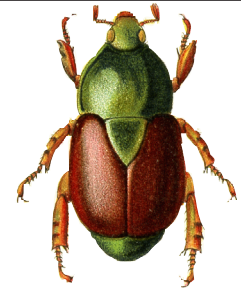


SCARABS



GD GR QRGLIQ, RFCW UGJJ AMKC.

Occasional Issue Number 71

Print ISSN 1937-8343 Online ISSN 1937-8351

October, 2012

WITHIN THIS ISSUE

Dynastes hercules in Ecuador 1

Dung Beetle Traps for Young Collectors 13

Scarabs Headquarters Relocates to Singapore .. 16

Ecuador—Land of the Giant Hercules Beetles

by Jen-Pan Huang

Museum of Zoology, Department of Ecology and Evolutionary Biology
2089 Ruthven Museums, University of Michigan
1109 Geddes Ave., Ann Arbor, MI 48109-1079
huangjp@umich.edu

BACK ISSUES

Available At These Sites:

Coleopterists Society
www.coleopsoc.org/default.asp?Action=Show_Resources&ID=Scarabs

University of Nebraska
museum.unl.edu/research/entomology/Scarabs-Newsletter.htm

EDITORS

Rich Cunningham
Scarab349@aol.com

Olivier Décobert
oldec@wanadoo.fr

Barney Streit
barneystreit@hotmail.com



Jen-Pan as he found his first Hercules beetle under a street light inside Cabañas San Isidro.

From April 27th to June 19th 2012, I visited Ecuador to collect fresh samples of three different subspecies of *Dynastes hercules* (Fig. 1) for molecular systematic studies. Giant Hercules beetles are referred to as “Catzo Hercules” by Ecuadorians, though in Spanish they are known as escarabajo. I never realized before this trip that these beetles would be extremely difficult to collect in large quantities that I need for population level research—single individuals are much more common to find. Fortunately, I met several experienced beetle collectors who kindly shared their knowledge about the ecology of the subspecies, gave me damaged individuals that were freshly collected, and even helped me find beetles in a few localities. Here, I deeply thank Franklin Neira from Cosanga for information about *D. h. lichyi* and *D. neptunus*, Diego and Juana Peña from Misahualli about *D. h. ecuatorianus* and potential hybrid zones between *lichyi* and *ecuatorianus*, Marco Bolaños from Rio Chuchuvi about *D. h. occidentalis* and *D. neptunus*, and my field assistants Elisa and Edwin Levy from the Pontificia Universidad Catolica de Ecuador (PUCE) for helping me to interview local collectors.

