A Passion for Rhinoceros and Stag Beetles in Japan

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I am from Shizuoka, Japan. I am currently pursuing my Ph.D in Entomology at the University of Nebraska-Lincoln and studying biology and applied ecology of insects in cropping systems. Among many insect taxa I am interested in, dynastines and lucanids are my favorite groups.

I have enjoyed collecting and rearing these beetles throughout my life. I began collecting beetles with my parents and grandparents when I was two years old. When I was about six, I learned to successfully
Rhinoceros and stag beetles are the most popular insects in Japan. They are most frequently collected and reared. Although many of my American friends think my hobby is strange, I still collect and rear some of the larger species in the United States. *Dynastes tityus* is one of my favorite U.S. species.

My son played with *Dynastes tityus* for the first time when he was 18 months old. It is common for Japanese parents to give or show rhinoceros and stag beetles to their young children.

Rear some Japanese species. Since I came to the United States, I have been enjoying working with American species. I have great support from my family to continue my hobby. My wife wants our two-year old son to become interested in rhinoceros and stag beetles. He loves them so far and always wants me to show him my beetles. What I miss the most about Japan is the fact I can easily purchase live beetles from all over the world as well as beetle rearing supplies.

Rhinoceros and stag beetles have positive reputations and are culturally and economically important in Japan. They are sought after not only by taxonomists and serious insect collectors, but by a large population of the general public. When I tell Americans that my hobby is collecting and rearing rhinoceros and stag beetles, some of them probably think I am the strangest person they have ever met. However, this is not the case in Japan. People think I am cool because I collect and rear *Dynastes granti* Horn, *D. tityus*

Live rhinoceros and stag beetles can be purchased in Japan. Live beetle sections at supermarkets can attract a lot of people. Courtesy of Japan Kuwagata Association. (Yes, we have McDonald's in Japan.)
Linnaeus), and *Lucanus elaphus* Fabricius in the United States. Even young children in Japan can recognize species from the U.S. and other counties. Collecting and rearing rhinoceros and stag beetles are culturally well accepted and are common hobbies among Japanese people.

The general public in Japan has a tremendous interest in insects. Many people are specifically interested in live insects instead of preserved specimens. Rhinoceros and stag beetles have been the most popular insects in the past few decades. Even those who have never taken any entomology courses are familiar with the basic biology of popular species and excel at collecting. For example, they know what type of habitat in which to look, what tree species attract beetles, where beetles hide during the day, and where to find larvae during the winter. Perhaps because people have such a large interest in insects, insect collecting is not restricted in most parts of Japan. Even national parks are generally open for insect collecting. As well as collecting rhinoceroses

*Lucanus maculifemoratus* Motschulsky is a popular Japanese species. Stag beetle collectors often target on this species. I found this specimen and a few other stag beetles on the same sap flow on an oak tree.

*Dorcus hopei binodulosus* used to be called a black diamond and was as expensive as real diamonds. This is a large species native to Japan and is most commonly reared today. This individual was reared by my mother, who did not even collect insects (I got her to take care of my beetles when I left Japan to come to the United States). Today’s rearing methods and supplies enable even beginners to successfully rear this species.

*Dorcus bucephalus* (Perty) from Indonesia reared and photographed in Japan. This is one of many foreign beetle species that can be legally imported to Japan. I also had my mother take care of this species when I left Japan. Even without much knowledge of rearing stag beetles, she reared this 80-mm long beetle, using commercially available rearing supplies.
Chalcosoma chiron is one of the most commonly sold foreign beetle species in Japan. Since I never had an opportunity to collect in the tropics, I placed my male Chalcosoma on a banana plant (a species that grows in central Japan) in our backyard, pretending as if I were in the tropics.

This is a part of the foreign stag beetle section of a beetle shop in Japan. Most of them are large species from the tropics. Normally, a male and a female of the same species from the same location are sold as a pair. A pair of Lucanus elaphus was sold for 15,000 yen (about $180) when I visited this shop. Although L. elaphus is considered a small species, it is expensive because stag beetles from the United States are not commonly sold in Japan.

and stag beetles in their natural habitats, people often purchase live beetles to keep them alive in their homes. In addition to beetle specialty shops, various stores such as super markets, home improvement stores, department stores, and pet stores have live beetle sections. In the 1990s, one of the Japanese stag beetle species, Dorcus hopei binodulosus Waterhouse, was often called a black diamond because it was black and as expensive as real diamonds. It was large and difficult to collect. They were coveted by people and sometimes worth thousands of dollars. Popularity of D. hopei binodulosus and other large beetles led to the development of a large beetle industry in Japan.

