defined, wide; intervals rugulose; apical calli muricate; 1-2-seriate, whitish, fine, interval setae; and 1-seriate, white, squamose, strial setae; length 1.08 times width. Venter deeply punctate; scales white, lanceolate, spaced; (♂) fovea of 5th abdominal segment round, shallow; pygidium slightly concave, roughly punctulate, nearly punctate. Legs black; femora mutic, clothed with white hairs; tibiae mucronate; tarsal segment 4 less than the combined length of 2 & 3; 4 projects beyond 3 less than 3's length; tarsal claws edentate.

TYPES. A single specimen in the U.S. National Museum, type no. 1365, bearing the data; 'Whitewright, Tex.; Rec'd 3.22.09; on cabbage; Hunter no. 1679, W212'.

DISTRIBUTION. ARKANSAS: MISSOURI: TEXAS: Plano, Wolfe City, Whitewright; DELAWARE: VIRGINIA.

Pierce stated that the species was described from four specimens received from G. W. Herrick, Texas State Entomologist, who reported them as destroying seedling cabbage in Whitewright, Texas and that E. S. Tucker found the weevil breeding abundantly in the crown of Lesquerella gracilis at Plano, Texas. A specimen from Delaware in the U.S. National Museum was collected from clover, and a Virginia specimen was collected from alfalfa.

C. munki Brown

(Fig. 71)

C. munki Brown. 1940. Canad. Ent. LXII: 187.

Length 1.75 mm.; width 1.0 mm. Head and body black. Head with large, deep, distinct puncts; clothed with fine, sparse, yellowish hairs; vertex vaguely carinate. Beak moderately punctate to scape insertion, shiny apically; entirely glabrous except for few basal hairs; length (♂) equal to pronotal width or 1.4 times pronotal length. Antenna piceous, (♀) scape inserted 1.52 times its length from beak apex; funicle 7-segmented; club oval. Pronotum with large, deep, nearly contiguous puncts; sulcus obsolete medially and shallow at the extremities; tubercles small, transverse; apical constriction not elevated; vestiture of long, fine hairs and a few small, white scales at sulcus base; width 1.4 times length. Elytral striae not deep, marked more by deep puncts; intervals slightly convex, nearly flat, slightly wider than striae; hair-like setae procumbent, 1-2-seriate on intervals; small, narrow, white scale per stria punct; apical calli distinctly

muricate; length 1.2 times width. Ventral vestiture of distinct, lanceolate, white scales. Fovea absent from fifth abdominal segment of female. Pygidium concave, punctate; vestiture of long hairs and very few, narrow, white scales. Legs black, tarsi dark piceous; femora mutic, clothed with spaced, white setae and narrow, white scales on dorsal side; no female tibial mucros; tarsal segment 4 about equal to the combined length of 2 & 3; 4 projects beyond 3 about equal to 3's length; tarsal claws edentate.

TYPES. A holotype, July 16, 1937 and two paratypes July 29, 1937, all females from Churchill, Manitoba, W. J. Brown collector, type no. 4283, in the Canadian National Collection.

DISTRIBUTION. MANITOBA: Churchill.

Dr. Brown's comments on this species are,

This species also belongs to the squamatus group. It may be recognized by the characters of its vestiture. In C. convexipennis, the species with which munki is most likely to be confused, the vestiture of the head and thorax is white and quite distinct, and the vestiture of the elytral intervals scarcely differs from that of the striae. The paratypes of Munki are similar to the holotype in size.

C. anthonomoides Dietz

(Figs. 21, 72)

C. anthonomoides Dietz. 1896. Trans. Am. Ent. Soc. XXIII: 444.

Length 2.2-2.5 mm. Venter black, pronotum pitchy black, elytra red-brown. Head with large, deep, spaced puncts; a seta per punct, nearly naked; vertex without a carina. Beak moderately striate and punctate, becoming progressively weaker toward the apex; setae sparse; length (♂) about equal to pronotal width or 1.4 times pronotal length. Antenna red-orange; funicle 7-segmented; club oval, acute; (♂) scape

inserted 1.08 times its length from beak apex. Pronotum with large, deep, distinct puncts; sulcus shallow, obsolete medially; tubercles small, distinct, acute; scutellum rounded, glabrous; apical constriction not elevated; ocular lobes of moderate size; oval, white scales on sides and few, narrower ones in sulcus extremities; sparse fine setae on disc; width 1.45 times length. Elytral striae narrow, weakly impressed; intervals wide, convex; apical calli weakly muricate; small, oval, white scales form a distinct postscutellar patch, very few scattered ones on disc; fine, 1-2-seriate setae elsewhere; length 1.19 times width. Venter with moderately dense, oval, white scales, smaller on abdomen; (♂) fovea of 5th abdominal segment oval, deep, clothed as abdomen except for the glabrous posterior border; pygidium punctate, flat, setate. Legs reddish; femora mutic, clothed with moderately dense, white, ligulate scales; tibiae mucronate; tarsal segment 4 about equal to the combined length of 2 & 3; 4 projects beyond 3 less than 3's length; tarsal claws edentate.

TYPES. A single specimen from D.C. in the Ulke collection at the Carnegie Museum.

DISTRIBUTION. District of Columbia.

The specimen in the Ulke collection is apparently the type although it is not labeled as such. Blatchley and Leng (1916) record Owen and Posey Counties, Indiana as localities, but I have not seen these specimens.

Dietz describes the color as black, but it is with a pitch black pronotum and red-brown elytra.

C. transversus Blatchley

C. transversus Blatchley and Leng. 1916. Rhynchophora N.E. America.
p. 450.

Broadly oval. Dull black, antennae and legs dark reddish-brown, femora fuscous at middle; surface very finely pubescent, almost without scales except some elongate whitish ones condensed on sides of meso- and metasterna and an indistinct scutellar spot. Beak of male slender, as long as thorax, finely striate, densely punctate throughout. Head densely and coarsely punctate. Thorax at middle one-half wider than long, sides broadly rounded from base to the strong apical constriction; disc coarsely, deeply and densely punctate, the tubercles small, obtuse, dorsal channel very faint. Elytra oval, at the prominent umbones one-third wider than the middle of thorax, sides thence converging to the broadly rounded apex; striae deep; intervals feebly convex, strongly rugose. Fovea of fifth ventral of male deep, transverse, its length nearly one-third the width of the segment. Length 2.5 mm.

Starke Co., Ind., rare; May 8.

I have not seen this species, and the above is transcribed from Blatchley and Leng (1916).

C. assimilis Paykull

(Figs. 26, 73)

Curculio assimilis Paykull. 1792. Monogr. Curc. Suec., p. 69.

Ceutorhynchus fallax Schultze. 1898. Deutsche ent. Zeitschr. p. 267.

C. brassicae Focillon. 1852. Rev. Zool. IV: 124.

var. biskrensis Pic. 1896. Miscell. Ent. IV: 43.

subsp. litturatus Schultze. 1903. Deutsche ent. Zeitschr. p. 292;

lc. 1902. p. 220.

var. major Esclera. 1914. Trav. Mus. Madrid. XI: 479.

C. alauda Herbst. 1792. Kafer VI: 410.

Coeliodes granulicollis Schoenherr. 1837. Genera Sp. Curc. IV: 307.

Curculio obstrictus Marsham. 1802. Ent. Brit. I: 255.

C. subrufus Marsham. 1802. Ent. Brit. I: 282; Stephens. 1831. Ill. Brit. Ent. IV: 26.

Length 2.5 mm.; width 1.5 mm. Entirely black. Head coarsely punctate, each punct with a pale, brassy scale; vertex with a fine carina; interocular flat to slightly concave. Beak striate to scape insertion, feebly puncto-striate apically; narrow scales basally, glabrous for most of its length; length (σ) 1.25 times pronotal width or 1.78 times pronotal length. Antennal scape black, the remainder piceous; funicle 7-segmented; club acute, elliptical; (σ) scape inserted 1.75 times its length from beak apex. Pronotum coarsely punctate; sulcus complete, well defined, shallow medially; tubercles distinct, transverse; scutellum glabrous; apical constriction well elevated; ocular lobes distinct; narrow, white scales on disc, oval on sides and along sulcus; width 1.43 times length. Elytra a little shiny, striae well defined, intervals flat, rugulose; apical calli muricate; vestiture of flat, yellowish, 2-3-seriate setae, evenly distributed on intervals, white, 1-seriate in striae, very short at apex; length 1.2 times width. Venter with dense, elliptical, white scales; (σ) fovea of 5th abdominal segment round-oval, shallow, clothed as abdomen, deeper posteriorly; pygidium convex, densely punctate, finely setate with few white scales. Legs black; femora mutic, clothed with narrow, lanceolate, pale yellow scales; tibiae mucronate; tarsal segment 4 less than the combined length of 2 & 3; 4 projects beyond 3 less than 3's length; tarsal claws edentate.

TYPES. Types of assimilis are unknown.