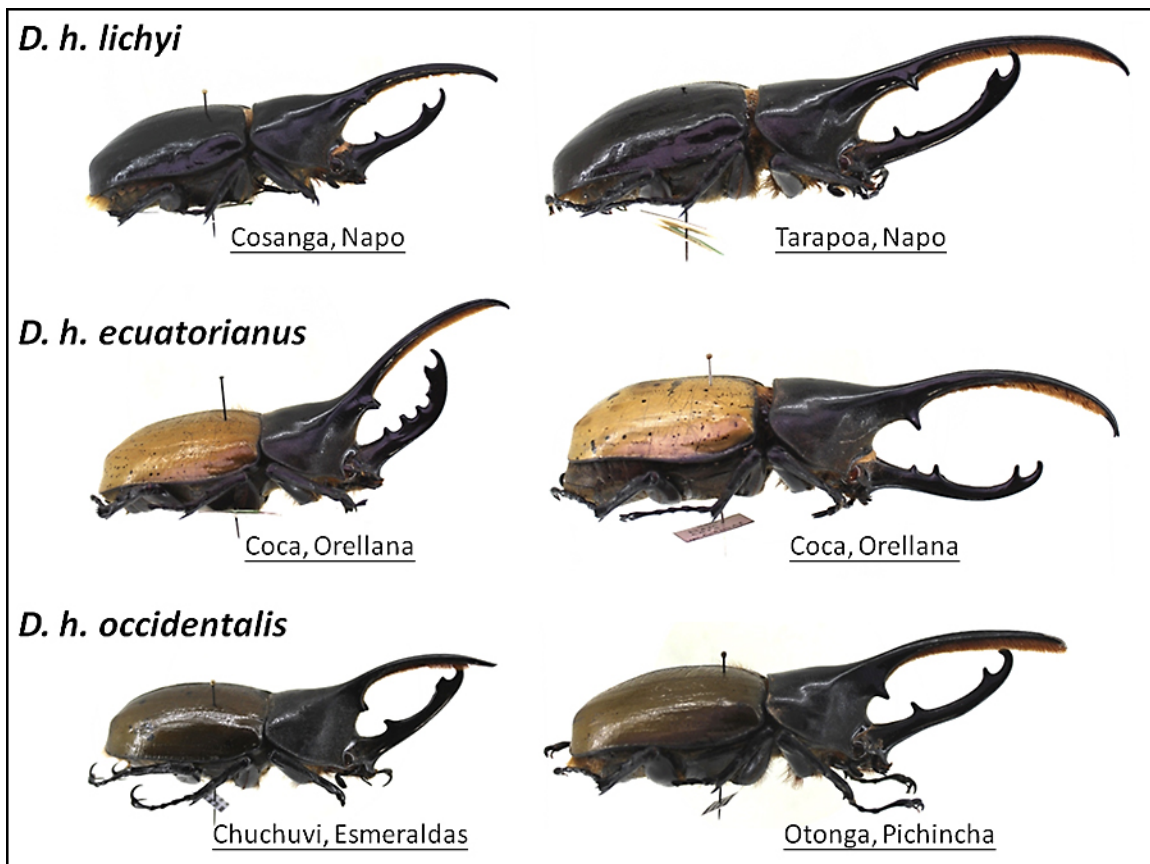


Figure 1: Three *Dynastes hercules* subspecies of Ecuador. Top left: a minor male *D. h. lichyi*, which lacks a typical fan shape cephalic horn (resembling ssp. *ecuatorianus*). Top right: a typical *D. h. lichyi* (Tarapoa oil station inside the Yasuní National Park is a location that both *D. h. lichyi* and *D. h. ecuatorianus* can be found under nearby street lights at nights [according to the PUCE museum records]). Center left: a minor *D. h. ecuatorianus* having multiple cephalic denticles (it has a fan shape cephalic horn). Center right: a typical *D. h. ecuatorianus*. Bottom left: a minor *D. h. occidentalis* (it also has a fan shape cephalic horn). Bottom right: a major typical *D. h. occidentalis* (specimens collected in this nearby region [Otongachi station] are often labeled as from Santo Domingo). These minor forms are around 10 cm and the majors 13 cm.

I knew very little about the natural history of Hercules beetles before this visit. All of the information that I had was from *BeKuwa** issues #18 and #32, a paper authored by Chalumeau and Reid (2002) regarding the distribution of different subspecies of *D. hercules*, and online insect dealers from whom I bought specimens for extracting DNA in order to reconstruct a phylogeny for the genus *Dynastes*. These data mostly include collection localities, although *BeKuwa* #32 has an article describing the natural habitat of *D. h. lichyi*. Additionally, the Japanese television program NHK produced a series “世界最大のカブトムシヘラクレスを追う” about the natural history of *Dynastes hercules* in Ecuador in 2006. In that series, *D. h. lichyi* was videotaped chewing bark from a cloud forest tree, likely a species of genus *Miconia*. A detailed animation of how a Hercules beetle uses its mouthparts to carve a tree trunk was shown the first time. While that series is undoubtedly by far the best documentation of the natural history of Hercules beetles, much important life history data are still lacking. The goal of this article is to shed light on additional Hercules beetle life history data.

**BeKuwa is the most prestigious Japanese magazine for information about beetle collecting and breeding. Almost every Asian kid who has an interest in insects has heard of or owns several issues of this magazine. Issues #18 and #32 have articles dedicated specifically to Hercules beetles, covering topics including taxonomy, distribution, natural habitats, and breeding experiences. There is additional information regarding Hercules beetles in other issues; for example, breeding competition reports on maximal body lengths for different subspecies scattered in many issues, which are always the most exciting to me.*

In the following sections, I introduce three Ecuadorian towns and local experts you can visit to talk with about the Hercules beetles, and the past local beetle trade market. If you come to Ecuador in the right season, directly encountering wild Hercules beetles, at least *D. h. lichyi*, is almost guaranteed.

Cosanga

It was truly a coincidence that I met Franklin Neira in Cosanga. I talked to the manager of Cabañas San Isidro about my interest in Giant beetles, and he happened to know that Franklin also has an interest in beetles. Franklin owns the only gas station in Cosanga, and if you drive a car from Quito to the Amazon via the famous touristic route (via Tena), you will pass by his gas station (if you take a bus, it will stop in Cosanga right next to this gas station [Fig. 2]). He had previously helped a Japanese collector find beetles, including *D. hercules*, *D. neptunus*, and *Megasoma* species, in the Sumaco and Amazonian regions. The Japanese collector would stay in Cosanga with him for about two months every time when he came to Ecuador and Franklin would go out with him to find live beetles. The price for live beetles sold by Franklin was based on the size of the beetle: a 12 cm long male *D. h. lichyi* was worth \$15, 13 cm was \$20, 14 cm was \$30, 15 cm was \$40, and Franklin did not want to talk about the price for male beetles larger than 16 cm long. Of course, people could still bargain with him about the prices. He also told me that the largest *D. h. lichyi* he has ever found is 16.9 cm long and the Neptune beetle *D. neptunus* 15.7 cm.

Sumaco (a volcano that is part of the Cordillera de Los Guacamayos) is the best-known region for collecting Ecuadorian *D. h. lichyi*. If you purchase a specimen from on-line suppliers (e.g., Insect-Sale [<http://www.insect-sale.com/>]), almost all of the Ecuadorian *D. h. lichyi* will be labeled “Cosanga.” You may occasionally find a *D. h. ecuatorianus* labeled as collected from

Cosanga, but it will likely be a mis-labeled individual. Adult *D. h. lichyi* can be found all year round in the Sumaco region, but it is most abundant from February to April. Adults are observed on rotten wood from October to December, indicating that these months are the likely mating season for *D. h. lichyi*. Eggs and larvae are most frequently found in January and February under rotten wood piles of many different tree species, but the adults are only associated with *Miconia* trees (“Piwee” in Ecuadorian Spanish [Fig. 2]). When beetle traders were prevalent about four years ago, Franklin said that the locals would even chop down a tall *Miconia* tree in order to collect these beetles, who usually feed high near the canopy. Because the host tree species is well known, most people collected this subspecies *lichyi* during daytime hours. If you want to collect *D. h. lichyi* using light traps, it will be best during a dark night without any moonlight and this beetle only flies out before 10 pm (most often from 7:30 to 8:30 pm)*. However, if you are also interested in *D. neptunus*, then they will be most active during 1 to 5 am. This means that if you want to collect both Hercules and Neptune beetles near Cosanga using a light trap like what I did, then you shall not sleep at nights (the temperature in Cosanga drops very fast after 8 pm, and can be close to 10 degree Celsius after 10 pm, which is really cold and wet in the cloud forest; additionally, it rains almost every night even in the “dry” season). A collection of 3 to 5 individuals per night will be considered extremely successful, but for most of the time people like me only found one after several nights of light trapping.



