NOTES ON TAXONOMY, ECOLOGY AND DISTRIBUTION
FOR SOME SPECIES OF *CHRYSOBOTHRIS* ESCHSCHOLTZ
(COLEOPTERA: BUPRESTIDAE) OCCURRING IN THE
UNITED STATES (INCLUDING HAWAII) AND CANADA

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ABSTRACT

Data are provided under 34 species in the genus *Chrysobothris* Eschscholtz; about
one-third of these are treated in detail. The following new synonymy is proposed: *Chry-
sobothris beeri* Barr = *C. caurina* Horn; *C. blanchardi* Horn = *C. rotundicollis* Gory and
Laporte; *C. burkei* Chamberlin = *C. semisculpta* LeConte; *C. columbiana* Barr = *C.
rotundicollis*; *C. grandis* Chamberlin = *C. monticola* Fall; *C. lata* Kerremans = *C.
cri-braria* Mannerheim. *Chrysobothris sinaloae* Van Dyke is treated as a subspecies of *C.
peninsularis* Schaeffer. New state/provincial records are given for 22 species, and new
larval host records are provided for four species.

In his revision Fisher (1942) treated 15 species (seven newly described) of
*Chrysobothris* which were known to occur in the United States and Canada.
Subsequent work, including this paper, brings the total number of recognized
species to 129, including five that are considered polytypic. My continuing
study of this genus over the past 16 years has revealed considerable new in-
formation, and much of this is presented here to be available for inclusion in
the U.S. Department of Agriculture Catalog, for which the fascicle on Bupres-
tidae is in preparation. Several of the species, such as *C. convexa* Fall, *C. orono*
Frost and *C. vulcanica* LeConte, were poorly known thus they are treated here
in detail. Similarly, special attention is devoted to some of the synonymies,
especially under *C. acutipennis* Chevrolat, *C. pseudacutipennis* Obenberger and
*C. monticola* Fall.

New state or provincial records and those confirmed (by rearing) larval host
records are so indicated by those categories appearing in CAPITAL letters, or
they are otherwise clearly identified. Plant species from which adults have been
collected are provided as new records, for reference, or incidentally as part of
label data, and may obviously signify a larval association. These plants do not
appear in capital letters. In citing data on type specimens, labels are separated
by a slash (/) and (h) means handwritten. Codens given at the end of label data
and elsewhere indicate collections in which the specimens are deposited, or
from which loans were made, and follow Arnett and Samuelson (1986). The
species are treated alphabetically.

*Chrysobothris acutipennis* Chevrolat

(Fig. 1)

*Chrysobothris acutipennis* Chevrolat 1835, Coleopt. du Mexique, fasc. 8, no.
(part) (syn. *acuminata* LeC.); Waterhouse 1887, Biol. Cent.-Amer., In-


The above synonymy represents only references (some differing from former citations as a result of my conclusions) pertinent to the confusion that has existed with regards the named taxa, plus those appearing after Fisher’s (1942) revision. This confusion became especially apparent in reading Fisher’s revision and examining type material, and largely resulted from a mix-up by him.

Material I borrowed from the LeConte Collection (MCZC) contained 4 specimens under C. acuminata and C. acutipennis from the same tray (A. F. Newton, per. comm.), labeled as follows: 1) “C. acuminata Lec./Berland.” (h)/“M.C.Z. Type 3762” (red tag)/“C. acutipennis Chev.” (h)/“C. acuminata Lec. Fisher ’39” (printed in pencil on yellow paper); 2) “78” (h)/“acutipennis 2” (h); 3) “Tex.”/“Reisig” (h)/“acutipennis 3” (h)/“C. acutipennis Chev. Fisher ’39” (pencil, yellow paper); 4) “Tex.”/“acutipennis 4” (h). These represent two species (1 & 2, length 14.3 and 10.5 mm, respectively; 3 & 4, 18.3 and 19.0 mm) and it is clear that Fisher recognized this. However, he mentioned only specimen 1—validating it as the lectotype of C. acuminata—and 2, stating that “without any doubt” they are the specimens mentioned in LeConte’s description. There is no direct reference to specimens 3 or 4 in either LeConte’s or Fisher’s works. However, the latter’s description of the male lectotype of C. acuminata distinctly fits specimens 3 and 4 (both female!) except the secondary sexual characteristics of specimen 1 (a male) are incorporated! His description of the female best fits specimen 2.

Although Fisher’s intentions are clear (i.e., he correctly recognized two species), his results are not; his determination labels on specimens 1 and 3 reflect the opposite. The small size of specimen 2 lends further confusion, as he gave the minimum length of 15 mm in his treatment under C. acuminata. Even more confounding is his giving 19 mm as the length of the lectotype.

One might at this point wonder if labels became mixed on specimens. I do not think so, and despite all the confusion specimen 1 (M.C.Z. Type 3762) should be considered the lectotype of C. acuminata. I have placed a clarifying label on it. Furthermore, it and specimen 2 match LeConte’s original description, in which the phrases “plagis elevatis sublaevibus nitidus” and (especially) “apice singulatim acuminatis et spinula brevi armatis” regarding the elytra, appear definitely to exclude specimens 3 and 4. However, LeConte gave a length range of 11.2–17 mm, the larger measurement providing the only clue that he might have had two species in his series. Specimens 3 and 4 may have been added to his collection after his description of C. acuminata was written.

In addition to examining numerous specimens, I have compared a color slide of the holotype of C. acutipennis with the lectotype of C. acuminata (which is almost a perfect match for Fisher’s redescription of the former!), and there is no doubt that the two are conspecific. Specimens 3 and 4 are C. pseudacutipennis Obenberger (q. v.). Waterhouse’s (1887) illustration of C. acutipennis is correctly associated.

Some descriptive clarification is necessary as a result of Fisher’s error, otherwise his descriptions can be used; however, the reader must be aware that
Figs. 1–9. Chrysobothris spp. 1, acutipennis, Cameron Co., Texas. 2, pseudacutipennis, Starr Co., Texas. 3, culbersoniana, Big Bend National Park, Texas. 4, indica, Oahu, Hawaii. 5, orono, Pickens, South Carolina. 6, hubbardi, Paisley, Florida. 7, vulcanica, Wallowa Co., Oregon. 8, convexa, Big Bend National Park, Texas. 9, woodgatei, N. Rim Grand Canyon, Arizona.
there is much descriptive overlap between the two species now involved, *C. acutipennis* and *C. pseudacutipennis* (= *acuminata*, sensu Fisher). In *C. pseudacutipennis* the front of the head of the male is black and variably cupreous and/or aeneous, with a narrow green margin along each eye, and the vestiture is dense and conspicuous; the clypeus is bright cupreous. In the female the front of the head is mostly black, with faint cupreaeonescent reflections, narrowly green and more broadly cupreous along the eyes; the surface is very coarsely, irregularly, somewhat rugosely punctured, not evidently granulose, and the vestiture is considerably less dense. In both sexes of *C. acutipennis* and *C. pseudacutipennis*, the first four visible abdominal sternites, especially the first, are more appropriately considered shallowly concave at middle. In *C. pseudacutipennis* the serrate submarginal ridge of the last visible ventrite is better developed.

