

SCARABS

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Occasional Issue Number 8

July, 1993

A Bibliography of the Scarabaeoidea of California

In this, part two of the Dr. Art Evans, Ph.D. double-issue bonanza, we present a bibliography of the checklist in the previous issue. This is not meant to be a comprehensive work, rather it contains references only to the original descriptions. This list should serve as a great starting point for those striving to put together a literature collection on western United States scarabs.

We again wish to thank Art for a tremendous job!

Discussion of Some Taxa in the Checklist

Besides the obvious problem of the immensity of a Scarabaeoidea of California project, there is the problem of dealing with several genera that need a taxonomic overhaul such as *Aphodius*, *Chnaunanthus*, *Phobetus*, *Phyllophaga*, *Gymnopyge* and *Hoplia*, to name a few. Then there is the fact that there are a number of new species that are undescribed. Several of these new species are in manuscript form as this issue goes to press. In addition, there are several populations of California scarabs that workers are sitting on because they are not sure if they are valid new species involved or not.

Let us go through the checklist and make some comments.

Pleocomma trifoliata did not make the checklist because nowhere in the literature is it stated to be from California. As stated in our premier issue, it is likely a *behrensi-sonomae* complex representative, probably from Fort Seward in Humboldt County.

The placement of the genus *Acoma* and others remains disputed. Perhaps it should be placed in the Melolonthinae. *Pleocomma*, to many workers, seems like primitive Melolonthinae in both structure and biology. The placement of Pleocomminae should probably reflect this relationship, if indeed a relationship can be established.

The list of possible new species continues to grow. There may be one or more new species in the following genera: *Onthophagus*, *Aphodius*, *Ataenius*, *Serica*, *Parathyce*, *Phobetus*, *Phyllophaga*, *Polyphylla*, *Coenonycha*, *Cremastocheilus*, *Hoplia* and *Glaresis*.

The genus *Chnaunanthus* is currently being revised by Bill Warner.

Dr. David Carlson is currently working on the genus *Ochodaeus*. There are two populations he is unsure of. The first is from Pinyon Flats, Riverside County, taken 13-IX-1975, and the other from Mid Hills, San Bernardino County, taken 3-VIII-1968. Perhaps additional specimens would help. You may contact Dave at 5229 Butterwood Circle, Orangevale, CA 95662, telephone (916) 989-0420.

The common imported species listed as *Onthophagus gazella* (Fabricius, 1787) formerly belonged to the genus *Onthophagus*, subgenus *Digitonthophagus*, which was erected by Balthasar in 1959. In 1981, Zunino raised this subgenus to generic rank. Please make this correction on your lists. We wish to thank Dr. Gonzalo Halffter for pointing this out to us.

Jim Saulnier may have a different *Onthophagus* from the Providence Mountains, San Bernardino County, taken from a *Neotoma* nest. *Onthophagus velutinus* is known from this area, and is a known inhabitant of *Neotoma* nests, but Jim feels that there are enough morphologi-

cal differences to warrant more effort toward collecting this population.

Aphodius biology is the subject of Jim's forthcoming master's thesis, which may include the descriptions of new species.

Some Arizona species, such as *Hybosorus illigeri* and *Acoma arizonica*, occur in Ehrenberg, a literal stone's throw from Blythe, California. Additional collecting on the California side of the Colorado River may produce these species as well as others.

Even though the list was only meant to be a tentative, working model, it was kindly pointed out to us by Dr. Alan Hardy that the genus *Euoniticellus* was omitted as well as up to twenty other species. Many thanks, Alan!

The California Scarab Project

by Doctor Art Evans, Ph.D.

This is the introduction that was supposed to accompany "A Checklist of the Scarabaeoidea of California" (*Scarabs*, Occasional Issue Number 7), but due to various reasons, it was omitted until now. Contrary to the exhortations of the editors and myself, the checklist was replete with suppositions, speculations, and errors. The bibliography in this issue cannot help but reflect these musings and outright gaffs.

With the recent appearance of Brett Ratcliffe's *Scarabs of Nebraska*, it became apparent that the California scarabaeoid fauna was ready for a similar review. My California checklist had its inception with me in the late 1970's and was catapulted into a somewhat more meaningful form shortly thereafter by the generous assistance given to me by Alan Hardy while I was an undergraduate at Cal State

Long Beach. Alan had been accumulating data on California scarabs for many years and had compiled his own list of the state's scarab fauna which he made available to me. After a somewhat lengthy hiatus from the scarab world, I recently dusted off my 1980 copy of the checklist and proceeded to update it. Rich Cunningham and Barney Streit assisted me in editing the final copy and the accompanying bibliography. I would like to say that all of the errors are my own, but that would be a misrepresentation of the truth! The guilty parties know who they are!