Figure 2: Cosanga. (A) Cosanga Gas Station and the surroundings. (B) “Piwee” trees near the Cosanga Gas Station. (C) Franklin was showing me how he collects and keeps live *D. h. lichyi* and *D. neptunus*. (D) Some dead *D. h. lichyi* samples that Franklin helped me find in the Sumaco region.

* I found only two females using light trap in La Bonita, and they came to my trap before 8 pm—one came right after sunset, 6:45 pm and the other one 7:50 pm. All the other samples, ca. 20, were found under street lights or on *Miconia* trees in the daytime with the help of Franklin.

The best region to find the subspecies *lichyi* is in between 25 km to 36 km from the major road interception point (Baeza-Tena and Baeza-Quijos roads) toward Tena (Cosanga is located at distance 20 km). These specimens will be labeled as from Cosanga because it is the closest Town and thus the closest transit center. In Franklin's experience of finding beetles in the Sumaco region for over ten years, he has found a lot of *D. h. lichyi*, *D. neptunus*, and a variety of small Dynastids like *Golofa* spp., but never a single *D. h. ecuatorianus*. *D. h. ecuatorianus* are found in the lowland rainforest from regions around Tena, which is 76 km away from Baeza, and in the Amazonian region. This is why in the previous part I talked about the mis-labelling of *D. h. ecuatorianus* from Cosanga obtained sometimes from several on-line specimen suppliers. Cosanga is not far away from Tena (56 km), and most beetle collectors hunt these giant creatures not just in the region where they process and export the specimens. The collection information for many specimens was labeled as where they were exported, but not where they were collected. It is critical for biologists and scientists (and even private collectors and beetle breeders) to fully appreciate this inconvenience, because the conservation policy or the predicted habitats for

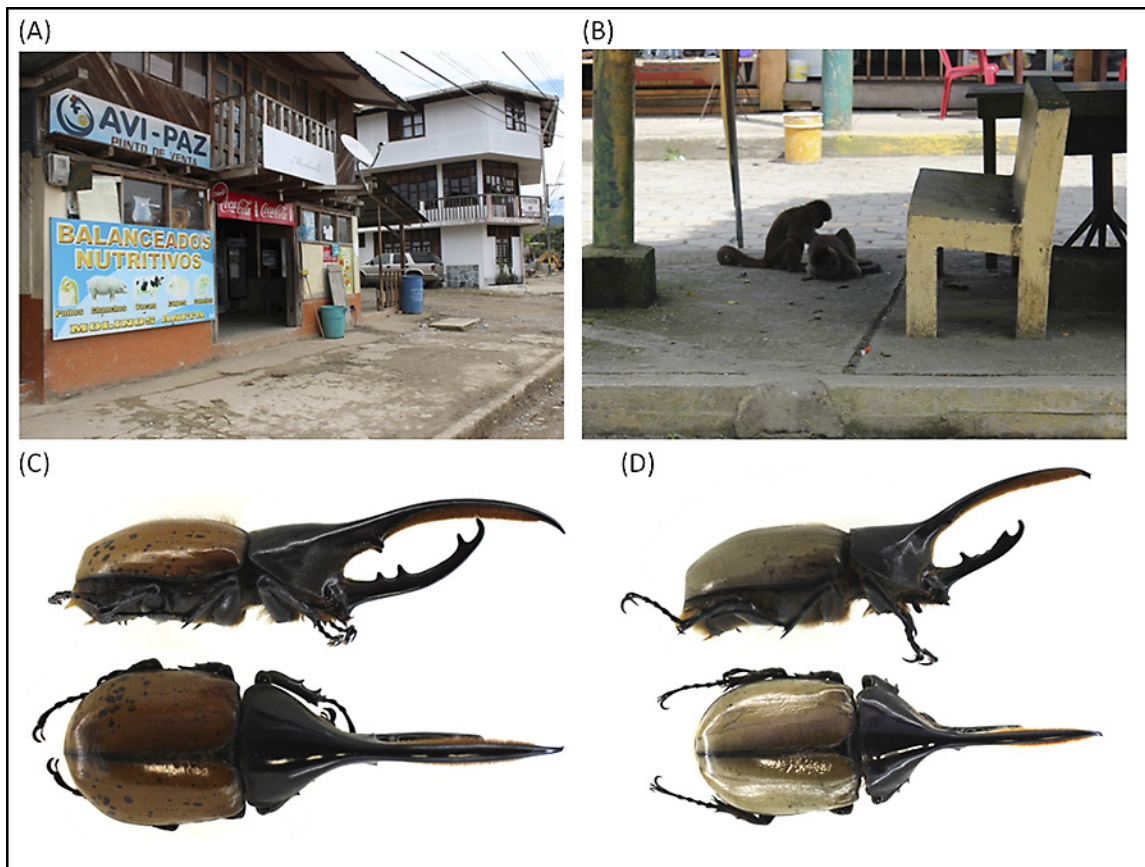


Figure 3: Misahualli. (A) The grocery store owned by Diego and Juana. (B) Local monkeys are the most competitive rivals for beetle hunting. They also have a bad reputation of stealing wallets and backpack accessories from visitors. (C) A typical *D. h. ecuatorianus* collected in the central circle of Misahualli (12 cm). (D) A *D. h. lichyi* collected at the edge of Cordillera de Los Guacamayos (10.5 cm).

protective area designed based on current and future distribution models are heavily affected by these imprecise collection records. Not to mention if a breeder wants to establish a clear pedigree for his/her special lines. I did, nevertheless, find one specimen collected in Cosanga by a PUCE student having some *ecuatorianus* resemblance (Fig. 1). This is however only a small male collected in the 90's and it doesn't have either a typical *lichyi* or *ecuatorianus* phenotype (in case of cephalic horn shape). The distribution of *D. h. ecuatorianus* in Sumaco (Cosanga) region is thus still not validated.