It is interesting to compare average sizes between populations of *C. acutipennis* and *C. pseudacutipennis* from SE Texas/northern Mexico and the Yucatan peninsula, from which regions came all but a few of the specimens studied. Males of *C. acutipennis* from the north range in length from 11.1-15.3 mm (n = 9, \( \bar{x} = 13.3 \) mm), females from 10.4-15.0 mm (n = 15, \( \bar{x} = 13.2 \) mm); from Yucatan the males range from 10.6-16.1 mm (n = 24, \( \bar{x} = 13.9 \) mm), females from 11.7-16.2 mm (n = 18, \( \bar{x} = 13.8 \) mm). Males of *C. pseudacutipennis* from the north are 14.1-17.4 mm (n = 14, \( \bar{x} = 16.2 \) mm), females are 15.7-19.7 mm (n = 6, \( \bar{x} = 17.7 \) mm); from Yucatan males are 11.8-13.6 mm (n = 3), females are 11.6-16.2 mm (n = 11, \( \bar{x} = 13.5 \) mm). From these data it is clear that *C. pseudacutipennis* averages larger in size than *C. acutipennis* in northern regions; also, it differs by having a distinct dark greenish luster. Less certain is that specimens of *C. pseudacutipennis* average considerably smaller in the south. In *C. acutipennis* there seems to be tendency for larger specimens in southern regions, as 48% of the specimens were above average versus 37% for northern specimens; additionally, eight specimens from Central America average 15.9 mm.

While body color and average size may be good distinguishing characters in the northern part of the range of these species, overall they are more readily separated by the anterior femoral tooth, which is obtusely rounded in *C. acutipennis* and acutely triangular in *C. pseudacutipennis*; and in the male by the outer segments of the antennae, which are uniformly metallic reddish above (testaceous and greenish-black below) in *C. acutipennis*, while in *C. pseudacutipennis* they are uniformly testaceous tipped with black.

The distributional range for *C. acutipennis* is from SE Texas to northern South America. It has been recorded in the literature from Arizona, but this is based on a misidentification (see under *C. pseudacutipennis*). Records from Mexico outside the eastern coastal states should be verified and may refer instead to *C. merkelii* Horn. Much more collecting in Mexico is necessary in order to more accurately define the species limits of this group. I have seen specimens from Mexico, TABASCO, Cardenas, 30-VI-83; Teapa, 10-IV-79, CEAM. The only confirmed host recorded is *Pithecellobium flexicaule* (Bentham) Coulter (in Texas); another host is *LEUCAENA PULVERULenta* (Schlectendal) Bentham, Texas Hidalgo Co., Delta Lake Co. Park, 27/28-III-86, GHNC.

**Chrysobothris adelpha** Gemminger and Harold 1869:1423. OKLAHOMA, McCurtain Co., Idabell, 9-VI-79, W. C. Shepard Coll.

**Chrysobothris arizonica** Chamberlin 1938:13. NEW MEXICO, San Juan Co., Navajo Lake, 25-V-74, BKDC. Adults of this species are commonly col-
lected from juniper; however, the only larval host known has been *Haplopappus laricifolius* Gray (Hetz and Werner 1979). I have seen a specimen reared from *GUTIERREZIA SAROTHRAE* (Pursh) Britt. & Rusby, Arizona, Pima Co., Three Points, 29-I-76, UAIC.

**Chrysobothris azurea** LeConte 1857:8. ALBERTA, 7 mi S Empress, em. 5-III/5-VIII-81, ex *PRUNUS VIRGINIANA* L. wood coll. VII-80, G. Hilchie, RLWE. KANSAS, Crawford Co., 26-V-87, on dead *Cercis canadensis*, T. C. MacRae Coll.

**Chrysobothris biramosa biramosa** (Fisher) 1935:117. NEVADA, Mineral Co., Walker Lake, 22-VII-78, reared ex *Atriplex* sp., UIMC.

**Chrysobothris carinipennis** LeConte 1878:459. Bright (1987) located this species in SW British Columbia on his distribution map. I have not seen specimens from the Cascade Range or westward, therefore suggest that his SW British Columbia distribution refers to the closely related *C. pseudotsugae* Van Dyke, for which he gave “Frye Creek and Merritt, BC” as “Canadian records.” However, Fisher (1942) provided those same two SE British Columbia localities under *C. carinipennis*. Though it is impossible to tell from his book, Bright’s records probably are mistakenly applied from Fisher’s work, as *C. pseudotsugae* appears to be absent east of the Cascades. The foregoing brings the British Columbia distribution of these species into line with that given by Barr (1971).

**Chrysobothris caurina** Horn


Even though it is not an uncommon beetle, *C. caurina* has an obscure taxonomic history because it was long confused with a much more widespread and abundant species. Barr (1974) recognized and clarified this confusion when he described *C. leechi*. With the exception in part of Horn (1886) and Fisher (1942), all other references to *C. caurina* refer almost entirely to *C. leechi*.

In contrast, all references to *C. laracis* Van Dyke (q. v.) occurring in California must be considered pertaining to *C. caurina*, although these apparently allopatric species are very closely related. Notable was a characterization of specimens from Yosemite National Park by Van Dyke (1918). I have examined many specimens from this area of the Sierra Nevada northward through Washington, comparing them to type material of *C. beeri* and an excellent photographic slide (courtesy of W. F. Barr) of the holotype of *C. caurina*. I find these species to be conspecific. Based on the foregoing discussion and considerable study of this species group of *Chrysobothris*, especially in the western United States, the distribution of *C. caurina* should be restricted to the Pacific Coast states, Nevada and British Columbia, probably not occurring east of the Sierra Nevada and Cascade Range.

**Chrysobothris chiricahuae** Knull 1937:37. Fisher (1942) keyed this species to two places, since with it and some others (e.g., *C. semisculpta* LeConte) there are some problems interpreting couplet 24. I have examined nine specimens and in my opinion *C. chiricahuae* more closely matches Fisher’s second alternative. Taking this route leads to the discovery that he misplaced *C. chiricahuae*
into couplet 98. In couplet 96 he clearly directs the user to couplet 102 (one may wonder if he intended the phrase concerning *C. chiricahuae* to appear in the first alternative). However, in this species the base of each elytron is not angulate at middle; instead it is very broadly rounded, though sometimes slightly sinuate at the middle (a character not mentioned in the original description or by Fisher). Given this, *C. chiricahuae* keys into couplet 104, where it can be readily distinguished by its relatively smooth, indistinctly and narrowly sulcate pronotum, and in the male the protibia is obtusely dentate at its apical third rather than apically dilated. The relationship of it to any species in the United States fauna is not readily apparent, though superficially it most closely resembles *C. semisculpta*. I feel that its affinities lie with the Mexican *C. densa* Waterhouse.