DISTRIBUTION. BRITISH COLUMBIA: Agassiz; CALIFORNIA: OREGON: Corbett, Logsden, McMinnville, Parkrose; WASHINGTON: Mt. Vernon, Lyndon.

This species was recently introduced from Europe. The first authenticated report of this beetle in the United States was by Baker (1936) from a collection made near Lyndon, Wash. in 1935. Since that time many reports dealing with the biology and control have been published (Breakey and Webster, 1942, 1943; Breakey, Webster and Carlson, 1944; Carlson, Breakey and Webster, 1945; Robertson, 1945; Smith, 1944; Webster, Breakey, Doucette and Carlson, 1943, 1944; Webster and Smith, 1937). Packard (1872) reported C. assimilis as a pest in Massachusetts, but it apparently did not remain established or else the identification was erroneous.

The host plants in America seem to be confined to cultivated Brassica and Raphanus. Doucette (1947) reported from field tests that Sisymbrium officinale, S. altissimum, Lunaria annua, Mathiola incana, Alyssum saxatile, Cardamine sp., Cheiranthus cheiri, Erysimum cheiranthoides, Capsella bursa-pastoris, Thlaspi arvensis were not attacked by C. assimilis.

A substantial list of hymenopterous parasites gathered from American and European literature includes: Amblymerus sp., Bracon maculiger Wsm., B. fulvipes Nees, Diopius affinis Wsm., D. oleraceus Haliday, Eulophus hegean Wlk., Eurytoma sp., Necremnus duplicatus Gahn, Selithricus ceuthorrhynchini Rondani, Sigalphus obscurellus Nees, S. pallipes, Thersilochus sp., Trichomalus fasciatus Thoms., and Zatropis sp. (Doucette 1948, Hoffmann 1954).

C. opertus Brown

(Fig. 74)

C. opertus Brown. 1931. Canad. Ent. LXIII: 119.

Length 2.5-2.7 mm.; width 1.4-1.5 mm. Black throughout. Head

with dense, imbricate, white, oval scales on vertex and between eyes, very small white scales around interocular patch, very few, brown, ligulate scales at the apex of the distinct carina; interocular area flat. Beak coarsely punctate to scape insertion, strio-punctate apically; length (♀) equal to pronotal width or 1.28 times pronotal length. Antenna piceous; funicle 7-segmented; club ovate; (♀) scape inserted 1.14 times its length from beak apex. Pronotum with large, deep, dense, rough puncts; sulcus complete, wide, moderately deep; tubercles large, conspicuous, acute; scutellum oval; apical constriction elevated, tubular, notched, with very wide cusps; ocular lobes large; vestiture of small, round, white scales equal to punct size, also scattered, brown, ligulate scales; width 1.28 times length. Elytral striae well impressed; intervals slightly convex, superficially punctate; apical calli distinctly tuberculate; vestiture of diffuse, scattered, large oval and small round white scales plus scattered suberect brown ligulate setae; striae with white, recumbent, narrow scales; length 1.14 times width. Venter with large, broad-oval, dense, white scales; puncts large, shallow, relatively dense; abdomen clothed similarly to sternum plus brown, ligulate scales; (♀) fovea of 5th abdominal segment absent; pygidium concave, roughly punctate, with moderately dense small white scales. Legs black to piceous; femora mutic, with large oval white scales plus brown ligulate scales; tarsal segment 4 equal to the combined length of 2 & 3; 4 projects evidently more beyond than 3's length beyond 3; tarsal claws edentate.

TYPES. One holotype and one paratype from Oliver, British Columbia, type no. 3145, in the Canadian National Collection.

DISTRIBUTION. BRITISH COLUMBIA: Oliver.

The elytral setae give this species an aspect similar to that of C. quadridens, from which it differs in having the setae flatter, much shorter and suberect; the elytral scales being wider; the pronotal tubercles more prominent; the femora mutic; and the tarsal claws simple.

GROUP G

This group is an heterogenous assemblage of species sharing the common characters of mutic femora, 7-segmented funicle and toothed claws. Their sizes range from small to large, and the coloring and vestiture are also variable. Some members are apparently related to members of group F, but it would be difficult to find usable characters to unite them into a distinct group.

Key to the Species of Group G

1. Length exceeding 2.5 mm. 2
- Length less than 2.5 mm. 5

2. A sutural vitta present ovalis
- No sutural vitta present 3

3. Postscutellar spot distinct, funicle 6-segmented,
 claw tooth weak wickhami
- Postscutellar spot diffuse, claw teeth distinct 4

4. Ligulate elytral scales 1-2-seriate dietzi
- Ligulate elytral scales 3-4-seriate moznettei

5. Length less than 1.75 mm., tarsal segment four
 projects greater than the length of three
 beyond three 6

- Length greater than 1.8 mm., tarsal segment four
 variable in the amount it projects beyond three 7
6. A vague interocular patch, pronotal sulcus weak,
 elytral striae not sharply delimited pusillus
- No interocular patch, pronotal sulcus complete,
 elytral striae sharply delimited pauxillus
7. Elytra bicolorous, the apex ferruginous neglectus
- Elytra unicolorous 8
8. Elytra some shade of brown 9
- Elytra black 12
9. Tarsal segment four projects beyond three greater
 than three's length; elytra red-brown or pitchy 10
- Tarsal segment four projects beyond three less
 than or equal to the length of three; elytra
 yellowish or orange-brown 11
10. Tarsal segment four projects beyond three twice
 the length of three; claw tooth small, distinct,
 a relatively distinct postscutellar patch adspersulus
- Tarsal segment four projects beyond three less
 than twice the length of three; claw tooth
 long; elytra with suberect setae convexicollis
11. Antenna orangish, claw tooth short, pronotal
 vestiture setaceous hamiltoni

- Antenna piceous; claw tooth long, pronotal
 vestiture squamous dubitans
12. No postscutellar patch13
- A postscutellar patch present14
13. Tarsal segment four projects beyond three one and
 a half times the length of three; elytra with
 relatively dense, wide-lanceolate to oval, white
 scales, and 1-seriate, long, yellow setae carteri
- Tarsal segment four projects beyond three equal to
 the length of three; elytra with 2-3-seriate,
 brassy, ligulate scales on the intervals and
 similar white scales in the striae omissus
14. Dorsal vestiture entirely white, tarsal segment
 four projects beyond three greater than the
 length of three walluensis
- Narrow dorsal scales brownish; tarsal segment
 four projects beyond three equal to the length
 of three15
15. Pronotal puncts fine; no sutural vitta mutabilis
- Pronotal puncts coarse; a sutural vitta present
 or not16
16. Sutural vitta present; length 2.25 mm. numulus
- Sutural vitta absent; length 1.8 mm. browni

C. ovalis Dietz

(Fig. 75)

C. ovalis Dietz. 1896. Trans. Am. Ent. Soc. XXIII: 438.

Length 2.7 mm.; width 1.7 mm. Body and head black. Head with a short carina; moderately coarse punctate; clothed with yellowish ligulate scales more or less dense between eyes; interocular area flat. Beak punctate and striate to scape insertion and few ligulate scales basally; length (♂) greater than pronotal length (about 1.47 times), about equal to pronotal width. Antenna piceous; (♂) scape inserted 1.0 times its length from beak apex; funicle 7-segmented; club long oval, acute. Pronotum with close, moderate, deep puncts; oval, white scales on sides and in sulcus, yellowish ligulate scales on disc; sulcus obsolescent mesially, deep at extremities; tubercles obsolete; apical margin not elevated or distinctly tubular; width 1.47 times length; ocular lobes well developed. Elytra with 3-4-seriate, ligulate, recumbent scales and scattered or diffuse oval, white scales condensed along the suture and behind the scutellum; striae well impressed, deeply punctate; intervals flat with large, relatively distinct puncts; apical calli sparsely muricate; length 1.14 times width. Venter clothed with contiguous to imbricate, large, oval, white scales; puncts large, shallow. (♂) fovea of 5th abdominal segment large, shallow, occupying the entire segment's length and about 1/3 its width. Pygidium flat becoming concave anteriorly; deep, moderate puncts; long, dense hairs in concavity; legs dark piceous, tarsi red-brown; femora mutic, clothed with oval, white scales and white and yellowish, ligulate scales; tibial mucros distinct; tarsal segment 4 less than the combined length of 2 & 3; 4 projects beyond 3 equal to 3's length; tarsal claws with a

moderately large basal tooth.

TYPES. A specimen from Minnesota, type no. 1377, in the U.S. National Museum.

DISTRIBUTION. MINNESOTA: ILLINOIS: Edgebrook.

Dietz described this species from three specimens from Minnesota and Illinois in Bolter's and the U.S. National Museum collections. Blatchley and Leng (1916) give the Illinois locality as Edgebrook.

C. wickhami (Champion)

(Fig. 76)

Ceuthorrhynchidius wickhami Champion. 1907. Biologia Centrali-Americana IV: 153-154.