Misahualli

When I was finished collecting in Cosanga, I asked Franklin with whom I should talk to obtain information about Hercules beetles in the Amazonian region. He suggested that I visit Juana Peña, who owns a grocery store in the town of Misahualli, which is well known for ecotourism (Fig. 3). The store is located near the town circle, and it is found by taking the first left turn after you get into town. Local kids know that the Peñas are interested in beetles and will bring those that are attracted to streetlights in the central park to them. Sometimes you can only find the remains of Hercules beetles left over from predation by the famous Misahualli monkeys (Fig. 3). The Peñas have helped many researchers find beetles, including Takesune Noguchi, a Japanese scholar from the University of Hawaii, who studies the beetle fauna of Ecuador. During my visit, they were helping Gerardo Arriagada S., a Chilean Coleopterist, to find species in Loja. The Peñas are also famous among the realm of amateur beetle lovers; they provided many of the specimens from Ecuador in *BeKuwa* issues #18 and #32, including the 16.9 cm male *D. h. lichyi* found near Lumbaqui. They have a personal collection studio in Ambato about two and a half hours south of Quito, and would be the best place to go to visit their collections. However, Diego often travels around Ecuador, so it would be wise to schedule your visit in advance.

“*Dynastes hercules lichyi* is capable of flying over a 30 km distance” Diego said. When I asked him about potential hybrid zones between *D. h. lichyi* and *D. h. ecuatorianus*, he suddenly gave this information to me. The distribution limit of *D. h. lichyi* in the Sumaco region is at a distance around 30 km from Tena, which also marks the end of the Cordillera de Los Guacamayos. Below this mountain line, although there are still *Miconia* trees, nobody has ever found ssp. *lichyi* on these trees or close to rotten wood piles (the most widely practiced ways to collect *D. h. lichyi* in the Sumaco region). However, people can still find ssp. *lichyi* under street lights near the city of Tena! This finding simply implies that ssp. *lichyi* has extremely good dispersal ability. The edge of Cordillera de Los Guacamayos also marks the beginning of Amazonia, which is the primary habitat of ssp. *ecuatorianus*. Therefore, this 30 km region should be the best place to study hybridization of Hercules beetles. However, hybrids are rarely found, and most individuals of different subspecies can be easily identified unambiguously according to Diego's experience. *D. h. ecuatorianus*, not like ssp. *lichyi*, is not associated with *Miconia* trees. Actually nobody is sure about what kind of tree the adults of *D. h. ecuatorianus* feed on. Subspecies *lichyi* and *ecuatorianus* may require completely different host species, so even though they can both be found under the same street light, the adults may never have the chance to meet each other in their natural habitats. The population of *D. h. lichyi* living at the distribution edge, however, does have some unique characters (Fig. 3). Some individuals found in this region tend to exhibit lighter elytral coloration and whitish horn and body hairs. Subspecies *ecuatorianus* does have relatively lighter colored elytra than that of the others. This implies that potential introgression between subspe-

cies may have occurred in this contact zone. Only with a large amount of samples from the edge of Cordillera de Los Guacamayos plus samples from nearby ssp. *lichyi* and *ecuatorianus* populations can genomic data be used to statistically test if this special form is the product of introgression, new mutations, standing genetic variation, or combined effects. So far, there is no such dataset available. Nevertheless, this unique whitish *lichyi* of the edge population is certainly another exotic “FORM” recorded in the highly variable Hercules beetle complex and I believe many public as well as private museums will be very interested in these samples.

Dynastes hercules ecuatorianus has a cycle of high and low adult emergences on alternate years and this year, 2012, happens to be the right year for finding adults. Adults of this subspecies start to emerge in early March (rainy season), but only with very few individuals. The population number will reach the peak during May and then quickly disappear in the wild again. Although I called it a peak, samples for this subspecies are still difficult to find in Ecuador—they only fly to your light trap after 1 am (actually, the beetle that came in the earliest during my entire collecting trip was around 3 am, and the latest 5 am). Additionally, these beetles never stay near light traps, and will crawl immediately away from the traps after they hit the ground. This means that you have to always wait next to the traps (or hire some local people to take care of the traps for you) all night long. Together, the unique biology of *D. h. ecuatorianus* and the unknown host association make this subspecies really difficult to collect using these conventionally practiced ways of beetle hunting. On the other hand, many dead samples can be found next to oil stations inside the Amazonian region. These samples may be half burned because of the huge oil flames (or glass flares, which is what the locals call them), but are still good for genetic and morphological studies (some of my samples from Yasuni are like this). However, the oil stations are restricted areas for visitors and the application for a one-time visit permit will take several weeks to process. Near the glass flares, ssp. *ecuatorianus* can be found all year round, but still most abundant in April, May and June. The price of *D. h. ecuatorianus* in Ecuador was \$25 for a male shorter than 12 cm long, and \$40 for specimens larger than 12 cm. For all the males having a size over 14 cm, it would depend on bargaining with the seller.

