

The Costate Species of *Colaspis*
in the United States
(Coleoptera: Chrysomelidae)

DORIS H. BLAKE

SMITHSONIAN CONTRIBUTIONS TO ZOOLOGY • NUMBER 181

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SMITHSONIAN INSTITUTION PRESS

City of Washington

1974

ABSTRACT

Blake, Doris H. The Costate Species of *Colaspis* in the United States (Coleoptera: Chrysomelidae). *Smithsonian Contributions to Zoology*, number 181, 24 pages; 27 figures, 1974.—Included are 19 species and four subspecies, of which seven new species and three new subspecies are described. Drawings have been made of all the species, and most of the drawings were made from the type-species.

OFFICIAL PUBLICATION DATE is handstamped in a limited number of initial copies and is recorded in the Institution's annual report, *Smithsonian Year*. SI PRESS NUMBER 5132. SERIES COVER DESIGN: The coral *Montastrea cavernosa* (Linnaeus.)

Library of Congress Cataloging in Publication Data

Blake, Doris Holmes, 1892—

The costate species of *Colaspis* in the United States (Coleoptera: Chrysomelidae)
(Smithsonian contributions to zoology, no. 181)

Bibliography: p.

Supt. of Docs. no.: SI 1.27:181

1. *Colaspis*. 2. Insects—United States. I. Title. II. Series: Smithsonian Institution. Smithsonian contributions to zoology, no. 181.

QL1.S54 no. 181 [QL596.C5] 591'.08s [595.7'64] 74-8607

For sale by the Superintendent of Documents, U.S. Government Printing Office
Washington, D.C. 20402 - Price 65 cents (paper cover)

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The Costate Species of *Colaspis* in the United States (Coleoptera: Chrysomelidae)

Doris H. Blake

Introduction

In a letter, dated 23 July 1926, from Gilbert Arrow of the British Museum (Natural History) to H. S. Barber of the U. S. National Museum, in answer to an inquiry concerning the type of *Colaspis brunnea* (Fabricius), Arrow wrote "The type is probably in the Copenhagen Museum and its identification will make a pleasant little problem for Mrs. Blake on her next trip to Europe." Now, nearly 50 years later, I am attempting what H. S. Barber was never able to clear up satisfactorily, that is, the identity of *Colaspis brunnea* (Fabricius) and *Colaspis suilla* (Fabricius) and the many other closely related species of *Colaspis* in the United States.

The earliest entomologist in America to tackle the problem was Crotch (1873), when he dealt with it by putting under the name of *C. brunnea* all the yellow-brown species of *Colaspis* at that time described in the United States, thereby synonymizing *C. suilla* (Fabricius), *C. lurida* Olivier, and *C. flavida* Say. Crotch at this time, in a line and a half, described *costipennis* as a variety of *brunnea*, and he ended this account by writing, "Every lead can be found between these extremes." Horn (1892), the next to write of this group, followed Crotch's short account with an equally short one, repeating Crotch's synonymy with the exception of *C. lurida*

Olivier and adding one more synonym, *C. flavicans* Lefèvre, which he stated was "merely a larger form." He too ended with the sentence, "Between all these forms there are intermediate specimens and every attempt to separate them will be found impossible."

Horn wrote that Lefèvre had changed Crotch's name *C. costipennis* to *Colaspis crotchi*, ignoring the fact that Crotch had described *costipennis* in 1873, four years earlier than Lefèvre had described his Argentine beetle as *C. costipennis*. Horn, however, did not dispose of Lefèvre's *costipennis*, which has stood as that for 95 years, even in the Junk catalog and Blackwelder's checklist of Coleoptera. So I am herewith renaming Lefèvre's Argentine species of *Colaspis* as *C. lophodes*, the *Colaspis* with ridges.

As early as 1906, Charles Schaeffer began to be interested in the *Colaspis* group and published an account of *C. championi* Jacoby that he declared to be a "more fully developed and very large form of the variable *brunnea*." But in 1919 and again in 1933, Schaeffer described six new species of this group—*C. viriditincta*, *C. viridiceps*, *C. crnicornis*, *C. lata*, *C. flavocostata*, and *C. brunnea floridana*—all valid species, thus breaking the tradition that all yellow-brown costate species were one species, the variable *C. brunnea*. Barber (1937), evidently inspired by Schaeffer's new species, published a short paper in which he discussed Schaeffer's *flavocostata* and described out of it two more new species. But he ended very much as had Crotch and

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Horn before him in writing of *C. brunnea*, "which even thus restricted is left as an insoluble complex." Thus Crotch, Horn, and Barber alike were in despair of resolving the identities of these old Fabrician species.

I have been more fortunate because I have been able to borrow the Fabrician types of *C. brunnea* and *C. suilla* from Copenhagen, as well as some of Lefèvre's types from the Paris Museum. Say's *flavida* is probably not in existence. Moreover, I have studied a large series of specimens, many already dissected by the fine fingers of H. S. Barber, and I have before me Schaeffer's types.

These yellow brown costate species of *Colaspis* have been confused because in all there is essentially the same pattern of elytral costae usually with double rows of punctures between the costae. This pattern of punctures holds also in species that occur in Mexico and Central America, some of which are only faintly costate, such as *C. subaenea* Jacoby and *C. fastidiosa* Lefèvre, and even in *C. fulvotestacea* Lefèvre, which is not costate at all in the male, the punctures are arranged in the same pattern as in the costate species. Moreover, in other characters, such as the head and prothorax, the costate species of *Colaspis* are very similar. The head is punctate with the clypeus having coarser punctures, the prothorax is almost always rather densely punctate, and the margin either angulate or dentate, or sinuate, rarely rounded. But in size and shape, in proportions of the prothorax and elytra, as well as to a certain extent in coloring and size of punctures, width of costae and variation in punctures, there are usually good differences, as examples, such species as *C. lata* and *C. suilla*. Furthermore, the aedeagus always shows good differences in the different species.

Colaspis brunnea and *C. suilla* represent two groups of the costate species. The species under the *brunnea* group are *C. floridana* Schaeffer, one yet undescribed from Louisiana, a third undescribed from Brownsville, and a fourth undescribed from New Mexico and Arizona. While these five are closely related, there are definite differences both externally and in the aedeagus. The species in the *suilla* group have been more difficult to understand, because I have much less material. In *brunnea* there are eight more or less equal costae on each elytron, giving the beetle a very well ribbed appearance; whereas, in the *suilla* group, there are

only four more prominent costae on each elytron, the intervening ones, when present, not so conspicuous.

These 4-costate specimens occur from Canada to Florida and west to Nebraska and Kansas, but I have seen only one or two specimens from each locality, never a good series and never many from nearby localities. Much more material is needed in this *suilla* group before I would venture to describe as species those now represented by only a few specimens.

Besides these *brunnea* and *suilla* groups, there are species that do not fall in either group, such as Crotch's *C. costipennis*, Schaeffer's *C. lata*, *C. crinicornis*, and *C. flavocostata*, and several undescribed species. Barber's two, *C. pini* and *C. pini schotti*, differ from any of the yellow-brown species in being much darker in coloring. Two western species with metallic green head and undersurface may also be found in Mexico, *C. viridiceps* and *C. viriditincta*, both described by Schaeffer, and also an undescribed species from Arizona that varies from being dark yellow brown to piceous black.

All of these, both Schaeffer's and the ones that I am describing, are plainly distinct species with good characters such as color, proportions, elytral punctation, width of elytral costae, and, above all, differences in the aedeagi, coupled with their geographic distribution. While difficult, these yellow brown costate species are not as impossible to differentiate as Crotch, Horn, and Barber found them.

In 1950, Bechyne changed the name of the genus *Colaspis* to *Maecolaspis*. Brown (1961), giving the reference to *Colaspis* in Fabricius' *Systema Eleutheratorum* (1801) with 27 species in it, including *flavicornis*, *brunnea*, and *suilla*, states that *flavicornis* was designated as type-species of the genus by Latreille in 1870, and that Bechyne incorrectly considered *C. testacea* Fabricius the type-species and erected the genus *Maecolaspis* for the species listed in the catalogs in *Colaspis*. He ends by writing that the nomenclature in the Junk catalog is correct.

The biology of *C. brunnea* (Fabricius) was first worked out in 1931 by J. H. Bigger of the Illinois Natural History Survey. The larvae there live in the ground for about nine months feeding on the roots of such plants as clover, grasses, soy beans, and timothy. They hibernate and the first pupae

are found in early June and the adults appear several weeks later. As adults they cause considerable damage to vegetables, such fruits as plums, peaches, and pears, and especially to corn. Some related species in the South are a pest to sugarcane and peanuts, and one species in the West has been collected in numbers on alfalfa. In Central and South America several species are destructive pests to bananas—one at the time of writing is devastating over 4500 acres of bananas in Panama. In connection with these the biology of *C. hypochlora* Lefèvre has been studied by both Gowdey (1926) and Salt (1928).

ACKNOWLEDGMENTS.—I wish to thank Mlle. Nicole Berti of the Paris Museum and Dr. S. G. Larsson of the University Zoological Museum of Copen-

hagen for sending me old types, R. T. Thompson of the British Museum (Natural History) for sending me Jacoby types, Dr. Gerhard Scherer of the Frey Museum, near Munich, for sending me Bechyne types, and Dr. George W. Byers of the Kansas University Museum, Hugh Leech of the California Academy of Sciences, Milton Sanderson of the Illinois Natural History Survey, Edward U. Balsbaugh of South Dakota State University, and Dr. P. J. Darlington of the Museum of Comparative Zoology at Harvard, for sending me material for study.

Specimens bearing the designation "USNM" (for the United States National Museum) are in the National Museum of Natural History, Smithsonian Institution, Washington, D.C.

Key to Species of *Colaspis*

1. Legs black or in pale specimens deep brown with black shadings. Arizona
 *C. melaina*, new species
 Legs yellowish or reddish brown 2
2. Head and sometimes prothorax with aeneous green luster 3
 Head and prothorax not green 5
3. Yellow brown above with only head aeneous green. New Mexico, Arizona, Mexico
 *C. viridiceps* Schaeffer
 Yellow brown above with head and prothorax and sometimes interspaces of elytra more or
 less green 4
4. Each elytron with 4 wide, well elevated, pale yellow costae with interspaces more or less
 green. Eastern U.S. *C. costipennis* Crotch
 Each elytron with 8 rather flat costae, elytra entirely pale yellow brown. Arizona
 *C. viriditincta* Schaeffer
5. Yellow brown above, each elytron with 8 costae of approximately same width or with first
 two costae near suture wider 6
 Yellow brown or darker brown above, each elytron with 4 conspicuous costae and usually
 4 narrower and often inconspicuous costae between 10
6. Body beneath with aeneous luster. Brownsville, Texas *C. planicosta*, new species
 Body beneath not aeneous, either piceous, dark reddish brown or pale yellow brown 7
7. Antennae pale with last joint and sometimes part of 10th joint dark 8
 Antennae pale with 7th and last joint dark, first two elytral costae usually wider 9
8. Body beneath pale and margin of prothorax and of elytra not metallic. Aedeagus strongly
 angulate before tip, with broad tip, Western Texas, New Mexico, Arizona
 *C. hesperia*, new species
 Body beneath often piceous, edges of prothorax and edges of elytra often metallic, aedeagus
 well rounded near tip. Eastern U.S. *C. brunnea* (Fabricius)
9. Aedeagus rounded before tip, tip narrow, elytral punctures often dark brown, usually alter-
 nating rather than double, many in single rows. Southeastern U.S. . *C. floridana* Schaeffer
 Aedeagus not well rounded but slightly angulate before tip. Baton Rouge, Houma, Louisiana
 *C. louisianae*, new species
10. Entirely pale yellow brown except last antennal joints, without dark or metallic markings;
 median tubercle on last abdominal sternite of male strongly recurved. Southeastern U.S.
 *C. recurva*, new species
 Usually with dark or metallic markings, median tubercle on last abdominal sternite of
 male not strongly recurved 11