Ceutorhynchus tescorum Fall. 1907. Trans. Am. Ent. Soc. XXXIII: 270.

(NEW SYNONYMY).

Length 3 mm.; width 1.75 mm. Pronotum, head, beak and venter black; elytra piceous. Head deeply and closely punctate; scales narrow-oval, white, somewhat erect near eyes; vertex distinctly carinate. (♂) beak 1.29 times pronotum length or about equal to pronotal width; rugo-punctate and finely setaceous to scape insertion, smooth and glabrous apically. Antenna piceous; funicle 6-segmented; club long oval, acuminate. Pronotum rugo-punctate; sulcus distinct, complete; tubercles large, obtuse; white, oval to ligulate scales along sulcus and on sides; ligulate, brown scales on disc; scutellum small, oval, glabrous; width 1.34 times length. Elytra length 1.1 times width; a distinct post-scutellar patch confined to interval 1 of narrow white scales; disc mottled with brown and white ligulate scales, 3-4-seriate on the intervals; strial vestiture similar; intervals flat, roughened, 2-3 times

strial width, muricate on intervals 7, 8 and 9; striae well impressed, distinct; apical calli distinct, muricate. Venter with dense, oval, white scales; distinctly punctate. (σ) fovea of 5th abdominal segment broad, very shallow, slightly elevated laterally; pygidium slightly convex, roughly punctate, sulcate anteriorly, hirsute. Legs reddish; femora mutic, clothed with white, ligulate scales and fine setae; tibiae not mucronate; tarsal segment 4 equal to the combined length of 2 & 3; 4 projects beyond 3 slightly more than 3's length; tarsal claws with a very weak tooth.

TYPE. Present location is unknown. [Parowan, Utah (Wickham);-- Mexico (Truqui, in coll. Fry), Mexico City (H. H. Smith) according to Champion].

DISTRIBUTION. CALIFORNIA: Big Pine, Bridgeport, Independence; NEVADA: Ormsby Co.; UTAH: Marysvale, Parowan.

The type of this species is probably in the British Museum, but there is a specimen in the USNM collection from Parowan, Utah determined by Champion as C. wickhami. The USNM specimen identified as Ceuthorrhynchidius wickhami by Champion and an MCZ specimen from Marysvale, Utah identified as C. wickhami but with no determiner's signature, are identical to C. tescorum Fall. That this synonymy was known before at the USNM is evidenced by the fact that the specimens in that collection are labelled wickhami = tescorum, but I have found no record of this synonymy being published.

The presence of a very weak tooth on each tarsal claw was overlooked apparently by Champion, but was noted by Fall. However, it is probable that when writing Fall was not aware of Champion's description, since Champion's description antedates Fall's by only five months. The

Fall type of C. tescorum is in the MCZ collection and bears the data "Ormsby Co., Nev.; Jul. 6, Baker; Type No. 25227".

Champion records C. wickhami from Argemone (Papaveraceae).

C. dietzi Leng

C. intermedius Dietz. 1896. Trans. Am. Ent. Soc. XXIII: 438.

--Blatchley and Leng. 1916. Rhynchophora N.E. Amer., p. 449.

C. dietzi Leng. 1920. Catalogue of Coleoptera North of Mexico.

C. dietzi Hustache. 1922. Miscell. Ent. XXVI: 19.

C. dietzi Hustache. 1930. Col. Cat., pars 113.

Length 2.7 mm. Entirely black. Head with dense, white, wide ligulate scales, slightly lifted and evenly distributed to the beak base. Beak shiny black, glabrous throughout. Antenna piceous; funicle 7-segmented; club large, long oval. Pronotum with large, deep, dense puncts; sulcus wide, shallow, complete; tubercles transverse, moderately distinct; scutellum glabrous, oval; apical constriction elevated; ocular lobes moderate; oval, white scales on sides and in sulcus, white ligulate scales on disc. Elytral striae moderately impressed, deeply punctate; intervals punctate, convex, twice strial width; apical calli muricate; scattered, broad, oval, white scales on disc but condensed into a diffuse postscutellar spot, and 1-seriate along first interval; brown, ligulate 1-2-seriate scales elsewhere; smaller, oval, white scales in striae. Venter with dense, large, round-oval, white scales; (♀) fovea of 5th abdominal segment absent; pygidium flat, with white, mixed oval and ligulate scales. Legs black, grading to piceous tarsi; femora mutic, clothed with moderately dense, oval, white scales; tibiae not mucronate; tarsal claws with a distinct, short, basal tooth.

TYPES. A single female specimen from Pennsylvania, holotype no. 2770, in the Philadelphia Academy of Science.

DISTRIBUTION. PHILADELPHIA (The type).

The name intermedius was already occupied by a European species so intermedius Dietz was renamed C. dietzi. Dalla Torre and Hustache (1930) in Coleopterum Catalogus pars 113, give Hustache authorship of C. dietzi based on a 1922 publication in Miscel. Ent. XXVI: 19. However Leng (1920) in the Catalogue of the Coleoptera of America, North of Mexico, p. 330, had mutated the name to C. dietzi. Therefore Leng and not Hustache should be given authorship of the name C. dietzi.

C. moznettei Fall

(Fig. 77)

C. moznettei Fall. 1917. Canad. Ent. XLIX: 389.

Length 2.9 mm.; width 1.75 mm. Entirely black. Head roughly and deeply punctate; vertex finely carinate; clothed with brownish, ligulate setae; distinctly concave between eyes. Beak strio-punctate to scape insertion and then diminishing to apex; ligulate setae at base becoming finer and sparser apically; length (♂) about equal to pronotal length or about .62 times pronotal width. Antennal scape (♂) inserted 1.03 times its length from beak apex; funicle 7-segmented; club ellipto-ovate, acuminate. Pronotum densely, moderately sized punctate; sulcus deep basally, obsolescent medially, moderately deep apically; tubercles obtuse; apical constriction not elevated; ocular lobes moderately developed; narrow, white scales in sulcus extremities; wide scales on sides; fine, ligulate setae on disc; width 1.39 times length. Elytral striae well impressed, deeply punctate; intervals wide,

flat, rugulose, clothed with 3-4-seriate, coppery, somewhat appressed, ligulate scales; oval, white scales forming a delta-shaped postscutellar spot and scattered on disc giving a slight hoary aspect apically; apical calli lightly muricate; length 1.14 times width. Venter with moderately dense, white, wide lanceolate scales; puncts large, shallow. (σ) fovea of 5th abdominal segment a round deep pit, equal in diameter to the segment's length. Pygidium coarsely punctate, slightly convex, clothed with long, hair-like setae. Legs black; femora mutic, clothed with ligulate scales generally and a vague band of narrow, elliptical, white scales near the apical 1/3; tibial mucros present; tarsal segment 4 about equal to the combined length of 2 & 3; 4 projects beyond 3 about equal to 3's length; tarsal claws with a distinct basal tooth.

TYPES. A single male specimen from Corvallis, Oregon, type no. 25222, in the Museum of Comparative Zoology.

DISTRIBUTION. OREGON: Corvallis.

Its closest relatives seem to be C. mutabilis and C. ovalis.

C. pusillus Leconte

(Figs. 29, 78)

C. pusillus Leconte. 1876. Proc. Amer. Phil. Soc. XV: 276.

Length 1.7 mm.; width 1.0 mm. Venter black, elytra and pronotum piceous. Head densely punctate; brassy, flattened setae generally and long lanceolate white scales behind eyes and forming a diffuse interocular patch; vertex without an evident carina. Beak strio-punctate basally and becoming less evident apically; flat, brassy setae basally, remainder glabrous; length (σ) equal to pronotal width or 1.35 times pronotal length. Antenna piceous; (σ) scape inserted 1.59 times its length

from beak apex; funicle 7-segmented; club ovoid. Pronotum roughly punctate with moderately sized puncts; sulcus very shallow, obsolescent medially; tubercles distinct but not prominent; apical constriction elevated; vestiture of slightly flattened hairs with scattered lanceolate, long, white scales tending toward a vague, longitudinal, median vitta; width 1.35 times length. Elytra with striae not well impressed, marked by setiferous puncts; intervals not much elevated over striae; a very vague postscutellar spot and sutural vitta of lanceolate scales, similar scales diffuse and scattered on disc; intervals with 2-seriate, long, ligulate, suberect setae on intervals; strial setae, shorter, appressed, white; entire aspect slightly hoary; length 1.2 times width. Venter clothed with lanceolate to elliptical scales relatively dense; (♂) fovea of 5th abdominal segment round, deep, its diameter nearly equal to the segment's length or about 1/5 its width; pygidium flat, clothed with white, very narrow scales; tibiae mucronate; tarsal segment 4 equal to the combined length of 2 & 3; 4 projects beyond 3 about twice 3's length; tarsal claws with a short basal tooth.

TYPES. A single specimen from California, type no. 3040, in the Museum of Comparative Zoology.

DISTRIBUTION. CALIFORNIA: COLORADO: IDAHO: NEW YORK: OREGON: TEXAS.