Even though extremely high prices for D. hopei binodulosus are not seen today, rhinoceros and stag beetles are having even greater impacts on Japanese society. People’s interest in these beetles led to establishment of easy and inexpensive rearing methods, which are available to both professional breeders and casual hobbyists. Even those who do not have any entomology background can easily rear large beetles using supplies specifically made for this purpose. Beetle jellies contain important nutrients for adult beetles and increase longevity and fecundity. Commercially available adult substrates increase egg laying by females. Special larval diets often lead to development of beetles that are larger than those found in the wild. Cages were made to control
humidity and also prevent pestiferous flies that are nuisance to people from entering and escaping from the cages. Supplies are readily available through local and online stores.

One of the monumental events accomplished by the popularity of rhinoceros and stag beetles in Japan is the revision of the plant protection law. This law historically prohibited importation of live insects. A number of Japanese people, including me, dreamed about someday being able to rear some of the most impressive beetles in the

*Dynastes hercules* is the most popular rhinoceros beetle species.

This is a part of the supply section. Various rearing supplies can meet the needs of different beetle breeders and beetle species.

This is another part of the rearing supply section. The top shelf has larval diets called kinshi-bin (sawdust infested with mushroom spawn). The second shelf has beetle jellies, jelly stands, and egg laying logs. The third shelf has substrate for adults and larval diets for rhinoceros and stag beetles.
A screen shot of the website from an online beetle shop. This page shows adult stag beetles on sale. Prices vary by the species, size, collecting location, and color. Courtesy of Tukiyono Kinokoen.

Another screen shot from the beetle shop website. This page shows substrates for adult rhinoceros and stag beetles and larval diets. Courtesy of Tukiyono Kinokoen.

The same online beetle shop has pages for their customers to submit pictures of them and their beetles. Each customer reports what species they are rearing, how big they are, and what products they used for rearing. Courtesy of Tukiyono Kinokoen.
There are several magazines focused specifically on rhinoceros and stag beetles. They target a wide range of audience from casual hobbyists and professional breeders to taxonomists. Articles in these magazines cover various topics, including taxonomy, collecting, and rearing.

Beetle contests are held in beetle magazines. Beetle breeders compete in different categories, and they try to make their beetles the largest, best shaped, and most beautiful possible. Anyone can submit their beetles if they find an appropriate category. The participants who finished in the top five places are featured on color pages in this magazine. Courtesy of Mushi-sha.

These black and white pages contain other participants in the same beetle contest. There are usually several pages like these for each contest. Many people love rearing beetles. Courtesy of Mushi-sha.

World such as *D. hercules* (Linnaeus) and *Chalcosoma chiron* (Olivier). This revision truly made dreams come true for thousands for Japanese people. In 1999 the regulation was eased, allowing certain foreign species of rhinoceros and stag beetles to be imported. As of 2011, live specimens of 115 rhinoceros beetle species and 773 stag beetle species can be imported to Japan without special permits. Over two million beetles are estimated to be imported annually. Since foreign beetles became available in Japan, the beetle industry rapidly grew. The number of beetle shops increased dramatically to meet the demand of live rhinoceros and stag beetles and rearing supplies.

Because rhinoceros and stag beetles are an important part of the lives of many people, thousands of websites and blogs about collecting and rearing these beetles exist in Japanese. Beetle themes are commonly found throughout Japan. Video games that por-
Insect themes are commonly found in Japan. This is a toy stag beetle strapped to my USB flash drive.

These are my son’s sweatshirts, long-sleeved t-shirts, and socks that have pictures of rhinoceros and stag beetles. All of these were purchased at regular clothing stores. When he wears these clothes in the United States, some of his friends’ mothers are scared.

