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(Scarabaeidae: Rutelinae)

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**A NEW SPECIES OF *Viridimicus* JAMESON FROM HONDURAS
(SCARABAEIDAE: RUTELINAE)**

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Abstract

Viridimicus omoaensis Jameson is described from Honduras. This species extends the distribution of the genus from Guatemala southwards in Mesoamerica. The characters that define the genus are expanded to include *V. omoaensis*. A key to the seven species in the genus is provided as well as additional locality notes for *V. aurescens* (Bates) and *V. cyanochlorus* Jameson.

Resumen

Se describe *Viridimicus omoaensis* Jameson de Honduras. Esta especie extiende la distribución del género de Guatemala hacia el sur en Mesoamérica. Se amplían los caracteres que definen el género para incluir *V. omoaensis*. Se proveen una clave para las siete especies en el género y notas de localidades adicionales para *V. aurescens* (Bates) y *V. cyanochlorus* Jameson.

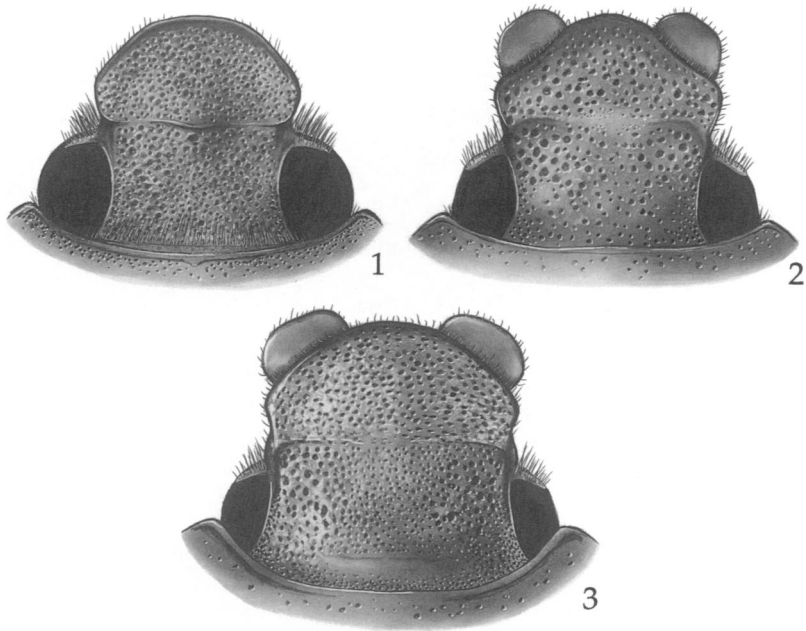
Species in the genus *Viridimicus* Jameson are large (about 25 mm in length) leaf chafers and were previously known to occur from central Mexico to Guatemala. The new species, *V. omoaensis* Jameson, as well as new records for *V. aurescens* (Bates), extend the distribution of the genus to Honduras. Species in the genus *Viridimicus* are distributed in mid-elevation, montane forests and have been collected at lights during rain or just prior to rain. Members of the genus are sexually dimorphic for color: males are metallic green and females are brown or black. The genus *Viridimicus* now includes seven species.

The parabolic form of the clypeal apex in *V. omoaensis* requires that the generic characteristics and limits of *Viridimicus* be redefined. All remaining species in the genus possess a semicircular clypeal apex. Because this character state overlaps with the sister genus *Parabyrsopolis* Ohaus, the key to genera of Areodina (Jameson 1990) is altered.

***Viridimicus omoaensis* Jameson, new species**

Figs. 1-4

Type Series. Holotype male labeled "Honduras: Cortés, Parq Nac Cusuco, 5 k. W Bs Aires, 26-27 August 1994, RD Cave collector." Genitalia and left wing card-mounted beneath specimen. Allotype female labeled as holotype. Holotype and allotype deposited at the University of Nebraska State Museum (Lincoln, Nebraska). Sixty paratypes (44 males, 16 females) with the following data: "Honduras: Cortés Dept., Cusuco National Park, Visitor Center, 1550 m, 20-22.viii.1998, D. C. Hawks, MV light during rain" (18 males, 4 females); "Honduras: Cortés, Parq Nac Cusuco, N15°29', W88°13', 21-22 August 1998,



Figs. 1–3. *Viridimicus* spp., head, dorsal view showing form of clypeus and mandibles. 1) *V. aurescens* (Bates) (mandibles hidden, clypeal apex semicircular); 2) *V. omoaensis* Jameson (mandibles exposed, clypeal apex parabolic); 3) *V. ratcliffei* Jameson (mandibles exposed, clypeal apex semicircular).