11. Large (7.8–8.5 mm in length), usually with metallic luster on lower surface and punctures on upper surface often with aeneous green luster. Aedeagus with long narrow tip. Arizona, Mexico *C. championi* Jacoby
Smaller (3.5–6.5 mm), aedeagus not with long narrow tip 12
12. Small (3.5–4.0 mm), head, prothorax, and undersurface dark brown, sometimes with faint metallic luster, elytra deep yellowish or reddish brown with very narrow costae, aedeagus narrowed to short tip. Southeastern U.S. *C. suilla* Fabricius
Elytral costae wider and beetles more rotund. Canada *C. suilla borealis*, new subspecies
Larger (4.2–6.5 mm), aedeagus wider, usually with small nodule at tip but in one species without it 13
13. Elytra more than 3 times as long as prothorax 14
Elytra 3 times or less as long as prothorax 17
14. Aedeagus without a nodule at apex. Louisiana and Mississippi *C. pini* Barber
Aedeagus with a nodule at tip 15
15. Interocular space approximately half width of head *C. flavocostata* Schaeffer
Interocular space more than half width of head 16
16. Aedeagus unusually long, beetles deep reddish brown. New Jersey to Washington, D.C.
..... *C. pini schotti* Barber
Aedeagus not unusually long, beetles yellow brown. New Jersey
..... *C. flavocostata avaloni*, new subspecies
17. Head, prothorax, and undersurface brown, elytra with 4 conspicuous wide yellow costae on each, punctate intervals deeper brown. Eastern U.S. *C. costipennis* Crotch
Head and prothorax usually paler, elytral costae not unusually wide or conspicuous 18
18. Unusually large and wide 19
Not unusually large and wide 20
19. Elytra only about a third longer than wide. Middle States *C. lata* Schaeffer
Elytra longer. Hind tibiae in male dilated at middle. Southern Louisiana
..... *C. crinicornis chittendeni*, new subspecies
20. Elytra with costae nearly flat. Hind tibiae in male dilated at middle. Brownsville, Texas
..... *C. crinicornis* Schaeffer
Elytra with usual elevated costae. Hind tibiae not dilated 21
21. Aedeagus with a moderately long pointed tip. Key West, Texas *C. keyensis*, new species
Aedeagus with a short nodule at tip. South Carolina, Florida *C. carolinensis*, new species

Colaspis brunnea (Fabricius)

FIGURES 1, 2

Galleruca brunnea Fabricius, 1798:94.

Colaspis brunnea.—Fabricius, 1801:411.—Olivier, 1808:891.—
Crotch, 1873:44.—Horn, 1892:223.—Barber, 1937:198.

DESCRIPTION.—Length of type specimen 4.5 mm, elongate oblong oval, shining, yellow brown above with dark margins, below with prosternum reddish brown but not as brown as breast, abdomen even deeper brown, almost piceous, with apex paler, densely punctate, elytra evenly costate.

Head with interocular space more than half width of head, occiput, front, and clypeus densely punctate, a slight depression on front, labrum pale with anterior margin widely and shallowly emarginate, jaws dark, head and prothorax slightly deeper yellow than elytra. Antennae in type specimen broken with only the four basal joints of one an-

tenna left, pale yellow. Prothorax wider than long with a tooth at each corner, sides widest below middle and faintly angulate, surface densely punctate with narrow explanate margin a little deeper reddish brown. Prosternum punctate, reddish brown. Scutellum pale yellow brown. Elytra a little wider than prothorax and about three times as long with 8 costae of approximately same width on each elytron and between first and second costae single rows of punctures, in third interval and the two following irregularly double rows of punctures becoming single near apex, 9th interval near margin with single row of punctures. Margin and epipleura deep brown, almost piceous. Body beneath with prosternum paler than breast, which is dark brown and abdomen still darker except apex which is pale. Only one anterior leg left with first tarsal joint broad, indicating the specimen is a male, one hind leg, which is entire, rest missing. Length 4.5 mm; width 2.1 mm.

TYPE.—Male, in Fabricius' collection, Copenhagen, Denmark.

TYPE-LOCALITY.—Habitat in America. Dom Hybner.

REMARKS.—H. S. Barber has discussed at length the confusion surrounding the name *brunnea* as applied to the New Zealand *Chrysomela brunnea* Fabricius, 1792, and the North American *Galleruca brunnea* Fabricius, 1798. Barber wound up by writing that, although the *International Code of Zoological Nomenclature* requires replacement of the specific homonym *brunnea* Fabricius, 1798, by a substitute name, he would not propose one for a species "whose identity may not be known for a very long time." Barber did not live long enough to know that the type of *brunnea*, 1798, was in existence as shown by Mrs. Zimsen's book on the Fabrician types, but he made a true guess as to which species of the yellow brown costate North American beetles corresponded with the Fabrician type, as evidenced by his determinations on labels in the collection "*brunnea* auct. H.S.B." I can see no reason at this late date for proposing another specific name for *Colaspis brunnea*. Fabricius first described it as *Galleruca brunnea* and in 1801 put *Galleruca brunnea* in *Colaspis*, Fabricius' own genus. Fabricius always kept the New Zealand species *brunnea* in *Chrysomela*. White in 1846 placed the New Zealand *brunnea* in *Colaspis*, but Baly listed it under his New Caledonia genus *Dematochroma* in 1881, and it was so designated by Lefèvre in his catalog of the Eumolpids in 1885. In 1886, Sharp made a new genus for it, *Eucolaspis*, thus disposing of it quite satisfactorily. Perhaps in the *brunnea* 1798 case it could be considered as a secondary homonym to be restored when the 1792 *brunnea* was removed to another genus. The one specimen of *Galleruca brunnea* in the Fabrician collection is the species that Barber suspected of being *brunnea*, and it is probably the most widespread species of *Colaspis* that occurs in the United States and the most abundant in collections that I have examined.

Colaspis brunnea is a good representative of a group of the yellow brown costate species of *Colaspis* that occurs in the United States. All of these have much the same sort of elytral costation, and the coloring above is pale yellow brown. Furthermore, the aedeagi differ a little in each, but all have the same general shape. These rather narrow

pale yellow species have 8 elytral costae of approximately the same width on each elytron, giving a very ribby appearance to the beetles. In the *suilla* group, on the other hand, there are only four principal elytral costae on each elytron that are prominent, although oftentimes there are narrower costae between these prominent ones. In the type specimen of *brunnea* there is a dark margin on the prothorax and elytra and below, the prosternum is reddish brown and the abdomen almost piceous. This dark coloration of margins and undersurface is found on most of the more northern specimens from Vermont, Massachusetts, and New York, but in New Jersey and Pennsylvania many have a pale undersurface, and in the District of Columbia and Virginia I have seen relatively few specimens with a dark undersurface. From Virginia south I have seen few specimens of *brunnea*. It is more common in West Virginia, Ohio, Indiana, Kentucky, Tennessee, Alabama, Mississippi, Louisiana, and even in northern Texas; farther west it occurs in Michigan, Iowa, Kansas, Arkansas, and Oklahoma. In all of these the abdomen may or may not be dark. In all the color of the antennae remains the same, only the last joint, and rarely the tenth joint, is dark. It has been repeatedly collected on *Meibomia*, *Desmodium*, and *Lespedeza*, and also found on strawberry, *Prunus angustifolia*, and peach, and such vegetables as string beans and corn, also feeding on cotton and peanuts.

From Say's (LeConte, 1859:196) description of *Eumolpus flavida* it appears most likely that he had *C. brunnea* before him. He gives for the locality "inhabits the U.S.," but he specifies that "the insect is common in Pennsylvania." The variety he describes as having the interstitial spaces of the elytra black and body beneath black was obtained on St. Peter's River (Pennsylvania). He wrote that this black variety might easily be mistaken for a distinct species. This black one is probably *C. suilla*. Unfortunately, however, there is little left of Say's collection. In the LeConte collection in the Museum of Comparative Zoology there is one specimen labeled "*C. flavida* Say," but it is doubtful if this is Say's specimen. It is *C. brunnea* and the undersurface is not piceous black but a deep reddish brown.

In Horn's synonymy of *C. brunnea* he lists *C. flavicans* Lefèvre. I have borrowed the type of this species, a female, from the Paris Museum. As Lefèvre (1885:33) wrote, it is nearly twice as big as

C. brunnea and also differs in its proportions, the elytra being four times as long as the prothorax. Both head and prothorax are unusual in having few punctures compared with most of the yellow brown species, and on the elytra the punctures are unusually fine, near the tip becoming single. Moreover, in coloring except for the dark apical joints of the antennae, the beetle is entirely pale yellow brown, fully living up to Lefèvre's name *flavicans*. The only reason I can see why Horn included this under *brunnea* is that this type has the locality label "America borealis." I have not seen any other specimen like it from North America and have seen only one other specimen, which bears the locality label "Rio de Janeiro, Brazil." This one appears to be the same species, having the same smooth head and flat, sparsely punctate pronotum. The elytra also agree in punctuation and in having smooth apex.

Schaeffer synonymized *Colaspis championi* Jacoby with *brunnea*, but that species too is much larger and, aside from being yellow brown and costate, bears little resemblance to the tiny *brunnea*. The aedeagus is very different, showing that it does not even belong in the *brunnea* group.

Colaspis louisianae, new species

FIGURE 3

DESCRIPTION.—From 4.0 to 5.0 mm in length, oblong oval, entirely yellow brown except jaws and 7th and 3 apical antennal joints, which are dark; elytral costae much as in *brunnea* except the two nearest suture wider than rest.

Head with interocular space more than half width of head, finely punctate over upper half with clypeus well defined and with scattered punctures, labrum with small emargination, jaws alone dark. Prothorax convex, densely punctate, sides faintly angulate below middle, a tooth at each corner. Scutellum pale. Elytra with 8 costae on each, first two next to suture tending to be wider and flatter and first two intervals more or less singly punctate. Body beneath entirely pale. Length 4.0–5.0 mm; width 2.5–3.0 mm.

TYPE.—Male, and 28 paratypes, USNM Type no. 26904.

TYPE-LOCALITY.—Paincourtville, Louisiana, 19 June 1929, W. L. Haley, on soybeans.

OTHER LOCALITIES AND HOSTS.—*Louisiana*: Baton Rouge, on fuchsia, rose, corn; Plaquemine, on turnip; Crowley, on cotton; Jeanerette, on soybeans; Lafayette, on cotton; Opelousa; Gueydan; St. Charles Parish, on corn; Houma, on soybeans; Poydras, on string beans.

REMARKS.—This species is close to *C. brunnea*, but the coloring is consistently paler, the undersurface is never dark, the antennae have joints 7, 9, 10, and 11 dark. The first two elytral costae tend to be wider than in *brunnea*. The aedeagus is distinctly angulate before the apex, and the beetles average a little larger than the typical *brunnea* specimens. It has been collected only from a small area about Baton Rouge and Houma, Louisiana.

Colaspis floridana Schaeffer, new status

FIGURE 5

Colaspis brunnea var. *floridana* Schaeffer, 1933:471.

DESCRIPTION.—Between 4.0 and 5.5 mm in length, oblong oval, yellow brown, sometimes pale reddish brown, usually with deeper brown elytral punctures, dark epipleura and dark apical joints of the antennae, first two elytral costae wider than rest with single lines of punctures between, sixth and seventh lines single in basal part and eighth single.

