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The Entomological Society of Manitoba

Newsletter

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ABOUT THE ESM NEWSLETTER

The Entomological Society of Manitoba Newsletter is a forum whereby information can be disseminated to Society members. As such, all members are encouraged to contribute often. The Newsletter is interested in opinions, short articles, news of research projects, meeting announcements, workshops, courses and other events, requests for materials or information, news of personnel or visiting scientists, literature reviews or announcements and anything that may be of interest to ESM members.

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Editors' Comments

Welcome to the spring issue of the 50th edition of the newsletter! Early-season flowers are blooming, insects are active, and now it is time for us to break our hibernation!

In this issue's submitted articles, we follow along with regular contributors as they explore early-spring habitats, and learn about Jewel Scarabs – with stunning images of course! If you have an insect-related story or field trip from Manitoba to share, please consider contributing to the summer/fall issue of the ESM Newsletter. Email us with any questions.

Enjoy!

Justis Henault and Phoenix Nakagawa
ESM Newsletter Co-Editors

President's Message

Greetings fellow bug enthusiasts!

I would like to let you know that the Youth Encouragement & Public Education (YEPE) Committee now has its own dedicated email address: entsocmanitobaeducation@gmail.com. This will help the committee keep track of its activities year after year and therefore help with continuity. It will also ease both communication between the committee and the public and members themselves. Furthermore, a Google Drive associated with this email address will be used as a repository for the YEPE Committee. Additionally, a Google form for booking outreach activities is available on the ESM website under the *Education* tab. Using this form, members of the public are now able to request outreach activities in a streamlined fashion, which will reduce back and forth communications and enable the YEPE Committee to more efficiently coordinate outreach activities. We must thank Cecil Montemayor, Madeleine Dupuis, and Jordan Bannerman for having taken the initiative and time to make these improvements and to implement them.

On the topic of outreach, it has been several years since I have given outreach presentations at schools, but over the last two months I have given three such presentations and really found them rejuvenating. Nowadays, I spend most of my time in my office and very little time observing insects, and I kind of miss it. It is amazing to see how young children have an innate curiosity about the natural world and how keen they are to see and touch insects. It seems to bring children such joy and excitement, and at these moments I recognize myself in them, in the excitement of being able to see and touch an amazing insect that I have never encountered before. It is also very rewarding to contribute to children's awareness of insects; next time they see an insect they may better appreciate it, and perhaps not be afraid of it—and hopefully not kill it without giving it a second thought! I believe that deep down what we fear is what we do not know, so by participating in the outreach program we do more than teach children about insects; we also teach them to live in peace with them. I am sure there is always room for more outreach volunteers, so anyone who is interested in giving outreach presentations can contact the YEPE committee at the aforementioned email address.

It appears that spring is finally here, and I am sure we are all glad for it. For most of us, it means a time for fun outdoors activities and for fieldwork. For the natural world, it is a time of rebirth and therefore an opportunity for us to observe insects in their natural habitat. As much as we can, enjoy the beautiful colors, patterns, and shapes of preserved insects and appreciate the behavior of insects in the laboratory. However, nothing beats observing insects in the wild. So, enjoy this time!

Vincent Hervet
President of the Entomological Society of Manitoba

Bulk order of discontinued ESC publications for ESM members

The Entomological Society of Canada (ESC) is giving away its remaining paper copies of the Memoirs, Supplements, Bulletin, and The Canadian Entomologist on a first come, first served basis. If anyone is interested in any of these issues, please contact Vincent Hervet (entsocmanitobapres@gmail.com) by **July 31st, 2024** with a list of issue(s) you would like to receive and we will place a bulk order, free of charge for ESM members. Note that not all the issues remain available as some of them have been sold out over the years. An inventory of the ESC Memoirs and Supplements that remain available is available at **https://esc-sec.ca/wp-content/uploads/2022/01/MemoirList-Jan-2022.pdf.** The ESC has indicated that paper copies not claimed by **October 19, 2024** will be destroyed.

Regional Director's Message

At our most recent Entomological Society of Canada (ESC) Board of Directors Meeting, held on January 17, 2024, we had updates on some of the coming annual meetings, as well as a few other items the ESC is dealing with.

The **joint annual meeting (JAM) for 2024** will be hosted by the ESC and the Entomological Society of Quebec in Quebec City from October 20 – 23, 2024. The meeting theme will be *The Good, The Bad and The Ugly - A Matter of Perspective*.

The committee planning the **2025 JAM** with the Entomological Society of Alberta had visited several hotels in Calgary and Edmonton. It has been decided that the 2025 meetings will be held from October 5-8 in Calgary and will be held at the Best Western Premier Calgary Plaza Hotel and Conference Centre. The primary reason for selecting Calgary was the ease of air travel from eastern Canada and the thought that proximity to the mountains may attract greater registration numbers.

