Buckets of *Ple-oh*-coma

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While I’m not a true *Pleocoma* or rain beetle enthusiast, no true scarab-o-phile can deny their “cool factor”. If you are a true *Pleco*-maniac, this article may have you heading for the hills west of Salem, Oregon, next fall. This is where males and females of a local subspecies, *Pleocoma dubitabilis dubitabilis* Davis (Figs. 1, 2) are collected by the bucket full. “How can this be?” you say. Allow me to elaborate.

In the fall of 2000, a farm worker brought in a coffee can to the Oregon Department of Agriculture (ODA) filled with male and female rain beetles from Noble Mountain Tree Farm,
about eight miles northwest of Salem in Polk County. He indicated a large population was present and believed the grubs were damaging young Christmas trees. Rick Westcott, then the ODA taxonomic entomologist, identified them as *P. d. dubitabilis*. Incidentally, it was Rick who, starting in 1969 and continuing to 1977, led a valiant effort to have another species, *P. oregonensis* Leach (known back then as the kid-friendly “Rufus the Rain Beetle”) designated as Oregon’s official “State Insect”. Unfortunately, politics intervened and in 1979 the Oregon swallowtail (*Papilio oregonius* Edwards) was given the official title. Sorry Rufus - I would rather have had you on a commemorative Oregon rain beetle stamp than a butterfly any day!

The 2,200 acres of Noble Mountain Tree Farm (Fig. 3) in mixed forest, farm and pasture (elevation 222 - 341 meters), is not what you’d think of as ideal rain beetle habitat, or is it? Every fall around the beginning of October, crew leader Augie Garcia and his beetle crew scour the slopes of the tree farm, shovels in hand, looking for rain beetles (Fig. 4). They usually don’t have to look very hard. Augie and his crew have become adept at finding the small mounds of pulverized soil indicating where a female has dug to the surface, and is either waiting for, or already in her burrow with one or more males (Fig. 5). After Augie and
his crew have been through an area, it’s covered with small holes, each one indicating where a female and usually one or more males was dug up (Figs. 6, 7). It’s quite a sight to see five-gallon buckets teeming with rain beetles they’ve collected over one or two mornings (Figs. 8, 9). In October, 2007, he and his eight-person crew (Fig. 10) collected nearly 27,500 (21,583 male; 5,914 female) rain beetles!

With this many beetles, it’s not surprising the grubs are causing some damage, especially to young noble firs, a new host record. One to three grubs have been found feeding on the roots of small, one- to two-year-old trees (12-18” tall), to as many as 37 grubs found on a single five-year-old (42” tall) noble fir. Damage ranges from stunted growth and reduced vigor to mortality of small groups of two- to five-year-old trees, (Fig. 11). Since 2000, economic losses attributed to damage by _P. d. dubitabilis_ have been estimated at $700,000 due to tree mortality and $300,000 in reduced quality, and is the first report of _P. d. dubitabilis_ as a pest of Christmas trees. Live female-baited traps made from empty milk jugs or five-gallon buckets buried in the ground have been effective in catching males and are often placed in infested areas by Augie and his crew. While collecting thousands of males and females during a season is possible, it’s labor intensive and whether it helps reduce the overall population or damage is unknown. Conventional control methods so far have been expensive and produced mixed results.
In 2004, Paul Robbins (see Scarabs #33, page 13), a scarab pheromone researcher at Cornell University, was sitting across the aisle from me on a bus ride to visit INBio during the Latin American Scarabaeoidologists meeting in Costa Rica. I mentioned the situation at the tree farm and thought it would be a unique opportunity to collaborate on some pheromone work given the ample supply of live Pleocoma to work with, something virtually unheard of. "I'd love to, it's never been done before, and they're such neat beetles!" he replied. Since 2005, Todd Adams (ODA) and I have been shipping live beetles collected by Augie and his crew to Paul in Geneva, NY. In 2007 alone, five shipments totaling 1,025 males and 589 females were sent. Paul collects the volatiles emitted by females, and identifies antennally active candidate compounds using a gas chromatograph coupled with still living excised male antennae (Figs. 12, 13). "I love their antennae. They're beautiful to work with. They have seven lamellae unlike most scarabs."

You can sense Paul's enthusiasm for working with live Pleocoma and he plans to keep "knocking at the door" of their pheromone chemistry until it's either opened wide or we run out of beetles (which is not too likely). If some promising candidate compounds are found, we'll test them in traps under field conditions at Noble Mountain. Who knows, it may eventually lead to new monitoring or control methods such as mass
trapping, mating disruption, or lure-and-kill technologies. Knowing their pheromone chemistry may also help shed light on their relationships to other scarabaeoids.