The cover of a notepad with pictures of rhinoceros beetles is shown on the left. This product may not be very functional as a notepad because almost half of the writing space is taken by pictures of beetles (right). However, this product is attractive to people because it has picture of popular beetles.

tray scarab and stag beetles have become popular. A beetle combat game caused a social phenomenon with huge numbers of sales and tournaments. Pictures of beetles are found on school supplies and clothing. Numerous beetle books targeting a wide range of people are available throughout Japan. There are several magazines focused specifically on rhinoceros and stag beetles. Articles in these magazines cover various topics such as taxonomy, collecting, rearing, behavior, biology, beetle business, and record breaking beetles (e.g., large and small specimens). Beetle contests are also held in beetle magazines. Beetle breeders compete in different categories, and they try to make their beetles the largest, best shaped, and most beautiful possible.

The whole world of beetle business
Stickers of rhinoceros and stag beetles.

Rhinoceros and stag beetle patches that can be attached to clothes and bags.

and hobbies exist in Japan because of the great interest people have for rhinoceros and stag beetles. If you are a scarabophile, you may want to visit Japan not only to collect but to find out how passionate people are about these beetles.
This photograph was taken at the same place and time as the one that appeared in *Scarabs* 59, Bug People XVI: Portal, Arizona, in the 1960s. We have both come a long way, and time has treated us rather well, I think. We were both President of the Coleopterists Society and are honorary members of that organization, as is this person’s wife, Anne. I like to think that this coleopterist and I have advanced our knowledge of Scarabaeoidea and Tenebrionidae a bit.

Answer: Henry Howden.
In September, 2000, I had to have my appendix removed. This, and a resulting infection, made me, with Anne’s concurrence, decide that we should not be too far from good medical facilities. With this in mind, Anne and I accepted an invitation from Richard Dearborn to visit Augusta, Maine, and work on the Forestry collection there and spend some time collecting locally. Unfortunately, slides taken on this trip and a subsequent trip to Louisiana cannot be found, so beetle pictures taken by Jocelyn Gill will replace and greatly improve my usual illustrations.

We left Ottawa on June 6, 2001, and drove to Gorham, New Hampshire, spending two nights there. One of our reasons for stopping there was to take the cog-railway up Mt. Washington. About 1936, a hurricane had destroyed part of the tracks of the cog-railway, so when my mother and I went to Mt. Washington, we took the road up the mountain. Back then I did not have any collecting equipment with me nor did I have a chance to collect. This time I was prepared and had several bottles, but no net. There was nothing of special interest that either Anne or I worked on, but any beetle found would be of general interest. When we finally reached the summit of the mountain, the weather was cold, windy and we were in and out of the clouds. The terrain consisted mostly of piles of

Photo 1: A common cerambycid, *Monochamus scutellatus* (Say) found on conifer logs. Photo courtesy Jocelyn Gill.
rock with paths marked by a few stacked rocks. As we had only an hour before we were due to return, we turned over a few pieces of wood and a few small rocks with no results. It was an interesting day spent as tourists, but a bust as far as our collecting went.

The next day we drove to a small motel near the Dearborn home several miles from the city of Augusta. The three or four miles of back road between our motel and the Dearborn house consisted mostly of a mixed hardwood-coniferous forest with some areas being cleared for new buildings. Many of these clearings had piles of logs and branches which provided some of our best general collecting, yielding numerous cerambycids (Photos 1 and 2) and buprestids (Photo 3). There were even a few *Hoplia* and *Dichelonyx* sitting on leaves. One small cerambycid, *Tetrops praeusta* (L.) (Photo 4), taken in a Malaise trap set near an apple tree near the Dearborn house, proved to be a European introduction which is an occasional pest in orchards.

The Dearborn’s dog obligingly deposited an occasional pile of bait in their dirt driveway which attracted some common *Aphodius* and *Dialytes ulkei* (Horn) (Photo 5). Fruit and dung traps caught nothing unusual and a one day trip to the coast produced nothing of real interest except the scenery.

I had hoped to find specimens of *Lichnanthe vulpina* (Hentz) (Photo 6), which is known to be a pest in cranberry bogs, but none...
were seen. In our two weeks near Augusta, we enjoyed the general collecting and the great hospitality of the Dearborns, but many of the scarabs collected also ranged north to the Ottawa area. The rest of the summer was spent in or near Ottawa.