From where I came from, Taiwan, there has been always an urbane legend about the relationship between *D. h. lichyi* and *D. h. occidentalis*. It says that *D. h. lichyi* and *D. h. occidentalis* live in close vicinity of each other in the Occidental Andes and the only way to identify females between these two subspecies is by altitudinal distribution, where *lichyi* is found in higher altitude than *occidentalis*. There were once several wild pairs of *D. h. lichyi* (supposed to be) imported from Ecuador into Taiwan as pets in 2003 or 2004. However, after one and a half year, the male offspring started to come out and most of them exhibited typical *occidentalis* characters. People started to realize that these “paired” *D. h. lichyi* were actually composed of male *lichyi* with female *occidentalis*, and thought that there must be some sympatric regions in the wild, which made discriminating females difficult. “This is completely wrong” Diego told me “*D. h. lichyi*, although can also be found in the Occidental region, is separated from *occidentalis* by different mountain ranges, instead of altitude.” In Diego’s experience of finding these giant beetles in the Occidental region, he has never found a sympatric region between *lichyi* and *occidentalis*. Mountain ranges of the Occidental region in Ecuador are mostly only around 2,000 meters height and there are extensive habitats not inhabitable for Hercules beetles on most mountain tops. Thus, there is no way for the two subspecies to exhibit altitudinal subdivision in Occidental Ecuador. They basically

have similar preferences for cloud forest habitats, although *D. h. lichyi* does prefer only highland regions while ssp. *occidentalis* can live in areas at nearly sea level. These two subspecies are found allopatrically in different mountain ranges, which geographically exclude each other in Ecuador. Insect collectors in Ecuador used to collect only males, because males had a much better sale price as specimens than females. However, when these sellers were asked for live pair beetles (mostly from Japan and Taiwan and sometimes Germany) they would sometimes just randomly pick up females in the nearby regions where the sellers process these beetles. The Occidental region was the center of many live insect dealers (for example, many Ecuadorian samples were originally exported from Los Bancos or Santo Domingo, which are inhabited by the subspecies *occidentalis*). “This is what I believe happened that time” Diego said. This implies that potentially some of these giant beetles in the pet trade market today are hybrids, even though they might exhibit typical characters of only one subspecies. On the other hand, these two subspecies rarely meet each other in Ecuadorian wild and natural hybrids should be rare.

“Have you ever seen a *Dynastes hercules* longer than 17 cm?” It is the most non-academic oriented but somehow most exciting question that I have ever asked Diego. “Yes, but it was already 11 years ago (2001) since the last time I saw one” Diego said. Having a Hercules beetle with a body length over 17 cm is the dream of many insect lovers, but only very few of them have had this privilege. Although there are always rumors about records of 18 cm Hercules beetles, none has been validated (not even a photo of the beetle with a caliper). The Taiwanese record of breeding Hercules beetles is a 16.7 cm *D. h. lichyi* by Yu-Shan Liu, the owner of a professional insect store, Tropical Jungle Co (*BeKuwa* #21 has a short interview about this store) and a 16.4 cm *D. h. hercules* produced this year in the annual Hercules breeders’ competition (<http://www.giant-beetles.com/record/firstannualthirdseason/1602.jpg>). While every once a while there will be a 17 cm long Hercules beetle, either *D. h. hercules* or *D. h. lichyi*, on the Japanese bidder website. Many people have wondered actually how common a real giant beetle, say 17 cm, is found in the wild, because despite there were and still are lots of insect breeders in Asia producing thousands of Hercules beetles every year, the chance of seeing a real giant seems pretty low among captive breed samples. A similar frequency likely also happens in the wild. For instance, over 1,000 samples of *D. h. lichyi* were collected every year during the beetle trading times according to Diego. Nevertheless, there was no 17 cm Hercules found between 2001 (the last one found) and 2008 (when an environmental protection law was erected), which implies that it has to be one out of a least 10,000. This might be the reason why private collectors are so eager for a 17 cm Hercules, and no matter how high the asking price, a specimen this big would sell out very quickly after being advertised.

Rio Chuchuvi

It is becoming more and more difficult to find *D. h. occidentalis* in the Occidental region of Ecuador*, so I followed Diego’s suggestion to visit a recently exploited habitat for this Chocoan subspecies, Rio Chuchuvi in Esmeraldas. There are actually only two accommodation places here in Chuchuvi. Once there you can start talking to local people and try to find someone who knows how to find beetles. Marco Bolaños lives with his family in a house near Balneario Chuchubi (Fig. 4), and he came to me after my field assistant explained to local people why we were there and what kind of beetles we were looking for. Marco is a famous local guide taking tours for butterfly observation, and he also breeds a variety of different butterflies and moths. He showed me some