To spread the wealth, I brought plenty of specimens of *P. d. dubitabilis* from Noble Mountain to the Sacred Order of the Lamellate Antennae (SOLA) meeting at the Entomological Society of America meeting in Reno last November. They were all taken and are now hopefully in collections far and wide. That's good - there's more where they came from. For several weeks each fall, male *P. d. dubitabilis* can be seen flying low over the ground between rows of Christmas trees at Noble Mountain on most mornings after a good rain. Augie and his crew are following close behind hoping they will lead them to more females. If so, another small hole will be formed and one or more rain beetles added to the bucket. All in a good day’s work.

For further reading please see:

How to Make Insect Images Before Submitting an Article to *Scarabs*

by Olivier Décobert

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Since the *Scarabs* newsletter is always open to submissions, I would like to present a method for obtaining images to accompany your article. If you have a scanner, you can easily obtain a scarab photo using this method:

1. Put your scarab (pinned in a box) against the glass of the scanner.
2. Scan it, using the best resolution.
3. Improve the picture by using software such as Easy Photo, Microsoft Office Picture Manager or Paint.

With some training, you can obtain a good photo. I show two examples:

![Figure 1: Pinned Sisyphus schaefferi (8 mm).](image1)

As you can see, it is also possible to eliminate the pin on the picture. I use Easy Photo but other software can do the same.

![Figure 2: Glued Anisoplia remota (9 mm).](image2)

Of course, there are sometimes problems of blown highlights and blocked-up shadows, especially if the insect is too big or too convex, but there are other solutions, such as a digital camera for the bigger scarabs).

Now, dear readers of *Scarabs* everywhere in the world, you can use your more interesting specimens and write articles for your preferred online newsletter! Share your knowledge! Thank you in advance!
Return to Latin America. Once again students talked me into arranging a trip to Ecuador during the “study break” in late February. The difference this time was that our departmental mammalogist would be in charge of the student group during their stay at the Rio Palenque Field Station near Santo Domingo. Anne and I, along with Bill Mason (Hymenoptera) and Monty and Grace Wood (Diptera) would go off by ourselves to the eastern side of the Andes after we reached Quito.

This time it was not an easy flight to Quito. We (30 of us) left Ottawa at 4 PM, flew to Toronto where we went through U.S. customs, then left for Miami at 9:45 PM, to catch the 3 AM flight to Quito. There we all went to the Hotel Embajador, had a meal and the student group caught the bus that took them to Rio Palenque on the western side. Our small group rented a van, shopped for groceries, returned to the hotel about 7 PM, ate and went to bed. We spent one day collecting at the top of the old road (Photo 1) to Santo Domingo at km 27 (3,200 meters elevation) and returned to the hotel in Quito that night. The catch consisted of one dung beetle and some good weevils for Anne.

The next morning the van wouldn’t start, so nearly half a day was spent getting it fixed before we left to
drive to Baeza (elevation about 2,000 meters), with a brief stop at 4,000 meters (Photo 2) and another where the road was being cleared from a recent landslide. I am not too sure what to call our lodging at Baeza, except that it was as dirty a place as we had seen for a long time. Rooms were defined by vertical planks with enough gaps between to greatly reduce privacy! Sheets had obviously not been changed for some time, the mattresses were about one inch of well-worn foam on boards. There was only one toilet for the twenty rooms. The toilet had a shower above it and a wire basket for used toilet paper, which, when someone used the shower, washed the paper over the floor (need I say more?). The one basin was outside near the front of the “hotel” in full view of the main street (Photo 3). We did use the basin for hand and face washing, but otherwise found the woods more sanitary. Despite the lodging, it was a great base for some interesting collecting.

The first night in Baeza we collected at the few town lights along the main street. Beetles were there in some numbers, *Golofa*, *Heterogomphus* (Photo 4), *Cyclocephala*, etc., good collecting but nothing startling except for the numbers. The next day we went south on the one dirt road along the eastern slope of the Andes. The area (Photo 5) was a mixture of small pastures and forest. The road was wet from recent rains and was rutted and slippery. We drove to the base of a steep hill where we decided to turn back as we didn’t think our van could get up the muddy road. Both large and small cup traps baited with feces were set, as well as one carrion trap. General collecting yielded *Canthon* and
Aphodius (as it was called then) under cow dung and passalids under logs. Many other beetles were taken by beating. The first evening our 18-watt black light was set up at dusk on the road side 5 miles south of town. Two specimens of a new species of Neoathyreus arrived at dusk (7 PM) and a short time later Golofa and other beetles arrived. We ran the light for only an hour or so and then went to eat. Afterwards the town lights still proved to be productive.