The male protibial tooth would appear to exhibit considerable variation, since it may be more narrowly rounded than on the holotype or may be broadly truncate; in the five specimens examined it is well developed. The mesotibial tooth is much smaller and very obtusely angular.

According to G. H. Nelson (in litt.), he collected 100 specimens during 1984, mostly from the underside of small pine limbs that were near or on the ground; some of the limbs were placed that way on purpose. I have observed this habit in several species of the genus. All specimens were collected high in the Chiricahua Mountains, Arizona, which is the only locality known for this beetle. The specimens ranged in length from 8.7-12.0 mm.

*Chrysobothris convexa* Fall

(Fig. 8)


When Fisher (1942) revised the genus *Chrysobothris* he saw only two specimens of *C. convexa*, the female holotype from New Mexico and a male from SW Texas; therefore, scarcely any discussion of variation could be given. Also, several important characters were either overlooked or inadequately defined. In addition to those specimens above, I have examined 7 male and 11 female specimens from Texas: Brewster Co., Big Bend N.P., Chisos Mts.; 6 mi E Panther Jct.; Pine Can. trailhead, 29°16’N, 103°14’W, 4,700’; Lost Mine Trail, 29°16’N, 103°15’W, 6,000–6,850’, 29/VI–11/VII, FMNH, RLWE. Presidio Co., 12 mi N Presidio, 6-V, USNM. Val Verde Co., 24-25 mi E Dryden, 22-VI/1-VII, GHNC. All but one were labeled as collected from *Viguiera stenoloba*, a shrubby composite. Since this beetle is so unusual and little known, and is misplaced in Fisher’s key, information is presented below to point out some important and variable taxonomic characters, to facilitate its identification and to help establish its relationship with others in our fauna.

Two major taxonomic characters, heretofore overlooked, together serve to distinguish *C. convexa* from all other known species of *Chrysobothris* from the United States. First, the clypeus is strongly elevated basally, forming a transverse carina on each side which extends from the lateral angles one-half to two-thirds the distance to the midline, thus giving the clypeus a deflexed appearance. The carinae usually are well developed and sharply defined, but may be narrowly interrupted. I found this distinctive clypeal configuration to be approached elsewhere in the genus only by several atypical specimens in the
group comprising *C. texana* LeConte and its relatives, none of which are even remotely allied to *C. convexa*.

The second character is of primary importance in using Fisher's key and concerns the presence of elytral vestiture. Fisher described the elytra as glabrous; in fact, they bear very sparse, short, usually extremely inconspicuous setae which are placed mostly adjacent to the costae. These setae are longer basally and are more numerous in the humeral region; they are similar to those of *C. beyeri* Schaeffer, though in that species the setae are longer and more conspicuous and abundant. Extreme care must be taken to observe the elytral vestiture, especially on specimens that may have been rubbed, become greasy, or come in contact with fluids.

*Chrysobothris convexa* exhibits a quite uniform facies. The most obvious variation is in size, the length ranging from 9.6–13.6 mm ($\bar{x} = 11.9$ mm). The head, in addition to the well-developed chevron of the vertex, bears variably developed frontal callosities ranging from one very small, irregular callosity on either side of the middle to a distinct and well-defined cordate elevation. In all but two specimens, the callosities touch at some point with the chevron. In all specimens the occipital carina, which varies in width, is strong and even, bears a fine longitudinal groove, and merges with the chevron. The front margin of the clypeus ranges from shallowly notched to broadly, shallowly, angularly emarginate at middle, and the sides may be slightly sinuate. Unfortunately the type specimen is atypical in this respect, which caused undue emphasis to be placed on the clypeal margin as a unique character. Nevertheless, the overall aspect of the clypeus certainly is distinctive.

The configuration of the pronotal surface is quite distinctive in this species, though the callosities are variably developed and the four transversely arranged ones may be poorly defined or connected on one or both sides. The smooth median line is usually very well defined but may be uneven and sharply constricted or confused by punctures; it is variable in width and extends from the base of the pronotum to or just behind the front margin.

The elytral costae exhibit slight variation, mostly in the nature of their apical termination and coalescence. The first, second and usually the fourth ones are elevated posteriorly. On all but one specimen there are irregularly elongate, shining black smooth areas between the costae, randomly located and sometimes vaguely indicated.

Both Fall (1907) and Fisher (1942) described the prosternum as without a median lobe; however, of the 20 specimens examined, 12 (including the type) bear a feeble, sometimes only partially developed lobe. Fall described the last visible abdominal sternite as without serrate margins. Fisher described the margins “not distinctly serrate” (type), but found them “slightly serrate” on the other specimen available to him. However, he retained *C. convexa* for those species having entire margins, stating that more material might prove this relationship incorrect. The type actually has the margins feebly crenulate, with a vague tooth on one side. The remainder of the specimens I examined exhibit considerable variation (even between sides on the same individual), ranging from irregularly and indistinctly serrate-crenulate to finely, distinctly, rather uniformly serrate. The lateral callosities of the abdominal sternites are vague or absent on some segments, particularly on the last and penultimate ones.

In addition to the characters given by Fisher for differentiating the male, the prosternum is coarsely, rather confluently punctate and bears much longer and more densely placed white setae. The median portion of the metasternum
and coxal plates and, to a lesser degree, the venter are more densely punctate and clothed with setae which are more densely placed and somewhat longer than in the female. One of the males examined has the front of the head a lighter coppery brown, and the clypeus is largely green.

In Fisher's key, *C. convexa* is misplaced. It should run to couplet 11, but fits neither alternative therein, though its distinctive clypeal configuration and short, sparse, inconspicuous elytral setae will readily distinguish it. It shares the most characters with the *subcyllindrica*-group, species which are in a state of evolutionary flux; they are poorly defined and in great need of biosystematic endeavor. However, *C. convexa* would stand alone in this group. Collecting data presented here strongly suggest *V. stenoloba* is a host for this beetle, strengthening its ties to the *subcyllindrica*-group which contains the only species known to me in North America that are associated with Compositae.

**Chrysobothris crandalli** Knull 1943:34. NEVADA, Churchill Co., 7 mi W Fallon, 18-VI-88; Lincoln Co., 3 mi N Lyman Crossing, T9S, R67E, Sec. 2 and Hoya, T11S, R66E, Sec. 30, 14-VI-88, all collected on *Heliotropium curassavicum*, NVDA, RLWE. UTAH, Emery Co., 3.2 air mi NE Little Gilson Butte, 5,000', 3-VI-82, EMUS. There are no published records of host data for this species. In California, adults have been collected on *Franseria acanthicarpa* and *Hymenoclea* sp. in San Bernadino Co. and on *Chaenactis* sp. in Riverside Co. Specimens of what appears to be a more brightly colored variety of *C. crandalli* were taken on flowers of *Encelia virginensis actoni* in Inyo Co., Owens Valley. According to C. L. Bellamy (in litt.) he and others have collected it on lower stems and exposed root crowns of *Palafaxia linearis* and on lower stems of dead *Croton wigginisi* in Imperial Co., Algodones Sand Dunes. The foregoing plants are all in the family Asteraceae except for *H. curassavicum* (Boraginaceae) and *C. wigginisi* (Euphorbiaceae). Most of the collections with which I am familiar were made in sandy habitats, and this may be more of a limiting factor in the distribution of *C. crandalli* than is the host plant.