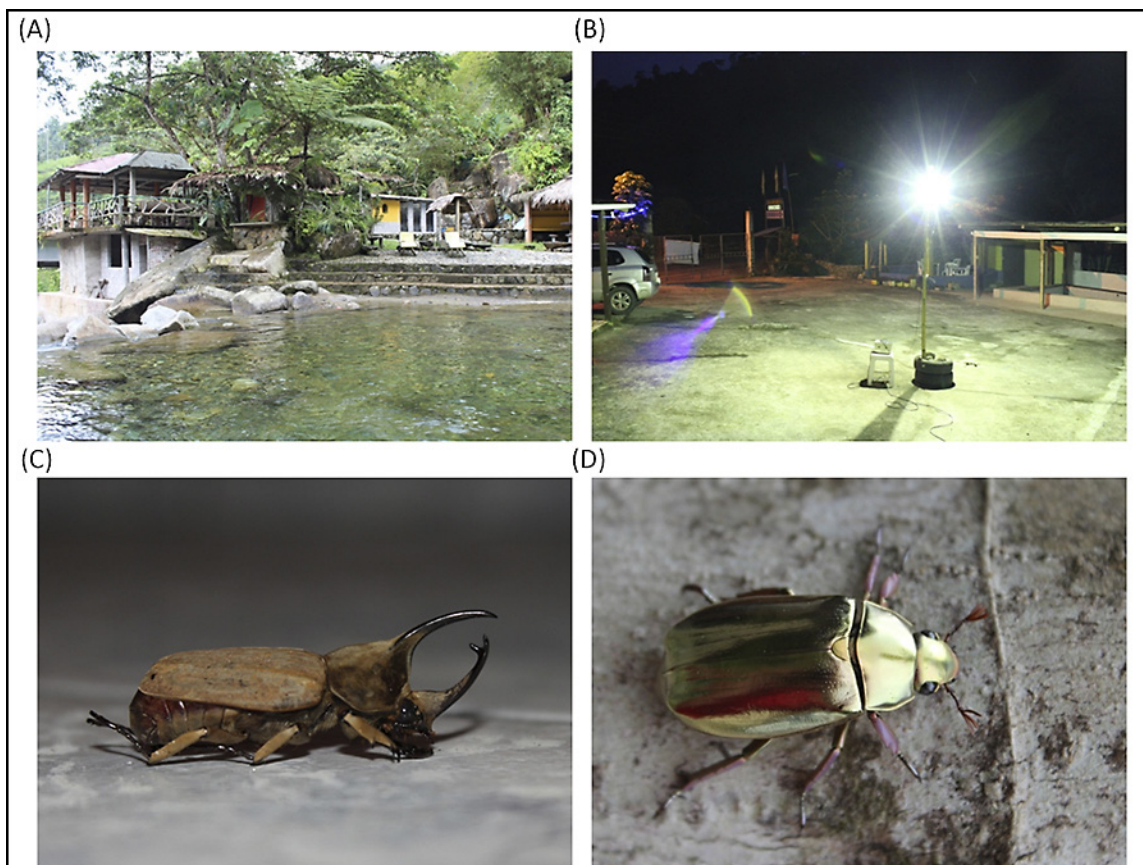


Figure 4: Rio Chuchuvi. (A) Parador Chuchuvi is a retreat built next to Rio Chuchuvi. (B) A mercury vapor light placed in Balneario Chuchubi, which has an open area surrounded by primary and secondary forests. It also has electricity, so you do not have to carry a generator and gasoline for your light trap. (C) *Spodistes grantis*, a small Dynastid, was attracted to the light trap at night. (D) A Jewel beetle was found in the daytime on trees near Rio Chuchuvi. This species is quite common in this area according to locals. Kids will bring them to you and sell them for \$3-\$5 (live) or \$1 (dead).

hawk moth species that he successfully breeds close to his garden during my visit. He also told me that a butterfly conservation and breeding center in Mindo has sent some people to his place to learn how to do this (specifically, they were here to learn more about adult and larval hosts for different butterflies and how to grow these plants). Additionally, he is now taking a course of tour guiding for Eco-tourism and will become a professional and full time guide very soon. He has helped a researcher from the University of Florida finding butterflies and moths every time when he comes to visit Chuchuvi. His kids are also really good at hunting insects, especially Jewelry beetles (Fig. 4).

**The number of Hercules beetles found in the famous Los Bancos and Santo Domingo regions has been decreasing. If you ask the local people why, they will tell you that it is because of illegal trades and over hunting. However, the Occidental region has been rapidly developed in recent years and many previously Cloud Forest habitats are now modified into grassland for cattle and dairy products. Personally, I believe that both direct and indirect exploitations are in effect, but the indirect one should be of major responsibility after visiting the Occidental side of Ecuadorian Andes.*

There are two times per year that people start to see an increase in the number of adult *D. h. occidentalis*. These two events correlate closely with seasonal changes, December and June. However, there will be a major adult rampancy once a year in February. Last February, there were two teams collecting this beetle near Rio Chuchuvi—one from local Ecuadorians and the other one from international people that looked like me (Asians?) according to Marco. Both of them set multiple light traps at different locations in this region and hired local people to regularly check the light traps, instead of directly buying beetles collected by local people. Their primary targets were Jewelry beetles, particularly a reddish-golden one (I did not know that such kind of Jewelry beetle exists here in Chuchuvi). They also collected the Hercules and Neptune beetles as well as the Harlequin beetle here. The record here right in the open space inside Balneario Chuchubi was five male Hercules beetles a night without counting females (I only found one pair of Hercules beetles after four nights at the exact same spot in late May). Like the subspecies *ecuatorianus*, adult *D. h. occidentalis* usually fly out very late at night; my own experience was 3:30 am (my field assistant and I regularly checked the trap every 30 minutes).

Forests in Western Ecuador are under very heavy exploitation now. Both legal and illegal logging can be seen everywhere. This however also increases collection reports of Hercules beetles in places close to previously unexploited tiny towns. For example, Alto Tambo is a small town 15 minutes drive from Chuchuvi. There are lots of woodlands and rotten wood piles being cleared



Figure 5: A Neptune beetle found near lights of a gas station around Los Bancos.

up rapidly, and it is in this region where many adult Hercules beetles have been found in recent years. We told local people that we could offer them rewards if they can provide me with live, freshly dead, and road-killed etc. samples. However, we often heard some of them say that “Somebody used to offer \$10 or \$15 per sample, how much will you pay for these beetles?” Of course, I did not have that much (\$20 was the salary I paid my field assistant per day, who speaks fluent English and can help carrying a generator over 1 km for setting up light traps inside the forest), and this made my collecting in this region really difficult even though I knew my beetles were there somewhere. Sometimes it makes me wonder if I represent too much a stereotype of an illegal-trade Asian guy, which makes them feel like I will pay them a lot for the beetles! These beetles are found when local people remodeled wooden fences, chopped down trees, and even worked inside the sugarcane and palm fields.