RD Cave collector" (11 males, 3 females); "Honduras: Cortés, Parq. Nac. Cusuco, N15°29', W88°12', 27–28 Ago 1998, rcol. J. Torres" (6 males, 2 females); "Honduras: Cortés, Parq. Nac. Cusuco, 5 k. W Bs Aires, 26–27 August 1994, RD Cave collector" (3 males, 2 females); "Honduras: Cortés, Cofradia, Cusuco, 26 Ago 1994, rcol. R. Cordero" (1 male, 2 females); "Honduras: Cortés, PN Cusuco, N 15°30', W88°12', 21 Ago 1998, rcol. J. Torres" (3 males); "Honduras: Cortés Dept., P.N. Cusuco, 15 July 1995," "D.C. Carlson collection" (1 male, 1 female); "Honduras: Cortés, Parq. Nac. Cusuco, N15°29', W88°12', 21–22 Ago 1998, rcol. R. Cave" (1 female); "Honduras: Cortés, Parq. Nac. Cusuco, 5 km W Buenos Aires, 24 September 1994, RD Cave collector" (1 male); "Honduras: Cortés, San Pedro Sula, Parque Nac. Cusuco, 24 Sep. 1994, rcol. R. Cave" (1 male). Paratypes deposited at the California Academy of Sciences, San Francisco, California (1 male, 1 female); Dave Carlson collection, Fair Oaks, California (1 male, 1 female); Ronald D. Cave collection, Zamorano, Honduras (13 males, 2 females); Daniel Curoe collection, Palo Alto, California (1 male, 1 female); Escuela Agrícola Panamericana, Zamorano, Honduras (4 males, 1 female); Dave Hawks collection, Riverside, California (18 males, 4 females); Henry and Anne Howden collection at the Canadian Museum of Nature, Ottawa, Canada (1 male, 1 female); Mary Liz Jameson collection, Lincoln, Nebraska (1 male, 1 female); Miguel Moron collection, Xalapa, Mexico (1 male, 1 female); Brett C. Ratcliffe collection, Lincoln, Nebraska (1 male, 1 female); United States National Museum,

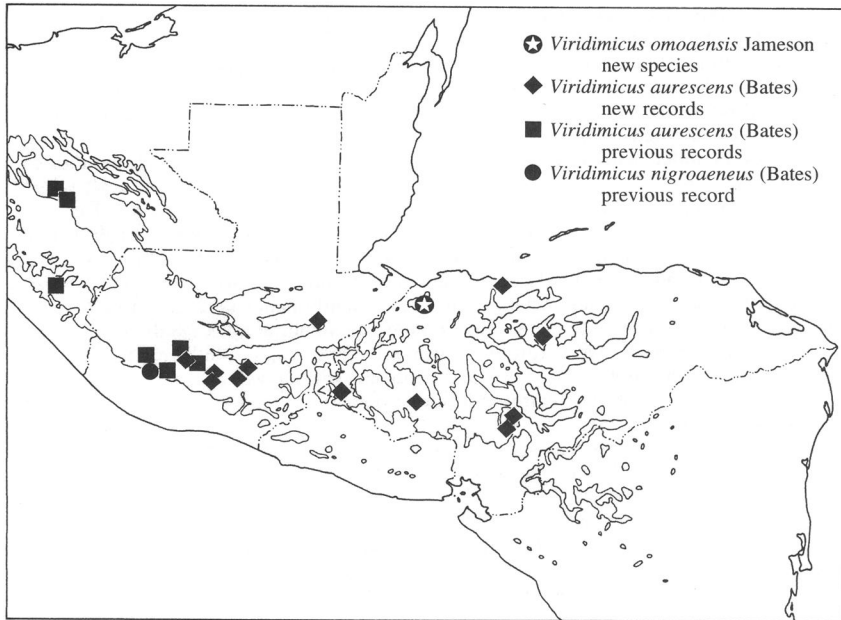


Fig. 4. Distribution of the species of *Viridimicus* south of the Isthmus of Tehuantepec (Chiapas, Mexico; Guatemala; Honduras; Nicaragua). Gray area equals 1,000 m.

