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CLASSIFICATION OF *DIPHLEPS* (HETEROPTERA: MIRIDAE: ISOMETOPINAE), WITH THE DESCRIPTION OF *D. YENLI*, A NEW SPECIES FROM DOMINICAN AMBER (LOWER OLIGOCENE–UPPER EOCENE)

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Abstract.—***Diphleps yenli*** n. sp. is described from two specimens preserved in Dominican amber. A revised key to the species of *Diphleps* is provided. Initial studies suggest that species of *Diphleps* can be classified in two groups based on the magnitude of the anterior pronotal concavity angle of males: less than 140° on *D. maldonadoi* and ***D. yenli***, n. sp. which occurs in Puerto Rico and occurred in Dominican amber, respectively; equal to or greater than 140° on *D. similaris,* which inhabits Turks and Caicos as well as the Bahamas archipelagos, and *D. unica,* known from the eastern United States.

Key Words: Miridae, Isometopinae, *Diphleps, D. yenli* n. sp., key to species

There are currently eleven New World genera of Isometopinae arranged in two tribes (Henry 1980): Isometopini containing the genera *Aristotelesia* Carvalho 1947, *Brailovskiocoris* Henry 1980, *Corticoris* McAtee and Malloch 1922, *Isometocoris* Carvalho and Sailer 1954, *Lidopiella* Henry 1980, *Lidopus* Gibson 1917, *Myiomma* Puton 1872, *Myiopus* Henry 1980, *Plaumannocoris* Carvalho 1947, *Wetmorea* McAtee and Malloch 1924 and the Diphlepini with *Diphleps* Bergroth 1924. The Isometopinae have been regarded as the most ancestral mirid subfamily (Wheeler and Henry 1978).

Diphleps contains four species: *D. maldonadoi* Henry 1977 from Puerto Rico, *D. similaris* Henry 1977 from Turks and Caicos and the Bahamas archipelagos, *D. unica* Bergroth 1924 from the eastern United States, all extant, and *D. yenli* n. sp. only known from Dominican amber, the first described fossil species of the Isometopinae.

Both *D. unica* and *D. maldonadoi* occur in mature forests. *Diphleps unica,* a summer univoltine mirid common in light trap catches, has been collected among lichens on the bark of oak, *Quercus* sp. (Fagaceae), on huckelberry, *Vaccinium* sp. (Ericaceae) (Blatchley 1926), on elm, *Ulmus alata* (Ulmaceae), and on honeylocust, *Gleditsia triacanthos* (Fabaceae) (Henry 1977, Wheeler and Henry 1978). Apparently, females of *D. unica* are far more common than males (Blatchley 1926, Wheeler and Henry 1978).