Most of the time, both Hercules and Neptune beetles here in Chuchuvi are found and collected under streetlights or by using light traps. Like Diego said, Marco confirmed that no one so far knows anything about the potential hosts for *D. h. occidentalis* and *D. neptunus*. Thus, unlike *lichyi*, these beetles can only be collected during the nighttime. Fortunately, not like *ecuatorianus*, there is a period of rampancy for *D. h. occidentalis*, which makes it also an abundant subspecies of the Giant Hercules beetle in Ecuador. The Neptune beetle here, although much rarer than *D. h. occidentalis*, is much easier to collect—if they fly to a light trap, they will never leave. Marco



Figure 6: Different color morphs of *D. hercules* found near the hotel El Reventador.

told me that *D. neptunus* also flies toward lights very late at night (from 1 to 5 am), but once it sticks on something that it can hold on to, it will stay at that place even during the daytime and leave the next following night. Thus, should someone in the future be interested in the population structure, morphological evolution, as well as phylogeography of *D. neptunus*, here is good news for you: you do not have to stay up all night when collecting this beetle!

Beetling in Ecuador

This is only dreaming; there is nothing close to birding with beetles. However, there are many types of Eco-tourism and a lot of bird watching groups present in Ecuador. These tourist groups tend to visit places where these giant beetles live. Ecuadorian government launched a new law for protecting natural resources, including exploiting insects from forests, four years ago. Now collecting, selling, exporting, and even transporting specimens without permits are illegal activities. However, many local people still remember what happened before four years ago, and some of them still have the knowledge of finding these beetles (some of them even keep samples from past beetle trades). If you try to talk to these people with respect, most of them are very willing to share with you everything they know about what happened here. And, if you are lucky enough, an Eco-tourism specifically for beetle finding may be on the way too. Try Googling birding tours in Ecuador—Coca, Cosanga, El Reventador, Mindo, Misahualli, and Yasuni etc. and enjoy seeing more humming birds than beetles here with your family in Ecuador. It will be safe and worthy and like I said in the very beginning, you will eventually meet these giants in the wild as long as you come in the right season (Figs. 5 & 6).

For Young Readers Only: Dung Beetle Traps as Gifts

Kent Fothergill, Biologist

Conservation Seeding and Restoration, Inc.
506 Center St. West
Kimberly, ID 83341 U.S.A.
www.csr-inc.com

Hey Kids! Christmas is coming and hand-made gifts are always in style. Here is a great gift idea for Mom and Dad: homemade dung beetle traps! The traps are easy to make from materials you probably already have at home. First assemble your tools and materials (Figure 1): used pop bottle (2-liter works best), wire (18 gauge electric fence wire works best, but any solid metal wire will work), pliers (for cutting and bending wire), scissors, and little plastic cups (a friend once grabbed a season's supply from McDonalds where they used them for ketchup).

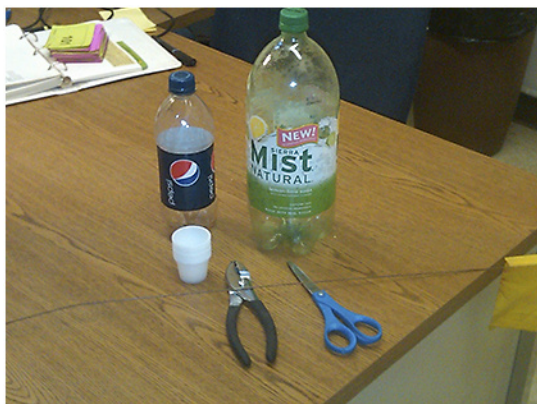


Figure 1: All tools and materials present, let's make a trap!



Kent wearing his tiger beetle disguise to better enable him to sneak up on unsuspecting scarab beetles.



Figure 2: Note insertion point of scissors. Remember, scissors are sharp – be careful! First carefully insert scissors into the pop bottle at the point where the top taper ends.



Figure 3: Remove the top of the bottle. Proceed to cut off the top of the bottle with the scissors. I have the label as a guide for a straight cut.



Figure 4: Inverting the top creates a funnel which makes this pitfall trap the bomb-dig-gity! Remember to remove the cap from the funnel or your trap or it won't be as effective.



Figure 5: A band of material has been removed from the top of the bottom of the trap. This makes the trap shorter and easier to bury in shallow or rocky soils.

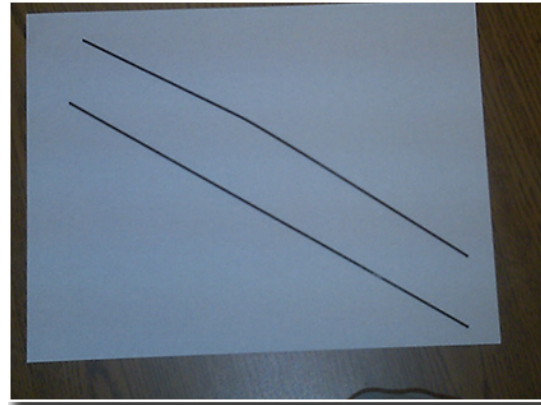


Figure 6: Next cut two 10-12" pieces of wire destined to become a 'spider' bait holder.

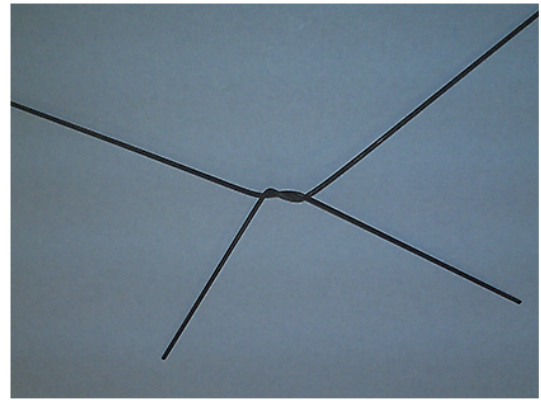


Figure 7: We have begun making the 'spider'. Please note that the wrap is about three inches from the ends of the wire.