The **2026 JAM** will be held in Winnipeg, but planning is still in the early stages, and a venue has not been selected yet, while the **2027 JAM** will be held in Newfoundland. It has now been approved that the **2028 JAM** will be held in Montreal and will be a joint meeting between the Entomological Society of America and the ESC. Normally, the Entomological Society of Ontario (ESO) would be in rotation to host the 2028 JAM, but the ESO had agreed to cede its place in the case that the ESA chose Montreal as the host city.

Some of the **physical assets** of the ESC that are stored in Ottawa have been moved to a new locker. The material is now being stored at *Just Right Self-Storage* in Ottawa. The material includes complete sets of The Canadian Entomologist, historical administrative documents, ESC awards related material, and extra copies of ESC publications that are marked for disposal unless requested by membership (please see details in the notice preceding the Regional Director's message).

The **Strategic Road Map** for the ESC has been looked at by the Executive Committee and feedback is being collated. This will then be distributed to the Board for final approval before it is made available to the membership more broadly. Hopefully this would happen before the JAM in the fall.

The ESC is due to renew its **contract with Cambridge University Press**. The contract is set to expire at the end of 2025 but if ESC chooses not to renew, it must provide written notice by September 2024. A task force has been assembled to deal with this.

Our next Entomological Society of Canada Board of Directors Meeting is on April 29.

John Gavloski; *Regional Director to the Entomological Society of Canada*

From the ESM Executive

Your Society Needs YOU!

The Entomological Society of Manitoba depends on its members to fulfill its purpose to further the spread of entomological knowledge. The Society functions thanks to the volunteered time and support of members - like you!

The following vacancies/up-coming vacancies have been identified:

Executive
President-Elect (elective)
Member-at-Large (elective)

Committees
Chair Scientific Program for Annual General Meeting 2024
Chair Social Committee

Information about duties and terms of appointment can be found here:
https://entsocmb.ca/ESM_committee_guidelines.pdf

Expression of interest and nominations, including self-nominations, can be submitted via e-mail to Jade Tanner (entsocmanitobasecretary@gmail.com) or Alberto Civetta (a.civetta@uwinnipeg.ca).

Submitted Articles

Opening Day for the 2024 Field Season

Thilina Hettiarachchi[1] and Robert Wrigley[2]
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Waiting impatiently through a long winter and the delayed spring of 2024, two entomological field guys could wait no longer to experience the great outdoors. And so, on a cold (7°C) and windy April 6th, with patches of snow still lingering in protected sites, the two of us headed out to the Portage Sandhills, 18 km south of Portage la Prairie (49.800629, -98.217526; off Provincial Road 54N), with the weather office promising a sunny, 15°C high (never quite made it!). This is the site where Deanna Dodgson and Robert carried out their study of the Eastern Red-winged Blister Beetle, *Tricrania sanguinipennis* (Say, 1824), whose triungulin larvae attach to ground-nesting bees (e.g., *Colletes inaequalis* Say, 1837 and *Colletes thoracicus* Smith, 1853), and then devour the bee larvae in the bee burrows (Dodgson and Wrigley, 2022). Robert wanted to determine if the adult beetles had begun to emerge by this date, to compare with March 19, 2021 and April 28, 2022. Another potential challenge was whether the primitive road would be passable to the site, which had delayed our investigations in 2022.

Eastern red-winged blister beetle, *Tricrania sanguinipennis*.
A) Dorsal view of female, B) Lateral view of female, C) Lateral view of male, D) A specimen struggling to rotate into its correct position.