The purpose of publishing the checklist in *Scarabs* was to generate interest among the readership and encourage their participation by contributing to the checklist. (*ed. note*: This purpose has been served as we have received numerous suggestions.) The updated list, which will appear in a future issue of *Scarabs*, (*ed. note*: Say what?) will become the foundation for a work tentatively entitled "The Scarabaeoidea of California." This work will be copiously illustrated and will include keys, descriptions, distributions and biological notes. Discussions of California's physical features, climate, vegetational communities, biogeography, and fossil species will be presented. In the next three or four years parts of the manuscript will be made available to interested persons for the purpose of testing keys, checking descriptions and identifying regions requiring further survey work.

During the past 20 years California has played host to one of the highest concentrations of scarabaeologists in the world. These workers include Ron Alten, Fred Andrews, Larry Bezark, Dave Carlson, Rich Cunningham, Bob Duff, Derham Guiliani, Alan Hardy, Frank Hovore, Delbert La Rue, Ron McPeak, Alex Reifschneider, Neil Rulien, Dave Russell, Jim Saulnier, Kirk Smith, Barney Streit and myself. Much of the locality, behavioral, and host data collected by these and other individuals remain unpublished.

The purpose of the California Scarabaeoidea Project is to develop a network of professional and amateur scarab workers and encourage the gathering of data in the form of specimens, observations, and

literature. The mission of the Project is to identify areas of the state in need of basic survey work, direct collecting efforts of adults and larvae, encourage the captive breeding of scarabs, collate biological and locality data and publish it. By making these data available, present and future generations of scarab workers will be encouraged to explore the poorly known regions of the state and further our biological knowledge by including immature stages in our observations and collecting efforts.

Although there have been numerous scattered species descriptions and generic revisions, California's scarabaeoid fauna has never been studied in its entirety. Several regional lists of beetles, including scarabaeoids, have appeared for Fort Tejon (Leconte, 1859; Davis, 1932), California Channel Islands (Fall, 1897; Fall and Davis, 1934; von Bloeker, 1939), selected California sand dunes (Hardy and Andrews, 1976), San Diego County (Moore, 1937), and southern California (Fall, 1901).

As the dust begins to settle towards the end of 1993, I will contact researchers and collectors to discuss the various aspects of the work, particularly with regards to the location of pertinent material and to discuss the resolution of several taxonomic issues. A number of undescribed species are awaiting description and several generic revisions will be initiated in order to fully address the California fauna. Every attempt will be made to examine the types of all California species, particularly those that have not been part of recent revisionary work.

I have received numerous friendly jabs with regards to the checklist's scheme of higher classification. This classification scheme is not carved in stone. Although it is often referred to as a "European" scheme, I prefer to think that it reflects somewhat of a more global perspective. Despite the uniqueness of the California fauna, it is important that it is viewed with this global perspective. Many of our species have been placed in subgenera, tribes, and even other genera in the European literature, but for various reasons, these changes are not presented or discussed in the North American literature.

I hope all of you will contribute. If any of you are willing and able to breed scarabs, please do so. Remember, correct identification of the adults is essential when dealing with immatures. The immature stages of most of our scarab fauna (or any scarab fauna, for that matter!) are unknown. Several regions in California remain poorly known in terms of their scarabaeoid fauna, such as the Coast Ranges, extreme northeastern California, the mountain ranges of the eastern Mojave, Great Basin areas, native remnants of Central Valley flora and the northern slopes of the San Bernardino Mountains, just to name a few. Many of the better known regions of the state have only been collected during the spring or summer months. Try collecting at some of your favorite haunts during different times of the year, or using a variety of collecting techniques. Our winter/early spring fauna is in need of further investigation. Photographs of habitats or scarab behavior will be of great value to the Project.

If any of you have corrections, additions, or comments regarding the checklist or bibliography of the Scarabaeoidea of California, or have specimens that you would like included in the California Scarab Project, please contact me directly at:

The Insect Zoo, Natural History Museum, 900 Exposition Blvd., Los Angeles, CA 90007, (213) 744-3558 office, (213) 746-2999 fax.

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Labeling Photographic Slides

Because every fine photographic slide collection deserves to be properly labeled, we investigated several of the available computer programs designed specifically for this purpose.