**Chrysobothris cribraria** Mannerheim


*Chrysobothris lata* is known only by the type (BMNH), which bears the locality “Floride” and measures 13.2 mm by 5.6 mm. Barr and Westcott (1976) related it to *C. rotundicollis* Gory and Laporte (*q. v.*), but its resemblance to that species is superficial. It matches well with large Florida specimens of the common, widespread and variable *C. cribraria*.

*Chrysobothris culbersoniana* Knull 1942:34. This species (Fig. 3) was described and has been known from only two males with scanty locality data. The holotype (FMNH) is labeled “Culberson Co., Tex., V-10-41/D. J. & J. N. Knull Collrs./HOLOTYPE” (printed) “Chrysobothris culbersoniana Knull” (red card)/“J. N. Knull Collection/Chrysobothris culbersoniana KNULL, det. J. Knull.” I have compared it to a female (8.1 mm) from Texas, Brewster Co., Big Bend N. P., Chisos Basin, 9-V-80, beating *Quercus* sp., RLWE, and found them conspecific. I have also examined a female (8.6 mm) and male (7.2 mm)
from NEW MEXICO, Hidalgo Co., Hwy. 80: 8 mi S Road Forks, 13-VI-82 and 8 mi S Roadsend [sic!] (probably = Road Forks), 17-V-83, both on Acacia greggii. F. M. Beer Coll., UIMC. G. H. Nelson (in litt.) provided an additional record from nearby: Granite Gap, 13-VI-83, on Acacia constricta, GHNC. Females differ as follows: Last visible abdominal sternite less flattened, broadly and weakly bisinuate at apex (Fig. 13); eighth tergite thickened apically, broadly rounded, densely, coarsely and deeply punctate (not described by Knnull; in the male, thickened and bimarginate apically, dorsal margin subtruncate with slight narrow emargination at middle, ventral margin broadly rounded, less densely and not deeply punctate); anterior tibia practically straight, unarmed.

This species appears closest to C. subeylindrica Menetries and its allies, but unlike most of them its limits appear well defined. In fact, it does not appear closely related to any species known to me. The indistinct (except at very base and apex) elytral vestiture; lack of lobe on anterior margins of prosternum; and in the male, cupreous-black front of head (in almost every example of the subeylindrica-group known to me this is bright green) and genitalia are very distinctive.

Chrysobothris exesa LeConte 1858:68. California, Imperial Co., Laguna Dam, 6/22-V-79, reared ex. SALIX sp., CJSC. Known hosts were mesquite and acacia.


Chrysobothris indica Gory and Laporte 1837:12. Students of the Buprestidae apparently have been unaware that this species (Fig. 4), reported as widespread from India to Indonesia, has been introduced in Hawaii. It was called to my attention by B. Kumashiro (in litt.) who provided the following information from various volumes of the Proc. Hawaiian Ent. Soc. [all taken from the section on Notes and Exhibitions (anonymous)] and based on specimens collected in Honolulu. It was first collected in 1946, then again in 1947, being reported as “Chrysobothris sp.” [13:12 (1947), 13:208 (1948), 13:323 (1949)]. In 1948 it was identified as “C. near tristis Deyrolle” by W. S. Fisher [13:341 (1949)], and in 1953 [15:275 (1954)] it was reported that a specimen “bit a boy on the lip” (a behavior one might expect from a species of Oxpteris instead!). Distributional and host data (outside Hawaii) and identification as C. indica were given in 16:19 (1954) and 23:324 (1981). Most of these specimens are in HDOA.

Specimens kindly given to me by Mr. Kumashiro were confirmed as C. indica by S. Bily (NMPC) and were collected at Salt Lake [district of Honolulu], 10-V-71 and Millilani [Town], 30-X-85, the latter being the only Oahu record from outside of Honolulu. However, Mr. Kumashiro (in litt.) reported a specimen from Maui, Kahului, 1-XI-85, ex light trap at airport, HDOA. There is a specimen from Hickam Field, Oahu, VI-59, in the USNM (J. M. Kingsolver, in litt.).

Chrysobothris laricis Van Dyke 1916:409. COLORADO, Gunnison Co., near Gothic, Virginia Basin, 11,000', 19-VII-80, W. B. Warner Coll.; Jackson Co., Gould, 12-VIII-70, Pinus contorta, SGWC, RLWE; Larimer Co., Rocky Mt. N. P., Milner Pass, 10,750', 6-VIII-72, Englemann spruce, RLWE. Literature records of this species from California are in error and should refer to C. caurina (q. v.); Chamberlin’s (1932) record from “Oak Ridge,” Oregon, also can be referred to that species, as I have seen C. laricis only from the northeastern part of this state and C. caurina is widespread in the Cascade Range. Barr and Westcott (1976) provided the only record of C. laricis from Arizona.
(Greer, 8,000'): Others are Coconino Co., Jacob Lake, 28-VII-76; Graham Co., Pinaleno Mts., 9,000’, 21-VI-80, Pinus and Abies slash, both BKDC & RLWE. The latter represent the southernmost known occurrence of this predominantly Rocky Mountains species. Van Dyke (1916) recorded the type locality as “Grant County, Oregon,” but Chamberlin (1926) cited “Sumpter” (which is in Grant Co.). It can safely be assumed that the type locality is Sumpter, since Chamberlin collected the specimens (Van Dyke 1916:410).

Chrysobothris leechi Barr 1974:3. No specific locality data exist for this species in Nevada, though its occurrence in the far western mountainous regions of that state has been taken for granted: Douglas Co., 3 mi E Stateline, 25-VI-68, RLWE.

Chrysobothris lineatipennis Van Dyke 1916:411. Originally described as a subspecies of C. mali Horn, it was later accorded species rank (Van Dyke 1923). The two are very close and belong to a group where species limits are at best difficult to define. The widespread C. mali is highly variable and utilizes a multitude of hosts. In contrast, C. lineatipennis occupies a much more restricted range within that of C. mali, is not nearly so variable, and seems restricted to plants in the genus Eriogonum.

Ironically, I found all but one of the distinguishing characters given by Van Dyke (1916) to be variable and of little use in differentiating the two taxa. However, he had very few specimens of C. lineatipennis for study. Fisher (1942) saw only a female, from which he made his redescription, and provided no original discussion. The holotype is a male; however, since Van Dyke's description was only to separate subspecies he did not provide sexual differences. These are, however, the same as found in C. mali. In males of both species the face varies in color from bright to rather dull green, occasionally with strong coppery overtones, and the prosternum is rather densely (rather than sparsely, as described by Fisher for C. mali) clothed with long setae, as opposed to sparsely so in the female.