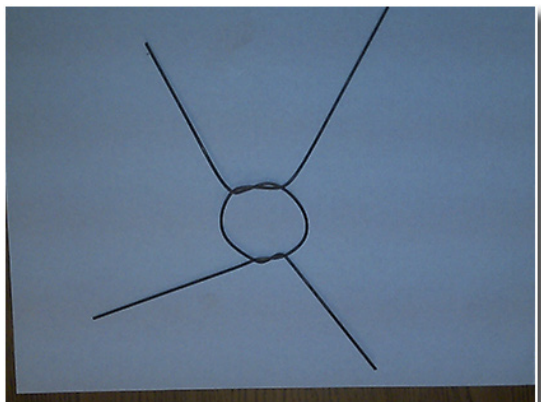


Figure 8: Next we form the actual bait holder portion of the spider and make another wrap to hold it together as shown. The bait cup will sit nicely in the little circle.

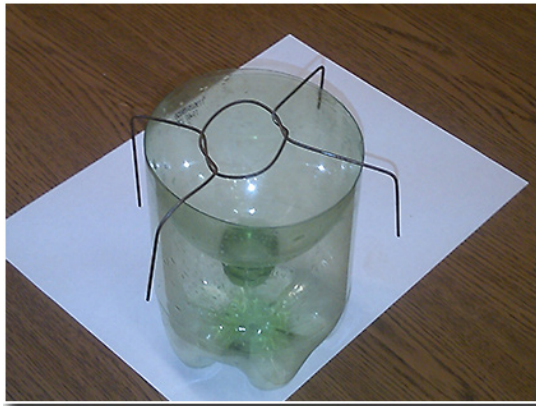


Figure 9: The next step is to bend the legs of the 'spider' so it will hold the bait above the trap. The legs of the spider are properly bent. Being slightly larger than the trap allows insertion of the wires into the trapping substrate (ground).

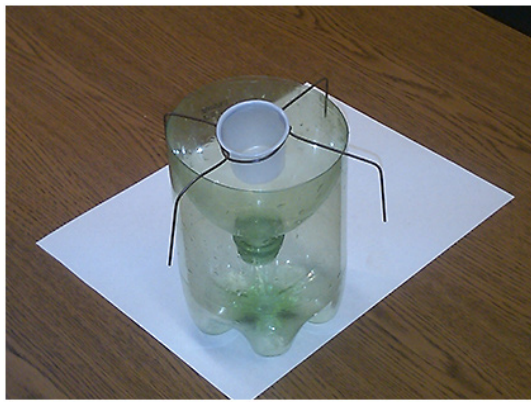


Figure 10: An assembled trap ready for burying, baiting, and deployment in field! Won't Mom and Dad be thrilled when they unwrap a set of these Christmas morning! Now just add a diet cup of your favorite dung beetle trapping bait and you are ready to go trap dung beetles. If Mom and Dad have been especially nice this year consider making them a nice bait to go with the traps! Holiday foods like nuts, chocolate, fruits, and eggnog have interesting chemical signatures that, after processing into bait, are very attractive to dung beetles. You can save bait in the freezer for months without loss of attractiveness, so the baits you make this holiday season can remind your parents of the wonderful holiday times you shared during the summer trapping season!



Figure 11: A dung beetle trap nicely set in a post burn environment. When your parents are ready to place traps in field they will most likely want to place a solution to kill the beetles so they don't tear each other apart. My parents like to use antifreeze, but alcohol or dish soap and salt are also used. Your parents will likely want to run and rebait their traps every week or so – be sure to keep your little brother well fed so Mom and Dad don't run out of bait!



Figure 12: *Phanaeus vindex*! Imagine how proud Mom and Dad will be when the trap their first *Phanaeus* with your special bait!

***Scarabs* Newsletter Headquarters Moves to Asia!**

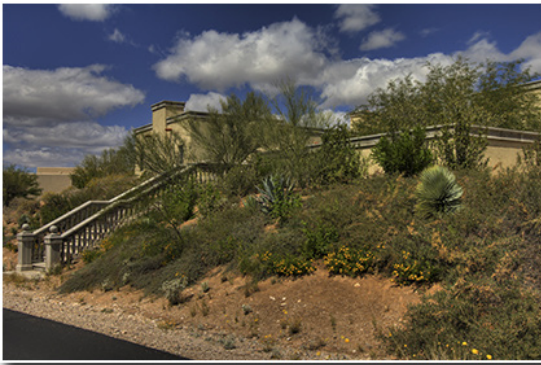
by Barney Streit

barneystreit@hotmail.com

My other life as an endodontist recently presented me with the opportunity to finish (or nearly finish) my dental career in the exotic locale of Singapore. Since I do not consider myself well traveled nor very worldly, I jumped at the the opportunity. I will be working for a large group with 53 offices.

I plan to use my new location as a hub to (hopefully) extensively travel in this part of the world. Who knows - I may even be able recruit articles from scarabaeologists in the area.

We are keeping our home in Tucson since we will eventually return. Anne will help house sit and promises to keep the doors open to bug people who have traditionally stayed while collecting: Annie Ray, Ian Swift, Gino Nearns, Keve Ribardo, Jacques Rifkind, Chuck Bellamy, Rich Cunningham, Bill Warner, Jim Saulnier, Art Evans and others will still be welcome!



Above: The former headquarters of *Scarabs*.

Right: Lead trap designer Anne will help oversee the former headquarters in Tucson, Arizona. She promises that her house sitting duties will not interfere with her efforts to innovate new and radical traps for scarab beetles.

