



A new species of planthopper in the genus *Myconus* (Hemiptera: Auchenorrhyncha: Fulgoroidea: Achilidae) from the Los Angeles Cloud Forest, Costa Rica

MARCO A. ZUMBADO ECHAVARRIA¹, EDWIN A. BARRANTES BARRANTES², CHARLES R. BARTLETT³, ERICKA E. HELMICK⁴ & BRIAN W. BAHDER⁵

¹Universidad of Costa Rica—Sede San Ramón, Departamento de Ciencias Naturales, de la Iglesia el Tremedal 400 mts al Oeste carretera hacia San Pedro, San Ramón, Alajuela, Costa Rica.

✉ marco.zumbado@ucr.ac.cr; nassua75@gmail.com; <https://orcid.org/0000-0002-2591-7662>

²Universidad of Costa Rica—Sede San Ramón, Departamento de Ciencias Naturales, de la Iglesia el Tremedal 400 mts al Oeste carretera hacia San Pedro, San Ramón, Alajuela, Costa Rica.

✉ edwin.barrantes@ucr.ac.cr; edwbarrantes@gmail.com; <https://orcid.org/0000-0001-9565-2105>

³University of Delaware, Department of Entomology and Wildlife Ecology, 250 Townsend Hall, Newark, DE 19716-2160, USA.

✉ bartlett@udel.edu; <https://orcid.org/0000-0001-9428-7337>

⁴University of Florida, Department of Entomology and Nematology—Fort Lauderdale Research and Education Center; 3205 College Ave., Davie, FL 33314-7719, USA.

✉ ehelmick@ufl.edu; <https://orcid.org/0000-0002-1118-4832>

⁵University of Florida, Department of Entomology and Nematology—Fort Lauderdale Research and Education Center; 3205 College Ave., Davie, FL 33314-7719, USA.

✉ bbahder@ufl.edu; <https://orcid.org/0000-0002-1118-4832>

Abstract

Recent survey work in Costa Rica has resulted in the discovery of a wide variety of undescribed species of planthoppers in the families Derbidae and Cixiidae. During a light trapping event in the Los Angeles cloud forest, a large planthopper was collected and determined to belong to the genus *Myconus* in the family Achilidae. Herein, the novel taxon is described with accompanying molecular data for the cytochrome *c* oxidase subunit I (COI) gene, 18S rRNA gene, and histone 3 (H3) gene and an updated key for the New World *Myconus* is provided.

Key words: Fulgoromorpha, Myconinae, Myconini, New World

Resumen

Estudios recientes en Costa Rica han resultado en el descubrimiento de una amplia variedad de especies de chicharritas no descritas, pertenecientes a las familias Derbidae y Cixiidae. Durante captura mediante el uso de trampas de luz en el bosque nuboso de Los Ángeles, se recolectó una chicharrita grande y se determinó que pertenecía al género *Myconus* en la familia Achilidae. En este documento, el nuevo taxón se describe con los datos moleculares que lo acompañan para el gen de la subunidad I (COI) del citocromo *c* oxidasa, el gen 18S ARNr y el gen de histona 3 (H3), además se proporciona una clave actualizada para *Myconus* en el Nuevo Mundo.

Palabras clave: Fulgoromorpha, Myconinae, Myconini, Nuevo Mundo

Introduction

The genus *Myconus* Stål, 1862, is comprised of four species: the type species *M. conspersivnervis* (Stål, 1862) described from Brazil (Stål, 1862, also reported from Belize Metcalf 1938); *M. trivittatus* Fennah, 1950, also known from Brazil (Fennah 1950), *M. collaris* Melichar 1904, recorded from Somalia (Melichar 1904); and *M. uniformis*

(Metcalf, 1938) (as *Messoides* Metcalf, 1938) documented from Panama was added to *Myconus* by the synonymy of *Messoides* by Fennah (1950).

Aside from original descriptions for these species, the only taxonomic work related to *Myconus* has concerned higher classification (Fennah 1950, Emeljanov 1992, 1993). Fennah (1950) revised the genera and tribes of Achilidae, recognizing seven tribes (implicitly placed in the two subfamilies established by Metcalf, 1938). *Myconus* was placed as the type genus in the Myconini Fennah (Achilinae) along with the genera *Myconellus* Fennah, 1950, *Cixidia* Fieber 1866, and *Epiptera* Metcalf 1938. Emeljanov (1992, 1993) revised the higher classification of Achilidae—including Achilixiidae—into two subfamilies (Apatesoninae Metcalf, 1938, Achilinae Stål, 1866), with traditional Achilidae placed into three supertribes and 12 tribes. Subsequently Achilixiidae were excluded from Achilidae (e.g., Urban & Cryan 2007, Song & Liang 2013), and Emeljanov's (1992, 1993) supertribes treated as subfamilies of Achilidae in the traditional sense (e.g., Bartlett *et al.* 2014, 2018). Emeljanov's (1992, 1993) Myconini included the genera *Myconus*, *Myconellus* and tentatively *Myrophenges* Fennah 1965 (with *Cixidia* and *Epiptera* transferred to Achilini), and placed the tribe in the supertribe Myconites (now subfamily Myconinae) along with 5 additional tribes (4 extant, 1 extinct). The current composition of Myconini is 5 genera *Myconus*, *Myconellus*, *Myrophenges* and the genera *Ganachilla* Wang & Huang, 1989 and *Haicixidia* Wang, 1989 described from China (Wang & Huang, 1989, Wang 1989).

