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# Four new species of *Chrysina* Kirby (Coleoptera: Scarabaeidae: Rutelinae) from Guatemala and Honduras

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# Four new species of *Chrysina* Kirby (Coleoptera: Scarabaeidae: Rutelinae) from Guatemala and Honduras

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**Abstract**. Four new species of the genus *Chrysina* Kirby (Coleoptera: Scarabaeidae: Rutelinae) are described from cloud forests of Guatemala and Honduras. The Guatemalan species are *C. alexae* n. sp. from Purulhá, Baja Verapáz in the central mountains and *C. woodruffi* n. sp. from Bulej, Huehuetenango in Los Cuchumatanes Mountains at elevations from 1500 to 2000 meters. The species from Honduras are *C. antonkozlovi* n. sp. from Celaque, Lempira and *C. maishei* n. sp. from El Güisayote, Ocotepeque, at elevations between 2000 and 2600 meters above sea level.

**Resumen.** Se describen cuatro especies nuevas del género *Chrysina* Kirby (Coleoptera: Scarabaeidae: Rutelinae) de bosques nubosos de Guatemala y Honduras. Las especies guatemaltecas son *C. alexae* n. sp. de Purulhá, Baja Verapáz en las montañas centrales y *C. woodruffi* n. sp. de Bulej, Huehuetenango en la sierra Los Cuchumatanes en alturas de 1500 a 2000 metros. Las de Honduras son *C. antonkozlovi* n. sp. de Celaque, Lempira y *C. maishei* n. sp. de El Güisayote, Ocotepeque, a elevaciones entre 2000 y 2600 metros sobre el nivel del mar.

## Introduction

Currently the genus *Chrysina* Kirby (Coleoptera: Scarabaeidae: Rutelinae) is composed of approximately 118 species, including the four described in this publication. The genus is distributed from the southwestern United States through Mexico, Central America to Ecuador (Monzón 2012). Most species occur in Central America and Panama (around 64 described species) and Mexico (with more than 60 species), with very low diversity towards the north in the U. S. (four species) and South America (three known species). *Chrysina* has been separated into 18 species groups according to ribosomal DNA phylogenetic patterns (Hawks 2001). The species described in this publication belong to the adelaida (Morón 1990, modified by Hawks (2001)) and macropus (Hawks 2001) groups. The first group is now composed of 20 species of which all are green (with brown or reddish color forms) except *C. adelaida* (Hope) and *C. quetzalcoatli* (Morón), which are striped red and green (with red, green and purple forms). The species in this group inhabit mostly high altitudes, usually at 2000 meters elevation, frequently ranging above 2500 m, and sometimes reaching 3000 m. The macropus group is best known because some of its species, such as *C. macropus* (Francillon), *C. adolphi* Chevrolat and *C. triumphalis* Morón, have some males with extreme development of the metasternum and posterior legs.

Guatemala and Honduras are small countries with high *Chrysina* species diversity, having about 33% of all species in an area that is less than 10% (rough estimate) of the area inhabited by the genus. The complex mountains and different biogeographic regions facilitate the evolution of high numbers of species many of which are precinctive. For example, of the approximately 46 species that occur in Guatemala and Costa Rica, only *C. luteomarginata* (Ohaus) occurs in both countries (about 2% shared species). Guatemala has been intensively studied for *Chrysina* (Monzón 1995, 2006) and therefore very few more new species are expected. Nevertheless, Guatemala has many interesting places where biological, biogeographical and ecological information could be added for the genus. On the other hand, Honduras has been studied moderately, with many cloud forests to be researched, most of them of very difficult access at the tops of the mountains.

The systematics of *Chrysina* is currently in an ambiguous state. Hawks (2001) synonymized the genus *Plusiotis* Burmeister with *Chrysina* stating that "recent molecular and morphology-based phylogenetic analyses by Hawks, Babcock, and Heraty (submitted) strongly support the monophyly of *Chrysina* + *Plusiotis* + *Pelidnotopsis*." After 15 years this phylogenetic work is still in progress and is the center of debate. For this reason, Morón and Nogueira (2016) consider that the synonymy continues to be unsupported. Considering that the genus *Chrysina* Kirby (1827) has precedence over *Plusiotis* Burmeister,

1844, evidence that *Chrysina* renders *Plusiotis* paraphyletic, the fact that there is no rule expressing that a proposed phylogeny must be published to prove the synonymy, and the lack of a nomenclatural act in Morón and Nogueira (2016) synonymizing the two genera, in this work I choose to follow Hawks (2001). Adding to the controversy, Márquez et al. (2013) use *Plusiotis* but classify some species of a group and into *Chrysina* (*Chrysina prasina* and *C. taylori*) without a formal nomenclatural act based on "Morón, unpublished data."

## Materials and Methods

This publication follows Hawks (2001) for *Chrysina* systematics, including his proposed informal species groups. Photographs for this publication were taken with a Nikon D7100 digital camera and Nikon macro AF-s 105 lens. Lighting was provided with two Nikon SB-R200 Speedlights with SW-12 diffusers. Specimens examined from and paratypes deposited in the following institutions and private collections:

| | |
|---|---|
| **AOK** | Anton Olegovich Kozlov, Moscow, Russia |
| **DC** | Daniel Curoe private collection, Distrito Federal, Mexico |
| **DCH** | David C. Hawks private collection, California, USA |
| **DR** | David Robacker private collection, Texas, USA |
| **EAPZ** | Escuela Agrícola Panamericana Zamorano, Tegucigalpa, Honduras |
| **FSCA** | Florida State Collection of Arthropods, Florida, USA |
| **GB** | Guy Bruyea private collection, California, USA |
| **JMS** | José Monzón Sierra private collection, Guatemala |
| **KP** | Kelly Price private collection, Vermont, USA |
| **MD** | Maishe Dickman private collection, Connecticut, USA |
| **ME-CURLA** | Museo Entomológico, La Ceiba, Honduras |
| **MNHUB** | Museum für Naturkunde, Berlin, Germany |
| **PJL** | Peter J. Landolt private collection, Washington, USA |
| **THP** | Thierry Porion private collection, France |
| **UVGC** | Universidad del Valle de Guatemala Collection of Arthropods, Guatemala |
| **WSUC** | M. T. James Entomological Collection, Washington State, USA |
| **ZISP** | Zoological Institute of the Russian Academy of Sciences, Saint Petersburg, Russia |

