



Scarabaeus

A NEWSLETTER FOR THOSE INTERESTED IN SCARABAEIDAE

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Notes on Pleocoma LeC. Pt. II
(Pt. I in Scarabaeus, #3, Nov. 1980)

In the early 1930's, Alonzo Davis published a "revision" of the genus Pleocoma LeConte, in which he presented brief characterizations of the known species, summarized the general habits as he knew them, and provided a simple key to the males. (Davis had no way of knowing how little of the Pleocoma puzzle actually lay before him, and so his treatment now seems very premature and superficial.) He remarked about the female beetles that they possessed so few important characters that "a workable key could not be produced for them." This is one of the few statements made by Davis that has stood the test of time and increased material! Linsley, however, with only a bit more material than Davis, in 1946 constructed a satisfactory preliminary key to the females of the 14 species available to him, and to date this remains the only published key. It is helpful in identifying some of the better known species, but for the most part, females remain a taxonomic muddle. There are a number of useable characters for separating females to species groups - and in some cases all the way to subspecies - but as more specimens become available for comparison, invariably the fewer constant differences remain at the species level. Further, since female Pleocoma are highly fossorial, they are subjected to considerable abrasion, altering the shapes and textures of most of the anterior body parts (used in species differentiation). Certain species, such as P. badia sensu lato and P. hoppingi exhibit clinal variability in the antennomeres, causing various populations to run into all parts of the key. There now are no "unknown" female Pleocoma - that is, all of the described species and subspecies, and most significant undescribed populations, have associated females (with the partial exception of P. rubiginosa transsierrae wherein the only female consists of a single complete head). I am slowly preparing keys to both sexes, and to make them be broadly useful, I will utilize an array of character states combined with distributional data, host plant and phenological data. So please collect carefully, and keep good field notes as you dig your female Pleocoma. Unlabelled females make excellent decorator display box items, entomology lab quiz questions, and raccoon fodder. (Note: the size range for female Pleocoma was incorrectly cited as "23-24 mm" in Pt. I of this article; it should read: "23-45 mm.")

Male Pleocoma are only somewhat easier than females to determine with absolute certainty, and in most large institutional collections there invariably exists a small amount of unidentifiable material. Most specimens, however, if adequately labelled, can be fairly easily placed within the present taxonomic setup. Any "hot" locality will have been enthusiastically collected year after year by novice Pleocomists (particularly if said locality is near a university with an

Entomology department), and so most large collections possess enormous series of the commoner local species, all taken at the same localities. Males of P. c. conjungens, for example, are very numerous in collections, nearly all specimens having been taken at a "traditional" locality near Mt. Hermon, Santa Cruz County. The species' overall distribution and patterns of populational variation are not particularly well known, but no one seems interested in doing more than "wowing 'em" back at school with how many males they were able to amass at the Mt. Hermon site. Much could be learned by abandoning the contest to seek out other populations, verify the larval host(s), analyze interpopulational character variability or behavioral differences (if such exist) and fill in locality gaps between the nominate subspecies and c. lucia.

Knowledge of intraspecific character variation is essential to the final taxonomic treatment of the various Pleocoma populations, and would-be collectors should search for populations in as yet unexplored regions. Many now-synonymized Pleocoma "species" might not have been described had adequate series been available; and, conversely, there are unique specimens now at hand which might well have a place in the nomenclature if we just had the material to properly assess them.

I recently collected an extensive series of a "new" Pleocoma from the Diablo Range west of Coalinga, but am hesitant to deal with it taxonomically until such time as material can be seen from north and south of the present locality. Of great interest would be Pleocoma from the Diablo range in Stanislaus and San Benito Counties (around the Pinnacles area, Panoche Pass and Pacheco Pass) and from the southerly Temblor Range.