The features of the Myconini are described in detail in Emeljanov (1993). The key diagnostic features are wings folded flat, overlapping (vs. e.g., *Apateson* Fowler 1900, *Tropiphlepsia* Muir 1924), hindwing with second anal vein thick, simple, nearly straight, and not reaching wing margin by a considerable distance (i.e., Emeljanov 1992, fig. 2), hind tibiae with 2-3 lateral teeth (vs. 5-7 in Rhotalini); forewing with 6-branched M, and CuA 4-5 branches; lateroposterior cubital area with 1-2 accessory transverse veins; lateral carinae of postclypeus not continuing onto anteclypeus.

The genus *Myconus* are relatively large achilids (~6-14 mm including wings), dorso-ventrally flattened, possessing a narrow head that projects weakly in front of the eyes, vertex transverse with distinct median carina and separated from the frons by a transverse carina; frons elongate with median carina continuing to clypeus, pronotum elongate at midline (tribal feature), extending anteriorly to the midpoint of the eye, mesonotum large, about as long as wide with three parallel carinae, and broad tegminae that do not strongly overlap (Metcalf 1938, Fennah 1950, Emeljanov 1993). The Myconini have a thick A_2 in the hindwing that does not reach the wing margin (Emeljanov 1993, fig. 2).

Very little is known about the biology of *Myconus*. Like other achilids, nymphs are assumed to be subterranean as they are feeding on fungal hyphae in rotten wood or leaf litter (Hepburn 1967, O'Brien 1971, Wilson *et al.* 1994, Dietrich 2003, Nickel 2003, Bartlett *et al.* 2014, 2018, Asche 2015, Gossner & Damken 2018), and adults utilize above-ground part of plants, mainly dicots (Wilson *et al.* 1994). In 2018, extreme weather events in Costa Rica caused the loss of hundreds of trees at La Selva Biological station and subsequently in 2019, light trapping was conducted in an open area of old growth forest near many downed trees. During this light trapping event, thousands of achilids arrived at the light trap represented by at least 30 different species. While achilids are common at light traps in Costa Rica, the amount collected at that event was much higher than usual and it is suspected that the large amount of dead wood resulted in this significant increase (B.W. Bahder, personal observation). The seasonal abundance of *M. uniformis* collected from light traps suggests that adults are active from July to October in Panama (Wolda 1980). *Myconus* collected by Wolda are in the collection at the Smithsonian Tropical Research Institute, Panama, including adults and nymphal exuviae collected in dead wood.

Recent surveys of planthoppers associated with palms in Costa Rica has led (so far) to the description of 14 new species, including five oecleine cixiids (two *Haplaxius* Fowler, three *Myxia* Bahder & Bartlett; Bahder *et al.* 2019a, 2020a; Barrantes *et al.* 2021; Echavarría *et al.* 2021a, 2021b); eight cenchreine derbids (in five genera; Bahder *et al.* 2019b, 2020b, 2020c, 2021a 2020b, 2020c; Echavarría *et al.* 2021c) and one otiocerine derbid (*Anotia* Kirby; Barrantes *et al.* 2020). The impetus for this survey activity is a renewed interest in the epidemiology of palm lethal decline phytoplasmas and their putative vectors in Florida and the Caribbean basin. While most new species have been collected directly from palms, light trapping has also been utilized and yielded new planthopper taxa, that may not be associated with palms but are still useful for constructing/informing phylogenetic relationships for new and described taxa. While light trapping in the Silencio de Los Angeles cloud forest, a large planthopper was collected and determined to belong to the genus *Myconus*.

Herein we describe a new species of the genus *Myconus* (Achilidae) as well as provide DNA sequence data for the cytochrome c oxidase subunit I (COI) gene, 18S gene, H3 gene and a key to the species of the genus *Myconus*.

Materials and methods

Locality and specimen collection. Individuals of the novel taxon were aspirated from a white sheet while light trapping in the Los Angeles Cloud Forest (Fig. 1) and stored directly in 95% ethanol. Specimens were collected at Reserva Privada el Silencio de Los Angeles, Hotel Villa Blanca, Alajeula, Costa Rica (permit no. SINAC-ACTo-GASPPNI-016-2018) on May 15, 2018 (10.20350, -84.485053) with permission of the management of Hotel Villa Blanca. Specimens were exported under permit number DGVS-256-2018 and imported into the U.S.A. under permit number P526-170201-001. All specimens collected were measured, photographed and dissected using a Leica M205 C stereoscope. Images of specimens and all features photographed were generated using the LAS Core Software v4.12. Voucher specimens, including primary types, are stored at the University of Florida—Fort Lauderdale Research and Education Center (FLREC) in Davie, FL, U.S.A (Holotype male) and the Florida State Collection of Arthropods (FSCA) (Paratype male) in Gainesville, FL, U.S.A. Label information of type is quoted, with ‘/’ indicating a new line.



FIGURE 1. Habitat where specimens of *Myconus jacuelinae* sp. n. were collected.

Morphological terminology. Morphological terminology generally follows that of Bartlett *et al.* (2014), except forewing venation following Bourgoïn *et al.* (2015). New taxa are intended to be attributed to Bahder and Bartlett.

Dissections and DNA extraction. The genitalia that were dissected also served as the source of tissue for DNA extraction. The terminal end of the abdomens with genitalia were removed and placed directly into a solution of tissue lysis buffer (buffer ATL) and proteinase K (180 μ l ATL and 20 μ l proteinase K) from the DNeasy® Blood and Tissue Kit (Qiagen). The genitalia was left to lyse for 24 hours at 56°C. Following lysis, eluate was transferred to a new 1.5 ml microcentrifuge tube and DNA extraction proceeded as per the manufacturer’s instructions. The genitalia were then immersed in 200 μ l of buffer ATL and 200 μ l of buffer AL from the same kit and placed at 95°C for 24 hours to remove fat, wax, and residual tissue. The cleared genitalia was then used for morphological characterization and photography.