Washington, D.C. (1 male, 1 female); University of Nebraska State Museum, Lincoln, Nebraska (1 male, 1 female).

Description. Holotype male. Length 26.5 mm; width across humeri 12.8 mm; greatest width 14.7 mm. *Head* (Fig. 2): Frons (with illumination and magnification) brassy, metallic green; clypeus castaneous. Surface of frons densely, confluent punctate (less so on disc); punctures moderate and moderately large, mixed, setigerous laterally; setae rufous, short. Frontoclypeal suture bi-arcuate. Clypeus declivous with respect to frons; sides divergent from base for one third length then converging apically to a weakly parabolic apex (Fig. 2); apex rounded, broadly reflexed; surface confluent punctate to coarsely rugopunctate, punctures moderately large. Interocular width 3.0 transverse eye diameters. Mandibles exposed in dorsal view (Fig. 2), weakly concave. *Pronotum*: Color (with magnification and illumination) reddish brown with brassy, metallic green reflections. Surface convex, with poorly defined, irregular concavities (for internal muscle attachment). Surface of disc moderately densely punctate, punctures moderate and small. Surface at margin, apex, and base moderately densely to densely punctate, punctures confluent or not at middle and apical margin; punctures moderate and small. *Scutellum*: Color (with magnification and illumination) reddish brown with brassy, metallic green reflections. Shape parabolic, width subequal to length. Surface moderately densely punctate, punctures moderate and small. *Elytra*: Color (with illumination and magnification) as pronotum. Surface with variably impressed, punctate striae; 1 line of punctures next to suture (poorly impressed), 3 in center of disc (weakly impressed, not reaching apex or base), 1 laterad of humerus (weakly impressed, not reaching apex or base); punctures small. Intervals broad, moderately densely punctate; punctures small and moderate in diameter, sparsely setigerous at margins of elytra, moderately setigerous at apex; setae rufous, moderate in length. *Pygidium*: Color as elytra. Surface densely punctate, less so at apex; punctures moderate (with setae) and small; setae rufous, moderately long to

long. *Legs*: Pro- and mesotarsi each with 1 claw enlarged, cleft, 2 times as wide as smaller claw. Metatarsus with 1 claw distinctly cleft, 1.5 times as wide as smaller claw. Protarsus with third tarsomere apically emarginate, with stout seta in emargination. *Venter*: Densely clothed with moderate to moderately long, rufous setae; sternites 1–6 less densely pilose. *Male Genitalia*: Symmetrical, apex rounded; internal sac cylindrical in shape, densely clothed with short, tawny setae.

Allotype Female. Length 28.7 mm; width across humeri 13.9 mm; greatest width 15.9 mm. Differs from holotype in the following respects: *Head*: Color castaneous, without metallic reflections. *Pronotum*: Color castaneous, with weak metallic green reflections at margins. Surface densely punctate, some punctures confluent at margins and apex, punctures large to moderate in diameter. *Elytra*: Color as pronotum. Intervals moderately densely punctate; punctures moderate in diameter. *Pygidium*: Color as pronotum. Surface from base to disc finely rugopunctate, at apex confluent punctate to moderately densely punctate, punctures at base and mid-disc minute and small, at apex small and moderate, mixed, some setigerous; setae rufous, moderately long. *Legs*: Protarsus with claws of equal size and width, not cleft. Meso- and metatarsi with claws of equal size and width, 1 claw weakly cleft. *Female Genitalia*: Ventral gonocoxites with apices broadly rounded, medial apices quadrate.

Paratypes (44 males, 16 females). Variation in measurements of males is as follows: length 22.8–26.4 mm; width across humeri 11.1–13.2 mm; greatest width 12.8–14.6 mm. Variation in measurements of females is as follows: length 27.1–30.0 mm; width across humeri 13.5–14.3 mm; greatest width 15.3–16.5 mm. Males and females differ from the holotype and allotype in the following respects. *Head*: Surface of frons with punctures separated by 1 puncture diameter. *Elytra*: Surface with 3 to 4 weakly impressed discal striae, additional weakly impressed stria laterad of humerus, not reaching apex or base.

Diagnosis. *Viridimicus omoaensis* is easily separated from other species in the genus by the following combination of characters: clypeal apex parabolic (divergent from base, laterally sinuate, apex rounded) (Fig. 2); dorsal coloration in the male brassy green; pygidium with disc densely, confluent punctate; mandibles in dorsal view exposed and weakly concave (Fig. 2).