### *Chrysina alexae* Monzón, new species
### (Figures 1, 2, 9, 13, 17, 21, 25, 28, 32, 33, 40)

**Type material. Holotype** male (UVGC) labeled "GUATEMALA, Baja Verapáz, Cerca Purulhá, Ranchitos del Quetzal, 1656 m. 16 JULIO 2001. 15.215747 -90.219087. Colector José Monzón S."; on red paper, "HOLOTYPE *Chrysina alexae* Monzón". **Paratypes** (79 males and 40 females) with data as follows: Same data as holotype (3 males); same data except "14 SEPT 2012" (4 males and 1 female); same data except "15 JULIO 2008" (2 males and 1 female); same data except "13 SEPT 2009" (2 males and 1 female); same data except "2 SEPTIEMBRE 2010" (1 female); same data except "13 JULIO 2009" (2 males and 2 females); same data except "25 JUNIO 2014" (3 males and 2 females); same data except "2 AGOSTO 2011" (5 males); same data except "26 JULIO 2011" (1 male); same data except "16 AGOSTO 2013" (2 males and 2 females); same data except "17 JUNIO 2001, Col. Monzón y Bailey" (3 males); same data except "Dept. Baja Verapaz, nr Purulha Ranchites, elev 5480´, N 15 degrees 12.935¨, W 90 degrees 13.148´; 2-7 July 2008, D.C. Robacker" (1 male); same data except "24 July 2011" (1 male and 2 females); same data except "16 July 2001" (1 male and 1 female); same data except "Rt CA-14, hotel Ranchito del Quetzel, 1600m, N15°12.929´W90°13.149´, 25 June 2014, R. S. Zack collr. BL/MV light traps" (2 males and 2 females); same data except "CA-14, nr Purulha, Hotel Ranchito del Quetzal, 1600 m, N°15 12.93 W90°13.13, 25/26 June 2014, Peter J. Landolt, BL/MV lights (2 males); same data except "Purulha, 1500 m, 16 July 2001, MV light R.D. Cave, D.C. Hawks, J. Monzón" (1 male); same data except "1500

m, 27-29 July 1992, MV light J. Monzon" (5 males and 1 female); same data except "26 August 1992" (1 male); same data except "1 June 1992" (1 male); same data except "Purulha 5 km N., Junio 1993, Jose Monzon" (1 male and 1 female); same data except "0,5 mi SE Purulha 1590m, 15°13´N, 90°12´W, 17-18 June 2001, BL-MV, R.A. Cunningham Collector" (25 males and 15 females)"; same data except "vic. Biotopo Quetzal, May 24-31 1989, J.E. Wappes" (1 male); same data except "Purulhá, 27.vii.1992, MV [no collector data]" (1 male); same data except "Biotopo Quetzal, 28ix2000, 1600m J. Monzón y D. Copeland, Colección J. Monzón" (6 males and 2 females); same data except "1600 m, 17 July 2001, MV light, R.D. Cave, D.C. Hawks, J. Monzon" (1 male and 2 females); same data except "1680 m, MVBL, 1.7 km S Purulha N15°12.82´ W90°13.03´, VI-30 to VII-1-2009, Ratcliffe *et al.* colls." (2 males and 4 females). All paratypes with label, on yellow paper "PARATYPE *Chrysina alexae* Monzón". Paratypes deposited in the DCH, DR, FSCA, GB, JMS, KP, MD, MNHUB, PJL, THP, UVGC and WSUC collections.

**Description. Holotype male.** Length 32.5 mm; width at elytral humeri 15.0 mm; maximum width (middle of elytra) 17.5 mm. Dorsal surface of head, pronotum and elytra yellowish green (Fig. 1); lateral sides of clypeus yellowish orange; antennal club dark brown with greenish hues, scape dorsally yellowish orange and golden green; pronotal margins and scutellum slightly yellowish. Color of venter yellowish green except for metasternum and internal surface of meso and meta femora and tibiae which are purplish green (Fig. 2); external surface of legs and coxae purplish orange; pygidium yellowish green with slight purplish tint and reddish golden apical margins; mentum and ventral surface of mandibles yellowish green with golden reflections; tarsi bluish silver. Clypeus (Fig. 9) with free margins, semicircular in dorsal view, slightly reflexed; surface with fine punctures; interocular distance 2.0 times wider than antennal club length. Mentum quadrate (Fig. 13); anterior depression broad, rugopunctate, punctures large and dense; lateral depressions anteriorly narrow and posteriorly broad covering angles; posterior margin with central narrow depression; surface with scattered deep punctures, except anterior depression. Pronotum at base 2.8 as wide as interocular distance; sculpture similar to frons. Lateral margin completely beaded, slightly effaced between inner borders of eyes and almost inexistent in front of scutellum. Elytra smooth, striae with sparse and fine punctures; intervals weakly convex. Elytron 21.5 mm long and 3.0 times as long as pronotum; lateral margin completely beaded, except close to pygidium. Pygidium (Fig. 17) finely punctate with one row of sparse, fine, pale setae along external margin; surface moderately convex. Venter with mesometasternal protrusion (Fig. 21) long and extending past mesofemoral base, rounded, slightly depressed. Metasternum slightly expanded (maximum height at coxa 13.5 mm), punctate, setae sparse, short and pale. Apical sternite with depression. Legs with protibiae tridentate, apical and middle teeth well developed, third vestigial. Metatrochanter with apex not protruding beyond metafemoral margin (Fig. 25); hind femora enlarged and widened (5.0 mm maximum width); apical spine long and well developed (Fig. 28); hind tibia curved. Genitalia dark reddish brown with parameres symmetrical, tightly narrowing at apical third and expanding slightly at apex, apically constricted and recurved, fused almost completely except for apex; length of genital capsule 10.0 mm (Fig. 32, 33).