Other areas of probable "new" Pleocoma populations (by new I do not necessarily imply a describable taxon, but rather a population which will add to our knowledge of the phenological puzzle) would include:

- * P. hoppingi - occurs from the southern Sierra to Calaveras County, but has not been taken north of Route 4. The Calaveras material represents the low end of an antennomere cline, so material from further north could be quite interesting. A hoppingi elytron (probably) was found near Omo Ranch in El Dorado County, so it may range to Route 50 and beyond.
- * P. staff - a single specimen has been taken at Redding, Shasta County, with the next nearest locality in Butte County. The Redding specimen is smaller and much darker than is typical of the species elsewhere.
- * P. simi/carinata/shastensis - these species are very close to each other structurally, and may occur as a mosaic of phenotypes in northern California and southern Oregon. Material at hand from Inwood and Big Bend (Shasta County) represents simi (sensu lato), and Linsley (1945, Pan-Pac. Entomol., 21(3): 113-114) mentions several imperfect specimens in this group from near Lyonsville, Tehama County [I have not seen these]. A black shastensis-type male is at hand from Redding, placing the reddish simi-like forms geographically intermediate to typical shastensis populations (at Pondosa and Bartle) and the Redding population. Further, material listed as carinata (by Fellin and Ritcher, 1967, Pan-Pac. Entomol., 43(4):251-263) from Douglas County, Oregon (14 miles NE Idleyley Park) is quite atypical, and is isolated from the nominate carinata populations by a large mass of simi populations.

* P. hirticollis - this species feeds on grass, and so populations are difficult to locate and define. A few ancient specimens are at hand labelled as coming from "Calaveras County" or "Nevada County," but I have seen no recent material from this section of the Sierra. There also exists a considerable distributional gap between any of the verified northern populations (Santa Clara to Sonoma Counties, Yolo County, San Joaquin County) and P. h. reflexa, known only from the Kern/Tulare County line.

I am currently working on the hirticollis complex, and so this latter problem is of great, immediate interest to me; I would also, of course, like to see unusual material of any Pleocoma species. Meanwhile, pray for rain and go get 'em!

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A CHECKLIST OF PLEOCOMA

Pleocoma LeConte 1856:24

Oregonensis group

<u>carinata</u> Linsley 1938:56	Jackson Co., Ore.
<u>crinita</u> Linsley 1938:53	Klickitat Co., Wash.
<u>minor</u> Linsley 1938:52	Hood River Co., Ore.
<u>shastensis</u> Van Dyke 1933:183	Shasta Co., Calif.
<u>dubitabilis</u>	N.W. Ore.
d. <u>dubitabilis</u> Davis 1935:30	
= <u>dubitalis</u> of authors	
d. <u>leachi</u> Linsley 1938:52	
<u>oregonensis</u> Leach 1933:186	Jefferson, Wasco, Sherman
= <u>remota</u> Davis 1934:23	Cos., Ore.
<u>simi</u> Davis 1934:24	Douglas Co., Oreg. to
	Shasta Co., Calif.

Staff group

<u>staff</u> Schaufuss 1870:52	N. Sierra, Calif.
= <u>adjuvans</u> Crotch 1873:58	
= <u>edwardsi</u> LeConte 1874:83	
= <u>ulkei</u> Horn 1888:234	

Fimbriata group

<u>fimbriata</u> LeConte 1856:25	N. Sierra, Calif.
<u>blaisdelli</u> Linsley 1938:55	Calaveras Co., Calif.
<u>marquai</u> Hovore 1972:69	Kern, Tulare Cos., Calif.
<u>tularensis</u> Leach 1933:186	Tulare to Mariposa Cos., Calif.
? <u>sonomae</u> Linsley 1935:12	Sonoma, Mendocino Cos., Calif.
? <u>rickseckeri</u> Horn 1888:5	Napa, Sonoma Cos., Calif.

Behrensii group

<u>behrensii</u> LeConte 1874:83	S.F. Bay area, Calif.
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Hirticollis group

<u>hirticollis</u>	
h. <u>hirticollis</u> Schaufuss 1870:58	Nev. Co., Fresno Co., Calif.
h. <u>vandykei</u> Linsley 1838:56	S.F. Bay area to Yolo Co., Cali
h. <u>reflexa</u> Hovore 1972:75	Tulare, Kern Cos., Calif.

Conjungens group

conjungens

- c. conjungens Horn 1888:234
c. lucia Linsley 1941:145

S. Cruz Co., Calif.
Monterey Co., Calif.

Badia group

badia

- b. badia Fall 1917:15
b. hirsuta Davis 1934:88
= nitda Linsley 1941:147
= venturae Linsley 1945:110
? linsleyi Hovore 1971:193
? octopagina Robertson 1970:107

L.A. Co., Calif
S.L.O., Vent., S.Barb.,
L.A. Cos., Calif.
L.A. and Kern Cos., Calif.
L.A. Co., Calif.