Viridimicus omoaensis resembles *V. ratcliffei* Jameson in the exposed, flattened mandibles and brassy green coloration of the male. However, *V. omoaensis* is easily separated from *V. ratcliffei* by its parabolic clypeal apex (Fig. 2) (semicircular in *V. ratcliffei* [Fig. 3]). In addition, *V. ratcliffei* is known only from Puebla, Mexico.

Viridimicus aurescens is here recorded from Honduras. It is distinguished from *V. omoaensis* by its semicircular clypeal apex (Fig. 1) (parabolic in *V. omoaensis* [Fig. 2]), dark green metallic coloration of the male (brassy green in *V. omoaensis*), and concave mandibles that are hidden in dorsal view (Fig. 1) (exposed and flattened in *V. omoaensis* [Fig. 2]).

Distribution (Fig. 4). *Viridimicus omoaensis* occurs in the northwest corner of Honduras in the Sierra de Omoa. Specimens were collected between 1560 and 1650 m elevation.

Temporal Data. July (2), August (58), September (2).

Deposition of Types. The Escuela Agrícola Panamericana (Zamorano) and the Universidad Nacional Autónoma de Honduras maintain the largest insect collections in Honduras, but neither maintains primary types. For this reason, the primary types were deposited at the University of Nebraska State Museum, U.S.A., where other types and specimens in the genus *Viridimicus* are deposited.

Etymology. This species is named for the Sierra de Omoa, the type locality.

Remarks. *Viridimicus omoaensis* occurs in the small, isolated mountain region of Sierra de Omoa in northwestern Honduras. Specimens were collected in Parque Nacional Cusuco in wet, montane, cloud forest. Dominant tree spe-

cies include *Liquidambar styraciflua* L. (Hamamelidaceae), *Podocarpus oleifolius* Don. (Podocarpaceae), *Billia hippocastanum* Peyritsch (Hippocastanaceae), *Clusia* sp. (Guttiferae), and *Pinus* spp. (Pinaceae) (D. Hawks, pers. comm. 1995 and pers. obs.). Specimens were collected at light just prior to rain or during rain and before midnight. Parque Nacional Cusuco is unusual in Honduras for having a high number of undescribed species of Rutelinae and probably many other undescribed plant and animal species. The isolated nature of the Sierra de Omoa has resulted in a high rate of endemism including *Plusiotis cusuquensis* Curro (Rutelinae: Rutelini) and a new genus and species of Ithonidae (Neuroptera) (Penny 1996).

Taxonomic Considerations

Viridimicus omoaensis expands the definition of the genus and requires an emendation to the key to genera in the subtribe Areodina (Jameson 1990). Previously, the genus *Viridimicus* was characterized as having a clypeus that is semicircular, diverging slightly from the base and being widest at the middle. The parabolic form of the clypeal apex in *V. omoaensis* requires a modified definition of the clypeus for the genus *Viridimicus*. The generic description for *Viridimicus* should be amended to include a clypeus that is semicircular (diverging slightly from the base and widest at the middle) or a clypeus that is sinuate laterally and converging apically toward a parabolic apex. The parabolic form of the clypeal apex is also observed in some populations of *Parabyrsopolis chihuahuae* (Bates), the taxon most closely related to species of *Viridimicus* (Jameson 1990). In some populations of *P. chihuahuae* (e.g., those in Arizona, USA) the clypeal apex is rounded, and in other populations (e.g., those in Jalisco, Mexico) the clypeal apex is truncate. Although there is overlap between the two genera for this character, the genera are separated based on the following characters: (1) presence of metallic green coloration in males in *Viridimicus* (absent in *Parabyrsopolis*), and (2) form of the male genitalia that are rounded at the apex (truncate in *Parabyrsopolis*). Due to the expanded definition of the genus, the key to the genera of Areodina (Jameson 1990) requires alteration at couplet 9:

9. Males metallic green; females metallic green, dark brown, or black. Parameres rounded apically. Central Mexico to Honduras *Viridimicus* Jameson
 9' Males and females reddish-brown, brown, or black. Parameres truncate apically. Southern Arizona to central Mexico *Parabyrsopolis* Ohaus

Key to the Species of *Viridimicus* (Modified from Jameson 1990)