For the next few days, we collected mostly near Baeza and were slowed down by rain on several afternoons. One day we drove back toward the high point of the road at 4,000 meters. The area was originally paramo, but had been burned over and grazed, so it certainly wasn't typical. There were bushes in some of the ravines, but the entire area was dry, which seemed odd considering the rain we had at Baeza. Monty had a bad back so he stayed in the van while Bill investigated one of the steep-sided ravines. When asked how the collecting was, Bill's answer came back, “Bloody awful”. Shortly thereafter we went back toward Baeza. Another day we tried the road to the lowlands and one of the Amazon tributaries. We didn't go too far, since the land was cut over, with few places to collect and these were generally dry.

Saturday night there were about 26 additional guests at the “hotel” and we didn't get much sleep, as they were there to party! The next day we picked up traps and got ready to leave the following day. The traps all yielded a number of good scarabs, the best, as far as I was concerned, was a series of a Cryptocanthon. The black light also brought in several more Neoathyreus, which was great except that they all turned out to be females. In front of our lodging the fauna, flattened by the occasional truck, yielded part of a large male Dynastes neptunus. I wish I had been there first, but I saved the largest piece for the record.

Returning to Quito, we were stopped along the way and asked for our vaccination records. It
turned out that there were cases of yellow fever in one of the lowland areas and anyone not having the proper shots, was given one immediately. All of us were OK and I was glad we were, because the same needle was used to vaccinate numerous people, including about 20 people on the bus ahead of us! It was still very dry at 4,000 meters, so we spent only a short time looking for insects before driving on to Quito.

At the Hotel Embajador we met up with the group that had been at the Rio Palenque Station. There was a flood of complaints about the food, mostly rice and beans, but otherwise there were no major calamities. However, no one suggested going back! Nevertheless, the trip seemed worthwhile to the students, particularly when they saw the snow in Ottawa.

In May Anne and I left for Costa Rica, along with Milt and Bev Campbell. We arrived at San Jose in the early evening, ate and briefly ran a black light on the porch of our cabin outside of town, collecting about 20 species of scarabs. The next morning we rented a rather old jeep-like, two door car that barely held the four of us and our luggage; cost $590 U.S. for the month plus gas.

We first went to CATIE, a large Central American agricultural experiment station at Turrialba. We were lodged in a large guest house (Photo 6) overlooking the canyon of the Reventazon River. The location was not too far from the historic Hamburg Farm, where W. Nevermann collected. There was a steep "nature trail" down to the river, where the vegetation was not disturbed and yielded
some great beetles. Dung traps yielded aphodiines, *Canthidium*, *Onthophagus*, *Phaneus*, *Eurysternus* and *Dichotomius*. A black light set on the porch of our lodging attracted numbers of *Phyllophaga* and *Anomala* along with many others. It was a great place to collect (Photo 7), and comfortable too! Four days were spent there before we moved on to Monteverde.

The road up to the turnoff to Monteverde was paved, but shortly after we started up the hills to higher country (Photo 8), the road degenerated, first to areas that had been closed by small landslides and not completely cleared, then to a rocky, gravel single lane track cut into steep hillsides. We were glad we had a high-clearance car. That year there were only two places to stay in Monteverde; the Pension Quetzal and one other, the former suggested to us as the better place to stay.

Cost for room and board per person was $10 U.S. per day and the meals were good. The Pension was a rather old, unpainted, two story, wooden building (Photo 9). Anne and I had a corner room with a double bed and a small bathroom attached. The first evening when I turned on the bathroom light I found a pair of mating scorpions just above the switch. As I am no lover of scorpions, the pair was quickly dispatched. After another scorpion fell on the bed when I closed the curtains I asked Susy, who generally ran things, why so
many scorpions? She replied that they were useful in controlling cockroaches and that their sting was about equal to a bee sting. Since I didn’t particularly object to the occasional cockroach, I slyly killed scorpions whenever I saw one in the building. During the time we were there I eliminated about 34 scorpions and noted, before we left, a decided increase in cockroaches! At least, I did learn something about scorpions, but I still would not recommend them as an agent for cockroach control in one’s house.