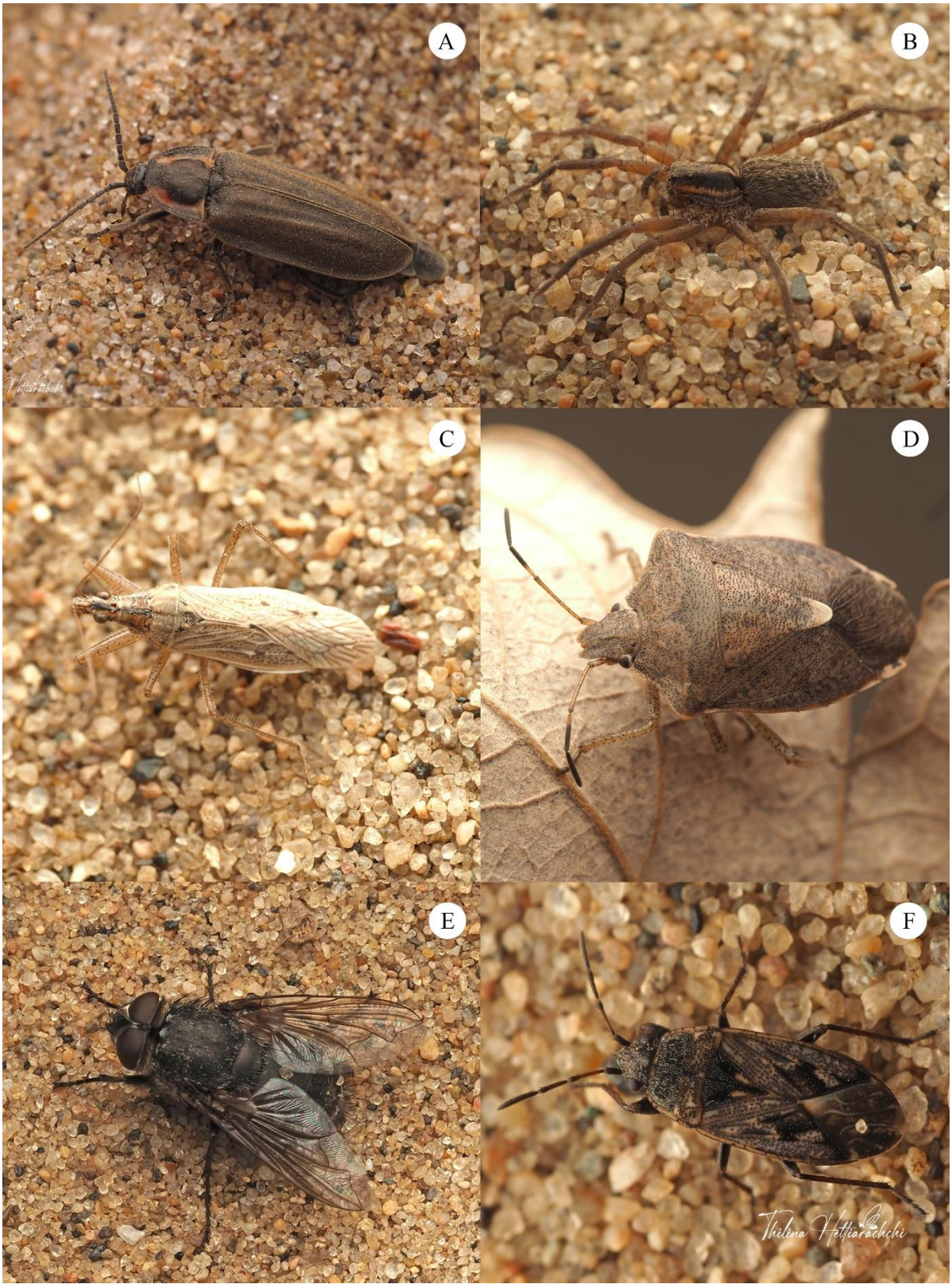
Selection of encountered insects - part 1. A) A nymph of speckle-winged rangeland grasshopper, *Arphia conspersa;* B) *Amara* sp.; C) and D) *Cuerna fenestella*; E) and F) *Cuerna striata*.

Images of authors. Thilina Hettiarachchi and Robert Wrigley (left); Thilina with his camera equipment in the field (right).

Patches of lingering snow at the sites.

Luck was with us because the road was mainly dry, and we discovered the first blister beetle within five minutes of arrival at a sandy blow-out. Barely able to crawl at 7°C (at 10:40 am), the specimen was difficult to photograph because it kept tumbling over and over in the gusty wind. Recalling where the species had been abundant in past years along a nearby trail, we soon found dozens of specimens, most upside down and struggling to regain their feet in the wind, others crawling slowly over the sand. In past years, there was a high proportion of the population found dead in early spring, likely from being caught by freezing overnight temperatures and snow falls. The beetles have such limited locomotory powers and are flightless; it appears most are unable to dig or locate a burrow to pass the night. Among the 35 specimens we observed on the sandy trail, 10 were dead. It should be noted that the adults do not feed, and so must attempt to find a mate within their two to three-week adult life stage. The risk of freezing and snow storms must be balanced with the benefit of having the beetle's triungulin larvae active by the time their bee hosts emerge and commence mating in the subsequent few weeks.

Selection of encountered insects - part 2. A) *Coccinella septempunctata*, B) Tiger moth caterpillar, C) and D) *Formica bradleyi*. E) *Formica obscuripes,* F) *Lasius* (*Chthonolasius*) sp.



Selection of encountered insects - part 3. A) *Ellychnia corrusca*, B) Wolf spider, C) *Nabis americoferus*, D) *Euschistus* sp., E) *Pollenia* sp., F) *Sphragisticus nebulosus*.