**Female.** Similar to male except body more convex; tarsi less robust; clypeus semiparabolic; epipleural fold wide, terminating in sulcus; hind tibiae slightly curved and apical sternite not depressed. Inferior genital plates simple (Fig. 40) asymmetrical, left one with wide apical prominence to the right, left plate with corresponding indentation; distal margin slightly crenulated with sparse short setae (based on female with database label "JMS10797").

**Variation.** Males: length 25.0–32.5 mm; width at elytral humeri 12.0–15.0 mm; maximum width 15.0–18.0 mm; metasternum height 10.0–14.0 mm (at posterior coxae); maximum posterior femoral width 4.0–6.0 mm. Females: length 29.0–35.5 mm; width at elytral humeri 14.0–16.0 mm; maximum width 17.0–20.0 mm (at epipleural fold). Color in type series varies in amount of purple in venter.

**Etymology.** Named for Alexa B. Price, young naturalist and daughter of my great friend and avid *Chrysina* researcher Kelly Price.

**Diagnosis.** This is one of the seven species in the macropus group in Central America, including the two described in this publication. The most similar species in the group are *C. prototelica* (Morón and Howden), *C. halffteri* (Morón) and *C. karschi* (Nonfried); all have the metatrochanter not or slightly protruding beyond the metafemoral margin. Of these three the most similar is *C. karschi* (Nonfried), which inhabits Guatemala and Honduras east of the Motagua Valley. It can be differentiated by its purple venter, shape and size of metafemoral distal spine (compare spine with a typical *C. karschi* from Honduras (Fig. 29)) and male genitalia which is narrow close to apex and slightly broadens and rounded at tip compared to flat and square in *C. karschi*.

**Distribution and remarks.** This species is currently known only from the cloud forests around the town of Purulhá, Baja Verapáz (Fig. 44). It is very interesting that there are several populations of *C. karschi* in Honduras (including the type locality) and east of the Motagua valley in Guatemala in the departments of Izabal and Chiquimula. It would be very important to conduct more in depth research (morphological and DNA) on the relationships between all of these similar populations to learn if they represent a species complex.

***Chrysina antonkozlovi* Monzón, new species**
**(Figures 3, 4, 10, 14, 18, 22, 34, 35, 41)**

**Type material. Holotype** male (UVGC) labeled "HONDURAS, Lempira, P. N. Celaque, Cerro Minas. 2600 m. 01-04 julio 2014. 14° 32´50 N -88° 40´11 W, V. Sinjaev & M. Márquez"; ; on red paper, "HOLOTYPE *Chrysina antonkozlovi* Monzón". **Paratypes** (16 males and 1 female) with same data as holotype. All paratypes with label, on yellow paper "PARATYPE *Chrysina antonkozlovi* Monzón". Paratypes deposited in the AOK, EAPZ, FSCA, JMS, KP and ZISP collections.

**Description. Holotype male.** Length 25.0 mm; width at elytral humeri 10.5 mm; maximum width (middle of elytra) 12.0 mm. Color of dorsum slightly dark yellowish green (Fig. 3); frons lighter yellowish green, clypeus coppery brown; anterior margin of clypeus and fronto-clypeal suture black; ocular canthi reddish golden; antennae reddish brown, scape dorsally greenish gold; pronotal margins greenish gold with reddish reflections; scutellum lateral margins greenish gold; elytral margins reddish gold, humeri and apical umbone yellowish green; pygidium iridescent golden green. Venter shiny yellowish green; sternites with posterior margin reddish gold; tibiae reddish brown; tarsi reddish golden green (Fig. 4). Clypeus (Fig. 10) free margins subtrapezoidal in dorsal view, margined and raised; surface with coarse and dense punctures; frons densely punctuate, punctures dense; fronto-clypeal suture complete; interocular distance 0.8 times wider than antennal club length. Mentum (Fig. 14) small, 1.3 times longer than wide; anterior margin depressed and irregular; lateral sides bottle shaped being wider and rounded distally and narrower close to anterior margin; surface with few large setigerous punctures, large narrow horizontal depression close to apex. Pronotum at base 2.7 times as wide as interocular distance; surface moderately punctate, punctures small. Lateral margin completely beaded. Elytra punctate striate; striae well defined and with punctures moderate in size and depth; intervals convex. Elytron 16.5 mm long and 2.8 times as long as pronotum; lateral margin with bead complete. Pygidium (Fig. 18) moderately punctate, apical margin with long sparse setae; surface moderately convex and slightly prominent towards the apex. Venter with mesometasternal protrusion very short and depressed (Fig. 22). Metasternal sides setigerously punctate, setae long and dense. Legs with protibiae clearly tridentate, apical and medial teeth well developed, third smaller. Genitalia with parameres subsymmmetrical, apex slightly slanted to the left, apically constricted, fused except for very broad "v" shaped, apex bidentate; length of genital capsule 8.0 mm (Fig. 34, 35).

**Female.** Similar to male except body stout; tarsi less robust and apical sternite not depressed; antennal club short (interocular distance 1.2 times wider than antennal club length). Length 27.5 mm; width at elytral humeri 13.0 mm; maximum width 15.0 mm. Inferior genital plates subsymmetrical; external margin with side pointing spine process and with long fine sparse setae (Fig. 41) (based on female with database label "JMS10798").

**Variation.** Males: Length 20.5–25.0 mm; width at elytral humeri 9.5–11 mm; maximum width 10.0–13.00 mm. Type series very homogeneous yellowish green, two specimens reddish brown with most margins golden green.

**Etymology.** Named in honor of my friend Anton Olegovich Kozlov from Moscow (Russia), a great and enthusiastic entomologist that brought this species to my attention.

**Diagnosis.** This is one of the five green species in the adelaida group in northern Central America (including the two described in this publication). This species seems to be a sister species of *C. centralis* (Morón) with which it shares many morphological characters. The two can be easily differentiated from the other three green species of the group in the region by having the elytral humeri and umbone yellowish green, very similar to color of disc (*C. pehlkei* (Ohaus)*, C. hawksi* Monzón and *C. maishei* have golden green elytral humeri and umbone, different from disc). It can be easily separated from *C. centralis* by the male antennal club, which is longer than the interocular distance, and the different shape of male and female genitalia.