I compared 39 specimens of C. lineatipennis to 15 of C. mali (most collected from southern California to southern Oregon) and found the elytral foveae to provide the best means for separation. In the former, on each elytron there is a single antemedian fovea which nearly or (usually) entirely interrupts the second costa, and there is only one small posterior fovea, which usually is indistinct or absent; when present it may be located at about the apical 3/8, which usually is near the end of the third costa. In C. mali there almost always are three foveae, the posterior ones usually being distinct and sometimes coalesced. Additionally, in C. lineatipennis the elytral costae usually are more extensively and strongly elevated, and the margins of the elytra usually are more finely serrate apically; however, the latter character is much less useful. The males may be distinguished by their genitalia (Fig. 12). In female C. mali the last visible sternite usually is more deeply notched, yet this is a variable character in both species. Finally, C. lineatipennis has always been collected from plants in the genus Eriogonum, while C. mali rarely occurs on that plant.

Chrysobothris monticola Fall


This species is one of the most widely ranging western representatives of a related group (part of Group IV of Horn 1886) which utilize the coniferous family Pinaceae as hosts. It was described from southern California and ranges from northern Baja California (Sierra Juarez, .6 & 4.5 mi S El Condor, 6/7-VII-75, RLWE; Sierra San Pedro Martir, Rcho. Viejo Mdw., 14-VI-54, CASC. First records for Mexico) to British Columbia, eastward across northern and central Idaho to western Alberta and MONTANA (Ravalli Co., Sula, 10-VII-22, FMNH), then south to central Colorado. Judging from the paucity of specimens seen, it is uncommon east of the Cascade Range and Sierra Nevada. It has a large elevational amplitude, specimens having been collected from about 200 m to 3,660 m above sea level; however, they are not often encountered in numbers above 1,525 m, except in southern California. This beetle has been recorded from four species of pines; additionally, I have collected it on Pinus sabiniana Dougl. and a species of pinyon. Probably it will utilize any species of pine growing within its range.

As might be expected of a species with such an extensive range, C. monticola exhibits considerable variation. I have examined approximately 400 specimens. The arrangement of the raised black sculpturing and the color of the depressed punctured areas of the dorsal surface are particularly variable. The color of the venter ranges from bright coppery to purplish black, often with brassy-green reflections. The clypeal emargination varies in width and depth. The specimens examined ranged from 10.2-16.5 mm in length. In females the apical emargination of the last visible sternite varies from narrowly to broadly triangular, shallow or deep; however, on some specimens the median ventral margin, which is continuous with the submarginal ridge of the sternite, is arcuate. Fisher's (1942) key and figure (65D) are misleading at best; his figure (63B) for C. grandis very well represents C. monticola. Additional variation was provided by Fisher.

The male genitalia (Figs. 10, 11) are distinctive for this species, though the degree of expansion and abrupt constriction of the parameres is slightly variable, and the apex of the median lobe varies from narrowly rounded to sub-truncate (the usual condition is broadly rounded). These variations may occur within a single population. A distinctive feature not mentioned by previous writers is the color pattern of contrasting testaceous or reddish-testaceous and dark brown or (usually) black. This pattern is quite uniform in 64 specimens examined from Idaho and the Pacific Coast states; however, in three of four specimens examined from the Rocky Mountain region, the internal piece of the median lobe was only slightly infuscated.

The differing facies of specimens from the latter area is at once evident, yet difficult to assess. It has been quite adequately described by Fisher. I have examined 17 specimens from this region, including most of those seen by Fisher. The most distinctive feature is the more diffuse sculpture of the elytra. Secondarily, the median pronotal sulcus is not usually as well defined as in the more western populations, largely an effect of the less elevated and more irregular calllosities bordering the sulcus. I have studied seven specimens from Idaho and most appear more related to Rocky Mountain populations, but some seem to represent a transition form. Further collecting in these regions may provide evidence for subspecific distinction. Although Rocky Mountain forms usually can be readily recognized, insufficient material is available to properly assess the nature of what may be just a clinal relationship.

I examined the holotype of C. grandis (CASC #5489) and found it conspecific with C. monticola. The former was described from one exceptionally large

female collected in east-central Oregon; the phenotypical expressions fall clearly within the range of variability of the western populations of *C. monticola*. I have not seen other specimens from Oregon east of the Cascade Range, though I have collected rather extensively there. Fisher recorded *C. monticola* from that region.

It seems odd that previous writers concerned with *C. grandis* did not even
mention an affinity with *C. monticola*. Chamberlin (1938), in comparing it to *C. californica* LeConte (probably due to similarity in size), stated that “... the prominently lobed prosternum [of *grandis*] at once separates it.” Fisher (1942) did not discuss the relationship, but took exception to Chamberlin, stating “... but the lobe is very narrow, and the species could be easily mistaken for one without a median lobe ... .” Chamberlin’s description of the prosternal lobe is the more accurate. Although this character is not uniformly reliable in some members of this species group, it appears to be extremely reliable in *C. monticola*. Barr (1971) restricted *C. monticola* to southern California and referred to the Pacific Northwest populations as *C. grandis*. *Chrysobothris monticola* appears to be most closely related to *C. leechi* Barr and was compared (as *C. grandis*) to that species by Barr (1974).

**Chrysobothris nixa** Horn 1886:98. MONTANA, Gallatin Co., 11-V-57, MTEC. This represents the easternmost locality known for this species.

**Chrysobothris octocola** LeConte 1858:67. When Nelson (1975) reviewed the group to which this species belongs, he was unaware that it had been reported from Hawaii: Oahu [Coop. Econ. Insect Report, USDA, 10:608 (1960); Proc. Hawaiian Ent. Soc. 17:321 (1961)] and Hawaii [CEIR 15:1306 (1965); Proc. Hawaiian Ent. Soc. 19:147 (1966)]. According to B. Kumashiro (in litt.), who provided several collection records from Oahu (1964–1984, HDOA), the species “... is found in the drier areas, where there is an abundance of mesquite.” Specimens were collected from May through January, most being taken from July through October. Additional records for *C. octocola* are: Hawaii Island, Puako, 29-XII-67, BPBM, and Hapuna Beach, 25-IX-74, RLWE; Lanai Is., Hulopoe Bay, 7-VI-71, BPBM. According to Johnston (1962) the only species of mesquite in Hawaii is *Prosopis pallida* (Willd.) HBK, a South American species, though most likely *C. octocola* was introduced into the islands in mesquite wood from SW United States where it is widespread and common. There are few records from the southern part of its range, in Mexico, except for Baja California. Nelson (1975) did not report it from San Luis Potosi (Chamberlin 1926) or Morelos (Cazier 1951). Since several closely related species occur in Mexico, those records may have been in doubt; however, I have been able to verify them.

Known larval hosts for *C. octocola* are shrubs and trees in the family Fabaceae; however, adults occasionally have been taken on plants in other families. An interesting record was obtained by R. C. Bechtel (in litt.), who collected larvae, pupae and teneral adults from a dooryard peach, *PRUNUS PERSICA* Batsch (Rosaceae), in Las Vegas, Nevada, 30-III-89, NVDA.