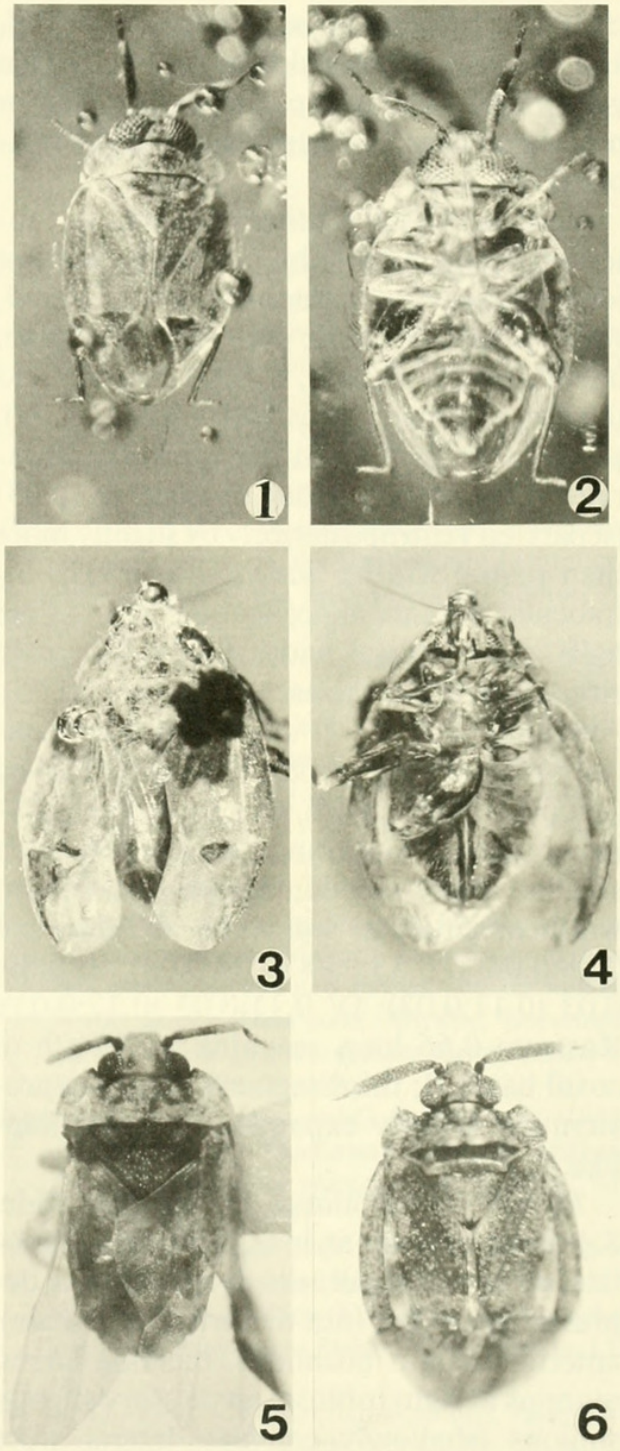
METHODS AND DESCRIPTION

Most Dominican amber comes from mines located in the Cordillera Septentrional, between Santiago and Puerto Plata, in the Northern Portion of the Dominican Republic. These mines are in the Altamira facies of the El Mamey Formation (Upper Eocene), which is shale-sandstone interspersed with a conglomerate of well-rounded pebbles (Eberle et al. 1980).

Differences in the magnitudes of absorption peaks in nuclear magnetic resonance spectra of the exo-methylene group of am-

ber from different mines in the Dominican Republic were used to calculate the age of the various mines (Lambert et al. 1985) using the 20 million to 23 million year age of the Palo Alto mine as a standard (Baroni Urbani and Saunders 1980). The ages of the mines in that region of the country vary from 25 million to 40 million years. Amber from the La Toca mine was the oldest, some 35 million to 40 million years old (lower Oligocene to upper Eocene). These age estimates are close to the independent dating reported by Schlee (1990) who gave a range of 30 to 45 million years for the La Toca mine. Davis (1989) reported 20–30 million years as the age of Dominican amber.

Nomenclature and measurements (in mm) follow Maldonado (1969) and Henry (1977). Several pronotal angles are compatible with our grouping but the most evident one is the pronotal concavity angle (pca). Intuitively, the pca is a measure of the relative "openness" of the anterior concavities of the pronotum. Formally, the pca is the angle subtended by the segment connecting the distalmost points of the anterior pronotal concavities and the projection of the inner anterolateral aspect of the pronotum. The description refers to the male holotype, parenthetical statements refer to the female paratype, if different from holotype. The holotype (HE 4-17) is deposited in the Poinar collection of Dominican amber maintained at the Museum of Paleontology, University of California, Berkeley (acc. no. 39839). The female paratype (12535) is deposited at the National Museum of Natural History, Washington, D.C. All specimens were photographed with a Nikon stereomicroscope using Kodak 125 Plus X film.



Figs. 1–6. 1, 2. Overall views of *Diphleps yenli* n. sp. male holotype. 1, dorsal. 2, ventral. 3, 4. Overall views of *D. yenli* n. sp. female paratype. 3, dorsal. 4, ventrolateral. 5. Overall dorsal view of *D. maldonadoi* female. 6. Overall dorsal view of *D. unica* male.

Diphleps yenli, New Species

Santiago-Blay and Poinar

Figs. 1–4

Length 1.9 (2.1), maximum width 1.1 (not taken); suboval, sparsely ornamented with pale yellow, short setae; pale yellowish brown, irregularly variegated with pale brown on eyes, pronotum, scutellum, embolium, cuneus, and abdominal apex (almost uniformly pale yellowish brown). Second antennal segment with a pale brown annulus between distal half and fifth (two pale annuli, close to basal and apical thirds,

excluding base and apex, respectively), third, and fourth segments pale brown. Venter pale yellowish brown except for slightly darker prosternal base and basal half of hind femora (Figs. 1–4).