Its closest relatives seem to be C. convexicollis and C. pauxillus. A specimen in the USNM bears a label 'N. altissima'.

C. pauxillus Dietz

(Fig. 79)

C. pauxillus Dietz. 1896. Trans. Am. Ent. Soc. XXIII: 442.

Length 1.45 mm.; width .88 mm. Entirely piceous or piceous-black.

Head clothed with sparse setae; roughly punctate confusing the vertical carina; interocular area flat with a few suberect setae near eyes. Beak punctate throughout but weaker apically, glabrous; length (σ) about equal to pronotal width or 1.5 times pronotal length. Antenna piceous; (σ) scape inserted 1.2 times its length from beak apex; funicle 7-segmented; club oblong-oval, not acuminate. Pronotum with dense coarse puncts; sulcus complete but very weak; apical constriction not elevated; ligulate setae on disc, few narrow white scales in sulcus area; width 1.56 times length. Elytral striae well impressed; intervals roughened, 2-3 times strial width, slightly convex; apical calli muricate; suberect, yellowish, ligulate setae and scattered, long, narrow, white scales on disc, the white scales forming a very obscure postscutellar spot; strial setae fine, short, hair-like; length 1.09 times width. Venter rugo-punctate, clothed with oval to narrow-oval, off-white, not very dense scales. (σ) fovea of 5th abdominal segment ill-defined. Legs piceous; femora mutic, clothed with ligulate setae; tibial mucros present; tarsal segment 4 less than the combined length of 2 & 3; 4 projects beyond 3 more than 3's length; 3's lobes short, 4 not especially long; tarsal claws with long, approximate teeth, nearly bifid.

TYPES. A single male specimen from New Mexico, type no. 3023, in the Museum of Comparative Zoology; and a single specimen from Northern Illinois, type no. 2774, in the Philadelphia Academy of Science.

DISTRIBUTION. ALBERTA: Medicine Hat, Lethbridge; COLORADO: MANITOBA: Aweme, Baldur; SASKATCHEWAN: Saskatoon.

Very similar to C. pusillus, but smaller and without a patch of white scales between the eyes.

C. neglectus Blatchley

C. neglectus Blatchley and Leng. 1916. Rhynch. N.E. Amer. p. 447.

C. pusio of Dietz. 1896. Trans. Am. Ent. Soc. XXIII: 441.

Length 1.9 mm.; width 1.2 mm. Pronotum with reddish apical margin; lateral and postscutellar area of elytra black, the remainder red-brown; venter black. Head deeply punctate; white scales on vertex, sides and frons, hair-like scales elsewhere; carina on vertex indistinct. Beak punctate and striate to scape insertion, weakly punctate apically; glabrous; length (σ) slightly shorter than pronotal width or 1.5 times pronotal length. Antenna reddish-brown; funicle 7-segmented; club acute oval; (σ) scape inserted 1.0 times its length from beak apex. Pronotum densely and coarsely punctate; sulcus deep basally, obsolete medially, shallow apically; tubercles prominent, acute; acutellum distinct, glabrous; apical constriction emarginate, not elevated; ocular lobes weak; piliform scales on disc, wider white scales in sulcus extremities, larger white scales on sides; width 1.6 times length. Elytral intervals slightly convex; striae moderately impressed with alternate stretches of narrow white scales and brown setae; narrow lanceolate, white scales around scutellar area and scattered on disc, yellow, 2-3-seriate, irregular setae on disc, general appearance mottled; length 1.08 times width. Venter with dense, white, broad-lanceolate scales extending onto elytral intervals 10 and 11; scales a little narrower and less dense on abdomen; (σ) fovea of 5th abdominal segment round, deep, elevated laterally, glabrous in apical half; pygidium flat, deeply punctate, fine setae medially directed. Legs reddish-brown; femora mutic, clothed with pale yellow, flat setae; tibial mucros distinct; tarsal segment 4 equal to the combined length of 2 & 3;

4 projects beyond 3 about equal to 3's length; each claw with an indistinct, acute, basal tooth.

This species greatly resembles C. pusio Mannerheim, with which it was confused by Dietz. Blatchley described C. pusio of Dietz as the new species, C. neglectus, and considered C. hamiltoni Dietz as synonymous with C. pusio Mannerheim. However C. hamiltoni is valid and the similarity between C. pusio and C. neglectus seems closer than that of C. pusio and C. hamiltoni. In fact, C. neglectus only differs noticeably from C. pusio in that the male fovea of the 5th abdominal segment is round instead of oval and the claws are weakly toothed instead of edentate. Of the specimens I have examined, there is some variability in C. neglectus with intergrades towards C. pusio. I am not entirely satisfied that these two species are distinct and feel that C. neglectus may be only an infraspecific group of C. pusio.

Buchanan's notes in the USNM (see discussion of C. pusio) refers to the chiefly eastern distribution of C. neglectus and western distribution of C. fulvotertius (which I consider synonymous with C. pusio). Specimens of C. neglectus in the USNM, CNC and U of Minn collections are primarily eastern being from N.J.; Ill.; Minn.; Ia.; Mich.; Mo.; Ind.; Kans.; Mass.; Laprairie and Darlingford, Que.; and Fredericton, B.C.

C. adpersulus Dietz

(Fig. 80)

C. adpersulus Dietz. 1896. Trans. Am. Ent. Soc. XXIII: 441.

Length 1.9 mm.; width 1.15 mm. Pronotum piceous; elytra and venter red-brown. Head coarsely punctate; vertex distinctly carinate; ligulate setae generally; oval, white scales behind eye and mixed with

yellow, ligulate scales forming a vague interocular patch; interocular area flat. Beak punctate to scape insertion, less so apically; curvature slight; length (σ) 1.33 times pronotal length, or about equal to pronotal width. Antenna piceous; (σ) scape inserted 1.33 times its length from beak apex; funicle 7-segmented; club ovate, not acuminate. Pronotum with moderate, dense puncts; sulcus moderately deep at extremities, obsolete medially; tubercles obtuse; apical constriction elevated; ocular lobes well developed; clothed with mixed oval, white scales and ligulate setae; width 1.33 times length. Elytral intervals convex, somewhat shiny, indistinctly rugulose; striae not deep; curved, ligulate, 2-seriate setae and diffuse, oval, white scales on intervals, a relatively distinct postscutellar patch; striaal vestiture narrow, lanceolate, white, appressed; apical calli granular, a little muricate on declivity; length 1.09 times width. Venter with oval, white, contiguous to imbricate, somewhat dense scales. (σ) fovea of 5th abdominal segment relatively deep, round-oval; pygidium slightly convex, with deep, moderately sized puncts. Legs red-brown; femora mutic, clothed with mixed whitish, ligulate and oval scales; tibial mucros distinct; tarsal segment 4 equal to the combined length of 2 & 3; 4 projects beyond 3 about twice 3's length; tarsal claws with a distinct, small, basal tooth.

TYPES. A single specimen from California, type no. 1379, in the U.S. National Museum.

DISTRIBUTION. CALIFORNIA: ARIZONA.

The Arizona specimen of C. adpersulus in the Ulke collection at the Carnegie Museum is apparently one of Dietz's types, but it is not labeled as such. Champion (1907) recorded Northern Sonora, MEXICO, as a locality from specimens sent to him identified as C. pusillus.

C. convexicollis Leconte

(Fig. 30)

C. convexicollis Leconte. 1876. Proc. Amer. Phil. Soc. XV: 276.var. atomus Dietz. 1896. Trans. Am. Ent. Soc. XXIII: 444.

Length 2.1 mm.; width 1.3 mm. Head, thorax and venter black; elytra pitchy brown. Head with moderate, deep puncts; ligulate scales generally and oval white scales behind eyes and near pronotal border; interocular area slightly concave. Beak coarsely punctured to scape insertion, less so apically; inconspicuous setae basally; length (♀) a little less than pronotal width or 1.26 times pronotal length. Antenna piceous; (♀) scape inserted 1.45 times its length from beak apex; funicle 7-segmented; club broad, elliptical, not acuminate. Pronotum deeply, densely punctate; sulcus complete, less deep medially; tubercles small, acute; ocular lobes weak; apical constriction slightly elevated; vestiture of mixed flattened setae and oval, white scales, the latter denser in sulcus and on sides; width 1.38 times length. Elytral striae well impressed, narrow; apical calli distinctly muricate; vestiture of mixed, suberect, pale, flattened setae and oval, white scales; striae with appressed, flattened, white setae; length 1.11 times width. Venter with dense, oval, white scales, a little less dense on abdomen; no fovea present on 5th abdominal segment of female; pygidium flat, roughly punctate, setate. Legs pitchy brown, slightly lighter than the elytral color; femora mutic, clothed with pale yellow scales of various narrow widths; tibiae not mucronate in female; tarsal segment 4 about equal to the combined length of 2 & 3; 4 projects beyond 3 more than 3's length; tarsal claws with a distinct, long, basal tooth.