Puncticollis group

- puncticollis Rivers 1889:17
australis Fall 1911:65
bicolor Linsley 1935:11

L.A., S. D. Cos., Calif., N.Baja
L.A. to S. Diego Cos., Calif.
S. Bern. Co., Calif.

Hoppingi group

- hoppingi Fall 1906:394

W.Sierras, Calaveras to
Tulare Cos., Calif.

rubiginosa

- r. rubiginosa Hovore 1972:74
r. transsierrae Hovore 1977:325

Kern and Tulare Cos., Calif.
Inyo Co., Calif.

Incertae sedis

- trifoliata Linsley 1938:57

"Seward, Alaska"

- compiled by ARH with information, corrections and additions by F. T. Hovore

RECENT LITERATURE

Krikken, J. 1980. A new Coenochilus from southern Africa (Coleoptera: Cetoniidae). Entomol. Bericht. 40:69-71.

Davis, Lloyd R., Jr. 1980. Notes on Beetle Distributions, with a discussion of Nicrophorus americanus Olivier and its abundance in collections (Coleoptera: Scarabaeidae, Lampyridae, and Silphidae). Coleopt. Bull. 34(2):245-251.

Nikolajev, G.V. and O.N. Kabakov. 1980. Neue sowie in Afghanistan erstmalig gesammelte Arten der Blatthorn kafer (Coleoptera, Scarabaeidae). Faunistische Abhandl. 7(25):223-228.

Carne, P.B. 1980. Pseudoryctes storeyi sp. n. and New Records of Other Species of Pseudoryctes Sharp (Coleoptera: Scarabaeidae: Dynastinae) J. Aust. Entomol. Soc. 19:255-258.

Endrodi, Sebo. 1978. Monographie der Dynastinae 8. Tribus: Phileurini, amerikanische Arten II (Coleoptera). Folia Entomol. Hungarica 31(2);85-164. [The final part of Endrodi's Monograph, which is a truly monumental and important work.]

FIGHTING BEHAVIOR OF Cotinus mutabilis (Cetoniinae) OBSERVED

Over a four-week period beginning about the third week in July, I was able to observe an aggregation of Cotinus mutabilis (Gory and Percheron) near the University of Arizona campus in Tucson. The beetles were found aggregating on a seep willow (Baccharis sarothroides Gray) in cultivation on the west-facing side of a two-story building. This plant species is a common shrub in desert washes around Tucson, but under cultivation this particular plant had reached sub-tree proportions. Up to as many as 15 individual beetles could be found on the tree at one time. On several occasions, usually hot afternoons, the beetles abandoned their roost, but by next morning the aggregation had reformed. The beetles were found only on the branches, not on the terminal leaves of the plant; mating pairs were common.

The beetles were observed feeding on the sap which oozed from several scars on the branches. The beetles enlarged these wounds with their mandibles as evidenced by the wood shavings left around the scar and the copious amounts of sap that flowed from these wounds. Only one beetle at a time fed from these scars and on 3 occasions, I observed beetles fighting on or in immediate proximity to these feeding scars. These battles were head-to-head shoving matches which consisted of powerful forward and upward thrusts of the head directed against the head and thorax of the adversary. Cotinus has two small opposing horns on its head; one is an upright clypeal horn, the other a forwardly-directed intra-ocular horn. The legs were used for purchase only. The encounters lasted for only a few minutes and ended when one combatant became dislodged and flew away. These "retreat" flights were towering and directly away from the tree. Although it could have retreated to another part of the tree, the loser was not observed to return, at least not immediately. Clearly the interactions of these aggregations warrant much more study than the few observations which are reported here.

It is interesting that the object of contention in these fights appeared to be the feeding scars, rather than over females or perches or burrows used as mating sites as is the case with Dynastine beetles (Eberhard, 1977, 1979). Also, unlike the Dynastinae in which only males have horns and engage in battles; both sexes of Cotinus have cephalic armour. I could not ascertain from my observations if these battles were uni- or bisexual since the beetles were not disturbed during combat and the loser invariably left the vicinity.

In the past, some authors have contended that the horns of Scarab beetles are nonfunctional (LaRivers, 1946) or at most ornamental (Arrow, 1951). The observation of fighting behavior in a beetle with such comparatively small horns is therefore of some interest.

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