PCR parameters and sequence data analysis. Sequence data was obtained for the COI, 18S, and H3 genes. To obtain sequence data, PCR reactions were performed in 25 μ l volume reactions and were comprised of 5x GoTaq Flexi Buffer, 25 mM MgCl₂, 10 mM dNTP’s, 10 mM of each primer, 10% PVP-40, and 2.5U GoTaq Flexi DNA Polymerase, 2 μ l DNA template, and sterile dH₂O to a final volume. All reactions were performed with an initial denaturation of 95°C for 2 min. followed by 35 cycles of denaturation at 95°C for 30 sec., annealing for 30 sec. and extension at 72°C. The primers used for respective loci with associated annealing temperatures and extension times are presented in Table 1. All PCR products were run on a 2% agarose gel stained with 1% GelRed (Biotium, Fremont, California, USA). PCR products of the appropriate size were purified using the Exo-SAP-IT™ PCR Product Cleanup Reagent (ThermoFisher Scientific, Waltham, Massachusetts, USA). Purified PCR product was quantified using a NanoDropLite spectrophotometer (ThermoFisher Scientific, Waltham, Massachusetts, USA) and sent for sequencing at Eurofins Scientific (Louisville, KY, USA). Contiguous files were assembled using DNA Baser (Version 4.36) (Heracle BioSoft SRL, Pitesti, Romania), aligned using ClustalW as part of the package MEGA7 (Kumar *et al.* 2016).

TABLE 1. Primers, annealing temperatures and extension times used in this study.

Locus	Primer	Direction	Sequence (5' → 3')	Annealing Temp.	Extension Time
COI	LCO1490 ¹	Forward	GGTCAACAAATCATAAAGATATTG	40°C	1 min. 30 sec.
	HCO2198 ¹	Reverse	TCAGGGTGACCAAAAAAATCA		
18S	18SF1 ²	Forward	ACTGTCGATGGTAGGTTCTG	55°C	2 min.
	18SR1 ²	Reverse	GTCCGAAGACCTCACTAAA		
H3	H3F1 ³	Forward	CAGACGGCBMGKAARTCSACC	51°C	30 sec.
	H3R1 ³	Reverse	GTKACHCKCTTRGCGTGRAT		

¹Folmer *et al.* 1994

²Bahder *et al.* 2019

³Echavarría *et al.* 2021

Other Material Examined. Holotype of *Messoides uniformis* Metcalf, 1938 from USNM, holotype of *Myconus conspersinervis*, and holotype adult male *Myconus trivittatus* Fennah, 1950 at BMNH.



FIGURE 2. Adult male habitus *Myconus jacquelineae* sp. n.; A) body lateral view and B) body dorsal view, scale = 1mm.

Systematics

Family Achilidae Stål 1866

Subfamily Myconinae Fennah 1950

Tribe Myconini Fennah 1950

Genus *Myconus* Stål 1862

Type species: *Achilus conspersinervis* Stål 1862

Diagnosis. General color mottled brown olive; tegmina with ~10 irregular deep chestnut markings between A1 and wing margin. Male terminalia with gonostyli broad, distal process broad and roughly quadrate. Pygofer with medio-ventral broadly triangular. Aedeagus strongly upcurved distally with pair of elongate dorsal process and pair of short ventral hooked processes sub-basally. Anal tube in lateral view with elongate curved apex.

Myconus jacquelinae Bahder & Bartlett sp. n.

Type locality. Hotel Villa Blanca, Reserva Privada el Silencio de Los Angeles, Alajuela Province, Costa Rica.

Diagnosis. Large (~14 mm), general color mottled brown-olive, forewing with irregular deep chestnut markings (~10) along A1 vein. Male terminalia with aedeagus distally upcurved, bearing a pair of elongate dorsal processes and short ventral processes ventrally; gonostyli broad, in lateral view, with dorsal distal process broad and quadrate and basal process, broadly rounded with dorsal subapical convexity. Anal segment in lateral view long, dorsal and ventral margins subparallel, apex strongly arched ventrad.

Description. *Color.* General color is mottled brown-olive, head with clypeus paler and irregular pale markings on face and genae; ocelli whitish; pro- and mesothorax brown to dark brown with pale spots (perhaps representing vestiges of sensory pits), mesonotum with intracarinal region paler (suggesting a pale median vitta on the mesothorax), legs less mottled and paler. Forewings heavily mottled basally with brown markings, a faintly darker diagonal marking from claval base or R vein (giving appearance of a V-shaped marking on forewings in repose), paler in distal 1/3 of the wing, clavus with irregular deep chestnut markings (~10) along A1 vein and between A1 and wing margin, white patch at stigma.

Structure. Males 14–14.1 mm long with wings, 9.97 mm without wings. Biometric data presented in Table 2.

TABLE 2. Biometric data for adult male ($n = 2$) of *Myconus jacquelinae* sp. n. (in mm).