TYPE. A single specimen from Belknap, Texas, type no. 3041,

in the Museum of Comparative Zoology.

DISTRIBUTION: ALBERTA: Medicine Hat; ARIZONA: COLORADO:
IDAHO: MONTANA: NEVADA: NEW MEXICO: TEXAS: UTAH: WYOMING.

The Arizona specimen in the U.S. National Museum bears a label
'S. filipes'. C. convexcicollis resembles C. pusillus and C. pauxillus.

C. hamiltoni Dietz

(Figs. 31, 81)

C. hamiltoni Dietz. 1896. Trans. Am. Ent. Soc. XXIII: 440.

C. pusio of Blatchley and Leng. 1916. Rhynchoph. N.E. Amer., p. 446.

Length 2.35 mm.; width .88 mm. Pronotum piceous-black; elytra orange-brown; venter black. Head coarsely punctate; clothed with moderately dense, small, oval scales; vertex not carinate. Beak punctate to scape insertion, smooth apically; scaly at base; length (σ) about equal to pronotal width or 1.54 times pronotal length. Antenna orangish; (σ) scape inserted 1.33 times its length from beak apex; funicle 7-segmented; club oval. Pronotum with dense, moderate puncts; sulcus obsolescent medially, shallow at extremities; tubercles moderate, distinct, acute; apical constriction abrupt, not elevated; ocular lobes obsolete; scales narrow, oval, white, somewhat wider on sides and in sulcus; width 1.43 times length. Elytral striae moderately impressed; intervals slightly convex, rugulose; apical calli muricate; interval and striae scales white, similar, oval, but a few narrower scales and setae occasionally in striae, relatively dense, irregularly 3-seriate, a vague postscutellar spot; length 1.77 times width. Venter with dense, oval, white scales; (σ) fovea of 5th abdominal segment oval, sharply delimited posteriorly, indeterminate anteriorly, relatively deep;

pygidium flat, rugo-punctate, with mixed setae and ligulate scales. Legs orange; femora mutic, clothed with moderately dense, white, narrow-oval scales; tibiae obscurely mucronate; tarsal segment 4 less than the combined length of 2 & 3; 4 projects beyond 3 less than 3's length; tarsal claws with a small, acute, basal tooth.

TYPES. A single specimen from Truro, Massachusetts, type no. 2772, in the Philadelphia Academy of Science and a single specimen from Nantucket Island, Massachusetts, type no. 1378, in the U.S. National Museum.

DISTRIBUTION. ALASKA: BRITISH COLUMBIA: CALIFORNIA: COLORADO: D.C.: ILLINOIS: MASSACHUSETTS: Cape Cod, Nantucket Island, Truro; MONTANA: NEW BRUNSWICK: Tabusinta; NEWFOUNDLAND: Stevensville Crossing; NEW MEXICO: NOVA SCOTIA: White Point Beach, Queens Co.; PRINCE EDWARD ISLAND: Dalvay House, Can. Nat'l Park; VIRGINIA.

Blatchley and Leng (1916) considered this species synonymous with C. pusio Mannerheim, but C. pusio has edentate claws as well as several other characters which distinguish it from C. hamiltoni. The specimen from Stevensville Crossing, Newfoundland in the Canadian National Collection bears the label 'Cakile'. Dietz (1896) and Pierce (1900) record Cakile americana as a host plant; and Blatchley and Leng (1916) recorded Cakile edentula Bigel and dubiously Polygonum.

C. dubitans Brown

(Fig. 82)

C. dubitans Brown. 1931. Canad. Ent. LXIII.

Length 2.1 mm.; width 1.1 mm. Pronotum red-brown, elytra yellowish brown, sternum orange-brown. Head roughly punctate; vertex

not carinate; clothed with white hairs which are a little wider between the eyes; interocular area flat. Beak punctate to scape insertion; length (σ) about equal to pronotal width or 1.3 times pronotal length. Antenna piceous, funicle 7-segmented; club long elliptical acute; (σ) scape inserted 1.14 times its length from beak apex. Pronotum roughly punctate; sulcus complete, moderately impressed; tubercles small, acute; ocular lobes not strongly developed; apical constriction not elevated; lanceolate white scales on sides, along sulcus and along pronotal base, white hairs elsewhere; width 1.37 times length. Elytral striae well impressed, punctate; intervals convex, shiny, slightly rugulose; apical calli distinctly muricate; vestiture of irregular 2-seriate, flat, pointed, yellowish setae; small lanceolate white scales in striae; length 1.19 times width. Ventral vestiture of oblong, white, not very dense scales; puncts shallow, spaced, moderately sized; (σ) fovea of 5th abdominal segment round-oval, large, moderately deep, clothed like the abdomen plus a few lateral yellowish hairs; pygidium convex, naked, with dense, shallow puncts. Legs the color of the elytra; femora mutic, clothed with flat, yellowish setae; tibiae mucronate; tarsal segment 4 about equal to the combined length of 2 & 3; 4 projects beyond 3 about equal to 3's length; tarsal claws with a distinct tooth, nearly bifid.

TYPES. A single specimen, representing the only known specimen of the species, from Wenoncha, Saskatchewan, collected 12 August 1925 by Kenneth King, type no. 3143, in the Canadian National Collection.

C. carteri Brown

(Fig. 83)

C. carteri Brown. 1931. Canad. Ent. LXIII.

Length 2.2 mm.; width 1.1 mm. Pronotum and venter black, elytra

piceous-black. Head with dense, deep, moderately sized puncts; clothed with flat, suberect setae; vertex distinctly carinate. Beak deeply strio-punctate to scape insertion and very weakly punctulate apically; vestiture as on head on basal half; length (♀) .88 times pronotal width or 1.23 times pronotal length. Antenna piceous; funicle 7-segmented; club broad-oval, obtuse; (♀) scape inserted 1.33 times its length from beak apex. Pronotum with deep, dense, moderately sized puncts; sulcus complete, distinct, a little shallower medially; tubercles very small, acute; scutellum hidden; apical constriction very slightly elevated; ocular lobes weak; clothed with wide-lanceolate, white scales denser on sides and in sulcus and suberect long, flat, yellowish setae; width 1.38 times length. Elytral striae narrow, not deep; intervals wide, flat; apical calli distinctly muricate; clothed with relatively dense, wide-lanceolate to oval, white scales and long, 1-seriate, yellowish setae; striae with inconspicuous flat setae; length 1.17 times width. Venter with dense, wide-lanceolate, white scales; puncts large, shallow, spaced; fovea absent from 5th abdominal segment of female; pygidium flat, with large deep dense puncts and white vestiture of lanceolate scales and flat setae. Femora mutic; black; clothed with white, flat hairs and narrow-lanceolate scales; tibiae not mucronate; tarsal segment 4 about equal to the combined length of 2 & 3; 4 projects beyond 3 about 1.5 times the length of 3; tarsal claws with a distinct basal tooth.

TYPE. A single known specimen from Brooks, Alberta, collected 11 June 1923 by Walter Carter from alfalfa leaves, type no. 3144, in the Canadian National Collection.

C. omissus Fall

(Fig. 84)

C. omissus Fall. 1917. Canad. Ent. XLIX: 388-389.

Length 2.25 mm.; width 1.35 mm. Body and head black. Head with obscure carina; closely punctate; clothed with yellowish setae, wider and white between eyes and close to pronotal border. Beak moderately punctate, weaker apical of scape insertion; glabrous; length (♀) slightly greater than pronotal width or 1.65 times pronotal length. Antenna piceous; (♀) scape inserted 1.67 times its length from beak apex; funicle 7-segmented; club oblong-oval, acuminate. Pronotum with dense, moderately sized puncts; ligulate, white scales along sulcus, on sides and in single file at pronotal base; sulcus complete, moderately deep; tubercles small, obtuse; apical constriction not elevated; ocular lobes well developed; width 1.5 times length. Elytra with 2-3-seriate, brassy, ligulate scales on intervals and similar white scales in striae; striae well impressed; intervals flat, rugulose; apical calli muricate, prominent; length 1.18 times width. Large, oval, white scales not very dense on venter, more spaced on abdomen. (♀) fovea of 5th abdominal segment weak. Pygidium flat with flat, suberect setae directed medially and a few medial hairs. Legs piceous, femora mutic, clothed with ligulate scales; tibiae not mucronate; tarsal segment 4 less than the combined length of 2 & 3; 4 projects beyond 3 about equal to 3's length; tarsal claws with an acute, basal tooth.

TYPES. Four specimens all bearing the data, 'Aweme, Manitoba; N. Criddle, 23-IX-1916; type no. 25224,' in the Museum of Comparative Zoology.

DISTRIBUTION. ALBERTA: Edmonton, Lethbridge; MANITOBA: Aweme,

Winnipeg; ONTARIO: Chatham, Ottawa, Pt. Pelee; QUEBEC: Aylmer,
Ft. Goulonge; SASKATCHEWAN: Saskatoon.