As the morning and early afternoon temperature crept up slowly to 14°C by 1:30 PM, we observed the following:

Family Acrididae: a nymph of *Arphia conspersa* Scudder, 1875
Family Carabidae: *Amara* sp.
Family Cicadellidae: *Cuerna fenestella* Hamilton, 1970, *Cuerna striata* (Walker, 1851)
Family Coccinellidae: *Coccinella septempunctata* L.
Family Erebidae: tiger moth caterpillars
Family Formicidae: *Formica bradleyi* Wheeler, 1913*, Formica obscuripes* Forel, 1886*, Lasius* (*Chthonolasius*) sp.
Family Lampyridae: *Ellychnia corrusca* L.
Family Lycosidae: Undetermined
Family Meloidae: *Tricrania sanguinipennis* (Say, 1824)
Family Nabidae: *Nabis americoferus* Carayon, 1961
Family Pentatomidae: *Euschistus* sp.
Family Polleniidae: *Pollenia* sp.
Family Rhyparochromidae: *Sphragisticus nebulosus* (Fallen, 1807)

Most of the above species were represented by only a few individuals, while the Seven-spotted Lady Beetle and the ants were abundant. Thilina was kept busy photographing, but had to repeatedly chase down specimens tumbled by the wind. The accompanying photos attest to Thilina's persistence and skill. We also heard the calls of Sandhill Cranes and American Robins (both traditional signs of spring), and observed piles of woody droppings from Ruffed Grouse, foot prints and scats of Coyotes, prints of White-tailed Deer and Deer Mice, and abundant burrows of Northern Pocket Gophers. At two sites, deep excavations provided evidence that a Badger had unsuccessfully attempted to dig out pocket gophers.

At first having reservations whether our expedition might prove premature so early in the field season, the day proved quite worthwhile. Sometimes, it pays to take a chance.

Acknowledgment

The authors express their gratitude to the contributors on the iNaturalist website (https://www.inaturalist.org/) who provided valuable assistance in identifying some of the insects here based on photographs.

References

Dodgson D and Wrigley RE. 2022. First record and ecological observations on the blister beetle *Tricrania sanguinipennis* (Say, 1824) (Coleoptera: Meloidae) in Manitoba. NatureNorth.com. http://www.naturenorth.com/spring/Blister_Beetle/Blister%20Beetle%20(Tricrania%20sanguinicollis)%20in%20Manitoba.pdf

***Chrysina* Jewel Scarabs (Scarabaeidae, Rutelinae); Featured Beetles from My Collection (Number Three)**

Robert E. Wrigley and Thilina Hettiarachchi

Chrysina chrysargyrea (Sallé, 1874). Costa Rica (30 mm).

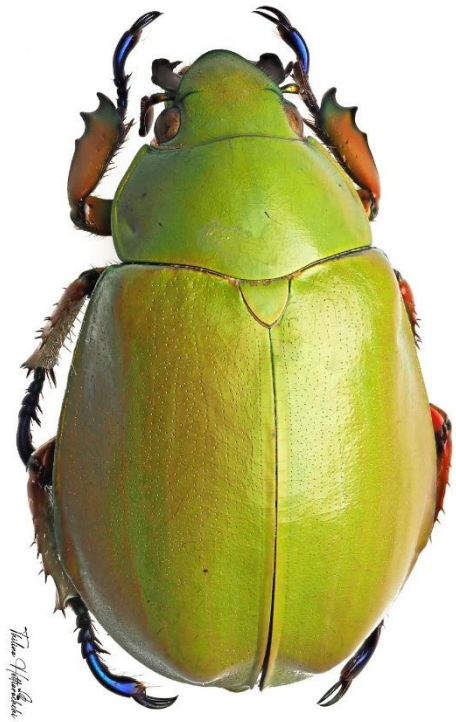
Chrysina (*chrysos,* gold in Greek; formerly *Plusiotus*) is a genus of about 138 species of shining leaf chafers, also known as jewel scarabs, named for the highly reflective, metallic bodies of numerous species. Inhabiting New World montane and cloud forests from Arizona and Texas to Columbia and Ecuador, their greatest species abundance is found from Mexico to Panama (each home to over 60 species). There are undoubtedly additional species to be discovered in remote regions. While most jewel scarabs are shades of green or brown (often with contrasting colourful legs), others display dazzling, iridescent colours of gold, silver or red (A few are even pink, purple or blue), rivaling the beauty of butterflies. Many species display colour polymorphism – specimens occurring in two or more colour varieties. As examples, *Chrysina chrysargyrea* comes in silver, gold and wine-red forms*, Chrysina aurigans* is generally gold but can be deep red, while *Chrysina arellanoi* may be green or reddish brown. Thomas et al. (2007) speculated if there was an adaptive purpose driving the frequency of these colour variants or whether it was due to a high mutation rate.

Chrysina arellanoi (Monzon 2012). (green and red forms). Mexico (24 mm).