Character	Range	Average \pm SE
Body length, with wings	14.0–14.1	14.05 \pm 0.05
Body length, no wings	9.97	9.97 \pm 0.00
Forewing length	11.8–11.9	11.85 \pm 0.05
Vertex length	0.55	0.55 \pm 0.00
Vertex width, basal margin	0.91	0.91 \pm 0.00
Vertex width, distal margin	0.74	0.74 \pm 0.00
Pronotum length, midline	0.55	0.55 \pm 0.00
Mesonotum length, midline	2.66	2.66 \pm 0.00
Mesonotum width	3.04	3.04 \pm 0.00
Frons width, dorsal margin	0.62	0.62 \pm 0.00
Frons width, clypeal suture	0.93	0.93 \pm 0.00
Frons width, widest	1.08	1.08 \pm 0.00
Frons width, narrowest	0.62	0.62 \pm 0.00
Frons length, midline	1.44	1.44 \pm 0.00
Clypeus length	0.85	0.85 \pm 0.00

Head. Head (including eyes) in dorsal view about half as wide as pronotum in dorsal view; in lateral view pointed, acrometopal region medially projecting. Vertex broad, wider than long (ratio of width at hind margin to length at midline ~1:0.55), trapezoidal, posterior margin concave (with median dorsal inflection at midline), anterior margin acutely pointed (Fig. 3), median carina evident, lateral carinae foliate (disc of vertex concave), transverse

carina distinct at apex (evident from dorsal, lateral and frontal view). Frons in frontal view broad, sides of dorsal projection appearing slightly concave (giving appearance of trigones characteristic of Taosini (Dictyopharidae), *viz.* Emeljanov 1997, 2011), median carina evident from dorsal margin to frontoclypeal suture, lateral margins sinuate (subparallel from vertex to level of antennae, then arched—broadening, then narrowed—to frontoclypeal suture), frontoclypeal suture dorsally arched; clypeus rhomboid, lateral carinae not extending to anteclypeus (a tribal feature according to Emeljanov 1993). Lateral ocelli large, hemispherical, below eyes and in front of antennae. Antennae laterally projecting (clearly exceeding eyes in dorsal view); scape wider than tall, apex appearing broadly membranous; pedicel elongate, twice as long as wide, flagellum bristle-like, with bulbous base. Rostrum reaching hind coxae, terminal segment approximately one-half length of basal segment.

Thorax. Thorax ‘humped’ in lateral view, pronotum and anterior mesonotum declinate to head. Pronotum in dorsal view as long as vertex at midlength, anterior margin carinate, following contours of posterior margin of head medially convex, convexly inflected behind eyes (anterior carinae of pronotum extending laterad and caudad to tegulae to form lateral margin of pronotum from dorsal view); median carina strong, posterior margin deeply convex. In lateral view, paradiscal region (below lateral margin) wide, irregularly quadrangular, with two carinae, dorsal carinae originating anteriorly at about 1/3 length of paranotum transverse (weakly convex) from anterior to posterior margin (face of paranota between lateral margin and top carinae bearing ~7 spots, irregularly arranged), a second originating just below the first diagonal toward ventroposterior margin (Fig. 3). Mesonotum slightly wider than long, tricarinate (lateral carinae laterally arched), carinae reaching posterior margin; rounded convexities laterad of lateral carinae at midlength (Fig. 3); scutellum weakly inflected upward, not clearly set off from scutum.



FIGURE 3. Adult male *Myconus jacquelineae* sp. n.; A) head frontal view, B) head, pronotum, and mesonotum dorsal view, and C) head, pronotum and mesonotum lateral view, scale = 1mm.

Forewing broad, elongate, weakly convex on leading margin, distinctly concave on trailing margin. Postcostal cell broad, extending 2/3 length of wing. Pterostigma between apex of ScP and RA veins including a series of transverse and diagonal veinlets. Composite vein ScP+R+MP forming short stem from basal cell before MP fork. Claval apex near wing midlength, fusion of Pcu+A1 in apical quarter of clavus with composite vein joining CuP before reaching wing margin. Branching pattern; ScP one, RA one, RP three, MP five, CuA three (excluding spurious veins in marginal cell between CuA and wing margin, distad of icu).

Three lateral teeth on hind tibiae on laterodistad margin, approximately evenly spaced, spinulation of hind leg 5-5-6 (Fig. 5).

Terminalia. Terminalia bilaterally symmetrical, pygofer in lateral view narrow, widest at ventral margin, anterior margin concave, ventral margin expanded, lateral fold extending from dorsal margin to approximately 2/3 distance to ventral margin (Fig. 6A); in ventral view with broadly triangular medioventral process (Fig. 6B). Gonostyli broad, in lateral view upcurving caudally, ventral margin slightly sinuate, dorsal margin with two large projections, a large process in distal half (“distal process”), subquadrate, posterior margin hooked cephalad, anterior margin sinuate, posterior corner of process rounded, anterior corner acute and curved (Fig. 6A); second process at laterobasal margin (“basal process”), broadly rounded with dorsal convexity (nearly closed by hooked distal apex) (Fig. 6B); in ventral view very broad, inner margins weakly concave, curved strongly distad to broadly rounded apex, outer margins irregularly sinuate (weakly concave; apex of basal process visible near midpoint on outer margins (Fig. 6B); in dorsal view, strongly cupped, distal processes with large caudally directed process, basal processes visible,

projecting distad (Fig. 6C). Aedeagus in lateral view slender, strongly upcurved distally, bearing two large, slender subapical processes (A1 & A2) on dorsal margin, processes sinuate with apices medially intersecting in dorsal view (Fig. 7), two hooked ventro-apical processes (A3 & A4), short, robust, sinuate (Fig. 7). Anal segment in lateral view long, dorsal and ventral margins subparallel, apex strongly arched ventrad (Fig. 6A); in dorsal view, ovoid (Fig. 6C); paraproct short, conical.