**Distribution and remarks.** This species is currently known only from the type locality, Celaque National Park, an isolated mountain located south of Santa Rosa de Copán (Fig. 44). It is interesting that even though some collecting has been conducted in the park by several researchers, this species was never collected. It seems to be isolated to the higher altitudes of the park.

### *Chrysina maishei* Monzón and Hawks, new species (Figures 5, 6, 11, 15, 19, 23, 36, 37, 42)

**Type material. Holotype** male (UVGC) labeled "HONDURAS, Ocotepeque, El Güisayote. 2,200 msnm, 10 JULIO 1999, Colector José Monzón S." ; on red paper, "HOLOTYPE *Chrysina maishei* Monzón & Hawks". **Paratypes** (33 males and 10 females) with data as follows: Same data as holotype except "N 14°25 W 89°03´, Res Biol Güisayote, 2000m, 16.ix.1998, J Torres" (1 male); same data except "29 August 1994, MV, R. Cordero, around 7000´" (7 males and 2 females); same data except "Nuevo Ocotepeque, El Portillo, 19-20 Ago. 1993, rcol R. Cordero" (1 male); same data except "Dept. El Guisayote, 25 July-5 August 1994, Bruyea, Cordero, Hawks, cloud forest 7000´-7500´" (13 males and 2 females); same data except "Guisayote Biological Reserve, 2100-2300 m, 16-19.viii.1998 MV light, D.C. Hawks & R.D. Cave" (6 males); same data except with second label "Maintained in captivity, Died 30 Aug. 1988" (3 specimen); same data except "1 Sept. 1988" (2 specimen); same data except "2 Sept. 1988" (1 specimen); same data except "5 Sept. 1988" (2 specimen); same data except "6 Sept. 1988" (1 specimen); same data except "7 Sept. 1988" (1 specimen); same data except "12 Sept. 1988" (1 specimen). All paratypes with label, on yellow paper "PARATYPE *Chrysina maishei* Monzón & Hawks". Paratypes deposited in the DC, DCH, DR, GB, MD, ME-CURLA, JMS and THP collections.

**Description. Holotype male.** Length 23.5 mm; width at elytral humeri 11.0 mm; maximum width (middle of elytra) 12.0 mm. Dorsum yellowish green (Fig. 5); frons lighter yellowish green, clypeus pinkish brown; ocular canthi greenish gold; antennae reddish brown, scape dorsally pinkish brown with green reflections; pronotal margins brownish gold with green reflections; scutellum yellowish green with brownish reflections; elytral margins greenish brown gold, humeri and apical umbone greenish gold; pygidium iridescent yellowish green with margins greenish gold. Color of venter shiny yellowish green (Fig. 6); sternite and mesosternal margins and suture reddish brown to pinkish brown; anterior femora, protibiae, meso and metatibiae pinkish brownish green; tarsi bluish or greenish silver. Clypeus (Fig. 11) free, margins semicircular in dorsal view, with anterior border straight; margined and raised; surface with coarse and dense punctures. Frons densely punctate, punctures not as dense as in disc; fronto-clypeal suture not obviously complete; interocular distance 1.3 wider than antennal club length. Mentum (Fig. 15) medium, 1.5 times longer than wide; anterior margin depressed and irregular; lateral sides bottle shaped being wider and rounded distally and narrower close to anterior margin; surface with few large punctures. Pronotum at base 2.5 times as wide as interocular distance; surface moder-

ately punctate, punctures small. Lateral margin completely beaded. Elytra punctate striate; striae well defined and with punctures moderate in width and depth; intervals convex. Elytron 16.0 mm in length and 3.2 times as long as pronotum; lateral margin with bead complete. Pygidium (Fig. 19) densely punctate, apical margin with long sparse setae, setae pale reddish yellow; surface moderately convex and slightly prominent towards apex. Venter with mesometasternal protrusion (Fig. 23) medium in length, not extending past mesofemoral base, rounded, slightly depressed. Metasternum sides setigerously punctate, setae long but not very dense. Legs with protibiae clearly tridentate, apical and medial teeth well developed, third smaller. Genitalia with parameres reddish metallic brown, asymmetrical, apex slanted to the left, apically constricted, fused almost completely except for narrow bidentate apex; length of genital capsule 8.0 mm (Fig. 36, 37).

**Female.** Similar to male except body more stout and averaging longer (to 29.0 mm); tarsi less robust and apical sternite not depressed; antennal club slightly shorter than in males. Inferior genital plates subsymmetrical; apical process expanded and truncate, with long fine sparse setae (Fig. 42).

**Variation.** Males: length 22.5–27.0 mm; width at elytral humeri 10.0–12.5 mm; maximum width 10.5–14.00 mm. Females: length 24.0–29.0 mm; width at elytral humeri 11.0–13.0 mm; maximum width 12.5–14.5. Most specimens homogeneous yellowish green, a few slightly darker green, seven males and one female pinkish or reddish brown.

**Etymology.** We are proud to name this species in honor of the first author's best friend Maishe Dickman, great insect collector, artist and photographer.

**Diagnosis.** This is another of the five green species in the adelaida group in northern Central America. Along with *C. pehlkei* and *C. hawksi* it can be separated from the others (*Chrysina antonkozlovi* and *C. centralis*) by having the elytral humeri and umbone golden green, different from the disc. It can be easily separated from *C. pehlkei* and *C. hawksi* by the shape of the male genitalia.

**Distribution and remarks.** This species is currently known from El Güisayote Biological Reserve, an isolated mountain east of Nueva Ocotepeque (Honduras), very close to the border of El Salvador and Guatemala (Fig. 44). Seemingly identical specimens are also known from: Honduras, La Paz Dept., Reserva Biológica Guajiquiro, Las Trancas, 2170 m, N 14°07′53" W 87°57′47".

