THREE NEW SYMPATRIC PLEOCOMA FROM THE SOUTHERN SIERRA NEVADA MOUNTAINS OF CALIFORNIA (COLEOPTERA: SCARABAEIDAE)

FRANK T. HOWORE

ABSTRACT: Two new species and one new subspecies of Pleocoma are described from sympatric populations in the Greenhorn Mountains of the southern Sierra Nevada range. Intraspecific character variation, comparison to closely related forms and biology are discussed following each description. An ecological description of the type locality is also presented.

Beetles of the genus Pleocoma have long been prized and much sought after by Pacific coast coleopterists, yet our knowledge of the habits and distribution of the genus is still rather fragmentary. The three new forms described herein help fill a large distributional gap between the central Sierra Nevada and Tehachapi Mountains. They also present the first recorded instance of three Pleocoma species occurring sympatrically. Refinements in collecting apparatus, easier access to remote areas, and increased knowledge of male Pleocoma flight habits will undoubtedly lead to the discovery of more such areas of species sympatry.

As in most populations of Pleocoma where series have been available for study, the three new taxa presented exhibit considerable minor morphological character variation. I have therefore selected as diagnostic characters those which appear most constant, both quantitatively and qualitatively.

Holotypes of new taxa described herein are on deposit in the Natural History Museum of Los Angeles County collection (LACM). Other institutions or persons receiving paratypes will be abbreviated in the text as follows: California Academy of Sciences, CAS; California Insect Survey, Berkeley, CIS; U. S. National Museum, USNM; F. T. Hovore, FTH; D. G. Marquand, DGM; C. E. Langston, CEL; T. W. Taylor, TWT; H. F. Howden, HFF; B. D. Streit, BDS; G. C. Walters, GCW; M. T. Gannon, MTG; R. L. Westcott, RLW.

Pleocoma marquand, new species

Description: Male. Form robust, olong-oval, moderately convex, dorsum slightly flattened; integument mostly dark brown to piceous; pubescence reddish-golden. Head black, vertical horn and anterior process of elytra thinly clothed with reddish-golden hairs; dorsal surface closely, irregularly punctate, with broad smooth area extending from lateral base of vertical horn anteriorly to base of ocular canthus; clypeal process small, constricted at base, only moderately reflexed, anterior face slightly concave medially, apex with moderately deep, obtuse notch, apical angles of notch acute, rounded; vertical horn elongate, sides subparallel, apex with shallow, obtuse notch, apical angles of notch rounded, anterior face of horn evenly convex, surface coarsely punctate, punctures elongate, sparsely clothed with long reddish-golden hairs; ocular canthi projecting forward from a right angle, anterior edge sinuate, apex acutely rounded; dorsal surface concave, smooth except for few elongate punctures apically; palpi and antennae dark reddish-brown, scape and lamellae darker, scape stout, subconical, second segment moniliform, strongly flattened, third segment elongate, much shorter than scape, slightly reflexed, fourth segment cylindrical, slightly more than one-half as long as third segment, fifth segment strongly transverse with acute process, segments six to eleven distinctly lamellate, sixth segment with lamella about two-thirds as long as that of seventh segment, lamella of seventh segment slightly shorter than that of eighth segment, that of eighth distinctly shorter than that of ninth, lamellae of ninth and tenth segments subequal in length, that of eleventh only slightly shorter, ratios of segments six to eleven in holotype 20:30:32:36:36:35. Pronotum piceous, less than twice as wide as long (length-to-width ratio in holotype 5.85:10.8), widest at posterior angles, posterior angles broadly rounded, lateral discal impressions feeble, with indistinct reddish macula: disc evenly convex, anterior median impression lacking, pubescence entirely absent, surface shining, finely, moderately densely punctate, punctures denser anteriorly, less distinct and more widely spaced laterally. Legs dark reddish-brown to piceous, clothed with long reddish-golden hairs. Scutellum finely, sparsely punctate centrally, nearly glabrous. Elytra black, shining, finely, shallowly, irregularly punctate, sutural striae moderately impressed, coarsely.