Head.—Dorsally concave, pronotal anterior margin nearly three times as wide as long; tylus very reduced (small), round, width across apex 0.1; eyes relatively large, lateral margin smooth, slightly emarginated toward antennal bases (not emarginated), almost contiguous ventroposteriorly, separated ventrally by width of rostrum (0.05) (separated ventroposteriorly by slightly more than rostral width); ocelli dark brown; intraocular distance at ocelli about a third (one half) of eye dorsal width 0.02:0.06; ocelli closer to eyes than to each other (0.03:0.06). Antennal segment I, slightly thinner apically than II (0.05:0.08); II slightly curved (almost straight), with very short setae, giving granulose appearance; III and IV much smaller than second; length, maximum width of antennal segments, as follows: I 0.08:0.06; II 0.35:0.08 (0.34:0.04); III 0.09: 0.03 (0.11:0.03); IV 0.11:0.03 (0.12:0.03). Rostrum 0.66 long, reaching midlength of coxal bases II; third segment reaching prosternum, slightly expanded laterally, flaplike.

Thorax.—Pronotum 0.25 long, 0.84 wide, 3.4 times as wide as long, minutely granulate, with two small, nearly contiguous depressions on disk (not discerned in female); anterior margin bisinuous, meeting lateral margins at right (obtuse) angle, very slightly sinuous (shallowly convex); lateral sides flattened, projecting laterally and angled slightly upward; anterolateral portions strongly arched (not arched) around eyes; posterior margin shallowly and broadly concave (very slightly sinuate), with a slight mediolongitudinal ridge from midlength to posterior margin (without ridge), without keels or indentations; pca $\approx$130–140°. Mesoscutum exposed; width across anterior angles 0.69 (0.63), about half the length of scutellum; scutellum basal width across 0.59 (0.41), with shallow, median, longitudinal ridge from midlength to apex. Hemelytra suboval; embolium 0.78 (0.66) long, wide 0.14 (0.19), about twice as wide as thickness of second antennal segment; cuneus maximum width 0.44 (0.42), maximum length (perpendicular to width) 0.56 (0.59), ending near apex of membrane. Hind femora thick, 0.25 (0.27) maximum width, 0.67 (0.66) long; with fine pilosity posteriorly.

Abdomen.—Last two visible segments abruptly narrowed (evenly rounded), with broadly rounded apex, not reaching apex of cuneus. Genitalia as in Fig. 9. (Right clasper cannot be discerned).

Diagnosis.—*Diphleps yenli* n. sp. can be distinguished from *D. maldonadoi* by its relatively short tylus and males with shorter interocular/intraocular ratio (about 4.4 on *D. yenli* n. sp.; 4.7–4.9 on *D. maldonadoi*). *Diphleps yenli* n. sp. can be distinguished from *D. similaris* and *D. unica* by the magnitude of the anterior pronotal $<90°$ angle ($\geq 90°$ in *D. similaris* and in *D. unica*).

Etymology.—This species is named after Yenli Yeh, beloved wife of author JASB; name by apposition (Art. 111h(i)2 International Code of Zoological Nomenclature 1985).

Key to the Species of *Diphleps*

Slightly modified version of Henry's (1977) key.

1. Anterior pronotal concavity angle of males less than 140° (Figs. 1, 3, 5) 2
– Anterior pronotal concavity angle of males equal to or greater than 140° (Fig. 6) 3
2. Tylus just reaching midlength of antennal I; males with interocular/intraocular ratio about 4.4 ..... *Diphleps yenli* n. sp. (Figs. 1–4)
– Tylus reaching past midlength or beyond antennal I; males interocular/intraocular ratio about 4.7–4.9 ..... *D. maldonadoi* Henry 1977 (Fig. 5)
3. Mesoscutum with distal, transverse carina; adults 2.0–2.1 mm long; rostrum reaching posterior margin of metacoxae or beyond; female with inner anterolateral side of pronotum nearly touching eyes; left paramere unnotched .. .. *D. similaris* Henry 1977

– Mesoscutum without distal, transverse carina; adults 2.4–2.6 mm long; rostrum not reaching posterior margin of metacoxae; female with inner anterolateral side of pronotum removed from eyes; left paramere notched .... *D. unica* Bergroth 1924 (Fig. 6)

Discussion

Species of *Diphleps* segregate in two major groups, each represented by two species, based on the morphology of the anterior pronotal concavity angle. *Diphleps maldonadoi* and *D. yenli* males have smaller (<140°) angles and, while they have well-developed eyes and reduced vertex, females have smaller eyes and larger vertex. *Diphleps yenli* male vertex is narrower and the tylus shorter than in any other described species of the genus. Conversely, *D. similaris* and *D. unica* males show a pattern reversal; they have greater (≥140°) angles.

Diphleps yenli n. sp. perhaps was a scale insect predator like some extant New World isometopines (Wheeler and Henry 1978).

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