- 1 Protarsus with inner claw enlarged and apically split. Abdomen ventrally flat or concave (Males) 2
 1' Protarsus with inner claw not enlarged or apically split. Abdomen ventrally swollen or convex (Females) (known for only three species) 8
 2 Protarsus with apex of third tarsomere ventrally emarginate; stout seta arising from emargination 3
 2' Protarsus with apex of third tarsomere ventrally entire, not emarginate; stout seta arising from ventral disc of tarsomere
 *V. cyanochlorus* Jameson
 3 Mandibles broadly exposed and flattened (not concave) in dorsal view (Fig. 2-3) 4

- 3' Mandibles narrowly exposed or hidden and weakly concave in dorsal view (Fig. 1) 5
- 4 Clypeus with apex semicircular (Fig. 3) *V. ratcliffei* Jameson
- 4' Clypeus with apex parabolic (Fig. 2)
..... *V. omoaensis* Jameson, new species
- 5 Pronotum laterally with large and confluent punctures or rugopunctate. Color of pronotum reddish-brown with brassy green reflections (under illumination and magnification) *V. unitus* Jameson
- 5' Pronotum laterally with punctures moderate or moderately large, punctures not confluent; not rugopunctate. Color of pronotum dark metallic green to brassy green (under illumination and magnification) 6
- 6 Disc of pronotum sparsely punctate, punctures small
..... *V. impunctatus* Jameson
- 6' Disc of pronotum moderately densely punctate, punctures moderately large (dense) and small (sparse) 7
- 7 Disc of pygidium finely, confluent punctate. Discal regions of clypeus and frons with large punctures generally separated by 1 puncture diameter *V. nigroaeneus* (Bates)
- 7' Disc of pygidium moderately, densely punctate, not confluent. Discal regions of clypeus and frons confluent punctate *V. aurescens* (Bates)
- 8 Mandibles narrowly exposed or hidden, concave in dorsal view (Fig. 1) 9
- 8' Mandibles broadly exposed and flat in dorsal view (Fig. 2-3) 10
- 9 Disc of pronotum sparsely punctate, punctures small. Color of pronotum shining dark green; color of head opaque, black
..... *V. impunctatus* Jameson
- 9' Disc of pronotum moderately densely punctate, punctures moderately large. Color of pronotum and head piceous to brown with weak metallic green reflections *V. aurescens* (Bates)
- 10 Clypeus with apex semicircular (Fig. 3) *V. ratcliffei* Jameson
- 10' Clypeus with apex parabolic (Fig. 2)
..... *V. omoaensis* Jameson, new species

Biogeographic Considerations

With the addition of *V. omoaensis*, the genus *Viridimicus* is now composed of seven species. Species in the genus are distributed from the Transverse Volcanic Belt in central Mexico to Honduras (the genus was previously recorded only as far south as central Guatemala). They inhabit pine-oak forests from elevations of 1,500 to 2,300 m. Three species, *V. aurescens*, *V. nigroaeneus*, and *V. omoaensis*, occur south of the isthmus of Tehuantepec in Mexico. Three species, *V. ratcliffei*, *V. cyanochlorus*, and *V. impunctatus*, occur north of the isthmus of Tehuantepec. The locale for *V. unitus* in Mexico remains unknown but is probably north of the isthmus of Tehuantepec. From Tehuantepec to Honduras, the mountain regions that comprise the Central American Nucleus form a fairly continuous mountain system, especially from southern Mexico to southeastern Guatemala. From southeastern Guatemala to eastern Honduras the Central American Nucleus is dissected, and, in the northern and eastern portions of Honduras (as well as northern Nicaragua), there are several small, isolated mountain "islands." One of these "islands" is the Sierra de Omoa (2,242 m) in the northwesternmost portion of Honduras. The Sierra de Omoa is part of the Cordillera del Norte, one of the oldest geological zones

in Honduras that includes three ranges: Sierra de Espiritu Santo, Sierra de Omoa, and Sierra de Nombre de Dios (Portillo 1984). Unlike the Cordillera Central that was formed during the Cretaceous era, this region was formed during the Paleozoic and Mesozoic eras (Portillo 1984). Within the Cordillera del Norte, the Sierra de Omoa is isolated by the valleys of the Rio Motagua (to the west), Rio Ulúa (to the east), and Gulfo de Honduras to the north. Three mountains lie to the south: Cerro Santa Barbara (2,835 m) about 40 km to the south, Sierra Gallinero (2,285 m) about 50 km to the southwest, and Cerro Pico Pijol (2,282 m) about 65 km to the southeast. The distances between these mountains and the deep river valleys serve to isolate the Sierra de Omoa. The isolated nature of the Sierra de Omoa probably promoted divergence from the ancestral populations of *Viridimicus*.