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irregularly punctate, geminate striae at margins of costae feeble, indicated only by single row of fine, shallow punctures, costae with few minute punctures, not elevated. Abdomen dark reddish-brown, sternites moderately densely, irregularly punctate, punctures moderate in size, thinly clothed with reddish-golden pubescence. Length 22-28 mm.

Female. Form ovate, robust; color reddish-brown; pubescence pale reddish. Head with clypeus coarsely, densely punctate, expanded apically, apical angles acute, rounded, anterior margin feebly sinuate near median notch, median notch small, shallow, narrowly rounded; vertical horn very short, stout, apical notch broadly obtuse, rounded, apices rounded; antennae castaneous, lamellae slightly darker, third segment short, subcylindrical, about one and one-half times longer than second segment, fourth segment slightly transverse, fifth segment with acute process, segments six to eleven distinctly lamellate, forming club, sixth segment with short lamella, lamellae of segments seven and eight subequal, only about three-fourths as long as that of segment nine, lamella of segment nine longest, those of segments ten and eleven slightly shorter than nine and of decreasing length. Pronotum convex, shining, dark reddish-brown, lighter laterally, less than twice as wide as long (length-to-width ratio in allotype 9:16.8), widest at posterior angles, posterior angles obtusely rounded, disc moderately, irregularly punctate, punctures larger and denser laterally and anteriorly, interrupted medially by vague longitudinal impunctate line. Scutellum finely, sparsely punctate anteriorly, few punctures with short re-
THREE NEW SYMPATRIC PLEOCOMA FROM CALIFORNIA

Figure 2. Pleocoma fimbriata Lec., left lateral view of head and pronotum, male. Scale equals 2 mm.

cumbent hairs. Elytra widest behind middle, transparent, surface shining, finely, irregularly punctate, costae elevated, nearly attaining elytral apices, sutural striae distinct, impressed, coarsely punctate, geminate striae at costae, feebly impressed, finely, irregularly punctate. Length 31–40 mm.

Holotype: Male, California, Tulare Co., Posey, 16 October 1971 (B. D. Streit) LACM. Allotype: Female, California, Tulare Co., Posey, 12 November 1971 (T. W. Taylor) LACM.


Discussion and diagnosis: Both sexes of P. marquai can be immediately distinguished from
Figure 3. Pleocoma tularensis Leach, left lateral view of head and pronotum, paratype (male). Scale equals 2 mm.

their closest congeneres, P. fimbriata Leconte and P. tularensis Leach, by the presence of distinct lamellae on antennal segments six and seven, with that of segment six two-thirds or more as long as that of segment seven. In both tularensis and fimbriata, segment six is at most angulate, segment seven sometimes with a short projection. Males of P. marquai may be further differentiated from fimbriata and tularensis by the fifth antennal segment which is strongly transverse with at least a short projection (at most slightly transverse in typical fimbriata and tularensis), and by the shorter, less strongly reflexed clypeal process (Figs. 1–3). In all specimens examined of marquai the pronotum is less than twice as wide as long, while in the 59 males of tularensis examined, the pronotum is at least twice as wide as long in all but two specimens, or about 3 percent.

Pleocoma marquai represents the southernmost form of the fimbriata–tularensis species group. Thus far, the northernmost known locality for marquai is about 30 miles south of the southernmost recorded point of collection of tularensis, and it is highly probable that somewhere in the intervening area the two populations overlap.

Biology: Adults of both sexes and larvae of P. marquai have been collected from burrows beneath Ceanothus cuneatus Nutt., and it is probable that this plant serves as the primary larval host. Pleocoma tularensis males and females have
been collected from pupal cells beneath Ceanothus cuneatus in Fresno County, and I have also collected female P. fimbriata beneath Ceanothus sp. (prob. integerrimus H. and A.) in El Dorado County. Although it appears that Pleocoma larvae are not necessarily oligophagous (Fellin, 1966), the fact that the three species in this group show an apparent preference for the genus Ceanothus as a primary host seems to substantiate their close biological relationship.

Adult activity of P. marquai in the vicinity of the type locality begins during or shortly after the first precipitation of the fall season, usually in early October, and may continue until early December in years of relatively low rainfall. Males will fly throughout the night while it is raining or snowing, and at dusk for several days thereafter, during weather conditions varying from heavy overcast to bright late afternoon sunlight.