Head with interocular space more than half its width, usually densely punctate throughout with clypeus clearly outlined, labrum emarginate anteriorly, jaws large and dark brown. Antennae varying considerably in color, some with apical joints from 7 to 11 dark, others with only joints 7, 10, and 11 dark, infrequently only last joint dark. Prothorax with sides somewhat undulate, not very clearly angulate below middle, moderately convex and densely, not coarsely punctate. Scutellum pale. Elytra a little wider than prothorax, yellowish or reddish brown with deeper brown suture and usually dark epipleura, rows of punctures usually darker brown, often alternating rather than being geminate, and generally uneven in rows 1 and 2 singly punctate, rows 6 and 7 single in basal part and row 8 entirely single. The two costae nearest suture much wider than rest. Body beneath and legs pale. Length 4.0–5.5 mm; width 2.2–2.5 mm.

Type and five paratypes in National Museum of Natural History.

TYPE-LOCALITY.—Ft. Myers, Florida, August, M. D. Leonard. Paratypes from Gainesville, Florida, 1927, J. S. Rogers.

OTHER LOCALITIES AND HOSTS.—*North Carolina*: Southern Pines; near Wilmington, on soybeans; Richmond County. *South Carolina*: Charleston, on roses, dahlias, hibiscus, geranium, cabbage; Clemson College; Johns Island, on peanuts; Florence, on cotton; Saluda County. *Georgia*: Seminole County, on beans and peas; Waycross, on rose; Thomasville; Head River; Richland; Stewart County; Savannah, on tomato, watermelon, okra, peanuts; Lake Park; Tifton, on cotton; Albany, on peanuts. *Florida*: Miami, on beans; Homestead, on avocado; Green Cove Springs; Lakeland; Tampa, on *Clathidium versicarium*; Hillsboro Beach, on *Mirabilis jalapa*; Cedar Key, on peanuts; Daytona Beach; LaCrosse; Rock Bluff; Live Oak; Altha; Madison; Vernon; Tallahassee; Quincy; Hilliard; Sanford; Yankeetown; Fruitville; Hudson.

REMARKS.—Although differing in general appearance from *C. brunnea*, this species belongs to the *brunnea* group and has a very similar aedeagus. It largely takes the place of *brunnea* in South Carolina, Georgia, and Florida, although we do have a few specimens of *brunnea* from those states, and a few specimens of *floridana* in North Carolina. Schaeffer described *floridana* as a variety of *brunnea*, but it is quite distinct, even the aedeagus is slightly different in being less rounded and more angulate. The real difference is in the costation of the elytra, which in *floridana* have the first two costae wider and separated by only a single row of punctures. This tendency to single rows is found also in the sixth and seventh rows in the basal part and there is only a single row in the eighth. The last antennal joints also are dark, often the last five joints are dark. In the Florida specimens the elytral punctures are darker than the costae, producing a striped effect that is noticeable. In Cuba there is a species I have named *C. amplicosta* that above is like *floridana* in having wide costae near the suture and single rows of punctures, but below it is dark metallic green with green edges to the pronotum and elytra. It belongs to the *brunnea* group having a similar sort of aedeagus.

Colaspis planicostata, new species

FIGURE 4

DESCRIPTION.—Between 4.7 and 6.2 mm in length, oblong oval, yellow brown above, usually with dark margins and dark undersurface having a metallic green luster, antennae pale with 7th and three apical joints usually dark, elytral costae in most specimens flat or only slightly raised except on sides and at apex, first two near suture widest.

Head with interocular space more than half width of head, densely punctate throughout, clypeus clearly marked, labrum with anterior edge shallowly emarginate, jaws dark, in some specimens head behind eyes deeper brown. Antennae pale with outer joints more or less dark. Prothorax moderately convex, densely punctate, sides rounded with little sign of angularity at middle, a tooth at each corner, margins often dark but seldom metallic. Scutellum pale. Elytra somewhat wider than prothorax with 8 rows of punctures, the first and last single, between these 8 rows bare intervals which are usually costate only at apex and on sides, first two near suture widest. Margin and epipleura dark, sometimes metallic. Body beneath with middle of prosternum, breast, and abdomen usually with metallic green luster, legs pale. Length 4.7–6.2 mm; width 2.3–3.2 mm.

TYPE.—Male, USNM Type No. 26905, and 12 paratypes.

TYPE-LOCALITY.—Brownsville, Texas, 10 June 1939, Thayer, collector.

OTHER LOCALITIES AND HOSTS.—*Texas*: San Benito, on green beans; McAllen, on grape leaves, okra, beans; Alamo, on alfalfa; Mission, on bean foliage; Pharr, on okra leaves; Brownsville, on Palm fronds, green beans, bell-pepper leaves; Esperanza Ranch; Edinburg.

REMARKS.—The only specimens of this species so far seen have come from the area in and about Brownsville, Texas. The usually flat elytral costae show elevated costae only at sides and apex and is its most marked character. The coloring of the undersurface differentiates it from *C. brunnea* and *C. louisianae* and other U.S. species of the *brunnea* group. In this green metallic luster of the undersurface it is like several Mexican species such as *C. freyi* Bechyne from Jalapa, Mexico, and still another species from farther south in Mexico, both

of which belong in the *brunnea* group and have even darker green undersurface. Both of these Mexican species have prominently costate elytra and somewhat differently shaped tips to the aedeagus. There is a species in Cuba (*C. amplicosta* Blake) with the undersurface all dark green, but that too is distinctly costate and the elytra resemble *C. floridana* in having wide costae near the suture. The aedeagus is different.

Colaspis hesperia, new species

FIGURE 6

DESCRIPTION.—From 4.5–6.2 mm in length, elongate oblong oval, pale yellow brown with abdomen or sides of abdomen often deeper brown. Antennae with terminal joint only dark, elytra with 8 regularly spaced costae on each.

Head with interocular space more than half width of head, densely punctate throughout, clypeus somewhat triangular with anterior margin widely and faintly emarginate. Prothorax feebly angulate or undulate on sides, moderately convex, often rugously and densely punctate. Scutellum pale. Elytra about three times as long as prothorax with prominent costae, the two nearest suture being wider, first and last intervals with single punctures. Body beneath pale with abdomen or sides of abdomen sometimes deeper brown. Length 4.5–6.2 mm.

TYPE.—Male, and 19 paratypes, USNM Type No. 26906.

TYPE-LOCALITY.—Pina County, Arizona, 26 July 1934, T. P. Cassidy, on cotton.

OTHER LOCALITIES AND HOSTS.—*Texas*: Ysleta, on cotton and lima beans; El Paso, on cotton and alfalfa; Presidio, on cotton. *New Mexico*: Mesilla Park, on grape foliage; Hatch; Dona Ana County, on cotton; Torrance County; Bernalillo County; Las Cruces; Las Vegas; Artesia. *Arizona*: Tucson; Midvale Farm, on cotton; Higley; Nogales; Gila Bend; Mt. Superstition; Phoenix, on alfalfa and cotton; Tempe; Ruby; Santa Rita Mts.; Sunnyside Canyon; Huachuca Mts.; Santa Cruz County; Tumacacori Mts.; Pajarito Mts.; Sycamore Canyon.

REMARKS.—This close relative of *C. brunnea* ranges from western Texas through New Mexico to Arizona, and differs from *brunnea* in being generally a little larger with longer elytra and more coarsely punctate pronotum. It is yellow brown

without dark margins or all dark undersurface, only the sides of the abdomen are frequently darker. The antennae as in *brunnea* are pale with only the last joint dark. The aedeagus is with a very wide tip and angulate, not rounded, before the tip, as in *brunnea*.

Colaspis suilla (Fabricius)

FIGURES 7–9

Galleruca suilla Fabricius, 1801:417.

Colaspis suilla.—Olivier, 1808:492.—Horn, 1892:223.

Fabricius' description of *Galleruca suilla* is as follows: ". . . nigro-aenea, obscura, elytris pedibusque cinereis. Habitat in Carolina, M. D. Bosc. Statura omnino *C. brunnea* at caput, thorax, et corpus nigra, aeneo obscure nitida." In Horn's revision of the boreal North American species of *Colaspis*, he has listed *suilla* as "variety" of *brunnea* along with *C. flavida* Say, *flavicans* Lefèvre and *costipennis* Crotch. Horn described *suilla* briefly as having a brown thorax with some metallic coloration. And there the matter has stood for the past 80 years.

In 1950, I examined the Bosc collection in Paris and found two specimens labeled "*G. suilla* Bosc.h. in Caroline." At that time I wrote in my notes, "This is not *Colaspis* but may be a species of *Metachroma*," of which then I did not have the intimate knowledge to name as to species. Later, when I came to work on the genus *Colaspis*, I noted that Olivier in describing *suilla* wrote that the elytra were with "elevated lines" (costae) and with rows of punctures between, which description did not apply to the two specimens labeled "*suilla*" in the Bosc collection. Following this description Olivier described as *Colaspis lurida* the species I had seen labeled "*suilla*" in the Bosc collection. Olivier's illustration of *lurida* clearly shows the single striate punctate elytra of a species of *Metachroma*. Unfortunately, however, Olivier's illustration of *suilla*, next to that of *lurida*, does not show clearly either the elevated lines or the two rows of punctures that Olivier described, and even the coloration is not like that of any species of *Colaspis* that I know. This illustration has undoubtedly been a deterrent to entomologists in recognizing *suilla*.

Mrs. Zimsen in her book on the Fabrician types

lists one specimen of *suilla* in the Fabricius collection, and on my writing to Copenhagen about the specimen, it was sent to me for study. It is not the same as the specimens in the Bosc collection labeled "*suilla*," but a species of *Colaspis* that corresponds with the brief Fabrician description. The existence of this specimen in the Fabrician collection coupled with Olivier's clear description of it are sufficient for me to decide that this one and not the two in the Bosc collection should be regarded as the type of *suilla*. Possibly the two labeled so in the Bosc collection are the result of some later transference of the label from a lost or disintegrating specimen of *Colaspis*.

This specimen from Denmark represents a species with dark brown, sometimes piceous, head and prothorax and somewhat paler reddish brown elytra, the elytra having dense punctation with four narrow paler reddish brown costae on each elytron. Probably this is the one that Say described as a variety of *Eumopus flavidus* having "interstitial spaces of the elytra black, beneath except feet black." The beetles are considerably smaller, more rotund and less elongate than in the group comprising *C. flavocostata* Schaeffer, *C. pini* and *C. pini schotti* Barber, although in coloring they are similar. *Colaspis costipennis* Crotch differs from all of them by having usually a distinctly green prothorax and head also with greenish luster and frequently the elytral punctures have an aeneous luster. The wide, pale, polished, pale yellow costae of *costipennis* are nearly as wide as the punctate intervals and wider than in any other species from the United States. Sometimes *costipennis* specimens lack the aeneous coloring, being deep reddish brown instead, but the wide elytral costae are always there to distinguish this species. This specimen from Denmark that I have chosen as lectotype of *suilla* is the smallest specimen of the species that I have seen. It is a male measuring approximately 3.5 mm in length. I have seen only two other specimens that correspond very closely with the type, one from Southern Pines, North Carolina, and the other from Mt. Vernon, Alabama, both also males, but somewhat larger. I have dissected both of these and their aedeagi are not at all like that of *C. brunnea*, being narrower and not bent before the apex, and the apex is much narrower. Following is my detailed description of the type specimen.

DESCRIPTION:—Approximately 3.5 mm in length, oblong oval, moderately shiny, densely punctate, with dark brown head and prothorax, beneath dark brown, prosternum with very faint metallic blue luster, abdomen reddish brown with tip paler, elytra deep yellow brown, legs yellow brown, antennae on type specimen broken with only eight joints of one antenna left, which is pale yellow brown with 7th and 8th joints dark.