### *Chrysina woodruffi* Monzón, new species
### (Figures 7, 8, 12, 16, 20, 24, 26, 30, 38, 39, 43)

**Type material. Holotype** male (UVGC) labeled "GUATEMALA, Huehuetenango, San Mateo Ixtatán, 2 km norte de Bulej. Bosque nuboso. 1990 m. 15.960728 -91.569280. 18 AGOSTO 2010. Col. Monzón y Camposeco"; on red paper, "HOLOTYPE *Chrysina woodruffi* Monzón". **Paratypes** (4 males and 3 females) with data as follows: Same data as holotype except (1 male and 2 females); same data except "4 AGOSTO 2011, Col. Camposeco y Monzón" (1 male); same data except "12 JULIO 2011" (1 male and 1 female); same data except "20 de JULIO 2012" (1 female); same data except "27 julio 1998. Cristina Bailey, Enio Cano y Jose Monzón Col." (1 male). All paratypes with label, on yellow paper "PARATYPE *Chrysina woodruffi* Monzón". Paratypes deposited in the FSCA, JMS and THS collections.

**Description. Holotype male.** Length 30.0 mm; width at elytral humeri 14.0 mm; maximum width (middle of elytra) 16.5 mm. Dorsal surface of head, pronotum and elytra yellowish green (Fig. 7); lateral sides of clypeus reddish yellow; antennal club dark reddish brown, scape dorsally golden green with reddish reflections; pronotal margins and scutellum yellowish green with red reflections. Venter yellowish green with reddish reflections (Fig. 8); mentum, underside of mandibles, lateral lobules of mentum, procoxae, propleura, apex of mesometasternal protrusion and prosternal process orange to greenish orange; meso and metatrochanters, apex of abdominal coxae, external margins of mesosternum and metacoxae, internal margins of meso and meta femora and tibiae, and distal margin of first sternite

reddish orange; pygidium similar in color to elytra but with a slight reddish tint and metallic reddish orange on lateral margins; tarsi bluish silver. Clypeus (Fig. 12) free margins semicircular in dorsal view, slightly reflexed; surface with fine punctures; interocular distance 2.5 wider than antennal club length. Mentum (Fig. 16) quadrate; anterior depression lightly divided in two wide segments; lateral depressions slightly marked; posterior margin almost straight; surface setigerously punctate, punctures scattered and large. Pronotum at base 2.4 times as wide as interocular distance; sculpture similar to frons. Lateral margin completely beaded, slightly effaced between inner borders of eyes and almost inexistent in front of scutellum. Elytra smooth, striae with sparse and fine punctures, intervals weakly convex. Elytron 21.0 mm long and 3.0 times as long as pronotum; lateral margin completely beaded, except close to pygidium. Pygidium finely punctate with one row of sparse, fine, pale setae along external margin (Fig. 20); surface moderately convex and prominent towards apex. Venter with mesometasternal protrusion (Fig. 24) small and slightly extending past mesofemoral base, rounded, slightly depressed. Metasternum very slightly expanded (maximum height at coxae 12.0 mm), punctate, setae dense, short and pale. Apical sternite with depression. Legs with protibiae tridentate, apical teeth medium, second longer and third very small. Metatrochanter with apex protruding beyond metafemoral margin (Fig. 26); hind femora slightly enlarged and widened (4.0 mm maximum width); apical spine moderately produced (Fig. 30); hind tibia very slightly curved. Genitalia dark reddish brown with parameres symmetrical, apically constricted and recurved, fused except for apical fifth of its length, apex narrow and bidentate; length of genital capsule 10.0 mm (Fig. 38, 39).

**Female.** Similar to male except body more convex; tarsi slightly less robust; epipleural fold wide, terminating in sulcus; hind tibiae straight and apical sternite not depressed. Length 31.0 mm: width at elytral humeri 14.5; maximum width 19 mm (at epipleural fold). Inferior genital plates simple (Fig. 43), slightly asymmetrical; distal margin crenulated with sparse medium setae (based on female with database label "JMS9746").

**Variation.** The type series has very little variation, which is of interest as many species of the group show marked variation, especially in the male development of the metasternum and hind legs. Males: length 30.0–31.0 mm; width at elytral humeri 14.0–15.5 mm; maximum width 16.5–18.0 mm; mesosternum height at posterior coxae 12.0–13.5 mm. Females: length 31.0–33.0 mm; width at elytral humeri 15.0–16.0 mm; maximum width 18.0–19.0 mm (at epipleural fold). Two male specimens show reddish purple on the ventral coloration.

**Etymology.** I am proud to name this species for Robert Woodruff, great friend, great entomologist and great collecting partner in many unforgettable expeditions. Some of his invaluable work includes founding the CSE (Center for Systematic Entomology) in 1986 and starting Insecta Mundi (with Ross Arnett) when he was CSE first president. Currently he is still supporting the collection, increasing the number of beetles by hundreds of thousands since he retired and has been named Emeritus Beetle Taxonomist.

**Diagnosis.** This is one of the seven species in the macropus group in Central America, including the two described in this publication. From these, only *C. baileyana* Monzón, *C. triumphalis* Morón and *C. woodruffi* have the metatrochanter protruding beyond the metafemoral margin. Of the first two, *C. woodruffi* differs in that the males don't have hypertelic development on hind legs and metasternum. The most similar species is *C. baileyana* but differs in the shape of the male genitalia, apex of metatrochanter (Fig. 27) and shape of the apical spine in posterior femora (Fig. 31). *Chrysina halffteri* sometimes has a slightly produced metatrochanter beyond metafemoral margin but triangular compared to *C. woodruffi*, which is well produced beyond metafemoral margin and square in shape.

**Distribution and remarks.** This species is currently known only from two kilometers north of Bulej in Huehuetenango department (Fig. 44). It has taken many years to collect the type series and most collecting trips don't produce specimens. *Chrysina woodruffi* is a very rare or difficult to collect species. Limited access, local idiosyncrasy and deforestation make it very difficult to find other potential sites for this species.