I take pleasure in naming this species after David G. Marqua, who first brought specimens of Pleocoma from the Posey- Glennville area to my attention, and who has made numerous contributions to this study.
**Pleocoma rubiginosa**, new species  
Figure 4

*Description:* Male. Form robust, broadly oblong-oval, moderately convex, dorsum slightly flattened; integument reddish-brown, pubescence pale reddish. *Head* dark reddish-brown, narrowly margined anteriorly with piceous, very densely clothed with long reddish hairs; dorsal surface irregularly, shallowly rugoso-punctate, with vague smooth area extending from anterior base of vertical horn laterally to apex of ocular canthus; clypeal process moderately reflexed, anterior face distinctly impressed medially, apex deeply, obtusely notched, apical angles produced, acute, rounded; vertical horn elongate, sides subparallel, apex with moderate rounded notch, apical angles acutely rounded, anterior face of horn only slightly concave medially, coarsely, irregularly punctate, punctures elliptical, surface clothed with long reddish hairs; ocular canthi stout, subquadrate, projecting forward slightly from a right angle, anterior edge sinuate, dorsal surface slightly concave, nearly glabrous; oblique supra-orbital carina distinct, extending medially on ocular canthus; palpi and antennae light reddish-brown, lamellae of antennae slightly darker, scape stout, subconical, slightly flattened dorsally, second segment moniliform, strongly flattened, third segment elongate, subequal to scape in length, slightly angulated anterior at apex, fourth segment only slightly transverse, angulated, fifth segment strongly transverse with acute process, segments six to eleven distinctly lamellate, sixth segment with lamella about two-thirds as long as that of seventh segment, lamella of seventh segment more than four-fifths as long as that of eighth segment, that of eighth distinctly shorter than that of ninth, lamella of ninth segment longest, those of tenth and eleventh slightly shorter than ninth, and of decreasing length, ratios...
of segments six to eleven in holotype 20:33:40:43:42:40. Pronotum less than twice as wide as long, barely widest at middle, sides broadly rounded, posterior angles broadly, obtusely rounded, lateral discal impressions feeble, maculate with piceous; disc convex, anterior median impression moderate, flattened, surface shining, densely, coarsely punctate except for narrow, median longitudinal impunctate line extending from anterior to posterior margins, entire surface of disc densely clothed with long, erect reddish hairs. Scutellum irregularly, moderately coarsely punctate, moderately densely clothed with long subcumbent reddish hairs. Elytra rich reddish-brown, transparent, shining, fairly uniformly, finely, shallowly punctate, sutural striae moderately impressed, irregularly punctate, geminate striae at margins of costae feeble, indicated only by single row of fine, shallow punctures, costae impunctate, not elevated. Abdomen dark reddish-brown, sternites finely, moderately densely punctate, clothed with long reddish pubescence. Length 24–29 mm.

Holotype: Male, California, Tulare Co., 1 mi W Posey, 16 January 1972 (C. E. Langston) LACM.

Paratypes: 47°, same locality as holotype, 2 January 1972 to 1 April 1972 (C. E. Langston) at blacklight trap. CEL 20, LACM 2, CAS 2, CIS 2, USNM 1, FTH 15, TWT 1, BDS 1, DGM 1, HFH 1, RLW 1.

Discussion and diagnosis: Plecocoma rubiginosa is perhaps only subspecifically related to "P. hoppingi" Fall, which it closely resembles in form and color. Males differ from "hoppingi" by the presence of only five long lamellae in the antennal club (seven in typical "hoppingi"), the absence of a flattened anteroventral process on the third antennal segment, the conspicuous median longitudinal impunctate line on the pronotal disc, the much more produced, more strongly reflexed clypeal process, and the longer vertical horn (Figs. 4–5). From the other similarly colored species, badia Fall and linsleyi Hovore, rubiginosa can be immediately distinguished by the fewer antennal lamellae (seven long lamellae in badia and linsleyi), densely hairy, heavily punctate pronotal disc, and subquadrate ocular canthi.