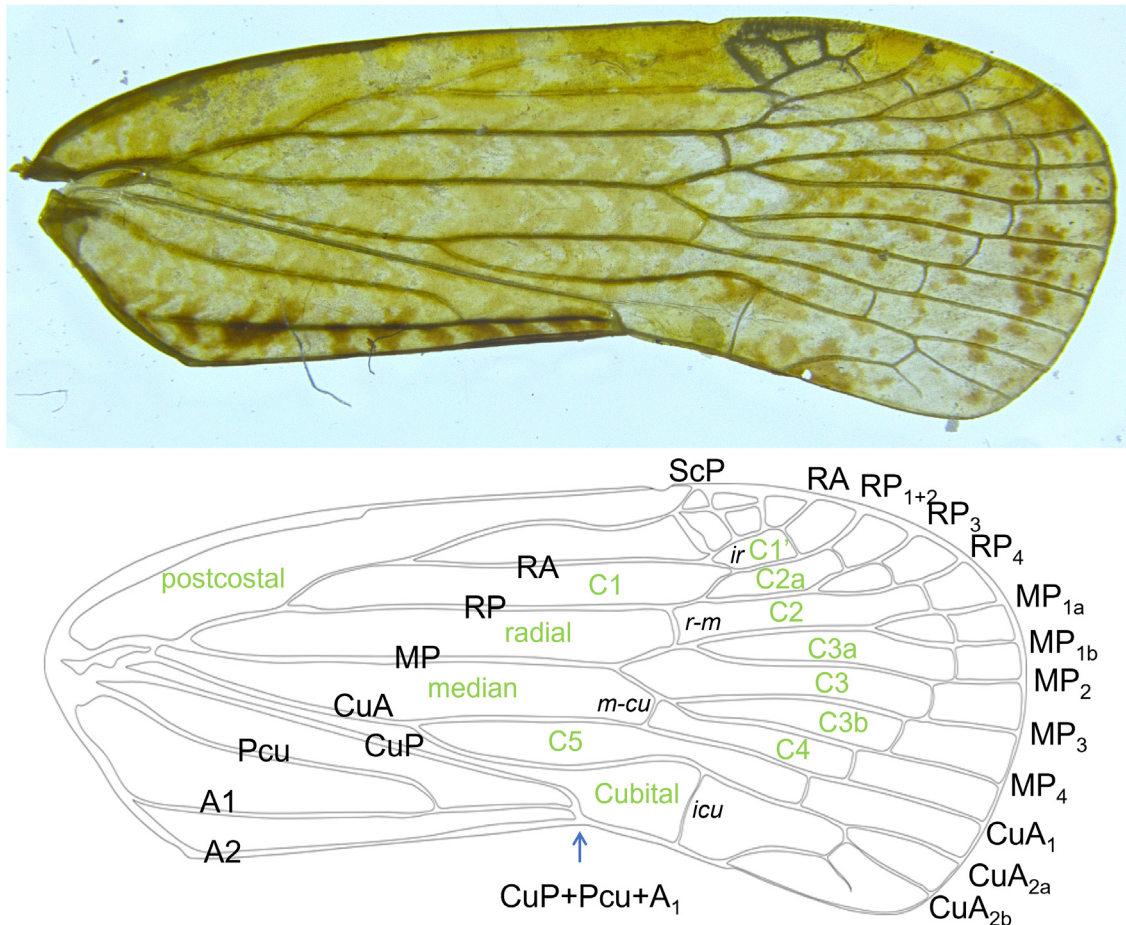


FIGURE 4. Adult male *Myconus jacquelineae* sp. n. forewing venation; black = vein, italics = crossvein, green = cell, ? = spurious vein.

Plant associations. Unknown, collected at light trap.

Etymology. The specific name is given as an honorific to the senior author's grandmother, Jacqueline Miller.

Material examined. Holotype male "Costa Rica, Alajuela Province / Hotel Villa Blanca / 23.VI.2019 / Coll.: B.W. Bahder, light trap / Holotype *Myconus jacquelineae* ♂" (FLREC); Paratype same as holotype (1 male, FSCA).

Sequence data. For the COI locus, a 678 bp sequence was generated (GenBank Accession No. OK314958); for 18S, a 1,394 bp sequence was generated (GenBank Accession No. OK316890); and for H3, a 296 bp sequence was generated (GenBank Accession No. OK324962).

Remarks. *Myconus jacquelineae* sp. n. appears to be the only New World *Myconus* with mottled coloration. *Myconus uniformis* (Fig. 8 & 9) and *M. conspersinervis* (Fig. 10) are much more uniform in coloration (or at least less mottled) and *Myconus trivittatus* (Fig. 11) has markings on the tegmina described by Fennah (1950: 19) as "a band from base of commissural margin to middle of costa, another from apex of clavus to stigma". Also, Fennah (1950, figs. 3-4) illustrated portions of the terminalia of *M. conspersinervis* and *M. trivittatus*. *Myconus conspersinervis* differs from *Myconus jacquelineae* sp. n. most obviously in that the distal process of the gonostylus in *M. conspersinervis* bears 3 apical spines and in *M. trivittatus* the distal process appears as an elongate hook. Geographically, *M. uniformis* would be the closest species to *M. jacquelineae* sp. n., however, *M. uniformis* is described (Metcalf 1938: 373) as "dark cinnamon brown, almost uniform above and below including tegminae and wings" whereas *M. jacquelineae* sp. n. forewings mottled with olive green and brown and. The terminalia of *M. uniformis* has not been

illustrated—the species was described from a single female specimen (type at the USNM). Furthermore, the black markings on the forewings of *M. uniformis* are absent from *M. jacquelinae* **sp. n.** The lateral carinae of the mesonotum are much more strongly curved than those of its congeners.