Head with interocular space more than half width of head, finely punctate above, clypeus also finely punctate and not very distinctly outlined, labrum yellow brown, faintly emarginate anteriorly. Prothorax with sinuous or slightly angulate sides, widest below middle, a tooth at each corner, moderately convex, shining dark brown, very densely and rather finely punctate. Scutellum brown. Elytra three times as long as prothorax and a little wider, yellow brown, very densely punctate between the four very narrow elevated lines on each elytron that are scarcely costate and without median lines between the double rows of punctures in the intervals. In interval near suture punctures becoming single in apical part, in second interval single only near apex, in third interval double almost to apex, and in 4th interval mostly a single row next to margin. Length 3.5–1.8 mm.

LECTOTYPE.—Male, in Fabricius' collection at Copenhagen, Denmark.

Colaspis suilla borealis, new subspecies

FIGURE 11

There are other specimens with wider elytral costae that are like the type in coloration, and these specimens are somewhat larger and more rotund. While not as large as *C. lata* Schaeffer these specimens are very similar in shape and coloring. I believe that these beetles may be a northern subspecies of *suilla*. The aedeagus is very much like that of the ones from the South but a little wider. I have chosen a series from Toronto, Canada, to be the type series of this more northern race, which I am calling *C. suilla borealis*, new subspecies.

TYPE.—Male, and two paratypes, USNM Type No. 26913, three paratypes in South Dakota State University, and two paratypes in California Academy of Sciences.

Colaspis recurva, new species

FIGURE 22

DESCRIPTION.—From 4.4 to 5.1 mm in length, oblong oval, entirely yellow brown except the last two or three antennal joints, which are usually dark, body beneath without any piceous or metallic coloring; last abdominal sternite of the male with a median tubercle strongly rounded and bent forward over posterior margin of sternite.

Head with interocular space a little more than half width of head, front and clypeus densely punctate, labrum with anterior edge with small emargination. Antennae pale with the last two or three joints dark. Prothorax with rounded sides, seldom angulate, a small tooth at each corner, surface usually very densely punctate, sometimes deeper yellow brown than elytra or pale with deeper irregular areas. Scutellum pale. Elytra with 4 costae on each elytron, between which are flattened ones as in specimens of *C. crnicornis* Schaeffer from Brownsville; 1st, 2nd, and 8th rows of punctures single and at least half of second row single. Body beneath with an unusual development of the median tubercle on last sternite of the male. This tubercle is strongly sclerotized, rounded and bent forward over the posterior margin of sternite six. Length 4.4–5.1 mm; width 2.3–2.8 mm.

TYPE.—Male, and 34 paratypes, USNM Type No. 26907.

TYPE-LOCALITY.—Gainesville, Florida, on azalea and camellia, May, June 1949, A. N. Tissot.

OTHER LOCALITIES AND HOSTS.—*North Carolina*: Southern Pines. *South Carolina*: Charleston. *Georgia*: Savannah, on rose; Peach County, on *Prunus mexicana*; Brunswick. *Mississippi*: Meridian.

REMARKS.—Barber, in a short penciled description of this beetle among his papers, wrote that it was similar in shape and sculpture to the type of *C. crnicornis* Schaeffer but differed in the unusual development of the tubercle on the abdomen in the male that was recurved, and he gave it the tentative specific name "*recurvus*" because of this tubercle. The beetles are like *C. crnicornis* in another respect—the elytra of many specimens appear nearly smooth except on the sides and at the apex where remains of costae are present. This is not always so, however; some specimens show the four prominent costae on each elytron as in the *suilla*

group. It is unlike *suilla* in that the beetles are entirely pale yellow brown without any deeper brown or metallic markings. The aedeagus also is unlike any in the *suilla* group, being broad with a wide tip, and it is not like the aedeagi in the *brunnea* group, not being bent before the tip. The beetles have been collected in North and South Carolina, Georgia, Florida, and Mississippi.

Colaspis carolinensis, new species

FIGURE 20

DESCRIPTION.—From 4.2–5.0 mm in length, oblong oval, pale yellow brown above with dark margin on elytra and dark sutural margin, dark margin about scutellum, breast and abdomen varying from being reddish brown to piceous, apical three antennal joints dark, four wide costae on each elytron, the two nearest suture widest.

Head with interocular space more than half width of head, densely punctate throughout, labrum even paler yellow with anterior margin having small emargination, jaws alone dark. Antennae long, three or four apical joints dark. Prothorax approximately twice as wide as long with sides somewhat undulate, densely punctate and often with dark margin. Scutellum dark around the edges. Elytra three times as long as prothorax with lateral and often sutural margins dark, lateral margin and epipleura often with metallic luster. Four costae on each elytron wider than intervening ones, the two nearest suture usually widest, first two intervals with single punctures most of their length. Body beneath varying from deep reddish brown to piceous. Length 4.2–5.0 mm; width 2.0–2.7 mm.

TYPE.—Male, and seven paratypes, USNM Type No. 26909.

TYPE-LOCALITY.—18 miles north of Charleston, South Carolina, 7 June 1933, E. A. Chapin.

OTHER LOCALITIES.—*South Carolina*: Manning. *Florida*: Suwanee Springs; Sebastian.

REMARKS.—This is another of the small yellow-brown species of the *suilla* group with four more prominent costae on each elytron. It is smaller than *C. recurva*, and has dark, often metallic, trimmings on the lateral elytral margin, and sometimes also on the prothorax and suture. Unlike most of the group, the aedeagus is rounded at the apex with a

tiny nodule in the middle. In some specimens, notably the females, the elytral costae are somewhat flattened.

Colaspis keyensis, new species

FIGURE 21

DESCRIPTION.—Between 4.2–4.5 mm in length, oblong oval, yellow brown with head and prothorax somewhat deeper yellow brown, edges of prothorax, elytra, and suture tending to be deeper brown as well as body beneath, which sometimes is nearly piceous, elytra with 4 prominent costae.

Head with interocular space a little wider than half width of head, densely and finely punctate throughout, labrum pale, very shallowly emarginate, jaws dark. Antennae with apical two or three joints tending to be darker. Prothorax not quite twice as broad as long with sides rounded, sometimes faintly angulate, not very convex, surface very densely punctate with lateral edges deeper brown. Scutellum deeper brown than elytra. Elytra nearly three times as long as prothorax and a little wider, with 4 more prominent costae on each elytron, the first two rows of punctures tending to be single, also 8th row single, punctures large in most specimens with very narrow costae between the wider ones. Body beneath deeper brown, almost piceous, first hind tarsal joint shorter than usual. Length 4.2–4.5 mm; width 2.2–2.3 mm.

TYPE.—Male, and three paratypes (2 males, 1 female), USNM Type No. 26908.

TYPE-LOCALITY.—Key West, Florida.

OTHER LOCALITIES.—“Tex.”

REMARKS.—This is another of the *suilla* group with four more prominent costae on each elytron and much like *C. carolinensis*, having almost the same coloring except a deeper brown prothorax. The aedeagus, however, has a longer point at the tip. There is one specimen labeled simply “Tex.” which has a similar aedeagus.

Colaspis crinicornis Schaeffer

FIGURES 17, 18

Colaspis crinicornis Schaeffer, 1933:469.

DESCRIPTION.—Between 4.5 and 6.0 mm in length, oblong oval, pale yellow brown to deeper reddish

brown with the 2 apical joints of antennae dark and undersurface deeper brown; prothorax broad with curving, sometimes undulate, rarely subangulate sides, and densely punctate surface; elytra with wide and usually flattened costae, margins sometimes faintly metallic.

Head with interocular space more than half width of head, densely punctate throughout, a slight depression in middle of front; anterior margin of labrum widely emarginate, jaws deep brown. Antennae pale with terminal and often part of 10th joint dark. Prothorax almost twice as wide as long and moderately convex with curving sides, sometimes undulate but rarely subangulate; surface shining, densely punctate. Scutellum pale. Elytra not much wider than prothorax and about three times as long; usually pale yellowish brown with margin dark, sometimes faintly metallic, costae in most specimens nearly flat except on sides and at apex, first two wider than rest with single rows of punctures between, 3rd row with alternating punctures becoming single toward apex. Body beneath deeper brown than above, sometimes with a slight metallic luster on metasternum. Hind tibiae dilated beneath at middle, more pronounced in male. Length 4.5–6.0 mm; width 2.3–3.0 mm.

TYPE.—Male, in National Museum of Natural History.

TYPE-LOCALITY.—Brownsville, Texas, O. Dietz.

REMARKS.—Except for one specimen labeled “Mexico on mesquite leaves” all the specimens in the NMNH collection are from Brownsville, Texas, collected by various people, one by H. S. Barber. One large female, about 6 mm long, is deep reddish brown and the first four rows of elytral punctures on one elytron are single, but on the other elytron rows three and four have mostly alternate punctures. The lack of elevated costae is similar to that found in *C. recurva*, but *C. crinicornis* is a larger beetle with a very different aedeagus.

Colaspis crinicornis chittendeni, new subspecies

FIGURE 19

DESCRIPTION.—In southeastern Louisiana, about Baton Rouge and Houma, occurs what appears to be a subspecies of this Brownsville beetle. It is of still larger size and the elytra are mainly with elevated costae. Some from Lockport, however, have

costae as flat as those from Brownsville. A series of 26 specimens from Houma collected on corn are larger than any other costate species of *Colaspis* that occurs in the United States except *C. championi* Jacoby. These measure from 5.7 to 6.8 mm in length. They are also broader than any except *C. lata* Schaeffer. In fact, H. S. Barber has written "near *lata*" on one, but the elytra are longer in proportion to the prothorax than in *lata*. These Houma specimens came from Dr. F. H. Chittenden's collection and he had put a red type label with a USNM type number on one specimen, showing that he had recognized it as new. He did not live to describe or even give it a name, so I am naming it as a subspecies of *C. crinicornis*, which it appears to resemble in most ways except in having elevated costae and being larger; it has a similar aedeagus. And I am naming it after the man for whom I first worked in the Bureau of Entomology, who was a good friend to me in those early days.

TYPE.—Male, and 25 paratypes USNM Type No. 26915.

TYPE-LOCALITY.—Houma, Louisiana, on corn, 13 June 1925, N. J. Rodriguez.

OTHER LOCALITIES AND HOSTS.—*Louisiana*: Lockport, on sugarcane; St. Charles, on corn; Taft, on sugarcane; Lucy; Wells Point.

Colaspis lata Schaeffer

FIGURE 16

Colaspis lata Schaeffer, 1933:469.

DESCRIPTION.—Between 5.0 and 6.5 mm in length, broadly oblong oval, yellowish or reddish brown with head and prothorax often darker, elytra with 4 prominent paler costae on each, punctures being deeper reddish brown, usually undersurface dark with metallic green luster, margins of elytra also metallic, sometimes elytral punctures faintly aeneous; apical two or three antennal joints dark.

Head with interocular space more than half width of head, front and upper part of clypeus densely and coarsely punctate, a median depression often in middle of front, labrum pale with emargination anteriorly, jaws dark. Antennae with apical joints dark, sometimes 7th joint dark too. Prothorax twice as broad as long with sides rounded,

scarcely at all angulate, a small tooth at each corner, surface densely punctate. Scutellum brown. Elytra a little wider than prothorax, about a third longer than wide, with 4 pale costae on each elytron, intervals geminate punctate, often with little trace of lesser costae in basal half, deeper brown than costae; punctures in single row in first interval near suture, and in row next to margin mostly single; margin and epipleura usually with dark blue or aeneous luster, elytral punctures often faintly metallic. Body beneath with middle of prosternum, breast and abdomen usually dark, often with metallic luster. Legs pale. Length 5.0–6.5 mm; width 2.3–2.5 mm.