As in most of the other species of Plecocoma, males of rubiginosa exhibit some variation in external morphology. The relative lengths of the first few antennal lamellae vary slightly within the type series, but the basic diagnostic formula is sufficiently constant to distinguish rubiginosa from other closely related species. The absolute shape and size of the clypeal process is also somewhat variable, but in all specimens it is much more produced and more strongly reflexed than in any specimen examined of "hoppingi." Biology: Nothing is known of the larval habits of this species. The specimens of the type series were captured with blacklight traps from January to April, considerably later in the season than the normal major flight periods of other Plecocoma in the area. Although the traps were checked at various times during any given night, specimens were usually found in the traps in the morning, indicating that males of rubiginosa, like those of several other species, fly most numerous at or slightly before dawn (Hazzeltine, 1950, 1952; Hovore, 1971). Most of the specimens were collected during heavily overcast skies and fog, with light rain or snow. A few specimens were found in the traps during a week of warm weather following a major snowstorm, flight probably having been initiated by melting snow or ground ice. Late season flight habits have also been recorded for "P. hoppingi" on the South Fork of the Kaweah River (Fall, 1906); in the vicinity of Yosemite National Park (Linsley, 1941, 1942, 1943); and at Dry Meadow, Kern County (Linsley, 1957). It is probable that the last record refers to a population more closely related to rubiginosa than to typical "hoppingi." Dry Meadow is in the Piute Mountains, about 24 miles southeast of Posey, while the type locality for "hoppingi" (South Fork of the Kaweah River, Tulare County) is approximately 48 miles north of Posey. Linsley (1938b) lists "hoppingi" from Kernville, approximately 8 miles east of Posey, and this record undoubtedly refers to a specimen of rubiginosa rather than typical "hoppingi.

Plecocoma hirticollis reflexa. new subspecies

Description: Male. Form robust, oblong-oval, convex, dorsum only slightly flattened: integument reddish-brown to piceous; pubescence pale golden. Head black, vertical horn and anterior process of clypeus moderately densely clothed with long, pale golden hairs; dorsal surface irregularly punctate; clypeal process pronounced, strongly reflexed, nearly parallel with vertical horn, anterior face deeply concave medially, apex with deep, acutely rounded notch, apical angles acute, rounded; vertical horn elongate, sides subparallel, apex with shallow, obtusely rounded notch, anterior face of horn evenly convex, surface coarsely punctate, punctures elongate; ocular canthi nearly right angular to longitudinal midline of head, anterior edge sinuate, apex broadly, acutely rounded, dorsal surface concave, irregularly punctate; palpi and antennae dark reddish-brown, scape and lamellae only slightly darker, scape stout, subconical, second seg-
Figure 6. *Pleocoma hirticollis reflexa*, new subspecies, left lateral view of head and pronotum, holotype (male). Scale equals 2 mm.

ment moniliform, flattened, third segment elongate, subcylindrical, slightly reflexed, fourth segment strongly transverse with short projection, segments five to eleven distinctly lamellate, fifth segment with lamella more than four-fifths as long as lamella of sixth segment, lamella of sixth segment only slightly shorter than lamella of seventh segment, lamella of seventh segment subequal to that of eighth segment, that of eighth segment slightly shorter than that of ninth segment, ninth longest, lamellae of tenth and eleventh segments subequal, slightly shorter than that of ninth. *Pronotum* piceous, more than twice as wide as long, widest at posterior angles, posterior angles rounded, lateral discal impressions distinct, maculate with pale reddish-brown; disc strongly convex, irregularly clothed with long, suberect pale hairs, anterior median impression indicated by narrow flattening of anterior surface, surface shining, densely, irregularly punctate, punctures small to moderate in size on disc, larger anteriorly. *Scutellum* finely, moderately densely punctate, moderately clothed with long recumbent hairs. *Elytra* rich chestnut-brown, transparent, shining, finely, shallowly, irregularly punctate, sutural striae moderately impressed, irregularly punctate, geminate striae at margins of costae feeble, indicated only by single row of fine, shallow punctures, costae impunctate, not elevated. *Abdomen* reddish-brown, sparsely punctate, thinly clothed with long, pale golden hairs. Length 20–25 mm.