Several of the programs are available only for the IBM PC and clones, others are written for the Macintosh as well. The program of choice, by our criteria, falls into this latter category.

The CRADOC CaptionWriter™ is available from Perfect Niche Software, Inc., 7100B East Main Street, Scottsdale, AZ 85251, TEL (602) 945-2001, FAX (602) 945-1023. They also sell laser labels made specifically for 35mm slides. These labels are 7/16" X 1 3/4" and come 80 printable labels to a sheet.

The reason this program is the one to buy is that, as of this writing, it is the only program that will allow five lines of text per label. This feature is critical to entomologists attempting to place as much scientific data as possible on the slide just as a pin label. Three- or four-line labels can also be made. Any font can be chosen, and the print can be set in bold, italics, etc., just as in a word processor.

A quirky command structure is no doubt the result from the program's clunky PC Dos origins. When activated, the program presents you with two labels, side-by-side, to be filled out by you. However, the program considers these two labels one label. A letter was written to Perfect Niche for an explanation. This inquiry was promptly answered with a return telephone call by a friendly and knowledgeable support person. She stated that most everyone places two labels on a slide, an upper and lower label, so this was why the software treats two labels as one label.

There is a set of ten user-definable keys which will print user-defined lines of text, including time and date stamps, and copyright notices including the copyright © symbol. For those who use some sort of cataloging system for their slides, a sequential numbering feature is provided.

One way to label a slide is to place the latin name of the subject, in italics, on the top label, similar to a determination label. In this way, if the slide is stored in a slide tray or box, the subject can be determined without removing the slide itself. The bottom label can hold the locality and date the picture was taken, just like the locality label. There is room for your name and copyright data for those interested in selling their images to various publications or photographic stock agencies for publication.

Once these two labels are filled out, they are stored in the "buffer." This is simply a temporary area of memory in the computer to store your work until it is time to print a sheet of labels. If you run a sheet of labels through a printer twice, it is possible the heat from the printer will dislodge a label the second time through the printer. If this happens, you will have a major problem getting the things off the rollers! Thus, unless you can afford lots of labels, wait until you can fill a full label sheet with 80 labels. If you print out less than a full sheet, throw the unused labels away.

On the Macintosh, the program defies Macintosh convention in its commands. To place your label (really two labels) into the buffer, you issue a Command-P. In every other program we know of, this is the print command. In the Caption-

Writer, however, this simply "prints" to the buffer. You may send one label (really two labels) or a full sheet of 40 (really 80) labels. Therefore, it is possible to fill a sheet of 80 labels with 80 different labels or several labels in any combination or even a single label.

Once you have 40 (80) labels in the buffer, the program notifies you and asks if you wish to print them. To do so, one must issue a Command-B to "Print the Buffer."

Once the somewhat unusual commands and nomenclature are learned, you will find this dedicated slide label program one of those utilities you just cannot do without. If you have any problems, the nice people at Perfect Niche will get you up-and-running in no time, at no charge.

Dr. Henry F. Howden

Both editors recently had the privilege of meeting Dr. Henry Howden at the Algodones Dunes in Imperial County, California. In the company of his wife, Ann, and Bill Warner, we literally lit up the place with our "fancy" AC and DC lights.

As one might expect when in the company of someone of Dr. Howden's caliber, time passed by all too quickly. Many things come to mind when talking to Dr. Howden. First, the man is friendly and easy to talk to, and has great stories. Amateurs like your editors found themselves at ease. It goes without saying Dr. Howden commands a great knowledge of entomology. Full of fascinating facts and anecdotes, Dr. Howden is not afraid to speak out on a controversial subject or to postulate theories which could eventually be proven wrong. We have always appreciated Dr. Howden's papers, as he has been fearless about tackling difficult or large taxa.

This is not to say Ann takes a back seat. Her expertise in the Curculionidae is widely known. An energetic collector, she collected a series of extremely minute and active Carabidae by flashlight which were running around the entrances of rodent burrows. Despite many trips to the area, your editors had never seen this beetle. While your editors

conversed with Dr. Howden, Bill Warner further embellished the reputations of Arizona collectors by “taking care” of their lights for them. The time spent with Henry, Ann and Bill was thoroughly enjoyed.

A nice series of *Acoma glabrata* was taken, which were noted to be smaller than typical *glabrata*. Dr. Howden is currently interested in this group. Perhaps a group of fossorial (Jim Saulnier, Frank Hovore, Delbert La Rue, Robert Duff, etc.) southern California collectors can get together some evening and duff out a female. 1992 was a strange year at Glamis. Last September, a *Xeropsammobius desertus* (usually a February bug) was taken. On this trip, which was in late July, Bill Warner took a *Pseudocotalpa andrewsi*, which is generally an April bug.