**Chrysobothris orono** Frost (Fig. 5)

**Chrysobothris orono** Frost 1920, Can. Ent. 52:232.


Nelson *et al.* (1981) recorded *C. hubbardi* Fisher for the first time from Georgia and South Carolina based on two specimens identified as that species in the J. N. Knuff Collection (FMNH). I have compared them with a color slide of the holotype and a female from Florida, Paisley, 21-IV-76, BKDC, and a series of *C. orono* from South Carolina, Pickens Co., 7 mi NE Pickens, various dates in V and VI/79–86, BKDC, RLWE. Only the specimen from
South Carolina, Jocassee (a female) is *C. hubbardi*. Kirk (1970) listed *C. orono* (det. by J. N. Knnull) from Jocassee based on at least two specimens. One of those is the aforementioned *C. hubbardi* specimen; another, a female, was sent to me from CUCU and it too proved to be *C. hubbardi*. Based on the foregoing discussion, *C. orono* in GEORGIA and SOUTH CAROLINA represent new state records, and *C. hubbardi* should be stricken from the Georgia list, even though it probably occurs there.

From *C. hubbardi* (Fig. 6), *C. orono* is distinguished by being more elongate and convex, and on each elytron the first costa is well developed, strongly elevated apically, and the raised smooth areas generally are more diffuse. Also, in *C. orono* a second elytral costa usually is more or less evident, and occasionally a small portion of a third costa. Fisher (1942) utilized the shape of the apical emargination of the last ventrite of the female to separate these species. I found this character in both to fall well within a range of variation to be considered normal for a single species in the genus; however, the sternite itself appears more narrowly triangular in *C. orono*. The strongly cupreous color above in *C. hubbardi* from Florida contrasts with weak cupreous reflections in those from South Carolina. The specimen of *C. orono* from Georgia is strongly cupreous above, while those from South Carolina bear moderate to weak cupreous reflections. The pronotal and elytral callosities are more elevated and distinct on the specimen of *C. hubbardi* from Florida, while in the South Carolina specimens these areas are considerably more punctate and similar to that found in *C. orono*. Despite these similarities *C. hubbardi* appears to be a valid species, though a reliable conclusion awaits discovery of the male.

Males of *C. orono* examined ranged in length from 11.4–16.0 mm (n = 13, \( \bar{x} = 13.7 \)); females were 14.4–16.7 mm (n = 8, \( \bar{x} = 15.5 \)); the small males will key to *C. trinervia* (Kirby) in Fisher (1942). However, *C. orono* is readily separated: in the males by a much more elongate protibial dilation, lack of a distinct greenish reflection ventrally (though sometimes this is faint in *C. trinervia*), and distinct genitalic differences; and in the female, by the broad, shallow apex of the last visible abdominal sternite (which is notched in *C. trinervia*).

Wilson (1969) discussed the biology of *C. orono* in Michigan, mostly on young (4–10') red pines. The beetles were noted to attack only living trees, 98% on the bole, 2% near the base of a branch. According to H. L. Dozier (in litt.), he collected the specimens from South Carolina only on exposed roots of large living pines. These roots were always in the sun and with damaged surface—bark removed in places, and at times with resinous areas or oozing sap at edges of the bark. Larval workings were located in heavily resinous areas under the bark on the underside of roots. Adult emergence holes were located on the upper surface, and resinous “push-ups” were often seen on the sides and tops of an infested root.

*Chrysobothris peninsularis* Schaeffer

*Chrysobothris peninsularis* Schaeffer 1904, Jl. N.Y. ent. Soc. 12:207.

This species has been recorded from Texas to California and the Baja California peninsula. I consider it to be polytypic, rationale for which is given under the following taxon. Specimens examined from W. Texas, W. Arizona, S. California and Baja California belong to the nominate subspecies, as does the following: NEVADA, Lincoln Co., Elgin, 3,900’, 17-VI-85, RLWE.
Chrysobothris peninsularis sinaloae Van Dyke, new status


Van Dyke related his species to C. peninsularis, but did not utilize male genitalia in the comparison. Based upon this character alone I would find these taxa to be conspecific. Van Dyke distinguished C. sinaloae by its larger size, a broader prothorax and, in the male, a green frons (bronzed in C. peninsularis) and less developed protibial dilation and tooth. I examined 16 male, 16 female C. p. peninsularis and 8 male, 12 female C. p. sinaloae (including two paratypes): There appears to be no differences in the prothorax, and the male characters are somewhat variable, though likely useful in separation if a series is available. In length, specimens of C. p. peninsularis ranged from 9.1-13.6 mm (x = 11.5 mm) and those of C. p. sinaloae ranged from 11.4-15.5 mm (x = 13.4 mm). Females average slightly larger. Additionally, and perhaps most useful when dealing with few specimens, C. p. sinaloae bears strong bronzy reflection dorsally, while this is usually weak in C. p. peninsularis. Fisher (1942) gave the length of C. peninsularis as 11-14 mm and said that specimens from Arizona were “more bronzy brown.” Thus, it is possible that those specimens represent C. p. sinaloae. In Mexico it has been known from near Mazatlan, Sinaloa, to near Ciudad Obregon, Sonora. I have examined specimens from CHIHUAHUA, Sa. Madre [Occid.], La Buja, 3,000’, 8-VII-72, RLWE; COLIMA, Armeria, 10-VIII-62, CEAM; JALISCO, 17 km SW La Huerta, hwy. 80, Km 235, 370 m, 9-X-88, RLWE; MICHOACAN, 7 km N La Placita, 18°35’N, 103°36’W, 11-X-88, RLWE.

Van Dyke mentioned the superficial resemblance to C. distincta Gory and C. schaefferi Obenberger, and indeed C. peninsularis appears related to them. It bears no similarity to C. densa Waterhouse, C. pusilla Gory and Laporte, or C. neopusilla Fisher, as alluded to by Dominguez-Rubio.

Chrysobothris piauta Wickham 1903:67. MONTANA, Madison Co., Gravely Mts., 29-VII-84, CLBC. This represents the northernmost locality for this species, the nearest being Reno, Nevada. Another interesting collection is CALIFORNIA, Shasta Co., vic. Whiskeytown L., road to Mad Mule Mt., 2,300’, 4-VII-82, RLWE.

Chrysobothris pseudacutipennis Obenberger
(Fig. 2)


The holotype of C. pseudacutipennis is a female bearing the following labels: “Texas/America borealis, Coll. Obenberger/Typus” (red)/“Mus. Nat. Prague, Inv. 22929/Chrysobothris pseudacutipennis m. Type, Det. Dr. Obenberger.” I have compared it with specimens under C. acuminata and C. acutipennis in the LeConte and Horn collections (MCZC), with material in the USNM examined by Fisher and with specimens in my collection. This species has been definitely known only from SE Texas, south of 28°30’N; however, I have
specimens from Brazos Co., College Station, which is approximately 30°27'N. Most of the specimens I have seen were collected on Prosopis glandulosa Torr. The only specimens I know from Mexico are: TAMAUPLAS, Cd. Victoria, 30-VIII-65, DSVC; SAN LUIS POTOSI, 41 mi S L.P., 26-VI-65, Prosopis chilensis; YUCATAN, Piste, VI to IX-68; QUINTANA ROO, "III"-66, all GHNC.