*Female.* Form robust, convex; color reddish-brown, pubescence pale golden. *Head* with dorsal surface densely, coarsely rugoso-punctate; clypeus expanded apically, apical angles obtuse, anterior margin bisinuate, median notch small, very shallow, rounded; vertical horn very short, stout, apical notch shallow, rounded, anterior face deeply impressed medially; ocular canthi subtriangular, anterior edge feebly
Three new sympatric Pleocoma from California

Figure 7. *Pleocoma hirticollis vandykei* Linsley. Left lateral view of head and pronotum. Male. Scale equals 2 mm.

sinuate, apices acutely rounded; antennae reddish-brown, scape and lamellae slightly darker, third segment elongate, subequal to scape in length, fourth segment with acute projection, about one-third as long as lamella of fifth segment, segments five to seven lamellate, forming club. Pronotum dark reddish-brown, lighter laterally; slightly less than twice as wide as long, widest at posterior angles, posterior angles obtuse, rounded; disc convex, shining, surface coarsely rugoso-punctate, punctures forming indistinct transverse rows, denser and larger anteriorly, lateral discal impression feeble, maculate with piceous. Scutellum sparsely punctate medially, few punctures with short erect hairs. Elytra pale reddish-brown, transparent, surface shining, finely, irregularly punctate, sutural striae feebly impressed, indicated by single row of punctures, geminate striae at margins of costae indistinct, finely, shallowly punctate, costae only slightly elevated, nearly attaining elytral apices. Length 29–31 mm.

**Holotype:** Male. California. Tulare Co., 1 mi N Posey, 18 December 1971 (C. E. Langston) at blacklight trap. LACM. **Allotype:** Female. Tulare Co., 1 mi W Posey, 3500 ft, 27 February 1972 (F. T. Hovore) dug from pupal cell. FTH.


**Discussion and diagnosis:** Three apparently distinct forms of *Pleocoma hirticollis* Schaufuss can be recognized: *P. hirticollis vandykei* Linsley (Fig. 7) occurs in the grassland regions surrounding San Francisco Bay; the nominate subspecies, *P. h. hirticollis* Schaufuss, has been collected in...
the Sierra Nevada foothills of Yuba and Nevada Counties; P. h. reflexa occurs in the foothills of the Greenhorn Mountains along the Kern-Tulare County border. Males of the three subspecies may be distinguished as follows:

Third segment of antenna usually angulate anteriorly. lamella of fourth segment one-third or more as long as that of fifth segment, lamella of eighth segment usually longest; elyptcal process moderate, slightly reflexed: elytra chestnut-brown. Length 25-28 mm. Yuba and Nevada Counties, California

Third segment of antenna usually not angulate anteriorly. lamella of fourth segment less than one-third as long as that of fifth segment, lamella of ninth segment usually longest; elyptcal process reduced, only feebly reflexed: elytra piceous to black. Length 17-24 mm. Alameda, Sonoma, and Yolo Counties. California

Third segment of antenna usually not angulate anteriorly. fourth segment of antenna transversely angulate or with vestigial lamella, much less than one-third as long as that of fifth segment, lamella of ninth segment usually longest: elyptcal process very pronounced, strongly reflexed: elytra chestnut-brown. Length 20-25 mm. Kern and Tulare Counties, California

In the type series the specific diagnostic characters are remarkably constant. The anterior elyptcal process exhibits slight variation in size and in the depth of the median notch, but in all specimens the elyptpus is more pronounced and much more strongly reflexed than in any specimen seen of either vandykei or hirticollis. The color of the pronotum in the male may vary from reddish-brown to piceous.

Biology: Males of reflexa in the vicinity of the type locality have been collected only after the area has received several inches of precipitation, with dates ranging from late November to mid-January. Most specimens were collected at night or at dawn, during or shortly after a drizzling rain. I collected a male at incandescent light shortly after dusk following a day of clear cold weather, and it is probable that male activity continues for several days subsequent to a major flight.

The allotypic female and two larvae were dug from their burrows in a grassy clearing, at depths of from one to four inches. The paratype female was found in a schoolyard baseball field. It is possible that the larvae of reflexa feed upon grass rootlets, as do those vandykei (Smith and Potts, 1945; Ritcher, 1947), but the soil from which they were dug is interlaced with numerous rootlets of Ceanothus cuneatus and Quercus Douglasii H. and A., and a definite feeding preference has not yet been observed.