Two cotypes in National Museum of Natural History.

TYPE-LOCALITY.—Harrison, Nebraska.

OTHER LOCALITIES.—*Nebraska*: Meadow. *S. Dakota*: Platte; Warner; Ft. Thompson; Vermillion; Chamberlain; Springfield. *New Mexico. Colorado. Canada*: Toronto. *Kansas*: Manhattan; West Kansas; Ellsworth; Gove County; Douglas County; Clark County; Madison. *Iowa*: Iowa City; Council Bluffs. *Wisconsin. Utah. Texas*: Dallas. *Georgia. Louisiana*: Covington.

REMARKS.—This is the broadest of the yellow-brown costate species in the United States. *C. crinicornis chittendeni*, new subspecies, alone approaches it in width, but in that species the elytra are longer and the beetle more of the usual proportions. In *C. lata* the elytra are short and wide. In fact, the beetle appears like a much enlarged female specimen of *C. suilla* in general shape and coloring. Except for a specimen from Toronto, Canada, and another labeled "Ga." all the rest have come from the Midwest from Texas and Louisiana to Utah, Colorado, and New Mexico. I doubt if the "Ga." label is correct.

Colaspis pini Barber

FIGURE 15

Colaspis pini Barber, 1937:201.

DESCRIPTION.—Between 4.5 and 5.7 mm in length, elongate oblong oval, not very shiny, yellowish or rusty reddish brown, sometimes with entirely yellow-brown antennae, but often with apical joints dark; prothorax densely punctate, elytra with somewhat

paler costae than intervals with punctures, punctures sometimes with a faint purplish or aeneous luster, margins dark, often with metallic luster.

Head with interocular space more than half width of head, a median line down front, densely punctate throughout, clypeus distinctly outlined, labrum with small anterior emargination, jaws deep brown or piceous. Antennae varying from being entirely pale to having 5 apical joints dark. Prothorax wider than long and with rounded, somewhat undulate sides, moderately convex, very densely punctate usually with dark metallic margin. Scutellum brown. Elytra more than three times as long as prothorax and somewhat wider, each with 8 costae, the intervening ones being very narrow, punctate intervals mostly with double rows of punctures that often have a greenish or purplish luster. Epipleura metallic green or purple. Body beneath and legs yellow brown, prosternum often with aeneous luster. Length 4.5–5.7 mm; width 2.3–2.7 mm.

TYPE.—In National Museum of Natural History, with 171 paratypes.

TYPE-LOCALITY.—Elizabeth, Louisiana, feeding on longleaf pine, 7 July 1924, R. M. Hallowell. Localities of paratypes from various southern areas. H. S. Barber, contrary to my practice, did not restrict his paratypes to the locality of the type.

OTHER LOCALITIES.—*Louisiana*: Ponchatoula; Covington; Woodworth; Slidell. *Mississippi*: Ocean Springs; Kiln; 5 m east of Longtown. *Arkansas*: Hope.

REMARKS.—The rusty reddish brown overall coloration of these beetles coupled with their elongate elytra are the distinguishing marks of this species. Beyond that, the aedeagus is unusually long for the costate United States species and at the apex is not bent and is without the usual sharp tip. While the beetles resemble *C. flavocostata* Schaeffer in shape and often in color, the aedeagus is altogether different.

Colaspis pini schotti Barber

FIGURE 14

Colaspis pini schotti Barber, 1937:201.

TYPE.—And allotype in National Museum of Natural History (paratype of *C. flavocostata* Schaeffer).

TYPE-LOCALITY.—Greenwood Lake, New Jersey, 29 July 1930, F. M. Schott.

REMARKS.—As Barber has stated, both *C. pini* and *C. pini schotti* are very similar to *C. flavocostata* except the coloring is darker rusty brown. It might be added too that in these the prothorax appears wider and the eyes farther apart than in *flavocostata*. *C. pini schotti* from New Jersey differs from *C. pini* chiefly in the shape of the aedeagus, which is shorter and the tip has a distinct nodule that is lacking in *pini*. Barber (1937) stated that he was unable to differentiate the specimens "geographically intermediate," as those from Maryland to South Carolina were all females. Later he collected 11 specimens from 8 miles northeast of Washington, D.C., of which several were males, and he was able to identify them as the subspecies *schotti*. In these specimens the coloring is less rusty and more golden brown.

Colaspis flavocostata Schaeffer

FIGURE 12

Colaspis flavocostata Schaeffer, 1933:470.

DESCRIPTION.—Between 4.6 and 5.4 mm in length, elongate oblong oval, head and prothorax an aeneous dark yellow brown, elytra with 4 pale yellow costae on each, intervals being dark yellow brown with aeneous luster, punctures frequently green, antennae with apical joints dark, body beneath dark brown with aeneous luster.

Head with interocular space scarcely more than half width of head, densely punctate throughout, often with shallow frontal depression, clypeus well marked, labrum with a shallow emargination anteriorly, usually head deep yellow brown with an aeneous luster, labrum pale yellow brown, jaws deep brown to piceous. Antennae unusually long and slender with outer joints dark. Prothorax wider than long, usually rounded at sides, sometimes subangulate, not very convex, densely punctate, deep yellow brown usually with aeneous luster, margins both lateral and basal greenish. Scutellum dark brown. Elytra wider than prothorax and more than three times as long, with 4 pale costae on each, intervals being darker brown with double rows of punctures, each pair separated by a more or less distinct lesser costa not as pale or wide as the four more conspicuous costae, punctures often aeneous

green. Body beneath usually dark with an aeneous luster, legs pale. Length 4.6–5.4 mm; width 2.3–2.5 mm.

TYPE.—Type and allotype in National Museum of Natural History.

TYPE-LOCALITY.—Chipola Lake, Florida.

OTHER LOCALITIES AND HOSTS.—*Florida*: Crescent City; Pensacola, on blueberry. *Georgia*: Milner. *South Carolina*: Francis Marion National Forest. *Mississippi*: Gulfport; De Soto Forest. *Louisiana*: Covington.

REMARKS.—This species has a coloration somewhat similar to *C. costipennis* Crotch but is a more elongate beetle with longer elytra and not so conspicuous elytral pale costae. In his original description of *C. flavocostata*, Schaeffer named the type-locality as Chipola Lake, Florida, and in a footnote stated that he had seen some specimens taken at Greenwood Lake, New Jersey, "which agree in every respect with the Florida specimens." He named these as paratypes. Barber at first believed these New Jersey specimens were conspecific with a Louisiana beetle that he had described as *Colaspis pini*, but upon dissection he found that the aedeagus of the New Jersey specimens was different from that of either *flavocostata* or his Louisiana species, *C. pini*, and Barber described it as *C. pini schotti*. These three, *C. flavocostata*, *C. pini*, and *C. pini schotti*, are all so similar in appearance that Barber wrote that they were "externally almost identical." They are to be distinguished only by the aedeagus. In consequence, there are very few specimens identified as *flavocostata* in the National Museum of Natural History collection, and these are necessarily males that have been dissected to be certain they are that species. There are numerous females that may be *flavocostata* from Florida, Louisiana, North Carolina, and even Virginia, but these are all without metallic luster.

Colaspis flavocostata avaloni, new subspecies

FIGURE 13

DESCRIPTION.—A series of six specimens collected at Avalon, New Jersey, and six others from various localities in New Jersey are very close to *flavocostata* with a similar aedeagus, but there are minor differences—the eyes are farther apart, the length of the first hind tarsal joint is shorter, the costae

flatter in most specimens, and the elytral punctures coarser, the coloring without metallic luster except on the epipleura, the head and prothorax are deeper yellow brown than the elytra but not at all aeneous, and neither does the dark brown under-surface have any metallic luster. I believe they can be regarded as a new subspecies of *flavocostata* and am naming them *C. flavocostata avaloni*.

TYPE.—Male, and five paratypes, USNM Type No. 26914.

TYPE-LOCALITY.—Avalon, New Jersey, George M. Greene collector.

OTHER LOCALITIES.—*New Jersey*: Lockport; Stone Harbour; Atlantic City; Helmbach; Anglesea; all collected by George M. Greene.

Colaspis costipennis Crotch, new status

FIGURE 23

Colaspis brunnea var. *costipennis* Crotch, 1873:44.—Horn, 1892:223.

Colaspis crotchi Lefèvre, 1877:142.

DESCRIPTION.—Between 4.5 and 5.5 mm in length, oblong oval, head and prothorax aeneous green or a very dark piceous with faint aeneous luster, body beneath brown with aeneous luster. Antennae with five apical joints dark, elytra with punctate intervals brown, often punctures faintly aeneous, 4 wide, pale yellow costae on each elytron.

Head with interocular space more than half width of head, clypeus not clearly divided from front, and all densely punctate, shining green with labrum pale yellow brown and jaws dark brown. Antennae with last apical joints dark, sometimes 7th to 11th joints dark. Prothorax with rounded sides, rarely a little angulate, not very convex, shining aeneous green or reddish brown with aeneous luster, densely and often coarsely punctate. Scutellum dark brown. Elytra with 4 wide, pale yellow costae on each, intervals brown, varying from pale reddish brown to deep brown with punctures often aeneous; epipleura dark metallic. Body beneath with aeneous luster, legs pale. Length 4.5–5.5 mm; width 2.2–2.5 mm.

TYPE.—In Museum of Comparative Zoology, Harvard College. Three specimens in the LeConte collection with type label no. 28447 on one.

TYPE-LOCALITY.—Type with a pink disc indicating Middle States (New York, Pennsylvania).

OTHER LOCALITIES AND HOSTS.—*Massachusetts*: Ipswich; Bailey's Bog; Wareham. *New York*: Cutchogue, L.I. *New Jersey*: Clementon; Brown's Mill; Lakehurst; DaCosta; Atsion; Malaga; White's Bog, on blueberry. *Washington, D.C.*: 9 miles northeast. *Virginia*. *North Carolina*: Muncy, on grape; Wilmington, on azalea. *South Carolina*: Pontiac, on grape. *Georgia*: Atlanta; Albany, on wild aster; Macon; Chester. *Florida*: Enterprise; Jacksonville; Tampa; Haulover; Orlando. *Alabama*: Jackson; Mobile. *Mississippi*: Wiggins, on grape. *Louisiana*: Perdido Beach, on pecan.

REMARKS.—Lefèvre and later writers recognized that Crotch's *C. costipennis* is more than a variety of *C. brunnea*, but that it is a very distinct species, not like any other in the United States. It is the only eastern species of *Colaspis* with usually a distinctly greenish head, prothorax, and undersurface, and is easily recognized by the four broad, pale yellow costae on each elytron. Some of the Florida specimens are paler and the head and prothorax as well as undersurface lack the green luster, being only reddish brown, but even in these the four wide, pale elytral costae remain its distinctive feature.

As stated in my introduction, Lefèvre described a species of *Colaspis* from Argentina, naming it *C. costipennis*, and renamed Crotch's species, published four years earlier, as *C. crotchi*. I am correcting this nearly a hundred years later.

Colaspis viridiceps Schaeffer

FIGURE 24

Colaspis viridiceps Schaeffer, 1933:468.

DESCRIPTION.—From 4.4 to 5.5 mm in length, elongate oblong oval, pale yellow brown, with head usually with aeneous luster, margins of prothorax and elytra and undersurface also aeneous, femora dark at apex, costae on elytra rather flat.