Obenberger's description of this species was unknown to Fisher at the time of his revision otherwise much of the confusion I discussed under C. acutipennis might have been averted. Obenberger appears to have considered Horn's entire treatment under C. acutipennis referable to C. pseudacutipennis and in large part I concur. For a detailed comparison with acutipennis, see under this species.

I examined the four specimens under C. acutipennis from the Horn Collection. The first is C. pseudacutipennis, 17.2 mm long and labeled "Tex./Horn Coll. H 10086/C. acutipennis Chev." Horn's description and figures undoubtedly were based on this specimen. His lower limit for length (.44") and distributional reference to Mexico must have been taken from LeConte (1860); therefore, they probably refer to C. acutipennis. His locality listing of Arizona can be readily explained by the remaining three specimens which are C. wickhami Fisher from Yuma, the type locality for that species!

Chrysobothris rossi Van Dyke 1942:117. SONORA, 30 mi S Navojoa, 29-VI-82, CDAE; Caborca, 30-VI-76, CIAN.

Barr and Westcott (1976) removed C. rotundicollis from synonymy under C. dentipes (Germar) and related it to C. lata Kerremans (herein synonymized with C. cribraria), probably interpreting a geographical association from the type localities which they cited as “Santo Domingo” and “Florida,” respectively. I compared the female lectotype (missing apex of last visible sternite) and male paralectotype (here designated; bearing no other label) of C. rotundicollis (both MNHN) with the lectotype and three paralectotypes of C. blanchardi (all MCZC), including the male genitalia, and found them to be conspecific. The types of the former measure 12.6 by 5.1 mm and 10.0 by 3.8 mm, respectively.

The type locality of C. rotundicollis is not “Santo Domingo,” but “S. Domingue” (given as “Saint-Domingue” in the original description). According to Descarpentries (in litt.) he wrote this label exactly as it appears on a calligraphic label fixed to the boxes of Count Mniszech, the former owner of the Gory and Laporte types, who ordered that the original handwriting of the authors be destroyed. It is possible that the locality refers instead to “St. Domingue,” which name I found applied to two localities in southern Quebec. This seems a more plausible locality as, although the species is widespread (occurring as far west as Arizona, with the southern record a single specimen from central Florida), most specimens are from northern regions. It is here recorded for the first time from NORTH CAROLINA, McDowell Co., 27-V to 10-VI-77, SGWS,
SIVC; and NEW HAMPSHIRE, Newton, 4/5-VII-46, DENH, GHNC. It is an uncommonly collected species and its introduction into the Caribbean region seems unlikely; however, a host genus, *Pinus*, occurs there.

Barr (1969) placed *C. columbiana* next to *C. blanchardi*, though stated that it keyed to *C. trinervia* (Kirby) in Fisher (1942). However, in his description the front margin of the prosternum is described “. . . with a broad, feebly developed, median lobe.” On this basis it should key to *C. blanchardi*. Since the description of the Pacific Northwestern *C. columbiana*, the known range of *C. rotundicollis* (as *C. blanchardi*) has been expanded westward to Alberta (Bright 1987) and SE British Columbia (Barr 1971), the latter based on a specimen which “. . . can, perhaps, more properly be assigned to . . . *columbiana* Barr.” I have seen specimens from MONTANA, Carter Co., 5 mi W Alzada, L. funnel in Pine, 20/VI-31/VIII-89, MTEC; WYOMING, Crook Co., Devils Tower Nat. Mon., 4,000', 15-VII-83, and have seen a specimen from Pullman, Washington (WSUC); each has a well developed median lobe on the prosternal margin. Comparison of a male paratype of *C. columbiana* with these and several other specimens determined as *C. blanchardi* leaves me with no doubt that they are the same taxon. According to Fisher, this species ranges in length from 10.0-13.5 mm. I have examined two females, one which is 15.4 mm long, labeled from St. George, Utah (which is impossible unless it came from imported firewood!), but with the added label stating “probably from Seegmuller Mt., Mohave Co., Arizona,” BYUC; and one 15.0 mm from Saskatchewan, SGWC. The range of *C. rotundicollis* in Arizona is thus extended 255 km to the northwest.

**Chrysobothris scitula** Gory 1840:160. ALABAMA, Elmore Co., hwy. 231, 6.2 mi S jct. hwy. 14, 4-VI-89, RHTC.

**Chrysobothris semisculpta** LeConte


*Chrysobothris burkei* Chamberlin 1929, Pan-Pacif. Ent. 5:110–111, figs. 2, 3. New synonymy.

This is a widespread and variable species which is known from Washington and Idaho to southern California. I have examined 347 specimens determined as *C. semisculpta* from throughout this range except Idaho, mostly from California. Conversely, *C. burkei* has been recorded only from the type locality; the male holotype (CASC #5500) is labeled: “14586a4 9-22-19/Type” (red)/“From Coll. of W. J. Chamberlin/TYPE Chrysobothris burkei Chamb. W. J. Chamberlin” (red). The specimen (CASC #5501) labeled “15331 Hopk. U.S./Big Basin San Mateo Co Cal/Type” (red)/“Chamb” (green)/“From coll. of W. J. Chamberlin/ALLOTYPE Chrysobothris burkei Chamb. W. J. Chamberlin” (red) is also a male! Actually, Big Basin is in Santa Cruz Co. I have examined 27 specimens determined as this species from Alameda, Santa Clara and Santa Cruz counties.

Chamberlin (1929) compared his species to *C. semisculpta* (as *C. contigua* LeConte) and *C. cuprascens* LeConte; however, in Fisher (1942) the only possible clue to the affinity of *C. burkei* is its placement in the key. In my opinion, all of the characters except two used by Chamberlin to differentiate *C. burkei* correspond to the variability exhibited by *C. semisculpta* throughout its range. Of these two—female apical emargination of last visible sternite and male protibial tooth—Chamberlin placed particular emphasis on the latter, which
appears to be longer, more acuminate and situated at about the apical one-quarter of the tibia. The female apical emargination is broad and deep; in *C. semisculpta* it is usually narrower and shallower.

Based on the foregoing, most California specimens from Santa Barbara Co. southward fit the *burkei* phenotype (I have not seen specimens from intermediate areas). In fact, Chamberlin labeled a specimen from "Big Bear, Cal." as a cotype (CASC; invalid designation). Conversely, according to Barr (1971), Chamberlin labeled a paratype from Oregon (OSUC; invalid designation).

All males examined from the South Bay counties of California exhibited a very well-developed, rather acuminate protibial tooth. In southern California populations, this character is much more variable, though usually less narrowly acute and sometimes approaching the shape found in specimens from the Sierra Nevada and northward. Interestingly, 13 specimens from North Bay Area counties (Napa, Sonoma) have the protibial tooth as in the eastern and northern populations of *C. semisculpta*, while the female apical emargination more closely matches that of the *burkei* phenotype.