The timing for scarab collecting was great. Our first night, we set the black light on the Pension porch and attracted 15+ species of scarabs plus a number of cerambycids and other Coleoptera. On the damp, back side of our building the vertical wood siding was somewhat moldy; feeding on the mold were three species of ceratocanthids. It was a great beginning to our stay at Monteverde. In front of the Pension there was a downward sloping, open field for perhaps 50 yards before the forest began. One tree was in bloom at the forest edge and the flowers yielded *Macrodactylus*, *Hoplia* and *Anomala*, along with a number of other beetles (Photo 10). On a trail in the forest a number of dung traps were set and within a few hours 44 scarabs were taken, which included *Uroxys*, *Canthidium*, *Coelodes*, *Ontherus*, *Onthophagus* and *Dichotomius*. That night, in addition to species collected the night before, *Phyllophaga*, *Ochodaeus* and other species of ceratocanthids were attracted to the black light.

For fourteen days we collected within a ten-mile radius of the Pension. Milt, accompanied by Bev, beat clumps of dead leaves during
the day for alliculids and sifted leaf litter for staphs. They often went their own way and one day Milt met a farmer who gave him a large male *Dynastes hercules* which was alive (Photo 11). Milt brought “Herc” back to Canada in a shoe, where he made a great hit in schools until it expired some months later. I believe “Herc” now resides in the CNC. Another day, Anne and I found a ridge below Santa Elena on the Pacific slopes with a clump of flowering *Croton* that produced several species of *Trigonoptastes*, some *Anomala* and many different cerambycids.

At the Pension I learned more than I wanted to about some other insects. Outside of our bedroom window there was a nesting box occupied by a pair of swallows. Two or three days after we arrived they vacated the box along with their brood. Several days later I developed some itchy red spots and one morning noticed spots of blood on my bed sheet. Careful exploration revealed several cimicids which had been happily feeding on the swallows, then found me an acceptable alternate when the swallows left. Extermination of several adults and removal of the nesting box solved that problem. The lesson - swallows and human bed bugs are closely related and aren't adverse to switching hosts! Recommendation - don't encourage swallows to nest outside of your bedroom window.

We did some collecting along the ridge trail in the Monteverde Park. There was no objection to our collecting beetles at that time, but there were still Park fees to pay on a daily basis. There were some different insects along the ridge, but the windy and damp habitat and muddy, steep paths did not make it one of our favorite areas. Despite this, *Cryptocanthion* and some spectacular cerambycids were collected along the ridge. Some of our best collecting was done near the Pension, with Anne turning up the most unusual catch. Anne had a favorite guava tree that had a number of *Pandeleteius* feeding on the leaves. She spent several hours prone under the tree observing her pets, when she noticed a snake on a branch just above her. After a hasty retreat, the rest of us were called over and caught the snake in one of our bug nets. It turned out to be a rather rare green *Bothrops* that one of the park rangers had asked us to look for; he badly wanted one to exhibit! That was the only snake we saw during our stay.

There were often afternoon rains which became more frequent until, near the end of the second week it rained all day, causing us to depart the next day in the rain for drier climes (we hoped) on the Pacific, lowland side of Costa Rica near Cañas at a place called “La Pacifica”.

On the way down, we encountered an untended, small herd of cattle on the road. There was a steep drop on one side of the dirt track and an equally steep
bank on the other side. We had no idea where the cattle belonged, but they ran ahead of us for several miles before getting off of the road. Someone may have had trouble finding them, not that we minded after following them for what seemed hours!

Back on the main paved road it continued to rain and did so all the way to La Pacifica. Our housing there consisted of a small square building (Photo 12) containing two units and a large overhang of a smooth concrete patio, perfect for setting out the black light when it rained, which it continued to do for days. We arrived in the early afternoon and, after getting our room, I sloshed through a level field to a nearby river bank which was raised above the normal ground level and was forested. There I set out six small dung traps with roofs to keep off the persistent rain. The rain made it difficult to do much more, but I did see several tiger beetles sitting on slightly raised ground in the field, which was their mistake as they were easy to net.

La Pacifica had an open air type of dining room that we visited that night. Tables were covered with white cloths and flowers adorned each table. Shortly after we ordered, a beetle landed on our table, a Bolbelasmus no less! Needless to say, this started me looking over the entire room, much to the amusement of the few occupants. Several more Bolbelasmus were collected before we left to check the black light on our sheltered patio. In spite of the heavy rain, there was a surprising number of beetles at the light, including Neoathyreus. The next morning it was still raining hard, so I waded (level ground was covered with several inches of water) out to the river bank and was again surprised to find the cup traps half full of Onthophagus. There were not many species involved, but the number active in the rain was interesting.

Even with the good catch, we decided to head back to San Jose as it continued to rain heavily. It was then that the fold-down passenger seat broke and had to be propped up. Then, when we stopped for gas, the car wouldn’t start! No one offered to help, so we pushed the car in the rain until we finally got it started. We were all soaked and not very happy with the car or the people at the filling station.
It took several hours to reach San Jose where we found lodging at the Pension Canada; well named! In the evening we found out that Dan Janzen had also been chased out of his lodging by the rain, so we spent the evening talking, while Dan mounted Lepidoptera.