Head with interocular space a bit over half width of head, densely punctate throughout, clypeus rectangular with no dividing lines, base of head and labrum yellowish brown, rest green, labrum widely emarginate anteriorly, jaws reddish brown. Apical joints of antennae from 7 to 11 more or less dark. Prothorax not quite twice as wide as long with sides usually angulate below middle, a tooth at each corner, not very convex,

densely punctate, pale yellow brown with lateral margin usually aeneous, basal margin dark. Scutellum dark. Elytra three times as long as prothorax and a little wider with flattened costae except on sides, first two rows of punctures near suture single and marginal one also single, in other rows punctures often alternating or single in part and unusually fine. Body beneath and epipleura dark aeneous, apex of hind femora and sometimes rest of femora dark. Length 4.4–5.5 mm; width 2.2–2.4 mm.

TYPE.—In National Museum of Natural History.

TYPE-LOCALITY.—Wheatfields near Globe, Arizona, Duncan collector.

OTHER LOCALITIES AND HOSTS.—*Arizona*: Tucson; Pima County; Nogales; Santa Cruz County; near Bisbee Junction, on *Verbena enceliodes*; Douglas, on *Ximenesia exauriculata*; Sakunte, on cotton; Roll, on alfalfa; 20 miles east of Casa Grande; Pinal County; Montezuma Pass; 6 miles west St. Xavier reservation; Patagonia; Florence; Arivaca Creek; Pima County. *Mexico*: Acapulco; Iguala; Taxco. *Michoacan*: Morelia; Tepic; Nayarit; Mulage. *Lower California*: San Domingo; Comonda. *Sinaloa*: Los Mochis; 26 miles north of Pericos. *Sonora*: Alamos; Hermosilla; Desenboque; San Bernardino; Rio Maya.

REMARKS.—This is essentially a Mexican species that ranges from southern Arizona through Lower California and Sonora, Sinaloa, Nayarit, Michoacan to Guerrero, and throughout its long range there is little variation. Schaeffer's name "*viridiceps*" identifies this slender, pale yellow costate species with the conspicuously shining green head and undersurface. Several hundred specimens in the National Museum of Natural History collection are from Roll, Arizona, where it was collected on alfalfa.

Colaspis viriditincta Schaeffer

FIGURE 25

Colaspis brunnea var. *viriditincta* Schaeffer, 1919:329.
Colaspis viriditincta Schaeffer, 1933:468.

DESCRIPTION.—From 5–6 mm in length, oblong oval, head and prothorax and body beneath often aeneous green; elytra yellowish or reddish brown, frequently with aeneous luster to scutellum, punctures often aeneous, apex of femora, sometimes

apices of tibiae and tarsal joints dark, elytral costae not much elevated except at apex, punctures large.

Head with interocular space more than half width of head, densely punctate throughout without definite outlines about clypeus, shining green except the reddish-brown labrum and mouthparts, anteriorly labrum widely and shallowly emarginate. Antennae with 5 basal joints pale, apical 5 or 6 tending to be dark. Prothorax convex with rounded sides, often somewhat angulate below middle, a small tooth at each corner, shining metallic green, densely but not coarsely punctate. Scutellum green. Elytra more than three times as long as prothorax and somewhat wider, convex, with evenly spaced but rather flat, except at apex, costae, intervals filled with coarse geminate punctures except in first row which is partially single; yellowish or reddish brown with punctures often aeneous, area about scutellum and down suture also often aeneous, margin either lavender or aeneous, epipleura pale. Body beneath with prosternum and often breast and abdomen aeneous, apical sternite of abdomen pale. Legs pale with apex of femora and sometimes tip of tibiae and tarsal joints dark. Hind tibiae of male dilated at middle. Length 5-6 mm; width 2.4-3 mm.

TYPE.—In National Museum of Natural History.

TYPE-LOCALITY.—Douglas, Arizona, F. H. Snow. Also collected there by W. W. Jones.

OTHER LOCALITIES.—*Arizona*: Tempe; E. W. Walker; Nogales; Moznette; Tucson; Pima County.

REMARKS.—F. H. Chittenden, in whose collection were the 46 specimens collected at Tempe, Arizona, had labeled this as a new species. I suspect that *C. viriditincta* may also occur in Mexico, although we have no specimens from there in any collection that I have seen. It has a coloration somewhat similar to *C. costipennis* Crotch, but it is larger and the elytral costae are twice as many as in *C. costipennis*. Schaeffer has noted another peculiarity, that is, in the male the posterior tibiae are strongly dilated at the middle, a character found in several other species, mostly Mexican.

Colaspis melaina, new species

FIGURE 26

DESCRIPTION.—Between 4.7 and 6.0 mm in length, elongate oblong oval, entirely dark yellowish brown

to piceous, head, margin of prothorax and margin of elytra as well as epipleura and body beneath often with bluish or faint aeneous luster, feet mostly dark. Antennae with paler brown basal joints and black outer joints. Elytra with 8 evenly spaced costae on each elytron.

Head with interocular space more than half width of head, densely punctate throughout, clypeus almost square, labrum and jaws reddish brown, rest of head black with bluish or aeneous luster. Antennae often entirely dark but in paler specimens basal joints dark yellowish brown. Prothorax wider than long, rather flat with sides faintly angulate below middle and a tooth at each corner, surface densely punctate, margin often with metallic greenish or bluish luster. Scutellum dark. Elytra nearly three times as long as prothorax and a little wider, usually not as deep in coloring as prothorax with paler deep yellowish brown areas at base and along sides, three specimens of moderately dark yellow-brown color with suture and lateral margins alone black; eight costae of approximately same width on each elytron; punctures between large, first and second rows and marginal row single. Body beneath and legs dark, in paler specimens dark yellowish brown, body often with metallic luster. Length 4.7-6.0 mm; width 2.2-2.7 mm.

TYPE.—Male, and 11 paratypes, USNM Type No. 26911.

TYPE-LOCALITY.—Hereford, Arizona, W. W. Jones, on *Ambrosia aptera*.

OTHER LOCALITIES AND HOSTS.—*Arizona*: Portal, at light; Patagonia, on *Datura*; Nogales, on weeds; Douglas.

REMARKS.—In appearance this beetle looks like a black form of *C. brunnea* (Fabricius) with the same strongly ribbed elytra having eight rows of costae of equal width on each elytron. In reality it is not at all closely related to that species, as the aedeagus is utterly different from that of the *brunnea* group, all of which have an aedeagus strongly bent at the apex. In this black species the aedeagus is not bent but has a long, pointed tip. In this regard it strongly resembles the aedeagus of *C. viridiceps*, a species in which the elytral costae are flatter, and the color of the beetles pale yellow brown, with distinctly green trimmings. *Colaspis melaina* has been collected only in the most southern part of Arizona along the Mexican border. I have been unable to find the description of any

Mexican species corresponding to it, however, nor have I seen any specimens like it from Mexico. *Colaspis inconspicua* Jacoby from Panama is a larger beetle with a more aeneous luster on the upper surface.

Colaspis championi Jacoby

FIGURE 27

Colaspis championi Jacoby, 1881:137-138.

Colaspis simplicipes Bechyne, 1950:253-254.

DESCRIPTION.—Between 7.0 and 9.0 mm in length, oblong oval, yellowish or pale reddish brown, with aeneous green edges to prothorax and elytra and sometimes elytral punctures, prosternum in middle and often breast aeneous, each elytron with 4 more prominent costae, all rather flat; punctures between mostly geminate except in rows near suture and margin.

Head with interocular space a little more than half its width, densely punctate over occiput and a few punctures on clypeus, smooth over tubercles and lower part of clypeus, punctures often shining metallic. Labrum with small emargination anteriorly, jaws piceous. Antennae pale with joints 7, 10, and 11 dark. Prothorax approximately twice as wide as long and almost as wide as elytra, with sides more or less angulate below middle, yellow brown with very dense punctation and aeneous lateral and basal margins. Scutellum pale. Elytra more than three times as long as prothorax, each elytron with 4 more prominent but rather flat costae, between which double rows of geminate punctures except in rows next to suture and margin, punctures often with aeneous sheen and rather large, leaving only very narrow midcostae, lateral margins of elytra aeneous. Body beneath with middle and sometimes entire prosternum, often breast, in part, aeneous. Abdomen usually yellow brown. Hind tibiae in male not dilated. Length 7.0-9.0 mm; width 3.5-4.5 mm.

COTYPES.—In British Museum (Natural History) and in Bowditch collection, Museum of Compara-

tive Zoology, Harvard, in latter, two specimens from San Geronimo, Guatemala, two from Presidio, Mexico, and one from Jalapa, Mexico.

TYPE.—Type of *C. simplicipes* Bechyne from Volcan Colima, Mexico, in Zoologische Staatssammlung, in Munich, paratype in Frey Museum.

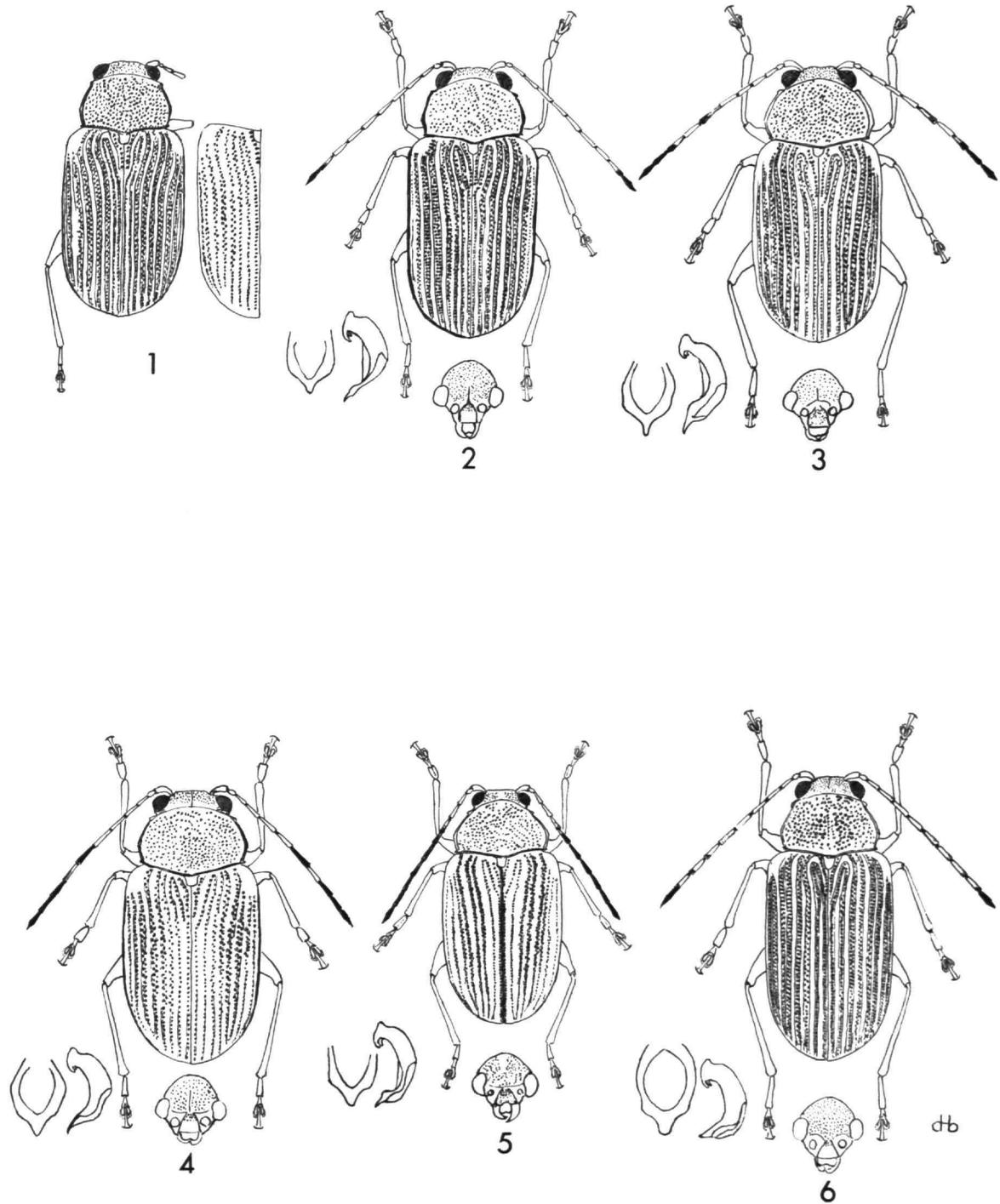
OTHER LOCALITIES AND HOSTS.—*Arizona*: Douglas; San Bernardino Ranch; Hereford, on corn silk. *Mexico. Guatemala*.