Relative position of the protibial tooth was determined from dividing the distance between the tibial and tooth apices by the length of the tibia. Results were as follows: South Bay Area counties ("*burkei*")—*n* = 8, *r* = .22-.26, *x* = .24; Napa and Sonoma cos.—*n* = 5, *r* = .28-.32, *x* = .30; southern California—*n* = 50, *r* = .22-.30, *x* = .26; southern Sierra Nevada north to Sierra Co.—*n* = 56, *r* = .26-.35, *x* = .29; Plumas Co. to Siskiyou and Modoc cos.—*n* = 39, *r* = .26-.33, *x* = .29; Oregon and Washington—*n* = 28, *r* = .25-.33, *x* = .29. This character seems to distinguish two groups. However, I think it is of little significance by itself, as the results of measurement are strongly, if not totally, reflective of the variable shape of the protibial dilation, the most acute of which are often directed forward.

*Chrysobothris burkei* is not worthy of species status, but a case might be made for it as a subspecies. First, however, a more detailed study of the *semisculpta*-group needs to be made, especially of specimens from distributional gaps, not only between *C. burkei* and *C. semisculpta*, but between the latter and *C. cuprascens* which is a species Fisher considered questionably distinct.

*Chrysobothris subcylindrica* Menetries 1859:182. Apparently there has been no specific record of this species occurring in Washington, as listings of it from that state (under *C. deleta* LeConte) have been shown to refer to other species. This is surprising, as it has been collected in large numbers adjacent to the Columbia River in Oregon (Barr and Westcott 1976). These authors discussed the known larval hosts, all of which are in the Asteraceae. An additional composite host is *CHRYSOPSIS VILLOSA* (Pursh) Nutt. ex DC, based on mature larvae taken during V-80 in the same area (ODAC). WASHINGTON, Walla Walla Co., McNary Nat. Wildlife Ref., 26-VI-70, SGWC.

*Chrysobothris texana* LeConte


This widespread western United States species was recorded from Mexico (Veracruz, Jalapa) by Dominguez-Rubio based on a single specimen which she described in detail. She compared it only with Fisher’s (1942) redescription,
giving but two differences, and stating: "Todas las demas caracteristicas son iguales, lo mismo que los genitales." I examined this specimen and it is not texana, nor does it appear to be closely related. Unfortunately it is badly discolored from boiling in KOH to extract the genitalia. Chysobothris texana is primarily a Great Basin–Rocky Mountains species, with Juniperus spp. as hosts, and its occurrence anywhere in southeastern Mexico seems highly improbable. It has not otherwise been recorded from that country; however, specimens are at hand from BAJA CALIFORNIA N., Sierra Juarez, .6 mi S El Condor, 6-VII-75; 6.4 mi N Valle de Trinidad, 4-VII-75, RLWE.

Chysobothris trinervia (Kirby) 1837:157. ARIZONIA, Coconino Co., Grand Canyon N. P., 4 mi N North Rim, 25-VII-79, RLWE. Fisher (1942) recorded this species from California, but in my opinion its occurrence in that state is to be doubted. I have examined hundreds of specimens of the genus from that state, as have several others who have collected extensively there, and it has not been seen. Neither have I seen it from southern Oregon nor Nevada.

Chrysobothris vulcanica LeConte 1861:346. MONTANA, Ravalli Co., Sula, 3-VIII-29, on Pseudotsuga menziesii, GHNC. Bright (1987) included California in the range for this species; however, no specimens are known from that state and I doubt it will be found there. It has been recorded from British Columbia though not from Vancouver Island, from which I have seen a specimen bearing no definite locality or date (SGWC). This species (Fig. 7) is rare in collections and no host or habitat data have been recorded. The known distribution indicates a more northerly distribution than for most species in this group, which are known from coniferous habitats and appear restricted to those trees as hosts. Most collectors look for adults on downed timber, especially slash and log piles, where many species can be taken in considerable numbers—but often not without considerable effort! Any deviation from this general habit by a species could account in large part for its apparent rarity (cf., C. orono).

On 4&5-VII-79 I collected 15 male and 4 female C. vulcanica in Oregon, Wallowa Co., NWSec. 28, T2N, R44E, 1,400 m. This site had been selectively cut recently, and numerous slash and logs were present on the ground. However, all but one beetle (taken as it lit on the soil) were collected from young Douglas fir, Pseudotsuga menziesii (Mirb.) Franco, which were bent over due to logging activities and/or snow. The trees were leaning at angles from about 15° to 45°, ranged in size from approximately 6.5–13 cm d.b.h., and were all or in large part exposed to full sun. Most had only a few branches, two bore none. Some had been scraped by logging equipment, but more often exhibited damage from exposure to the sun. The latter scalds the trunk and cracks the bark, which appears to be what attracts C. vulcanica. Females were observed probing these areas with their ovipositors. Borings seen in trunks show that the larvae mine extensively beneath the bark in these wounded areas, the end result being extensive scarring of the tree. Several old and new adult emergence holes were observed. Numerous trees of other coniferous species in a similar condition, plus cut and upright (or nearly so) wounded Douglas fir, were examined at the site and only species of Chrysobothris were noted. Elsewhere, Chrysobothris spp., notably C. monticola Fall and C. sylvana Fall, have been observed on such trees as harbored C. vulcanica, but not with the consistency exhibited by the latter at the Wallowa Co. site. However, on VIII-82, at 1,220 m in the Palouse Range near Moscow, Latah Co., Idaho, I found several C. vulcanica on damaged upright trees or cut stumps of Douglas fir (approximately .3 m diameter) which were exuding much pitch.

Barr (1971) gave the length of C. vulcanica as 15–19 mm, whereas those I
examined ranged from 13.5–17.5 mm. The lower limit of size could cause problems in identification based on existing keys to species.

**Chrysobothris woodgatei** Champlain and Knull 1922:144. This species (Fig. 9) is rarely collected, having been recorded from only four mountainous localities in the north of Arizona, New Mexico and Colorado; and in extreme southwestern Utah. Northward extensions are now documented by two specimens from Utah, Rich Co., Limber Pine [summit above Logan Canyon, 2,380 m], 23-VI-85 and WYOMING, Natrona Co., Casper Mt., 7,200’, 1-VII-75, both RLWE. The only clue to its habits was provided by Tanner (1928, as *C. quadrilineata* LeConte—see Barr and Westcott 1976): “Taken around *Pinus ponderosa* on the East trail.” I collected two specimens of *C. woodgatei* as they lit on pieces of dead pine twigs on the ground at Pt. Imperial, Grand Canyon, Arizona. According to R. J. Lavigne (in litt.), the Casper Mt., Wyoming, site is a sandstone outcrop above shortgrass prairie, with a clump of *Pinus flexilis*, some *Populus tremuloides* and *Juniperus scopulorum*, and an understory of short grass, *Allium* sp., *Arenaria* sp., *Musineon* sp. and *Sedum* sp.; furthermore, “The fauna on this mountain has some peculiar elements in it.”

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