The next day included a morning visit to the National Museum and an afternoon at the University of Costa Rica going over their fairly extensive beetle collection. Rain continued all day and I began to think the country would dissolve. Next day, June 8, we went to the airport in the rain. Milt and Bev were going back to Canada while Anne and I headed for México.

Anne and I boarded our plane at 11:30 AM and sat on the runway until 2 PM waiting for the weather to improve enough for the pilot to see the end of the runway. When we finally arrived in México City about 4:30 PM it was cloudy but NO rain. We stayed for two nights in a good downtown hotel and spent the day sightseeing, a rare event for us.

The following day we flew to Oaxaca city and were met by Ed and Mary Greenwood, who hosted us during our stay in Oaxaca. We had met the Greenwoods years before in Veracruz and later became friends when they lived in Ottawa. Both liked natural history and Ed worked on both cacti and orchids and, when Ed retired, they moved to México and invited us to visit whenever we were near.

There was lots of greenery around the Greenwood house (Photo 13), so I ran a black light the first night we were there. Nothing unusual at the black light but Ed suggested that I check the street lights adjacent to a nearby park. There we found adult Xyloryctes by the hundreds under the lights. Parts of the road were slippery with flattened beetles! A few dozen were collected, but limited space prevented me from taking more. The nicest part of the day was that it didn’t rain.

The next several days were spent collecting on some rather cut-over hills just to the northeast of the city which turned out to be very productive for cetonids and for Anne’s weevils. Chloroxanthe and three species of Euphoria were collected, along with a number of dung feeding species,
including *Onthophagus* and *Geotrupes*. On June 12 we went northeast on Highway 175 stopping at higher elevations between 2,000 and 2,500 meters in forested areas. There were cattle in most places we stopped, and under their dung we collected *Geotrupes*, *Copris*, *Phanaeus*, *Onthophagus*, *Aphodius*. Other scarabs and weevils were collected by beating. That day our investigations also turned up George Ball, Steve Ashe and Danny Shpeley camped near El Cerezal (Photo 14). They all joined us for dinner that night; news and tall stories negated any evening collecting.

The next day we all went our separate ways. Anne, Ed and I went into the mountains near Diaz Ordaz where we took numerous scarabs under dung and *Macrodactylus* and *Anomala* on *Acacia* flowers. On the dirt road we encountered a four-foot rattlesnake (Photo 15) that took no interest in us; we let it go its own way. It was the only snake we saw during that trip in México.

One day Ed took us to a lumber camp at the turn off 78 km south of Oaxaca on Highway 131. Normally the area was closed to visitors, but Ed had permission to enter on Sundays when there was no lumbering. No cattle were in the forest, but mushrooms were fairly common, so I spent some time collecting on them. Surprisingly, both *Canthidium* and a pair of *Phanaeus* were found under some of the rotting mushrooms; the *Phanaeus* was later described by Dave Edmonds.

Several days later we collected along Highway 175 toward Puerto Ángel (Photo 16), collecting several different *Geotrupes* under dung.
The next day we collected near Oaxaca in the morning as I was not feeling well. That afternoon I went to bed with a fever and later chills. I was not sure what I had, but thought it might be malaria, as I first had an increasing fever followed by chills. The next day tests showed that I had typhoid fever. The timing seemingly indicated that I had contracted it when I had forgotten and used tap water to brush my teeth on our stop in México City. I had taken the typhoid shots, but they did not give complete immunity! For several days, when I had chills, the metal cot I was on would rattle. The night I started feeling better, we awoke to my cot rattling. That time it wasn't the chills but an earthquake, and Ed yelled for everyone to get outside. We evacuated in a hurry, plaster was coming off the wall, dogs all over the city were barking and some tall columnar cacti in the garden were swaying. When things gradually quieted down, we saw there was no major damage, so we went back to bed. The next day we learned that the epicenter was several hundred miles away; it was bad enough where we were!

I was able to spend one more day recovering, then flew to México City and in the afternoon visited with Gonzalo Halffter. The following day saw us back in Ottawa.
Many of our readers have seen, or own, Bob Woodruff’s jewelry made from our glorious scarabs. He has exhibited at the Entomological Society of America and elsewhere for many years. He has taught such jewelry techniques in several courses in Guatemala. We show here some examples; a full article on his experiences will appear in a future issue.

Our trap researcher Anne proudly displaying two of Bob’s bola ties as well as a pair of his Phanaeus vindex earrings.