Leonard (1926) records this species from New York also.

C. wallulensis n. sp.

(Fig. 85)

Length 1.9 mm.; width 1.25 mm. Head and body entirely black. Head densely punctate; vertex obscurely carinate; interocular area slightly concave; vestiture moderately dense, white, oval near posterior border, cuneiform elsewhere. Beak 1.2 times pronotal width or 1.76 times pronotal length; densely punctate and moderately clothed with cuneiform scales to scape insertion, naked and weakly strio-punctulate apically. Antenna piceous; funicle 7-segmented, segment 1 & 2 subequal, 1 thicker, segments 3 to 7 gradually shorter and wider; club long, oval, sub-acute; scape inserted 1.5 times its length from beak apex. Pronotal width 1.47 times length; punctation moderately rough, dense, deep; median sulcus complete, shallow; tubercles not prominent, acute; scutellum minute, glabrous; sides slightly rounded to apical constriction; apical constriction elevated, the anterior margin not emarginate; ocular lobes well developed; vestiture of white, moderately dense, oval and cuneiform scales, the oval scales predominant on the sides, and along sulcus, the cuneiform scales predominant on disc. Elytral length 1.13 times width; striae moderately impressed, deeply punctate, each punct with a small, long-oval scale or rarely a white hair; intervals moderately rugo-punctate, flat to slightly convex; vestiture of large oval and cuneiform, white, moderately dense scales, the cuneiform scales irregularly 1-seriate, the oval scales diffuse but condensed into a

more or less distinct postscutellar spot and a sutural vitta; apical calli distinctly muricate. Venter with moderately dense, oval, white scales; (σ) fovea of 5th abdominal segment shallow, oval, not quite equal to the segment length and equal to $1/3$ the segment width; (♀) fovea round, small moderately deep; clothed as the remainder of the abdomen; pygidium convex, coarsely and densely punctate, vestiture of moderately dense, oval and cuneiform white scales. Legs black grading to piceous tarsi; femora mutic, clothed with oval and cuneiform scales grading to hairs (σ) tibiae mucronate; tarsal segment 4 equal to the combined length of 2 & 3; 4 projects beyond 3 greater than 3's length; tarsal claws each with a distinct basal tooth.

TYPE. Wallula, Walla Walla, Washington. Four specimens, all bearing the label "Wallula, Wn; IV-5-1949; G. H. Nelson."; 3 males, 1 female.

Similar to C. mutabilis and C. numulus in the distribution of white elytral scales, but the narrow vestiture is also white in C. wallulensis.

C. mutabilis Dietz

(Fig. 86)

C. mutabilis Dietz. 1896. Trans. Am. Ent. Soc. XXIII: 437.

Length 2.4 mm.; width 1.5 mm. Head and body piceous black. Head roughly punctate; clothed with brownish, ligulate scales; vertex finely carinate. Beak weakly punctulate throughout; naked; well curved length (♀) slightly greater than pronotal width or about 1.47 times pronotal length. Antenna piceous; (♀) scape inserted 1.67 times its length from beak apex; funicle 7-segmented; club elliptical. Pronotum

with fine, dense, puncts; sulcus complete, not deep; tubercles distinct, acute; apical constriction elevated; ocular lobes well developed; oval, white scales in sulcus and on sides, ligulate setae on disc; width 1.33 times length. Elytral striae narrow, impressed; intervals flat rugulose; scattered, round-oval, white scales condensed to form a vague post-scutellar spot, coppery, ligulate scales 1-2-seriate on intervals, white and appressed in striae; apical calli muricate; length 1.13 times width. Venter with large, oval, white scales increasing in density toward the sides. Fovea absent from 5th abdominal segment of female. Legs piceous; femora mutic, clothed with ligulate scales; no tibial mucros; tarsal segment 4 less than the combined length of 2 & 3; 4 projects beyond 3 about equal to 3's length; tarsal claws with a small, acute tooth.

TYPES. A single specimen from California, type no. 3021, in the Museum of Comparative Zoology; and a single specimen from Santa Rosa, California, type no. 2769, in the Philadelphia Academy of Science.

DISTRIBUTION. CALIFORNIA: San Francisco Co., Santa Rosa Co.; KANSAS: IDAHO.

Sixteen specimens from Idaho in the U.S. National Museum are identified as near C. mutabilis. I have considered them as a form of C. mutabilis with some misgiving. Further biological information on these specimens may warrant species rank.

C. numulus Dietz

(Fig. 87)

C. numulus Dietz. 1896. Trans. Am. Ent. Soc. XXIII: 439.

Length 2.25 mm. Entirely black. Head with broad, oval, white scales from behind eyes to vertex; brown, ligulate, scales on front;

vertex with a relatively distinct carina; interocular area slightly concave, clothed with white, ligulate scales. Beak punctate and clothed with white, ligulate scales to scape insertion. Antenna piceous; funicle 7-segmented; club large, long-oval. Pronotum with large, dense, rough puncts; sulcus shallow, obsolete for most its length, very wide; tubercles moderately distinct, transverse; scutellum minute, rounded; apical constriction very slightly elevated; ocular lobes well developed; oval, white scales on sides, in sulcus and in single file at pronotal base, brown ligulate scales elsewhere. Elytral striae moderately impressed; intervals slightly convex; apical calli distinctly muricate; broad, oval, white scales along base and forming a postscutellar patch on intervals 1 and 2 and a sutural vitta, sparsely scattered elsewhere; brown, 2-seriate, ligulate scales elsewhere. Venter with dense, large, oval, white scales and moderately large and deep, dense puncts; (σ) fovea of 5th abdominal segment large, oval, shallow, not occupying the full length of the segment, slightly elevated laterally, clothed as the abdomen; pygidium slightly convex, deeply punctate, clothed with oval, white scales on upper part and brown, ligulate scales on lower part. Legs piceous-black, tarsi piceous; femora mutic, clothed with moderately dense, white ligulate and oval scales; tibiae mucronate; tarsal segment 4 about equal to the combined length of 2 & 3; 4 projects beyond 3 about equal to 3's length; tarsal claws with a short, basal, distinct tooth.

TYPES. A single specimen from Texas in the Philadelphia Academy of Science, holotype no. 2771.

DISTRIBUTION. Texas (the type).

C. numulus resembles C. dietzi but is considerably smaller.

C. browni n. sp.

Length 1.8 mm.; width 1.12 mm. Entirely black. Head roughly punctate, moderately clothed with slightly flattened white and yellowish setae; interocular area flat; vertical carina obsolete. Beak striopunctate basally to scape insertion, weakly punctulate apically; scape inserted at middle of the beak or about 1.3 times the scape length from the apex. Antenna dark piceous to black; funicle 7-segmented; club oval, not acute. Pronotum densely and roughly punctate; tubercles small, acute; sulcus shallow but wider and deeper at extremities; vestiture of flattened, brownish setae and small, oval, white scales in sulcus base, at the posterio-lateral corners and a few a short distance anterad of the tubercles; apical margin elevated and broadly emarginate to form noticeable lateral cusps; width 1.5 times length. Elytra clothed for the most part with setae similar to those of the pronotum and arranged in two series on the intervals, 3-4-seriate on the first interval; small, oval, white scales forming a trapezoidal patch for about one-third the elytral length behind the scutellum; similar white scales scattered on apical half, and a few at the base of intervals four to six; intervals moderately rugose; striae punctate, each punct with a fine inconspicuous brown hair; apical calli not distinctly muricate; length 1.16 times width. Venter clothed with moderately dense scales similar but slightly larger than those of the elytra; male fovea of the fifth abdominal segment shallow, oval, clothed as abdomen, a low callus on each side. Legs black; femora mutic, clothed with flat white hairs, male tibiae mucronate; tarsal segment 4 equal to the combined length of 2 and 3 and projecting beyond 3 about equal to 3's length; tarsal claws each with a small basal tooth.

TYPE. One male holotype from Reindeer Depot, Mackenzie Delta, 6 July 1948; 3 paratypes from the same locality, 1 male collected 12 July 1948 and 2 females collected 6 July 1948. All specimens were collected by W. J. Brown.

Close to C. oregonensis from which it differs in having fine brown strial setae instead of squamous white setae; the legs black instead of piceous; the fovea of the male fifth abdominal segment shallower and more oval; and the claws with a short tooth instead of simple. Similar to C. pusio also from which it differs primarily in being unicolorous.

SPECIES INCERTAE SEDIS

C. rubidus Schönherr

C. rubidus Schönherr. 1837. Genera et Species Curculionidum IV. p. 484.

This species was described briefly by Schönherr followed by a more detailed description by Gyllenhal. Therefore the author should be Schönherr and not Gyllenhal as stated by Dalla Torre and Hustache (1930). The general description seems to place this species in the complex of species that includes C. pusio Mannerheim, C. neglectus Blatchley, C. oregonensis Fall and C. hearnei Brown.

Included here is a free translation of the description from Schönherr (1837).