Although we had collected in western Florida and extreme north-eastern Texas, we had never spent any time in Louisiana. We had been told by Chris Carlton, Professor of Entomology at Louisiana State University, Baton Rouge, LA, that we were welcome to visit. On April 26, 2002 we flew to Baton Rouge via Atlanta, and were early enough to have lunch with Andy Cline. In the afternoon we went with Andy to the Entomology Department to see the collection and later meet with Chris Carlton and Victoria Bayless. The next day was spent looking at the collection, renting a car, and that evening going to a “shrimp boil” at Chris Carlton’s home. The “boil” almost didn’t happen; the propane gave out in the first few minutes and the hunt for more lasted for quite a time. However, a good time was had by all; we met a number of interesting people - too bad we didn’t keep a list! The next day was spent looking over the L.S.U. collection and getting suggestions about where to collect. We were warned that it had been an unusually dry spring, but there had been some recent rains.

Photo 3: A common buprestid, *Chrysobothris femorata* (Olivier) that was on oak and other dead hardwoods; trying to catch specimens was fun. Photo courtesy Jocelyn Gill.
The following morning we drove north to the town of St. Francisville and took a room at a Best Western. Eleven miles east of town the Entomology Department was allowed to use a cabin in a wooded area with a small pond. Driving there we passed a hotel with a golf course attached called “The Bluffs”. From there to the cabin it was wooded and looked like good collecting. At the cabin (which we could enter) we set up several flight intercept traps, and dung and banana traps. The area was very dry and only a single *Aphodius* was collected under a small bit of dung. That night a black light attracted only two species of *Phyllophaga*, some *Diplotaxis*, *Anomala* and several species of *Aphodius*. I had hoped to collect several species of large lucanids (Photo 7), but none were seen the entire trip.

After four days we were told that we would have to leave because the hotel had booked a convention and all the rooms were filled. As we had booked the room for a week, we were unhappy, to say the least, but our arguments did no good. To make a long story short, we wound up at “The Bluffs”, and since it was “off season” we obtained a room at almost the same rate that we had at the motel. Also they did not mind us collecting insects - “We were welcome to all the **** bugs”! In one place the grounds keepers had piles of branches and even a few recently cut trees. The area yielded many species of cerambycids, buprestids, weevils and even a few scarabs at our black light, *Aphodius*, *Trox*, *Phyllophaga*, *Phileurus*, *Dialytes ulkei* (Horn), a species found in the Dearborn’s driveway, attracted by bait left by their dog. Photo courtesy Jocelyn Gill.

Photo 4: *Tetrops praeusta* (L.), a European species of cerambycid that has also been collected in Quebec, Canada on live apple twigs. Photo courtesy Jocelyn Gill.

Photo 5: *Dialytes ulkei* (Horn), a species found in the Dearborn’s driveway, attracted by bait left by their dog. Photo courtesy Jocelyn Gill.
and a *Pelidnota* (the last genus now has more North American names that need to be sunk due to a recent “revision” by a European author). Our traps at the cabin did not collect anything new, but the banana traps collected many nitidulids and the dung traps produced several species of *Onthophagus*, including the colorful *O. concinnus* Laporte (Photo 8)

We departed from The Bluffs and returned to Baton Rouge, spending the remainder of the day at the Entomology department. The next day we turned in the car and tried to get on the 1:30 PM flight to Atlanta. It was over booked, so we waited for the 3:30 plane, which was delayed by bad weather for an hour. Arriving in Atlanta, we were too late for the Ottawa flight and all other possible flights were fully booked. We spent the night in Atlanta, arriving in cool (as stated in my field notes) Ottawa about noon the next day.
In mid-August we flew to Vancouver Island to visit two of our daughters who, at different times, had migrated there. We spent a week visiting and, as usual, collecting. The most interesting scarab collected was *Cremastocheilus armatus* Walker, often found in the dunes of Island View Beach, south of Sidney. Vancouver Island is supposed to be the type locality, but Walker also collected on the mainland and his data on the species described did not include exact localities. I was, and am, happy to leave this problem to others, but the Island View *C. armatus* differed slightly from “armatus” that I had collected in the Okanagan Valley, British Columbia.