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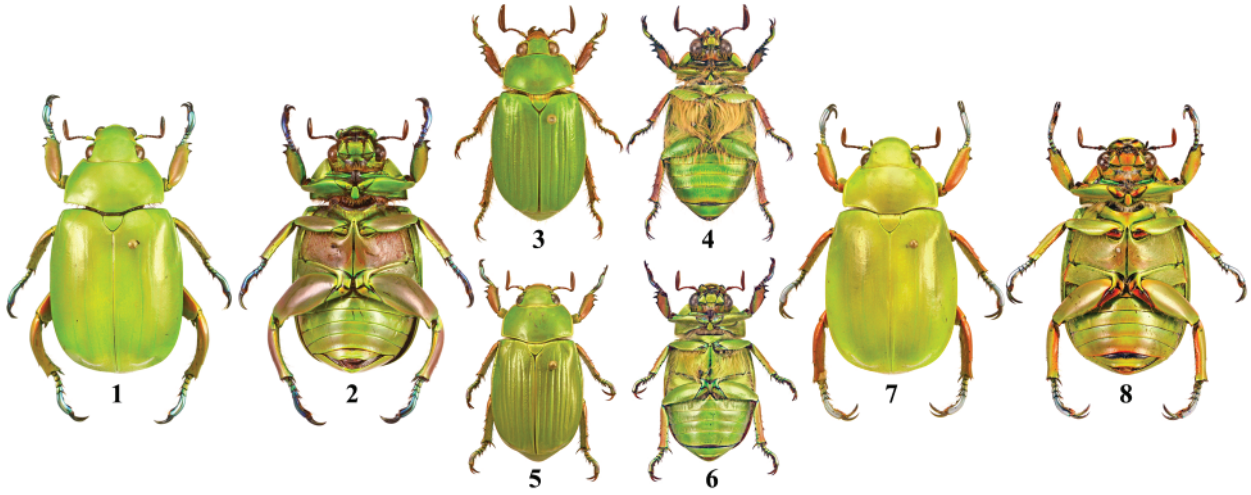
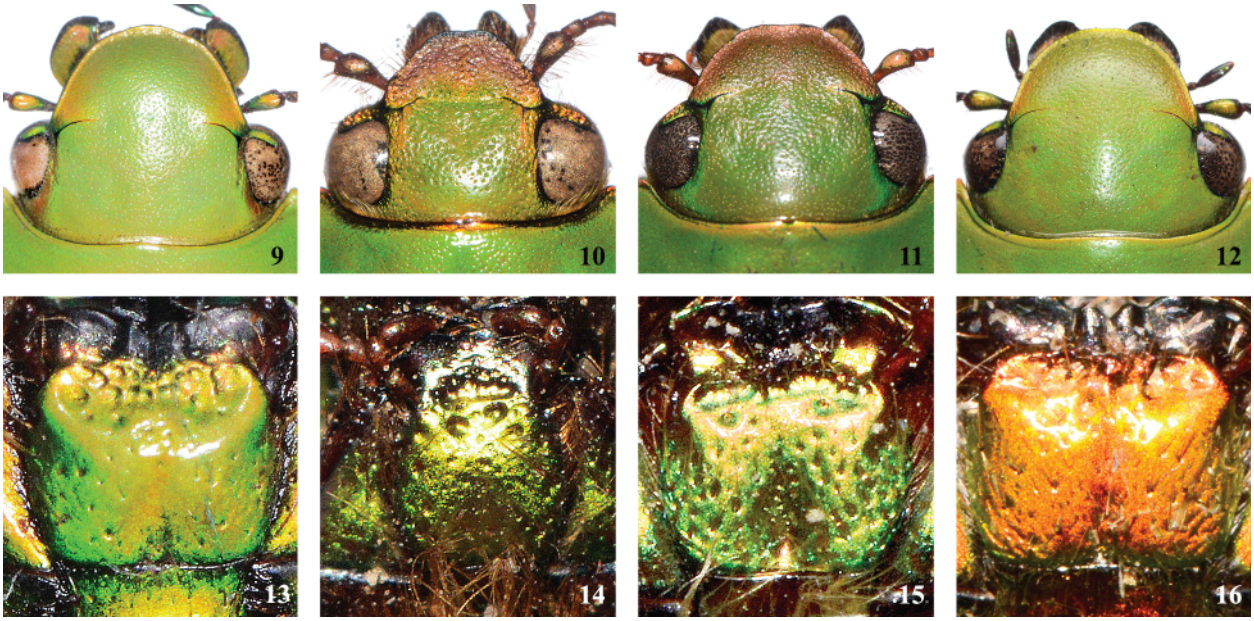
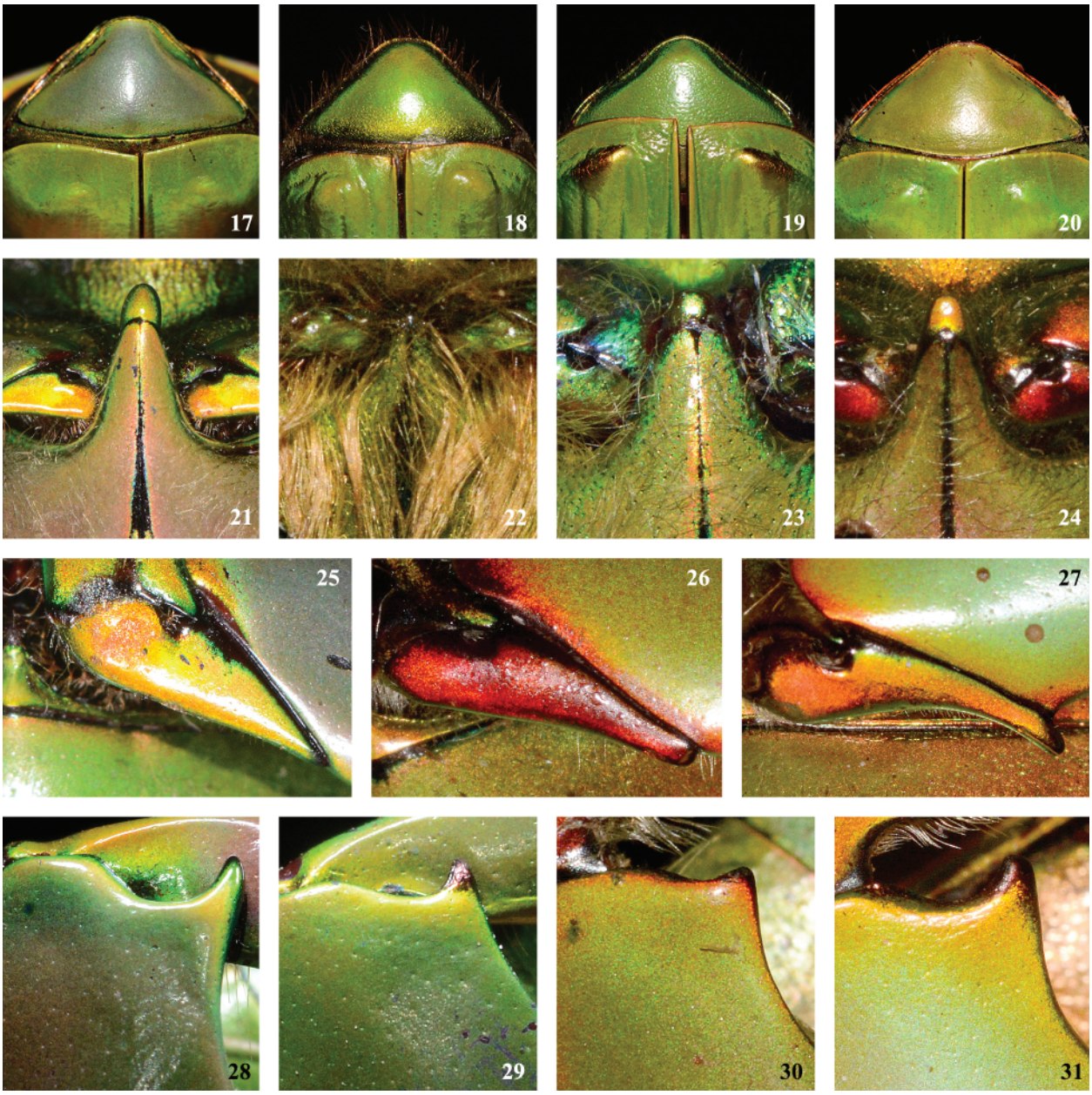