FIGURE 5. Hind tibia and tarsus of *Myconus jacquelinae* **sp. n.** showing spinulation.

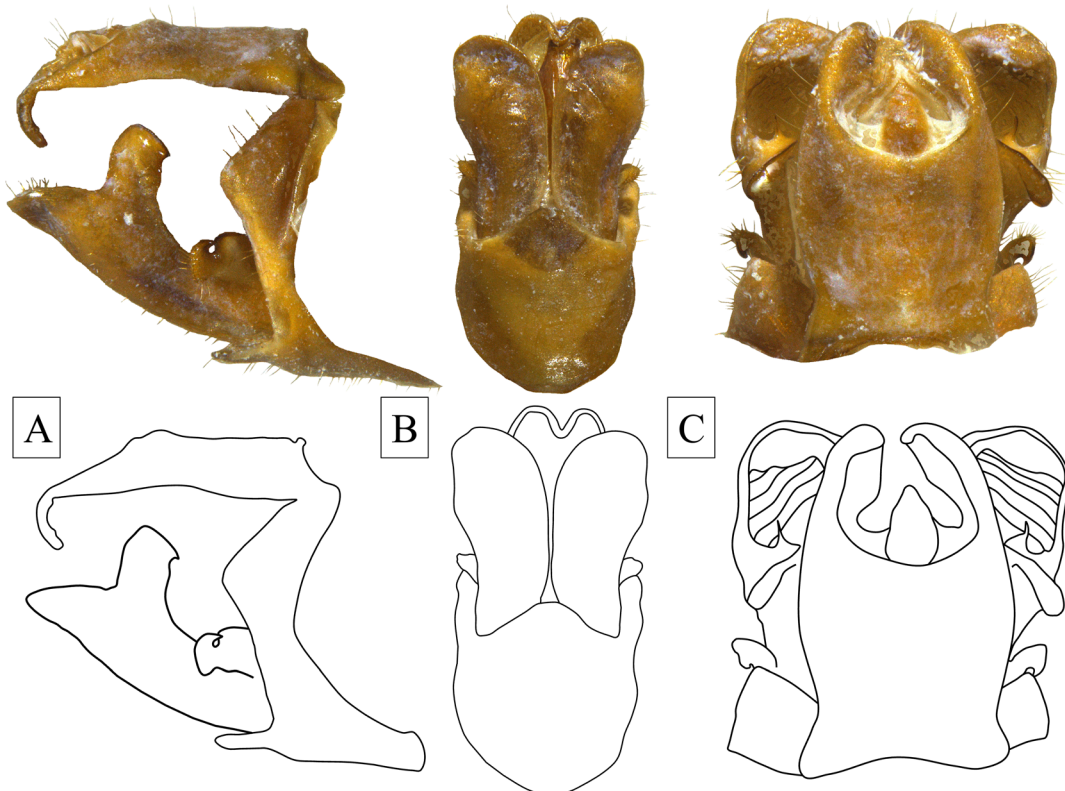


FIGURE 6. Male terminalia *Myconus jacquelinae* **sp. n.**; A) lateral view, B) ventral view, and C) dorsal view.