C. rubidus Schn.

Pitchy-black, white-squamulose densely below and spotty above, tarsi testaceous; thorax deeply punctate, bituberculate, caniculate, constricted in front, elevated apical margin ferrugineous; elytra striate, fusco-testaceous, ornamented with sparse white-squamulose spots.

Country, northern America, from Mississippi, from Say's home museum, with description missing.

Size and form of Coeliodes quercus. Head round, convex, punctulate, piceus; eyes low, brunneus, not prominent; rostrum hardly as long as head and thorax, strong, gently arcuate, cylindrical, punctulate, pitchy-black, squamulose. Antennae somewhat pitchy-black. Wide posterior part of the thorax short, doubly narrowed in front, apex emerginate, widely transversely impressed behind the apex, elevated apical margin ferruginous; sides behind stricture suddenly widened, base sinuate; disc nearly flat, caniculate at the middle, lateral tubercles on both sides obsolete, deeply punctate all over, piceous-black, at the sides widely and in the dorsal vitta narrowly, densely white-squamulose. Scutellum hardly visible. Elytra in front subtruncate, very wide basely, humerus obtusely angulate, not widened at the sides, apices singly rounded, more than twice the thoracic length, strongly convex above, narrowly striate, striae hardly

punctate; interstriae flat, closely alutaceous, fusco-testaceous, opaque, with numerous spots, oblong, white squamulae especially sprinkled toward the sides. Head below punctate, fusco-piceous, with dense white squamulae. Tarsi moderately pale testaceous, white-squamulose; femora not swollen, mutic; tibiae thin, arcuate.--Ghl.

The C. nubilus Gyllenhal of Henshaw's list (1885) is probably an error in transcription from C. rubidus.

C. umbellae Fabricius

Rhynchaenus umbellae Fabricius. 1801. Syst. Eleuth. II. p. 687.

Ceutorhynchus umbellae Fabricius. 1837. Transcribed by Schönherr in
Genera et Species Curculionidum IV. p. 503.

The brief description from Schönherr (1837) is:

C. umbellae Fabricius Patria: Carolina
Nigricans, elytris striatis, scutello albo.--Fabr.
Rhynchaenus id. Fabr. Syst. El. II p. 450. 60

Leconte and Horn (1876) list Rhynchaenus umbellae F. in Appendix II as an unrecognized species, maintaining that Fabricius's description is worthless and that the specimen upon which it was based should probably be referred to Rhinoncus pericarpus. Klima (1935) lists the species under Rhynchaenus, apparently following the placement made by Fabricius.

The species at present cannot be identified and may never be identified, and perhaps should be ignored, especially as having any affinity with *Ceutorhynchus*.

INDEX OF HOST PLANTS

Alliaria

officinalis (garlic mustard)

C. erysimi, C. puberulus

Allium

cepa (onion)

C. tau

sativum (garlic)

C. tau

Arabis (rock cress)

alpina

C. floralis

Argemone

C. wickhami

Armoracia (Cochlearia)

lapathifolia (horse-radish)

C. americanus, C. quadridens, C. rapae, C. septentrionalis

Barbarea

praecox (scurvy grass)

C. floralis

vulgaris (barbarea) (yellow rocket)

C. septentrionalis

Brassica (Sinapis) (mustard)C. americanus, C. assimilis, C. erysimi, C. quadridens,C. septentrionaliskaber (arvensis) (charlock)C. quadridenscheiranthusC. erysimihirta (alba) (white mustard)C. erysimi, C. quadridensnapus (rape)C. assimilis, C. quadridensnigra (black mustard)C. erysimi, C. quadridensoleiferaC. quadridensoleracea (broccoli, burssel sprouts, cabbage, cauliflower kale)C. assimilis, C. erysimi, C. quadridens, C. rapaepekinensis (Chinese cabbage)C. americanuspubescensC. quadridensrapa (turnip)C. assimilis, C. rapaeCakileamericana (edentula) (American sea rocket)C. hamiltoni

maritima

C. floralis

Capsella

bursa-pastoris (shepherd's purse, medic)

C. erysimi, C. floralis

Ceanothus (red-root)

C. nodipennis

Cheiranthus

C. erysimi

Cicuta (water-hemlock)

occidentale

C. bolteri

Cornus (dogwood)

C. septentrionalis

Crambe

maritima (sea-kale)

C. floralis

Erysimum (treacle mustard)

cheiranthoides (worm-seed mustard)

C. floralis

naperum

C. invisus

Heuchera (alum-root)hispidaC. echinatusLepidium (pepper-grass)C. americanuslatifoliumC. erysimidrabaC. floralisruderalesC. erysimisativum (garden cress)C. floralisvirginicum (wild pepper-grass)C. americanus, C. rapae, C. septentrionalisLesquerellagracilisC. lesquerellaeMatthiolaC. erysimiMedicagosativa (alfalfa)C. americanus, C. carteri, C. consanguineus, C. lesquerellae,C. punctiger

NasturtiumC. rapaealtissimaC. pusillusofficinale (watercress)C. erysimi, C. quadridenssilvestreC. floralisPolygonum (knotweed)C. hamiltoni, C. sulcipennisRaphanussativus (radish)C. americanus, C. assimilismaritimumC. quadridensraphanistrum (jointed charlock)C. quadridensRorippaamericanaC. semirufuspalustris (yellow cress)C. pusioSalix (willow)C. decipiens

Sinapis (see Brassica)Sisymbriumaltissimum (tumble mustard)C. rudisofficinaleC. quadridens, C. rapae, C. septentrionalisaustriacumC. quadridenssophiaC. floralisstrictissimumC. quadridensthalianumC. floralisStanleyaC. adjunctusTaraxacumofficinale (dandelion)C. punctigerThlaspiarvense (field penny cress)C. floralis, C. squamosulusTrifoliumpratensis (red clover)C. erysimi, C. lesquerellae, C. quadridens

Vacciniumcorymbosum (highbush blueberry)C. semirufus

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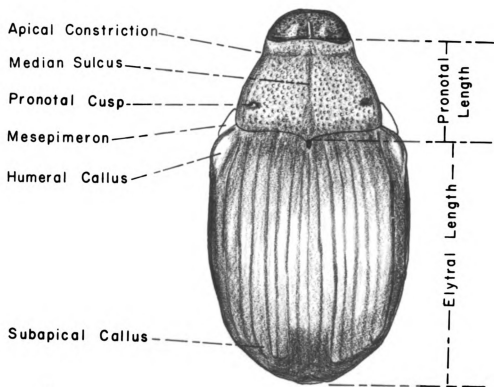
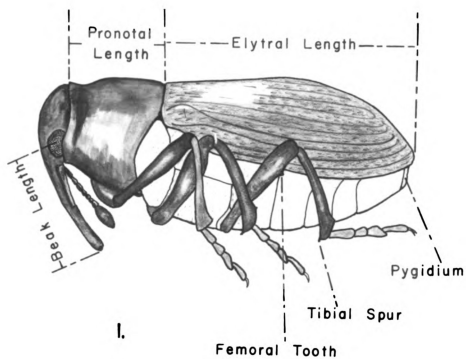
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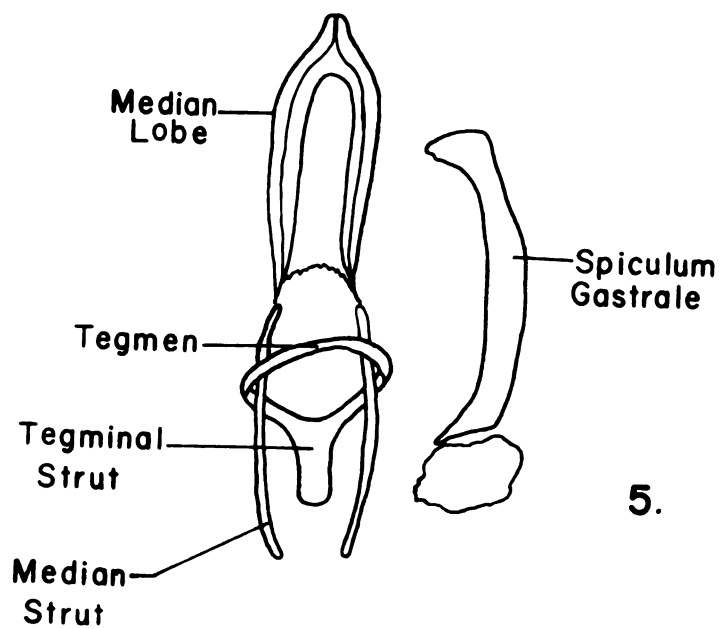
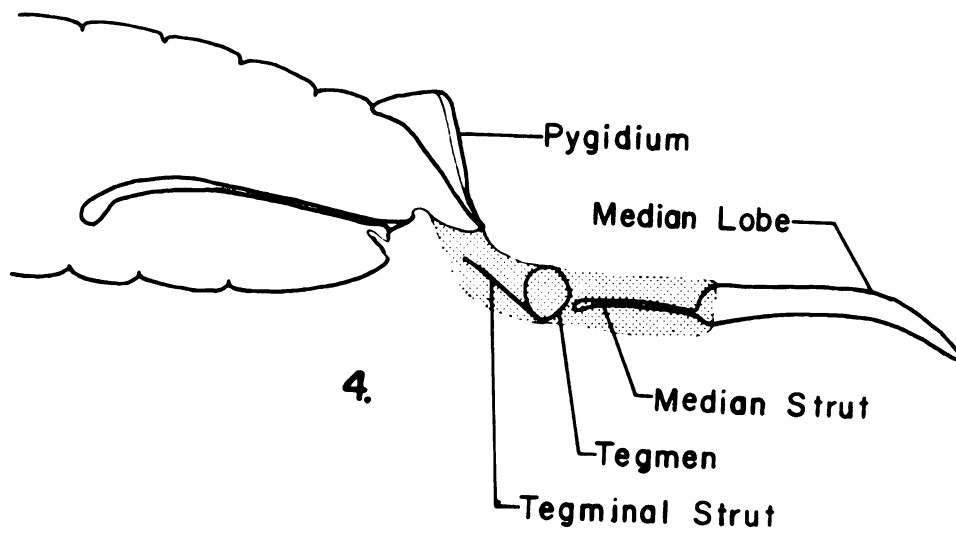
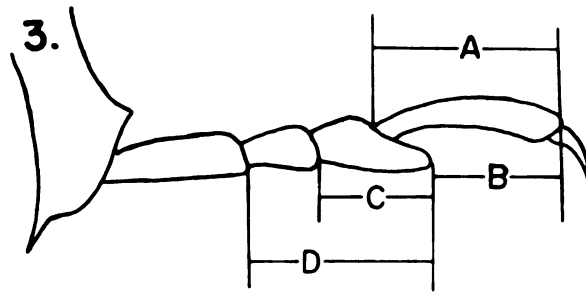
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PLATES