I Quit!!

By David Russell

It has been brought to my attention that once again *Phobetus panamintensis* has escaped the editors. The realization has finally set in that the northern California collectors can't be constantly bailing out these southern California guys!! The Chinese have been through the year of the Cock, the Monkey, the Sheep, the Horse, the Snake, the Dragon, and the Rabbit since the editors stated their quest. The Chinese are running out of animals, both real or mythological! I've decided partly in sympathy for the editors and partly in fear of the editor's collecting techniques being contagious to pack up my family, lock, stock, barrel and bug cases and move back to the mid-west. Before I go however, I propose an official name change for the road from Hwy 190 towards Panamint Dunes to Cunningham Circle. Though not truly a circle, it accurately represents the designs permanently etched into the terrain by this editor's futile searches. I understand from an aircraft that the design is very similar to those found in the wheat fields of England.

On July 14, 1993 my family and I are moving to Oxford, Ohio, home of Miami University. There, I will begin life as a

student in graduate school. Under the direction and guidance of Dr. Seldom Guttman, we will analyze the DNA and/or enzymes of the Scarab genus *Polyphylla* to attempt to either add to or further sort out the taxonomic muddle. Dr. Guttman is a population geneticist with a particular ability in sorting out species complexes. He has worked on such widely diverse groups as cranes, salamanders, tree hoppers, fish and opossums over the past several decades.

Our goal is to establish through genetic and biochemical analysis, individual species and their relationships. We hope to be able to select those morphological characters that best delineate a given species. The widely variable external and genital characteristics may then be better sorted and selected because of the results obtained through the enzyme and DNA testing. For fun, interest and to add to the argument, we may apply these tests to higher taxa such as genera, tribes, or sub-families of the Scarab world.

Along those lines, I need your help!! I am interested in all *Polyphylla*, and could use as many representatives from as many populations as possible. I am particularly interested in unusual or restricted populations or morphs. For example, the white *P. decemlineata* from the Mono Lake Dunes of eastern central California or the *P. nr. diffracta* from the Coral Pink Sand Dunes in Utah, just to name two.

There is a hang-up because the specimens need to be sent alive by overnight mail to us in Ohio. I have found that putting a couple of handfuls of dried grass in a paper sack, then simply putting the *Polyphylla* in the bags in the field is easy and safe for the beetles. Twenty or thirty can be easily placed in one bag. Females are of great interest and would be safer if separated from the males. Collecting data should be sent with your name, address and phone number so that I can thank you and reimburse the postage. The post office has free overnight priority boxes to put the paper bags in along with some crumpled-up newspaper. I will have a FED EX number also. The boxes should be sent to: Dr. Sheldon Guttman, Department of Zoology, Miami University, Oxford, Ohio 45056.

Please call the office at (513) 529-3181 or the lab at (513) 529-3379 after mailing a box so we can arrange for someone to meet it in the mailroom and put the specimens into liquid nitrogen as quickly as possible. Any and all efforts are appreciated. If you need more information please call me at the lab phone.

News Flash

Brett Ratcliffe, University of Nebraska State Museum, has just been awarded \$189,149 by the National Science Foundation to conduct a three-year faunistic survey of the Dynastinae of Costa Rica and Panama. The results of the study will be published in the *Bulletin of the State Museum* in a format similar to Ratcliffe's *Scarab Beetles of Nebraska*. Keys to taxa will be provided in both English and Spanish. The study is being conducted with the cooperation of INBIO in Costa Rica, and they will be hiring an apprentice curator with funds from the grant. Ratcliffe indicated that one of his first priorities is to augment the already large data base.

Congratulations and good luck, Brett!

“Wirth”Less Tip #3

If you collect *Phanaeus* by roaming pastures or grassland and employing the “poking through piles” method, you could be missing out on many specimens.

Remember that calf dung is especially attractive, but is often found in small “splatters.” These small pieces of food source are quickly located and buried, leaving only a tiny push-up as a clue to the beetles' presence.

Next time out, make a point of digging up these dirt push-ups, and you will astound your companions with your collecting proficiency. You will then be able to brag about yourself in the same fine tradition as the intelligentsia.

Thanks to Chuck Wirth, now “The Hermit of St. David” (Arizona), for another nice tip.

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SCARABAEOIDEA OF CALIFORNIA

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