REMARKS.—There can be no doubt that Bechyne's species, *C. simplicipes*, is a synonym of *C. championi* Jacoby. I have dissected a male paratype of Bechyne's and found the same shaped aedeagus as in *C. championi*, a shape unusual in the genus because of the long narrow tip. This is essentially a Mexican species that just crosses the border on the edge of Arizona. It is the largest species to occur in the United States. *Colaspis championi* might easily be confused with another species from Mexico and Central America that so far has not been found in the United States. Jacoby called this species *C. gemmingeri* Harold. Now Harold described *C. gemmingeri* from Brazil and Jacoby noted that there were small differences in the Brazilian species in the shape of the elytra. Bowditch also noted a difference in the swelling on the underside of the hind tibiae, in the male, and named this Mexican species *C. confusa*, describing it briefly in a line and a half. *C. championi* is entirely without this swelling. It is the palest of the three, often only the undersurface and lateral margins being aeneous, although sometimes the elytral punctures show aeneous glitter. *C. confusa* is greener, and *C. gemmingeri* is greenest. But the clearest differences are to be found in their aedeagi.

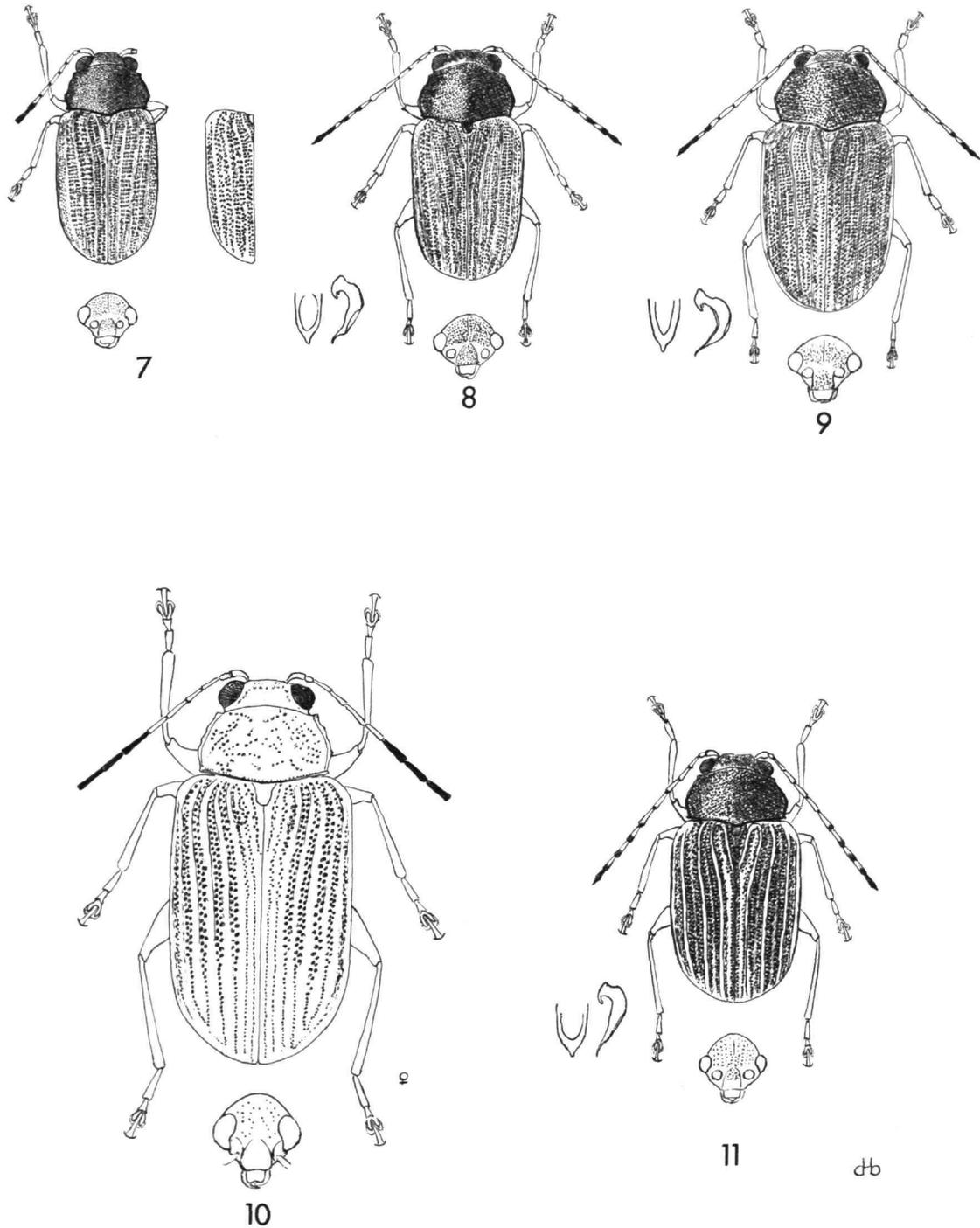
Colaspis championi Jacoby is very close to still another Central American species not yet described. In fact some of Jacoby's specimens under *championi* may possibly be this other species. Of the five specimens in the Bowditch collection only two from Presidio, Mexico, are males, and it is necessary in this case to dissect for the aedeagus to be certain which is *C. championi*. So for this reason I am making a lectotype of *C. championi* of one of the males from Presidio.

Literature Cited

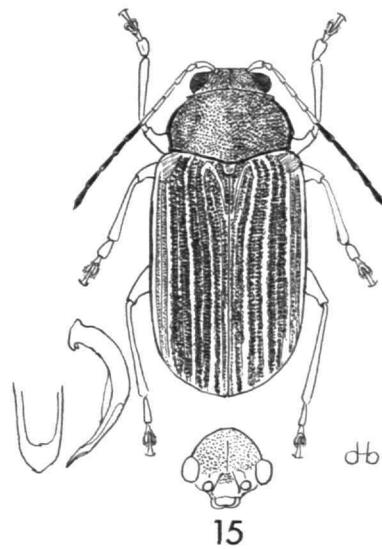
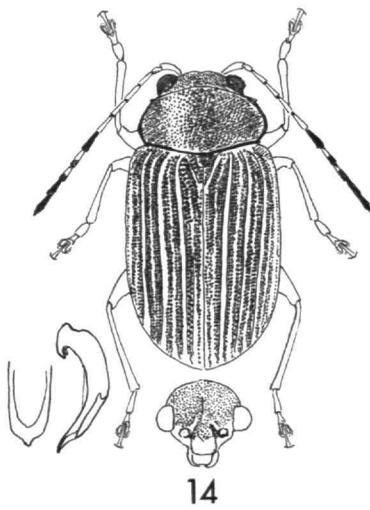
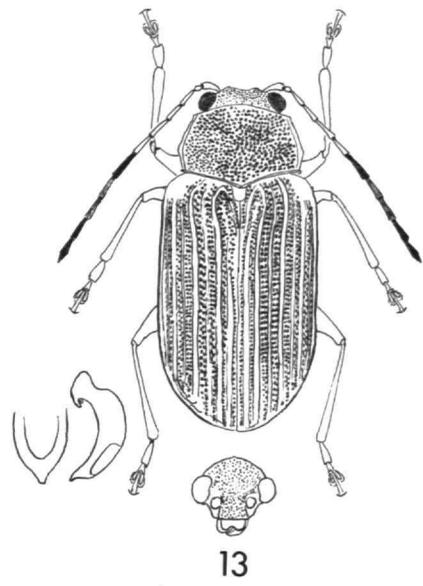
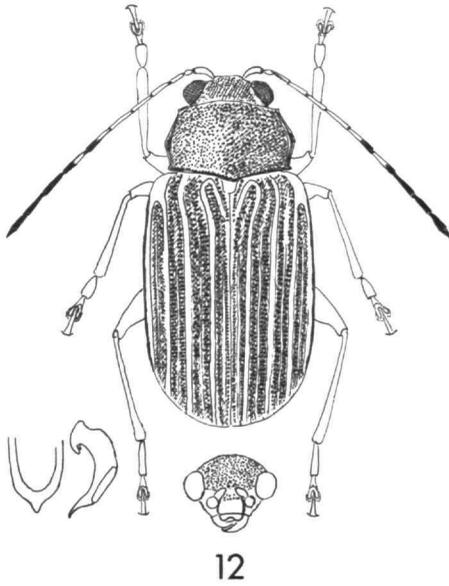
- Barber, H. S.
1937. Some Species of *Colaspis* from the *brunnea* Confusion. *Proceedings of the Entomological Society of Washington*, 38 (9):198, 201.
- Bechyne, Jan
1950. Notes sur les Eumolpides Americains. *Mitteilungen Muenchener Entmologischer Gesellschaft*, 40:253-254, 274.
- Bigger, J. H.
1931. The Grape *Colaspis* as a Corn Pest in Illinois. *Transactions of the Illinois Academy*, 24 (31):235-240.
- Brown, W. J.
1961. Notes on North American Chrysomelidae. *Canadian Entomologist*, 93 (2):973.
- Crotch, G. R.
1873. Material for the Study of the Phytophaga of the United States. *Proceedings of the Academy of Natural Sciences of Philadelphia*, 25:44.
- Fabricius, J. C.
1798. *Entomologiae Systema*. Supplement, page 94.
1801. *Systema Eleutheratorum*. Volume 1, pages 411, 417.
- Gowdey, C. C.
1926. The Banana Fruit Scarring Beetle (*C. hypochlora* Lef.). *Bulletin of Entomological Research*, 17:137.
- Horn, G. H.
1892. The Eumolpinae of Boreal North America. *Transactions of the American Entomological Society*, 19:196, 223.
- Jacoby, Martin
1881. Coleoptera. Number 1 in volume 6 in Godman and Salvin, editors, *Biologia Centrali-Americana*. Pages 137-138.
- Latreille, P. A.
1810. *Considerations Generales sur l'Ordre Natural des Animaux*. 432 pages.
- LeConte, J. L.
1859. *The Complete Writings of Thomas Say on the Entomology of North America*. Volume 2, page 196.
- Lefèvre, M. Ed.
1877. Coleopteres nouveaux un peu connus. *Annales Societe Entomologique de France*, 5 (7):142.
1885. Eumolpidarum Catalogus. *Memoires de la Societe Royal des Sciences de Liege*, series 2, 11:33.
- Olivier, A. G.
1808. *Entomologie . . . Coléoptères*. Volume 6, pages 492, 891.
- Salt, George
1928. A Study of *Colaspis hypochlora* Lef. *Bulletin of Entomological Research*, 19:295.
- Schaeffer, Charles
1906. On New and Known Genera and Species of the Family Chrysomelidae. *Bulletin of the Brooklyn Museum*, 1 (9):236.
1919. Notes on Chrysomelidae. *Journal of the New York Entomological Society*, 27:329.
1933. Short Studies in the Chrysomelidae. *Journal of the New York Entomological Society*, 41:466-471.