Chrysina beetles have attracted considerable research on the nature of their nano-structural, reflective cuticle, consisting of up to 70 layers of chiton (embedded with uric acid crystals for enhanced reflectivity), which reflect and refract specific wavelengths and circularly polarized (CP) light, producing the metallic colours. While some species of *Chrysina* demonstrate only left-hand CP light, *Chrysina respendens* and other highly reflective species produce both left- and right-handed (i.e., optically ambidextrous) CP light (Fernandez del Rio et al. 2012). Green *Chrysina* beetles reflect polarized light in a range of directions (i.e., off-specular angles) due to the cusp-like structure of the cuticular surface, while the flat surfaces of gold and silver beetles reflect light like a mirror (up to 97% of incident light), at the same angle as the incoming light (specular reflection) (Fernandez del Rio et al. 2016).

Chrysina gloriosa (Page 19) displays both surface types with the green elytra interrupted by eight silver stripes, which offer camouflage for the beetle when resting in juniper foliage (green with white resin flecks). The polygonal cuticular cells in the green areas behave as multi-wavelength micro-mirrors, those in the silver stripes as broadband mirrors (Agez et al. 2017). Remarkably, the beetle can both reflect and see CP, while no predators can, thus providing intraspecific communication without attracting predators. Polarized light reflecting from a gold or silver female *Chrysina* may

assist a male to perceive and home in on a female hidden in a dense forest canopy (although most species fly and mate at night).



Chrysina adolphi (Chevrolat, 1859). Mexico (35 mm).

Chrysina macropus (Francillon, 1795). Mexico (38 mm).

There is still discussion regarding what natural-selection factors have been operating to evolve such mirror-like metallic surfaces of several *Chrysina* species, rather than the obvious camouflaging green so predominant in the genus. The beetles' shiny gold and silver appear to reflect the colours of the surrounding vegetation, making it difficult for predatory birds or lizards to pick out a stationary beetle hiding under leaves during the day. The diverse bright colouring of the legs (e.g., pink, purple, blue) among species in the same region may also serve in conspecific recognition and crypsis, e.g., the tarsi of *Chrysina adolphi* are a beautiful deep purple while *Chrysina macropus* has red legs and blue tarsi.

Chrysina adelaida is unusual in sporting brown and green stripes, reminiscent of a piece of candy, which break up the outline of the beetle, while the chocolate-coloured *Chrysina modesta* (brown form) looks like a dead leaf. *Chrysina victoriana* (Hope, 1840), from Oaxaca, Mexico, was one of the first species of jewel beetles to be described, and is coloured a rich, mat reddish-brown and lime-green, simulating bark or dead and living leaves. *Chrysina cunninghami* from Panama is a bright coppery-red with whitish punctures, resembling fruit or new leaves.

Chrysina adelaida (Hope, 1840). Mexico (30 mm).

Chrysina victoriana (Hope, 1840). Mexico (36 mm).

Chrysina species range from 15 to 40 mm in size, with females often larger than males; males of some species, such as *Chrysina macropus* and C. *erubescens,* having greatly enlarged hind legs. Numerous males have been observed attracted to and attempting to mate with a single female. After mating, the female lays single eggs in damp wood or soil. The larvae hatch in a few weeks and feed on fungi-ridden wood or plant roots for a few months to a year. The larval stage has not been described for most *Chrysina* species. The larva undergoes three moults and overwinters, the pupal stage requires one to two months, and the adult remains underground for at least another three months until emerging during the local rainy season, usually from May to September over most of the range (Hawks 2002). Captive-raised adults of *C. gloriosa* and *C. beyeri* live 2 to 3 months (David's Beetles 2022). Adults devour leaves of their specific host trees and contribute to pollination when hiding in flowers during the day.

Chrysina erubescens (HW Bates, 1889). Mexico (35 mm).

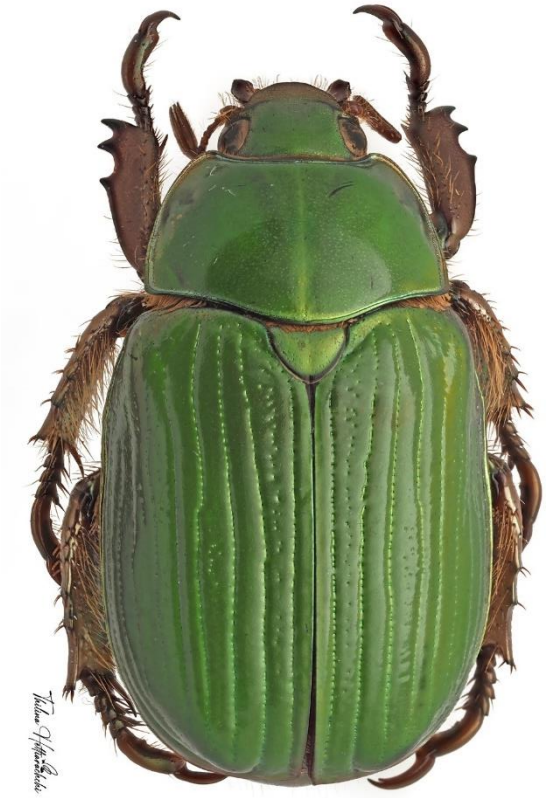
Chrysina beetles are highly sensitive to humidity, with adults emerging from burrows in numbers when rain dampens the soil; they remain underground during periods of drought. *Chrysina gloriosa* was found to be active and feeding for 24 hours following a monsoon storm in Arizona (Young 1957). Most species are nocturnal and are drawn to lights (Hawks 2002). However, females of certain species, such as *Chrysina pricei*, have been found only on the ground and are believed to never fly or come to lights, and consequently are rarely observed. *Chrysina* beetles spend most of their time resting under branches or feeding on the leaves of their host trees, flying only when searching for a mate or when disturbed. Certain species such as *C. woodi* may be seen flying during daylight hours; one individual travelled 1.1 km in a 24-hour period, demonstrating a remarkable dispersal ability (Maddox 2017).