In comparison to the Cordillera de Norte, the Cordillera Central forms a relatively contiguous mountainous region from southern Mexico to Honduras. Rather than isolating populations (as with *V. omoaensis*), these mountains have served to maintain lineage cohesiveness in populations of *Viridimicus*. I have studied many specimens of *Viridimicus* from the areas of Mexico (Chiapas), Guatemala, and Honduras in the Central American Nucleus. In comparison to the description of *V. aurescens* provided in Jameson (1990), I have noted variations in: form of the clypeal apex (semicircular to semiovate and weakly reflexed to moderately reflexed), punctuation of the discal regions of the clypeus and frons (confluently punctate or nearly so), punctuation of the pronotum (moderately dense to densely punctate [not confluent]), punctuation of the elytral intervals (moderately densely punctate, punctures small to moderate, some transverse or weakly transversely rugose), distribution of the setae on the lateral edge of the elytra (extending from mid-elytra to elytral apex or at apex only), density and length of the setae on the lateral edge of the elytra (moderately dense to dense; moderately long to long), the form of the sculpturing of the pygidium (moderately to densely punctate, punctures not confluent), and the density and length of the pygidial setae (moderately dense to dense; moderately long to long). These character variations are not substantial or consistent differences. I believe that these variations reflect subpopulations of *V. aurescens* and do not warrant designation of new species or subspecies. All specimens that I studied appear to be conspecific with *V. aurescens*. This hypothesis is further substantiated by the geography of the area that allows for gene flow within and between subpopulations of *V. aurescens*.

The possibility exists that populations of ancestral *Viridimicus* may have become isolated in regions such as the Sierra de Dipicto y Jalapa (on the border between Honduras and Nicaragua), Cordillera Nombre de Dios (northernmost Honduras), Sierra Gallinero (western Honduras near the border of Guatemala), or other regions in Mesoamerica. These regions and many others are still largely unexplored entomologically. Knowledge of the flora and fauna of these regions is needed to supplement our relatively poor understanding of biodiversity and evolutionary patterns throughout Mesoamerica.

New Locality Notes on *Viridimicus* Species *Viridimicus aurescens* (Bates)

Viridimicus aurescens is distributed from Chiapas, Mexico to Honduras in pine-oak forest from 1,850 to 2,300 m elevation. In addition to localities provided in Jameson (1990), *Viridimicus aurescens* also occurs in the following newly recorded localities. The record of this species from the coastal, lowland

location of Lancetilla in Honduras (Fig. 4) may be in error or may refer to a locality near Montaña del Tiburón approximately 15 km from Lancetilla.

Guatemala. *Baja Verapaz*: Cerro del Mono (8 rd. km N. of San Lorenzo, 2150m), Posada Montana del Quetzal [hotel at La Union Barrios], Purulhá (8 km S., 1,600 m; 5 km E.), Salamá (17 km N., 1,700 m, flight intercept trap), Zacapa Biotopo de Quetzal. *El Quiché*: Chugeza, Chopol. *Sacatepéquez*: Cerro Alux (2,260 m, 2,300 m), Sn. Lucas, Vol. Agua (N. slope, 7,000 ft.).

Honduras. *Atlántida*: Lancetilla. *Francisco Morazán*: Tegucigalpa (30 km E.), Cerro Uyuca (1,800 m), Zamorano (12 km W.), Cerro Uyuca (1,870 m, 14°92'N, 87°05'W, ex. flight intercept trap), P.N. La Tigra. *Intibucá*: El Tabor, La Esperanza (~2,000 m). Ocotepeque: R.B. Guisayote. *Olancho*: Parq. Nac. La Muralla (1,450 m). New Country Record.

Viridimicus cyanochlorus Jameson

The female of *V. cyanochlorus* remains undescribed. An additional male specimen was collected under logs in the following locality:

Mexico. Oaxaca: San José del Pacífico (Rte. 175, 3.2 km S., 2,440 m).

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