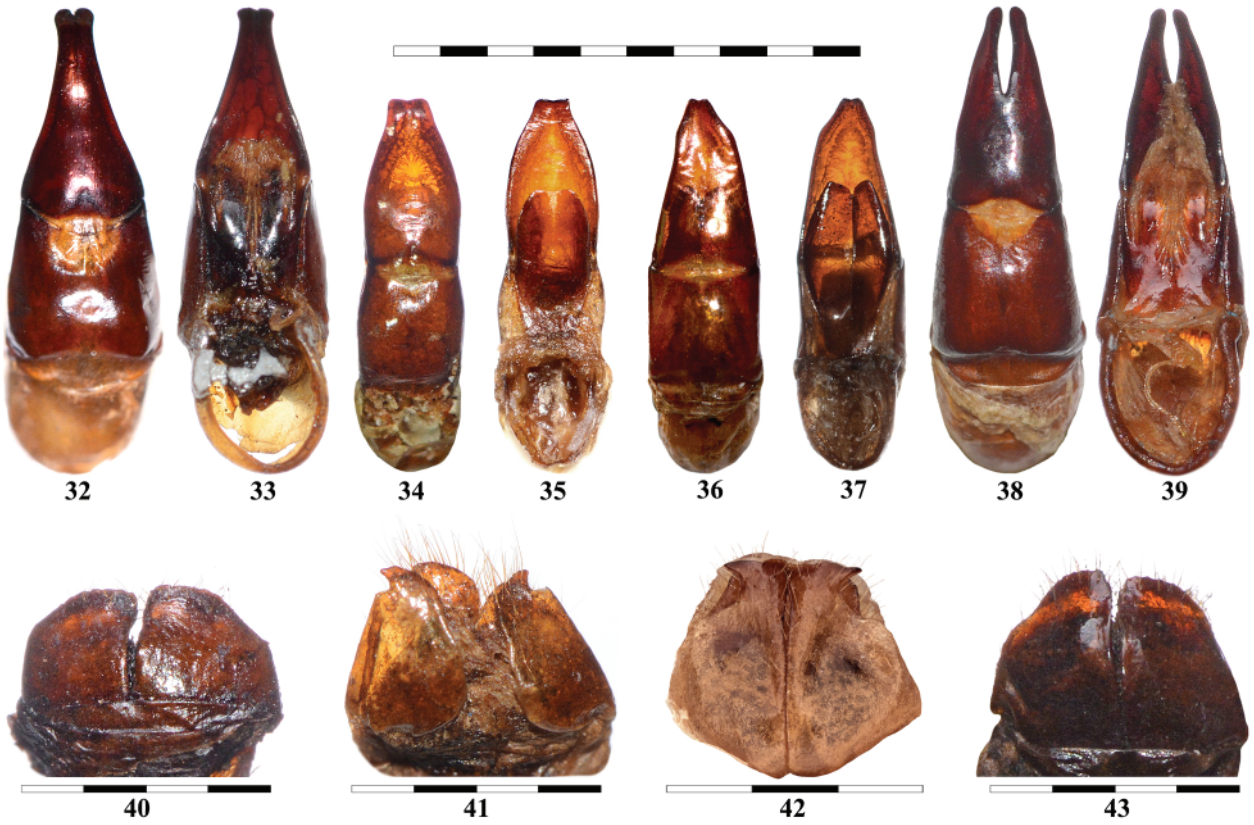

**Figures 1–8.** Dorsal and ventral habitus of adult *Chrysina* specimens (1x). **1–2)** *C. alexae* holotype from Purulhá, Baja Verapáz, Guatemala. **3–4)** *C. antonkozlovi* male paratype from Cerro Minas, Lempira, Honduras. **5–6)** *C. maishei* holotype from El Güisayote, Ocotepeque, Honduras. **7–8)** *C. woodruffi* holotype from Bulej, Huehuetenango.