It has been reported that essentially all montane forests from Arizona to Ecuador harbor one or more species of *Chrysina*, with each individual species typically restricted to a few, or sometimes only one, mountain range (Moron 1990). With the complex geography in the Mexican state of Oaxaca (three mountain ranges converge), 29 species of *Chrysina* have been recorded (most inhabiting oak and oak-pine forests), and several more are anticipated, likely making the area the most species-rich of any comparable size throughout the range of the genus (Monzon-Sierra et al. 2020).

Specific host trees for the four American southwest species include Arizona juniper leaves (*Juniperus arizonica*) for *C. gloriosa* adults and Arizona sycamore (*Platanus wrightii*) logs for larvae, Mexican

blue oak (*Quercus oblongifolia*) for *C. beyeri*, ponderosa pine (*Pinus ponderosa*) for *C. lecontei*, and Texas black walnut (*Juglands nigra*) for *C. woodi*. Further south, other genera of trees serving as species-specific hosts for adults and larvae include *Abies*, *Alnus*, *Arbutus*, *Heliocarpus*, *Juglands*, *Juniperus*, *Liquidambar*, *Pinus*, *Plantanus*, *Quercus*, and *Turpina*. It has been suggested that noxious chemicals in the diet (e.g., terpenes in pines, tannins in oaks, and juglone in walnut) may result in a bitter taste of the beetles, thereby offering some protection from predation (Levin 1976).

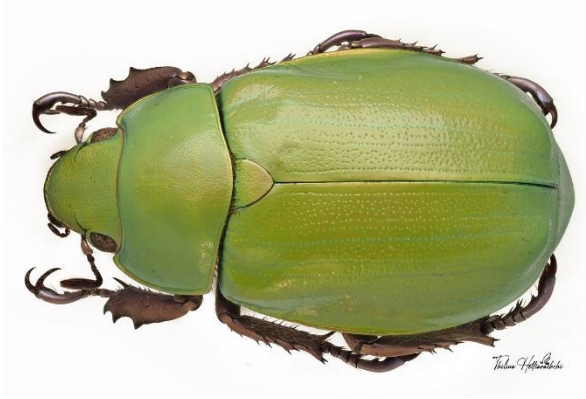
Chrysina woodi (Horn, 1885).
USA, Texas (30 mm).



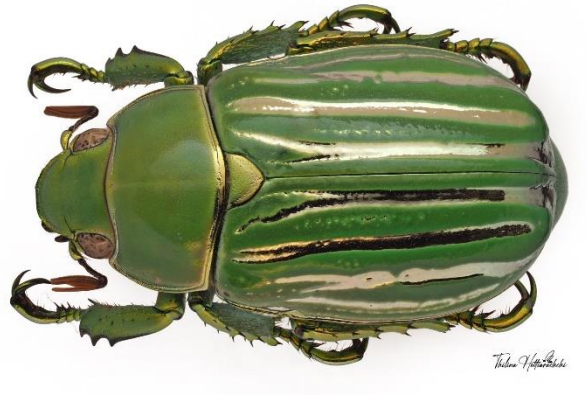
Chrysina lecontei (Horn, 1882).
USA, Arizona (21 mm).

On several trips to the Huachuca and Chiricahua mountains of Arizona, near the Mexican border, I was fortunate to find (by night lighting with a mercury vapour bulb) three species of *Chrysina* at similar high elevations during the summer monsoons – *Chrysina beyeri* (found only in Arizona), *C. gloriosa* (Arizona to Texas), and *C. lecontei* (Arizona and New Mexico). A fourth species in my collection, *C. woodi*, is native from New Mexico to western Texas. All four species' ranges extend into northern Mexico. It was such a thrill to see (and hear) numbers of these wonderful beetles come flying in and landing on the white sheet. Numerous specimens also arrived at the darkened periphery of the sheet, so frequent checks in the surrounding area was also productive. Excited to pick up and examine my prizes closely, I immediately became aware of their strong legs and needle-like tarsal claws penetrating my skin. Attempting to dislodge all six legs at once was a real challenge, but I was

too excited to dwell on any discomfort. I turned a magnificent specimen of *Chrysina gloriosa* over and over to admire its shiny-green elytra with silver stripes (turning black when rotated) – one of North America's most attractive arthropods.