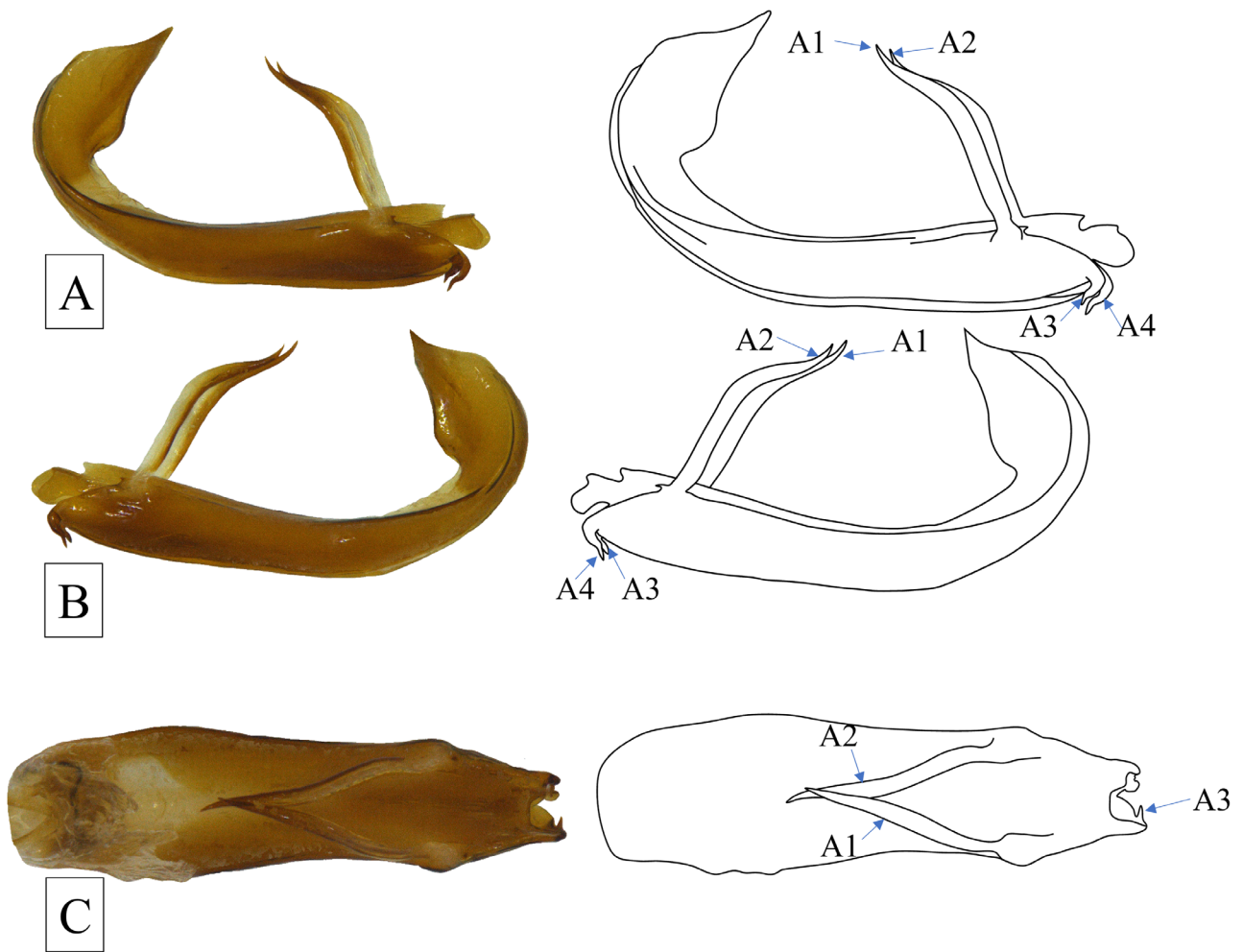


FIGURE 7. Aedeagus of *Myconus jacquelineae* sp. n.; A) left lateral view, B) right lateral view, and C) dorsal view.

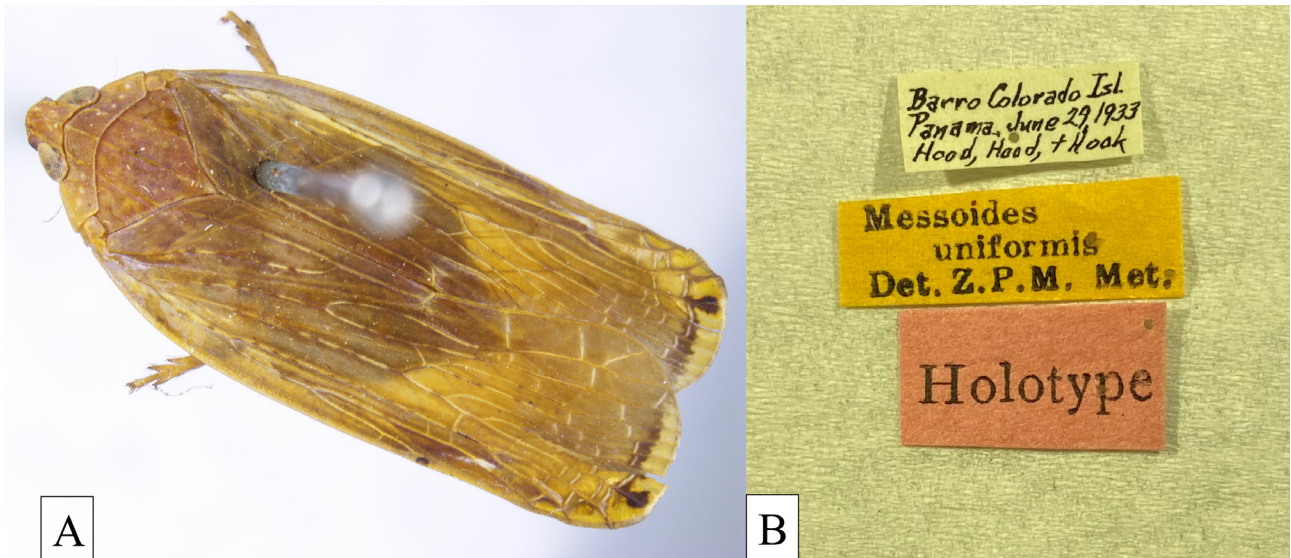


FIGURE 8. Holotype of *Messoides uniformis* Metcalf, 1938 (at USNM), A) dorsal view and B) labels.



FIGURE 9. Adult male *Myconus* from Wolda collection at Smithsonian Tropical Research Institute, Panama, reported as *Myconus uniformis* by Wolda (1980).