**Figures 9–16.** *Chrysina* spp. structures. **9–12)** Clypeus of males. **9)** *C. alexae*. **10)** *C. antonkozlovi*. **11)** *C. maishei*. **12)** *C. woodruffi*. **13–16)** Mentum of males. **13)** *C. alexae*. **14)** *C. antonkozlovi*. **15)** *C. maishei*. **16)** *C. woodruffi*.




**Figures 17–31.** *Chrysina* spp. structures. **17–20)** Pygidium of males. **17)** *C. alexae*. **18)** *C. antonkozlovi*. **19)** *C. maishei*. **20)** *C. woodruffi*. **21–24)** Mesometasternal protrusions of males. **21)** *C. alexae*. **22)** *C. antonkozlovi*. **23)** *C. maishei*. **24)** *C. woodruffi*. **25–27)** Male metatrochanter. **25)** *C. alexae*. **26)** *C. woodruffi*. **27)** *C. baileyana*. **28–31)** Males metafemoral apical spine. **28)** *C. alexae*. **29)** *C. karschi*. **30)** *C. woodruffi*. **31)** *C. baileyana*.




**Figures 32–43.** *Chrysina* spp. genital structures, scale in mm. **32–39)** Male genital capsule dorsal (d) and ventral (v) habitus. **32)** *C. alexae* (d). **33)** *C. alexae* (v). **34)** *C. antonkozlovi* (d). **35)** *C. antonkozlovi* (v). **36)** *C. maishei* (d). **37)** *C. maishei* (v). **38)** *C. woodruffi* (d). **39)** *C. woodruffi* (v). **40–42)** Female inferior genital plates. **40)** *C. alexae.* **41)** *C. antonkozlovi.* **42)** *C. maishei.* **43)** *C. woodruffi.*

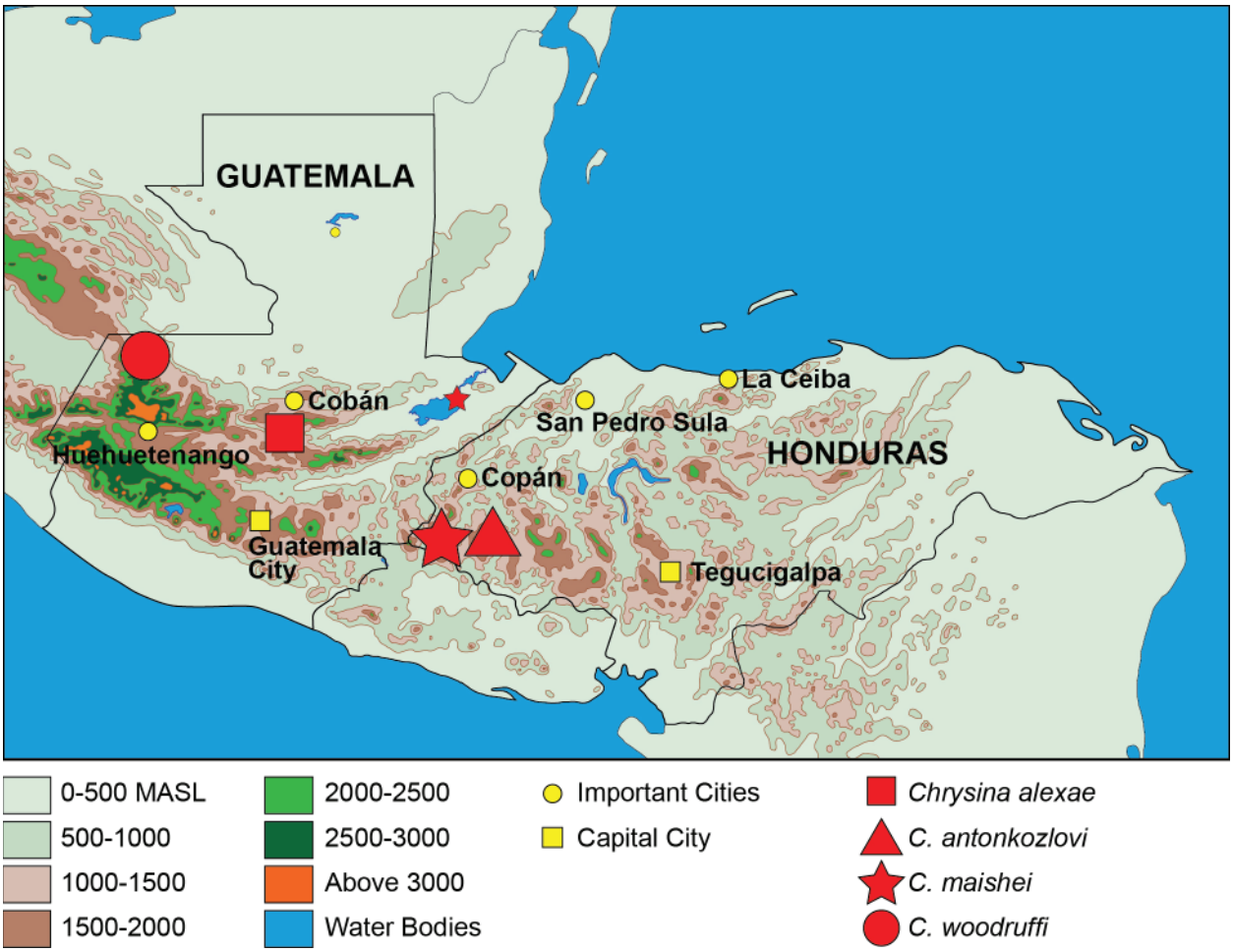



**Figure 44.** Distribution map for *Chrysina alexae* n. sp., *C. antonkozlovi* n. sp., *C. maishei* n. sp. and *C. woodruffi* n. sp. in Guatemala and Honduras.