Chrysina beyeri (Skinner, 1905). USA, Arizona (33 mm).



Chrysina gloriosa (LeConte, 1854). USA, Arizona (22 mm).

It was a thrill to find large numbers of *Chrysina beyeri* in Ramsay, Miller and Carr canyons in 2015, the same sites where Henry Skinner discovered the first four specimens and later described the species in 1905. While collecting at Canadian dipterist Dr. Monty Wood's Monteverde Biological Research Station (https://www.estacionbiologica.com) in the Costa Rican cloud forest (Puntarenas Province) in 2014, I was fortunate to acquire a magnificent gold specimen of *Chrysina respendens*, which remains a real prize in my collection. During that trip, I had an opportunity to visit the famous Instituto Nacional de Biodiversidad (INBio) in Santo Domingo, Heredia, and the multiple museum trays of *Chrysina* species were breathtaking. It was fascinating to witness several local people being trained to sort through large fresh collections of beetles for identification later by entomologists.

Chrysina respendens (Bouchard, 1875). Costa Rica (22 mm).

Chrysina dzidorhum (Arnaud, 1994). Ecuador (25 mm).

Concern had been expressed by a few conservationists that the intense annual collecting of these popular beetles, especially in the southwestern United States, would place these species at-risk, but other researchers disagreed, stating that as long as their specific habitats were protected, numbers appear to remain at safe levels. With the abundance I witnessed of the three US species, I agree with the latter view, at least in the near future. As Dr. Ronald Cave (2001) explained; "Catching insects isn't like hunting jaguars. Millions of jewel scarab eggs, larvae, and pupae remain underground, while collectors take only adults. Meanwhile, the journey to scarab habitat weeds out all but the most determined. Many cloud forests are a strenuous trek away; others require a helicopter." Locals in Guatemala have developed a cottage industry selling *Chrysina* beetle jewelry to tourists (Woodruff 2009).

Chrysina species are part of the Neotropical flora and fauna that periodically spread south into northern South America (3 or 4 species) and north into the southern United States during warm and wet interglacial periods of the Pleistocene. Subsequently, hot and drier conditions forced their primary habitats (tropical premontane and montane rainforest) to retreat to higher elevations, and so most species of beetles are now isolated on the higher elevations of mountain ranges, mainly 1200 to 2300 metres, but a few species may be found at 50 and 3800 metres. A number of species are present in small populations from a single mountain top or elevational range (several known from only a couple of individuals), so their existence is precarious, vulnerable to over-collecting and habitat loss (Hawks 2002). Further habitat destruction in Mexico and Central American countries,

global warming, and related drought will likely cause the extinction of certain species in the coming decades – a tragic and needless end to such wonderful insects, the result of human overpopulation leading to excessive pollution and demands on natural resources.

Members of the genus *Chrysina* have been proposed to be important bioindicators of high-quality forest. While theoretically protected in parks of several central American countries, cloud forests and their faunas remain under threat due to lack of resources to ensure long-term conservation. Ongoing challenges are the usual culprits of illegal or excessive logging and the conversion of natural landscapes to agriculture (e.g., coffee farms) and cattle pasture. *Chrysina* larvae require rotting logs for development, while adults devour tree leaves, so once forests are gone, local populations are destroyed. While the majority of research of this genus has focused on the group's structural colouration, remarkably few reports have dealt with species' ecology, due to a number of factors. Among these must be the challenges posed by both remote mountain access, and general challenges in studying canopy life.

Chrysina aurigans (Rothschild and Jordan, 1894). Costa Rica (28 mm). The cracking of the elytra is due to dehydration.

"The clear association of *Chrysina* species with Neotropical mountain forests, along with their eye-catching habitus, makes jewel scarabs an ideal candidate group as ambassadors of the remaining Neotropical cloud forests" (Jocque et al. 2013). "They [*Chrysina* species] are prized among collectors

to the point of an inordinate fondness, some would say obsession, known among aficionados as the 'green fever.' Entomologists are truly treasure hunters" (Thomas et al. 2007)

The specimens of *Chrysina* in my collection never fail to amaze visitors on seeing the fantastic array of colours and patterns. I look forward to seeing future publications on these beetles, for they are truly living jewels of Nature.

A checklist of species with illustrations is provided by David Hawks (2002), and species' distributions and locality records by Moore et al. (2017).