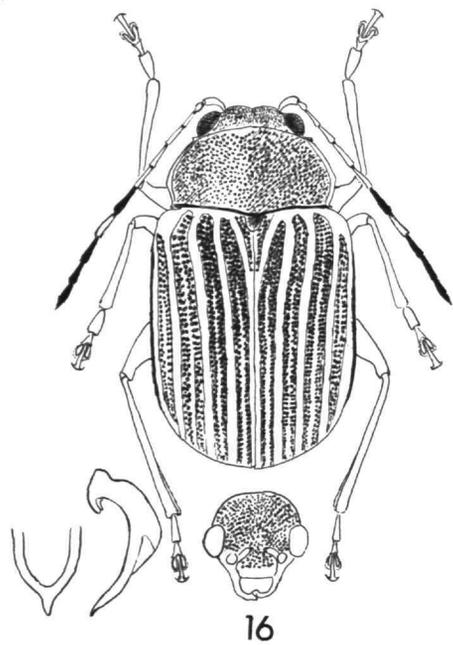
FIGURES 1-6.—1, 2, *Colaspis brunnea* (Fabricius); 3, *C. louisiana*, new species; 4, *C. planicostata*, new species; 5, *C. floridana* Schaeffer; 6, *C. hesperia*, new species.



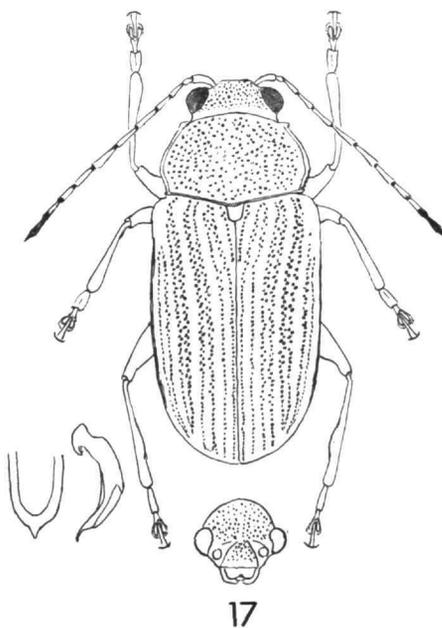
FIGURES 7-11.—7-9, *Colaspis suilla* (Fabricius); 10, *C. flavicans* LeFèvre; 11, *C. suilla borealis*, new subspecies.



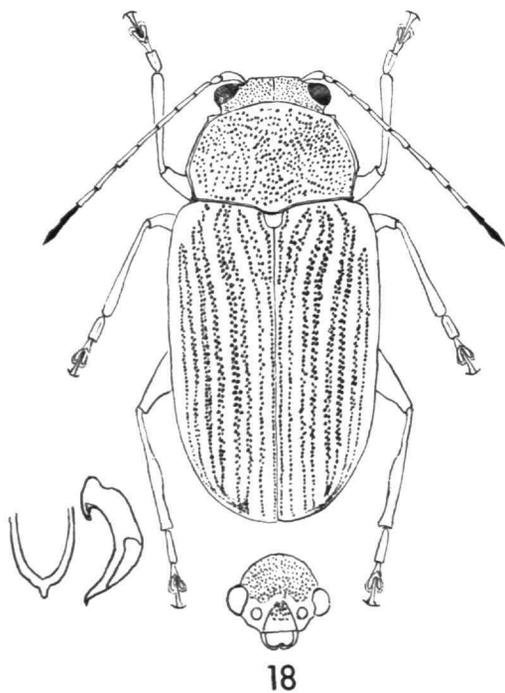
FIGURES 12-15.—12, *Colaspis flavocostata* Schaeffer; 13, *C. flavocostata avaloni*, new subspecies; 14, *C. pini schotti* Barber; 15, *C. pini* Barber.



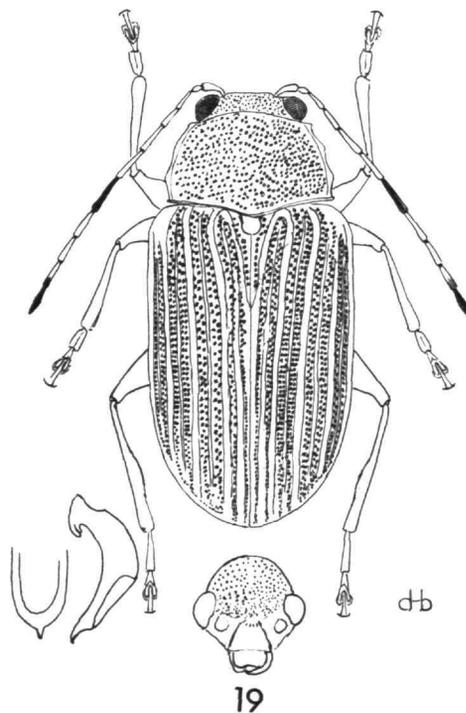
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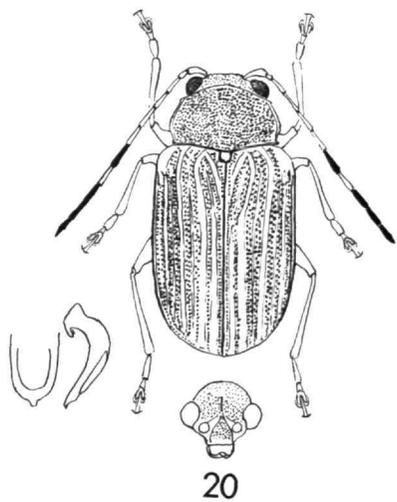


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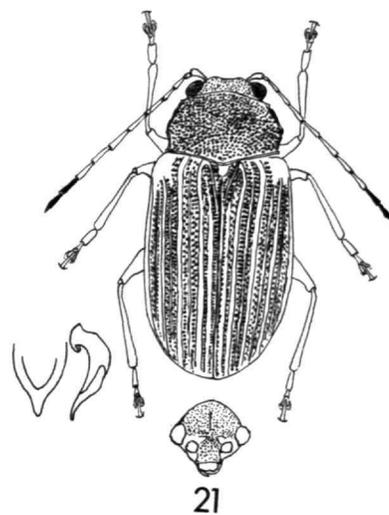


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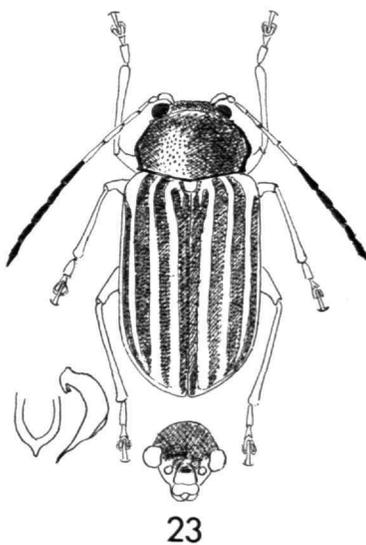
FIGURES 16-19.—16, *Colaspis lata* Schaeffer; 17, 18, *C. crinicornis* Schaeffer; 19, *C. crinicornis chittendeni*, new subspecies.



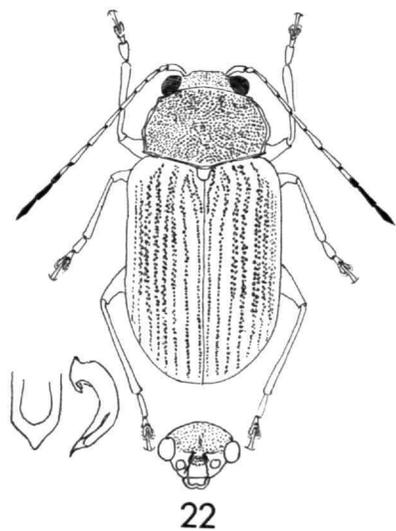
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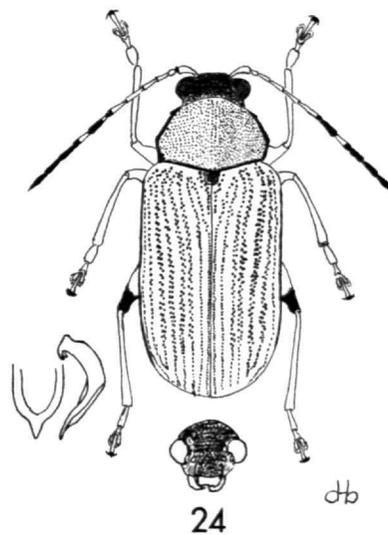
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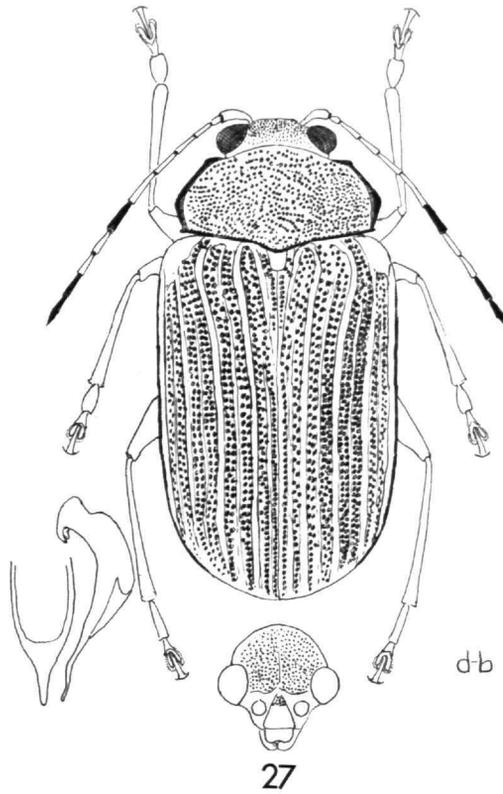
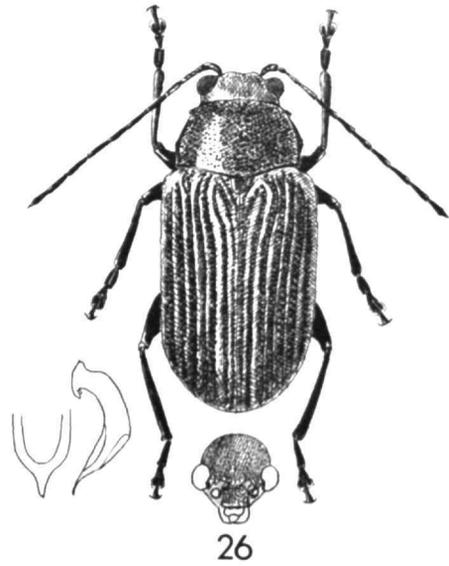
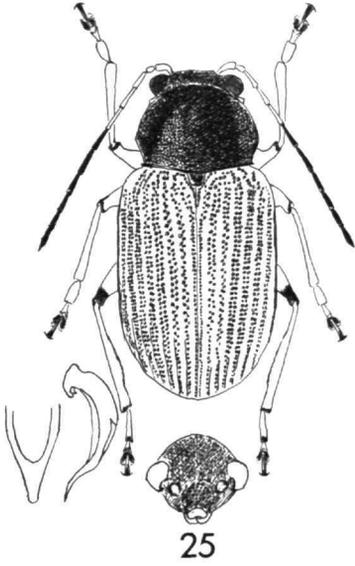
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FIGURES 20-24.—20, *Colaspis carolinensis*, new species; 21, *C. keyensis*, new species; 22, *C. recurva*, new species; 23, *C. costipennis* Crotch; 24, *C. viridiceps* Schaeffer.



FIGURES 25-27—25, *Colaspis viridincta* Schaeffer; 26, *C. melaina*, new species;
27, *C. championi* Jacoby.

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