1. Lateral view of a generalized Ceutorhynchus showing anatomical areas of taxonomic importance.
2. Dorsal view of a generalized Ceutorhynchus showing anatomical areas of taxonomic importance.



3. Tarsus of a general Ceutorhynchus
 - A. Length of fourth tarsal segment
 - B. Projection of fourth tarsal segment beyond third segment
 - C. Length of third tarsal segment
 - D. Combined length of second and third tarsal segment.
4. Sagittal section of abdominal apex with male external genitalia extended.
5. Male external genitalia showing morphological parts of importance.



Male External Genitalia of Species of
Ceutorhynchus

6. C. pollinosus Dietz
7. C. obliquus Leconte
8. C. tau Leconte
9. C. horni Dietz
10. C. adjunctus Dietz
11. C. sulcipennis Leconte
12. C. decipiens Leconte
13. C. rapae Gyllenhal
14. C. punctiger Gyllenhal
15. C. americanus Buchanan
16. C. isolatus Dietz
17. C. sericans Leconte

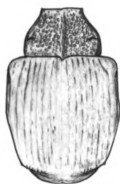
Male External Genitalia of Species of
Ceutorhynchus

18. C. septentrionalis Gyllenhal
19. C. floralis (Paykull)
20. C. zimmermanni Gyllenhal
21. C. anthonomoides Dietz
22. C. persimilis Dietz
23. C. siculus Dietz
24. C. erysimi (Fabricius)
25. C. lesquerellae Pierce
26. C. assimilis (Paykull)
27. C. pusio Mannerheim
28. C. oregonensis Dietz
29. C. pusillus Leconte
30. C. convexicollis Leconte
31. C. hamiltoni Dietz

Dorsal View of Species of

Ceutorhynchus

- 32. C. pollinosus Dietz
- 33. C. ouipennis Dietz
- 34. C. disturbatus Dietz
- 35. C. angulatus Leconte
- 36. C. obliquus Leconte
- 37. C. tau Leconte
- 38. C. consanguineus Dietz
- 39. C. pervestitus Fall
- 40. C. horni Dietz



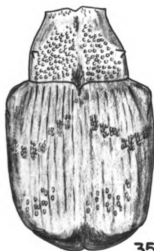
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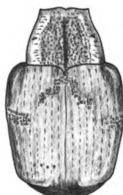
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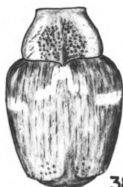
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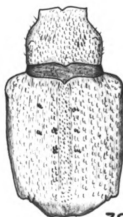
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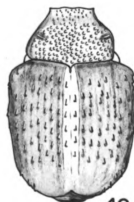
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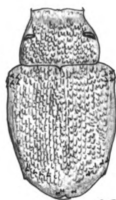
Dorsal View of Species of

Ceutorhynchus

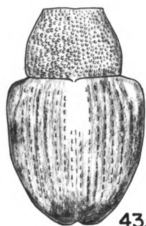
- 41. C. nodipennis Dietz
- 42. C. adjunctus Dietz
- 43. C. sulcipennis Leconte
- 44. C. armatus Dietz
- 45. C. echinatus Fall
- 46. C. decipiens Leconte
- 47. C. sericans Leconte
- 48. C. bolteri Dietz
- 49. C. punctiger Gyllenhal



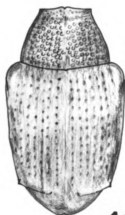
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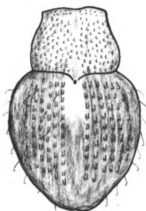
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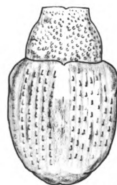
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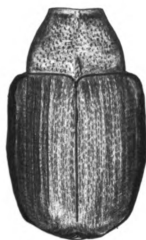
Dorsal View of Species of

Ceutorhynchus

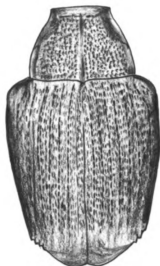
- 50. C. quadridens Panzer
- 51. C. rapae Gyllenhal
- 52. C. subpubescens Leconte
- 53. C. americanus Buchanan
- 54. C. rudis Leconte
- 55. C. notatulus Fall
- 56. C. invisus Fall
- 57. C. puberulus Leconte



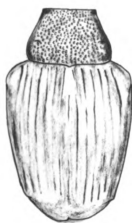
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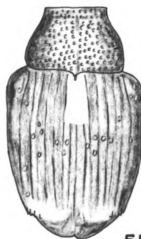
52.



53.



54.



55.



56.



57.

Dorsal View of Species of

Ceutorhynchus

- 58. C. semirufus Leconte
- 59. C. septentrionalis Gyllenhal
- 60. C. zimmermanni Gyllenhal
- 61. C. albopilosus Dietz
- 62. C. erysimi (Fabricius)
- 63. C. hearnei Brown
- 64. C. handfordi Brown
- 65. C. sculus Dietz
- 66. C. oregonensis Dietz
- 67. C. squamatus Leconte
- 68. C. pusio Mannerheim



58.



59



60.



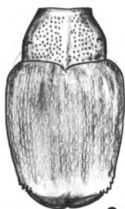
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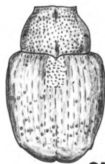
62.



63.



64.



67.



65.



68.



66.

Dorsal View of Species of

Ceutorhynchus

- 69. C. convexipennis Fall
- 70. C. lesquerellae Pierce
- 71. C. munki Brown
- 72. C. anthonomoides Dietz
- 73. C. assimilis (Paykull)
- 74. C. opertus Brown
- 75. C. ovalis Dietz
- 76. C. wickhami (Champion)
- 77. C. moznettei Fall
- 78. C. pusillus Leconte



69.



70.



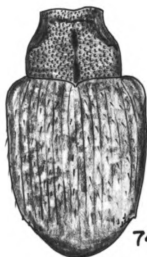
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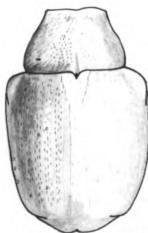
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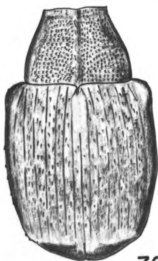
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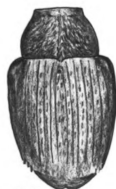
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76.



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78.

Dorsal View of Species of

Ceutorhynchus

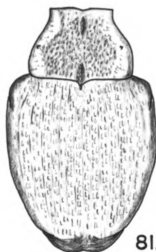
- 79. C. pauxillus Dietz
- 80. C. adpersulus Dietz
- 81. C. hamiltoni Dietz
- 82. C. dubitans Brown
- 83. C. carteri Brown
- 84. C. omissus Fall
- 85. C. wallulensis n. sp.
- 86. C. mutabilis Dietz
- 87. C. numulus Dietz



79.



80.



81.



82.



83.



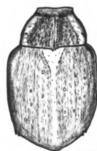
84.



85.



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87.

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