After a week on Vancouver Island, we flew to Reno, Nevada, arriving on August 24, 2002. Anne had seen a very unusual *Pandeleteius* weevil from California near Reno, collected in late August. The specimen was beyond the usual range in North America for the genus; also it was unlike any other U.S. species. For those reasons, plus the fact that the area had been visited by a number of collectors, we suspected it might be mis-labeled. Nevertheless, it was a good excuse to collect in an area new to us, even though it was not the best time of year.
In Reno we rented a car, found a motel that suited our budget and the next day went to Loyalton, California, the nearest town to the locality listed on the label of the odd weevil. Since there was no host listed on the label, we collected where we could near Loyalton on Dog Valley Road (Photo 9), beating a variety of plants. The area yielded one species of weevil (not what we wanted), one clerid and one chrysomelid. After several hours we moved on to a nearby pine forest, again with no luck. Driving south, we took a wrong turn, and after a time, wound up at Donner Pass (elevation 7,200 feet.). The Pass (Photo 10 and 11) was of historic interest as an early wagon train had been trapped there by heavy snow for four months and when found there were only 48 out of 87 still alive. We found many tourists there, but few insects and not any we wanted.

We then went around the eastern edge of Lake Tahoe, finding lots of traffic and people, so returned to Reno. The next morning we visited the Department of Agriculture and met Jeff Knight (Photo 12). He showed us their collection, which had a number of interesting scarabs, including a female Megasoma collected in southern Nevada. We were given some better maps and also learned that there had been no rain in much of Nevada and adjacent California for several months. Jeff gave us information on possible collecting sites, including some nearby sandy areas.

Photo 9: Dog Valley Road Near Loyalton, California, where we hoped to collect additional specimens of the unique, odd Pandeleiteius that was labeled from that area. Unfortunately, we did not find any specimens of the genus.

Photo 10: Donner Lake, California, just below the Pass and below where the wagon train was marooned for four months by heavy snow.

Photo 11: Donner Pass, California, where one of the worst wagon train accidents in the history of the USA happened: of the 87 people on the wagon train, only 48 survived!
That afternoon we collected near the California - Nevada state line. The area was very dry and two hours of tree bashing and sweeping yielded only three species of small weevils, nothing else. The following day we drove south of Reno to two small lakes with adjacent small sand dunes. We first collected around Little Washoe Lake (Photo 13), finding only a species of tiger beetle. We then moved to the larger Lake Washoe, which had fairly extensive sand-dune area around it (Photo 14). There we collected one dead *Serica*, cicindelids, cerambycids, meloids and some other small beetles. Digging up some of the dune plants looking for scarabs was unproductive, but we did find several of the cerambycids at the base of the occasional plant.

That evening we ran our black light in the dunes, but only one beetle came to the light. We did collect a few others by beating, but no scarabs. The evening was cool and windy, and at 10 PM we returned to Reno.
Our last day there we decided to collect at the higher elevations, driving to Route 43 and then west up into the Sierras. Our first stop (Photo 15) was at approximately 7,500 feet where we collected on a clump of yellow flowers which yielded a number of tiny weevils. We then drove on to a high point at 8,900 feet (Photo 16) where there was a US campground. Collecting there on pine and other conifers turned up one dead *Dichelonyx* and two species of broad-nose weevils. At a slightly lower elevation a series of a different chrysomelid was taken on *Artemisia*. Everything was just too dry for most beetles; so back to Reno without solving the *Pandeleteius* locale.

The evening was spent packing and the following morning we flew to San Francisco, then to Toronto where we spent an hour on paperwork since our checked bags were missing, then on to Ottawa and more forms to fill out, arriving home at midnight.

In November we made a brief trip to Florida where we first went to Ft. Lauderdale for the Entomology Society of America annual meeting and then to the Archbold Field Station for several days of collecting and an extended meeting of a few coleopterists. It was a pleasant way to end the field work for the year 2002.
Here are two images of a male *Golofa pizarro* Hope, 1837. It used to be called *Golofa imperialis* Thompson, 1858. Brett Ratcliffe and Ron Cave placed *G. imperialis* under synonymy in *The Dynastine Scarab Beetles of Honduras, Nicaragua and El Salvador*. This species comes from a forest at 2,000 meters elevation very close to Guatemala City. It generally flies during the period from September to October.