Recommended Reading

Barria MD. 2023. A monographic revision of the jewel scarabs Genus *Chrysina* from Panama, Columbia, and Ecuador (Coleoptera: Scarabaeidae: Rutelinae: Rutelini).

Evans AV. 2010. Reflections on Arizona's jewel scarabs. What's Bugging You? https://arthurevans.wordpress.com/2010/09/27/reflections-on-arizonas-jewel-scarabs-part-1/ (accessed April 1, 2024)

Findleyson ED, McDonald LT, and Vukusic P. 2017. Optically ambidextrous circularly polarized reflection from the chiral cuticle of the scarab beetle *Chrysina resplendens*. https://royalsocietypublishing.org/doi/10.1098/rsif.2017.0129 (accessed April 1, 2024)

Hawks D. 2022. Checklist of *Chrysina* species (Scarabaeidae: Rutelinae: Rutelini). https://unsm-ento.unl.edu/Guide/Scarabaeoidea/Scarabaeidae/Rutelinae/Rutelinae-Tribes/Rutelini/Chrysina/Chrysina-Catalog/ChrysinaC.html (accessed April 1, 2024);

Zea E-Books Collection 141. https://digitalcommons.unl.edu/zeabook/141

References

Agez G, Bayon C, and Mitov M. 2017. Multiwavelength micromirrors in the cuticle of the scarab beetle *Chrysina gloriosa*. Acta Biomaterialia 48: 357-367. https://www.sciencedirect.com/science/article/abs/pii/S1742706116306298 (accessed April 8, 2024).

Cave RD. 2001 (February). National Geographic. http://www.nationalgeographic.com/ngm/0102/feature3/index.html (accessed April 6, 2024).

David's Beetles. 2022. *Chrysina gloriosa* and *beyeri* care. https://davidsbeetles.com/blogs/news/chrysina-gloriosa-beyeri-care (accessed April 9, 2024).

Fernandez del Rio L, Arwin H, Landin J, and Magnusson R. 2012. A Mueller matrix spectroscopic ellipsometry study of scarab beetles of the *Chrysina* genus. Conference Paper. 7th Workshop Ellipsometry, Leipzig, March 5-7.

Fernandez del Rio L, Arwin H, and Jarrendahl K. 2016. Polarizing properties and structure of the cuticle of scarab beetles from the *Chrysina* genus. Physical Review E 94: 012409. https://ui.adsabs.harvard.edu/abs/2016PhRvE..94a2409F/abstract (accessed April 7, 2024).

Hawks DC. 2002. Jewel scarabs. Programs Information: Nebraska State Museum. Museum Notes 15. https://digitalcommons.unl.edu/museumprogram/15 (accessed April 6, 2024).

Jocque M, Vanhove MPM, Creedy TJ, Burdekin O, Nunez-Minon JM, and Casteels J. 2013. Jewel scarabs (*Chrysina* sp.) in Honduras: Key species for cloud forest conservation. Journal of Insect Science 13: 21 https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3738100/ (accessed April 1, 2024).

Levin DA. 1976. The chemical defenses of plants to pathogens and herbivores. Annual Review of Ecology and Systematics 7: 121-159.

Maddox TG. 2017. Population analysis of *Chrysina woodii* (Coleoptera: Scarabaeidae) in the Davis Mountains of west Texas. Masters Thesis, Angelo State University. https://core.ac.uk/download/198021671.pdf (accessed April 6, 2024).

Monzon-Sierra J, Blackaller-Bags JF, and Hawks DC. 2020. Description of a new species of *Chrysina* Kirby (Coleoptera: Scarabaeidae: Rutelinae) from the Sierra Azul, Oaxaca, Mexico, a new synonymy, and notes on *Chrysina* species found in the Sierra Azul. Insecta Mundi 0803: 1-7.

Moore RM, Jameson ML, Garner BH, Audibert C, Smith ABT, and Seidel M. 2017. Synopsis of the pelidnotine scarabs (Coleoptera, scarabaeidae, Rutelinae, Rutelini) and annotated catalogue of the species and subspecies. Zookeys 666:1-349. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5534527/ (accessed April 9, 2024).

Moron MA. 1990. The Beetles of the World. Vol. 10: Rutelini 1. Sciences Nat, Venette, France, 145 pp.

Thomas DB, Seago A, and Robacker DC. 2007. Reflections on golden scarabs. American Entomologist, 53(4): 224-230. https://academic.oup.com/ae/article/53/4/224/2389740 (accessed April 9, 2024).

Woodruff RE. 2009. Scarab jewels. Scarabs 41: 1-12. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5534527/ (accessed April 9, 2024).

Young FN. 1957. Notes on the habits of *Plusiotus gloriosa* LeConte (Scarabaeidae). The Coleopterists Bulletin 11: 67-70.

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