ECOLOGY OF THE TYPE LOCALITY

The sympatric occurrence of three distinctly different species of Pleocoma is unique in the recorded distribution of the genus. There are several localities known where two species are sympatric, and three species (fimbriata, hirticollis, and edwardsi Leconte) have been recorded from the vicinity of Nevada City, Nevada County, California. However, the exact localities of their collection have not been documented in sufficient detail to establish a definite area of sympathy.

The site near Posey where P. rubiginosa, P. marquai, and P. h. reflexa are sympatric is in a rather poorly defined ecotonal area. The grassy hill-sides surrounding the site are dotted with deciduous Blue Oaks (Quercus Douglasii H. and A.) and Buckbrush (Ceanothus cuneatus Nutt.), characteristic of the Foothill Woodland plant community, while the shaded canyon bottoms hold mature stands of Yellow Pine (Pinus ponderosa Doug.), Incense Cedar (Libocedrus decurrens Torr.), Alder (Alnus sp.), Maple (Acer macrophyllum Pursh.), and Willow (Salix sp.). Yellow Pine and Incense Cedar indicate the lowest influence in this area of the Yellow Pine Forest plant community (Munz and Keck, 1970), which predominates at higher elevations.

The blacklight traps from which the specimens were collected were placed near private dwellings along the bottom of a well-drained west-facing canyon at an elevation of approximately 3500 ft. The north-facing canyon-side is dominated by large Black Oaks (Quercus Kelloggii Newb.), with brush cover primarily composed of low-growing stands of Gooseberry (Ribes sp.), Blackberry (Rubus sp.), Rose (Rosa californica Cham. and Schlect.), Buckbrush, and Mountain Mahogany (Cercocarpus betuloides Nutt.). A thick carpet of leaves covers much of the slope, and the soil beneath is a poorly consolidated clay loam. On the drier, south-facing canyon-sides the dominant tree is the Blue Oak, with brush cover widely spaced, composed of Buckbrush, Coffeeberry
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A REVIEW OF EUCYLLUS HORN
(COLEOPTERA: CURCULIONIDAE, BRACHYRHININAE, PERITELINI)

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ABSTRACT: The genus Eucyllus Horn is reviewed with the three species: vagans Horn, unicolor Van Dyke, and echinus Van Dyke, redescribed and discussed. Three additional species are described as new: saesariatus from Sonora, Mexico, and Arizona, carinarostris from California, and cinereus from California. Eucyllus tinkhami Tanner is placed in the genus Eucollinus Buchanan. Distributional and biological information is given for each.

While we were reviewing the Peritelini it became evident to us that the whole tribe was in need of study. Many new species were encountered in fieldwork in western North America. Because an abundance of material exists and several new species required description, the genus Eucyllus Horn was chosen as a starting point.

The following standard abbreviations (Arnett, et al., 1969) are used: BYUC—Entomological collections. Brigham Young University: CASC—Entomological collections, California Academy of Sciences; CIAN—Centro de Investigaciones Agrícolas del Noroeste; CSCLB—Entomological collections, California State University, Long Beach; ELS—E. L. Sleeper collector; ELSC—E. L. Sleeper collection; FWPC—Frank W. Pelsue collection; INIA—Instituto Nacional de Investigaciones; LACM—Natural History Museum of Los Angeles County; and USNM—United States National Museum.

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EUCYLLUS HORN

Eucyllus Horn, 1876:74.
Eucyllus Van Dyke, 1936:31, (lapsus).
Type species: Eucyllus vagans Horn, by monotypy.
Description: Rostrum slightly longer than broad, continuous with head; epistoma smooth, devested of scales, triangular in shape with carinate margins, and a fringe of 10-12 setae bordering the carinate margins; head not as long as broad, with smaller and more abundant punctures than rostrum, little or no sculpturing; antennae inserted in the basal third of rostrum; scrobe a flat-bottomed channel with no pronounced convex area distal of the eye. Funiculus with seven segments, vestiture of scales and setae similar to remainder of body; scape feebly arcuate attaining anterior margin of prothorax; club oval-acuminata, clothed with short fine setae. Eyes nearly round.

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