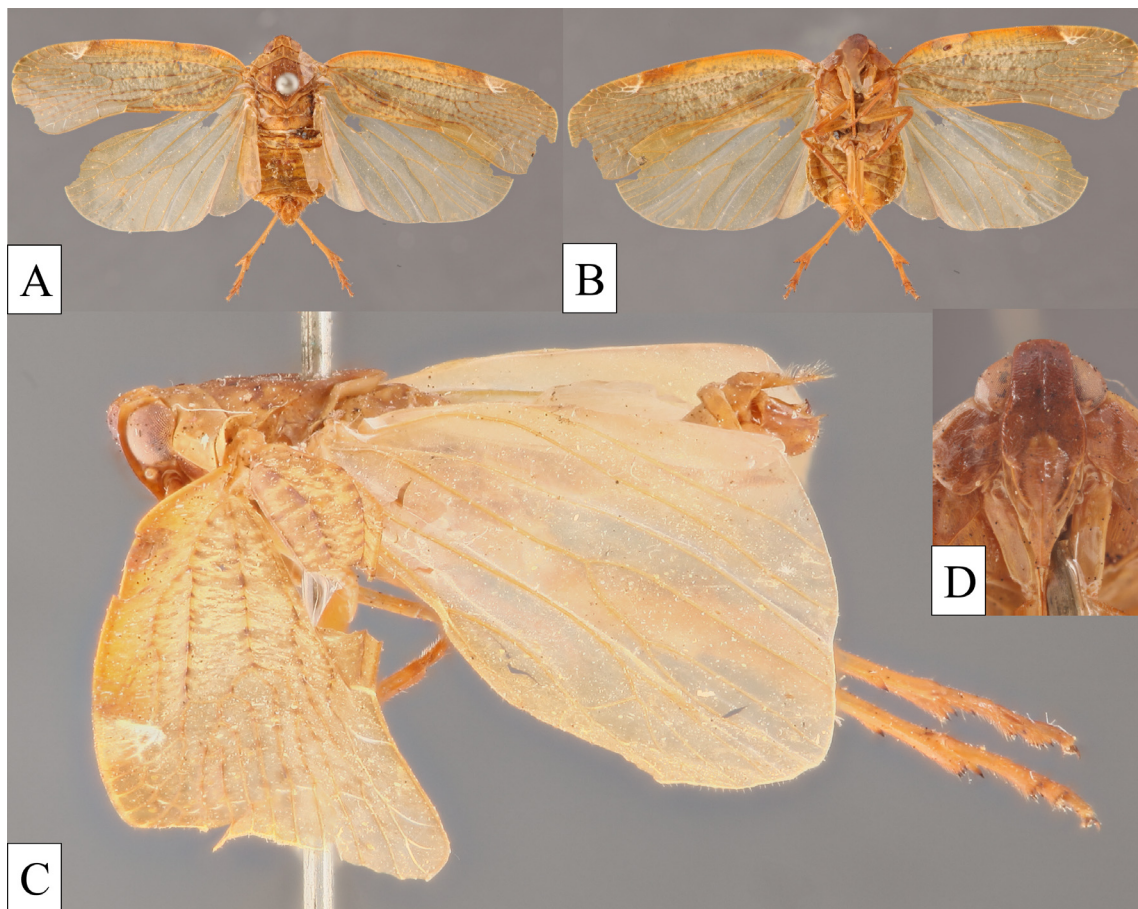


FIGURE 10. Holotype of *Myconus conspersinervis*, A) dorsal view, B) ventral view, C) lateral view, and D) frontal view.



FIGURE 11. Holotype adult male *Myconus trivittatus* Fennah, 1950 (at BMNH).

A preliminary key to species of New World *Myconus*

1. Body color mottled, olive green and light brown, clavus with irregular deep chestnut markings (~10) between A1 and wing margin, distal dorsal process of gonostyli broad and quadrate in lateral view, Costa Rica *jacquelinae* **sp. n.**
- 1.' Body color more uniform, fuscous; clavus not marked with ~10 dark spots, dorsal process of gonostyli variable 2
2. General body color uniform dark cinnamon brown, tegmina with paler veins; Panama (described from female) *uniformis*
- 2.' Body color not as above (described from Brazil) 3
3. Distal dorsal process of gonostyli curved cephalad, apex sharply pointed, two bands present on forewing, Brazil *trivittatus*
- 3.' Distal dorsal process of gonostyli curved caudad, trifurcated, Brazil (also reported from Belize) *conspersinervis*

Discussion

With the addition of *M. jacquelinae* **sp. n.**, the genus *Myconus* consists of 5 species distributed from Belize to south-east Brazil and one species described from Somalia. While we are skeptical that the African species (*M. collaris*) is properly placed to genus, for the current project we were only concerned with taxa from the New World. *Myconus* is sparsely reported at present in the literature, but we suspect the genus is broadly present within the Neotropics (we have examined specimens that appear to be this genus from Ecuador), and it is underreported in part because of the obscure nature of the relevant taxonomic resources. However, members of *Myconus* are relatively large and distinctive (relative to the Plectoderini) making it an amenable subject for further study.

The molecular data generated in this study were not analyzed in any formal capacity because the taxa present in GenBank are not consistent among the loci sequenced in this study, meaning no consensus tree could be generated. Future research efforts will focus on collecting fresh material of described taxa and generate data for the corresponding loci so that in the event additional new achilids are described and supplemented with molecular data (this research group or others), formal analyses can be conducted.

Recent palm-related survey efforts in Costa Rica have led to the descriptions of 14 new species of cixiid and

derbid (including 3 new genera) planthoppers. While *Myconus jacquelinae* sp. n. was collected at a light trap and thus cannot confirm a plant association, the discovery of all new planthoppers, regardless of host highlights that fulgoroidea in Costa Rica have been largely misrepresented. A renewed interest in planthoppers associated with palms is due the emergence of lethal bronzing, a phytoplasma disease of palms in Florida, and it being transmitted by the cixiid *Haplaxius crudus* (Dzido *et al.* 2021). The survey efforts being conducted in Costa Rica and Jamaica are to identify other insects that are putative vectors of these pathogens and serendipitously discovered a high level of undescribed taxa that appear to be palm specialists. As these survey efforts begin to expand beyond palms by incorporating broader collection technique, the rate of discovery of novel taxa is likely to increase. *Myconus jacquelinae* sp. n. represents the first novel taxon discovered that does not belong to the Cixiidae or Derbidae.

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