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NEW GENUS AND NEW SPECIES OF THE SUBFAMILY COLPOPTERINAE (HEMIPTERA: FULGOROIDEA: NOGODINIDAE) FROM COLOMBIA

Vladimir M. Gnezdilov

Zoological Institute, Russian Academy of Sciences,
1 Universitetskaya Emb., Saint Petersburg 199034, Russia; e-mails: vmgnezdilov@mail.ru,
Vladimir.Gnezdilov@zin.ru; https://orcid.org/0000-0002-7331-8744

A new genus and a new species, *Colomboga brachyptera* gen. et sp. n., of the subfamily Colpopterinae (Nogodinidae) is described from Central Colombia. This is the first published record of Colpopterinae from the country and the first representative of this subfamily with rather short forewings. Generic placement and possible phylogenetic affinities of *Colomboga* gen. n. to other genera within the tribe Colpopterini are discussed.

Key words: Colpopterini, morphology, new genus, new species, South America

INTRODUCTION

Already twenty years ago the subfamily Colpopterinae Gnezdilov, 2003 was redefined and transferred from the family Issidae Spinola to the family Nogodinidae Melichar (Gnezdilov 2003*a*, 2012, 2017). Currently this group includes two tribes – nominative Colpopterini Gnezdilov, 2003, with 41 species in nine genera, and fossil monotypical Niadrimini Szwedo, 2019, from the Eocene (Gnezdilov 2012, 2018, Szwedo *et al.* 2019, 2022, Poinar *et al.* 2020, Bahder *et al.* 2023, Bourgoin 2023). Within the tribe Colpopterini eight genera are known from the Neotropical Region, including two monotypic ones from the Dominican amber. Additionally, one monotypic genus is recorded from Southern Africa.

Neotropical species are mainly known from the Caribbean islands and from Mexico in Central America (Metcalf 1958, Gnezdilov 2012). Only a single species of the subfamily, *Colpoptera longula* Lethierry, 1890 (described from Venezuela), is recorded from South America, which was more than 130 years ago (Lethierry 1890). Below a new species representing a new genus is described from Colombia after the series of specimens collected by Alexander Lindig, German botanist who resided in Bogotá DC between 1859 and 1863. The "Lindig trail" that is presumably the type locality of many species described from Bogotá DC, is still preserved in the El Delirio Reserve (Moncada *et al.* 2022).

This new genus and species are peculiar within the subfamily Colpopterinae by rather short forewings (shortly surpassing abdomen apex, with reduced appendix), with few transverse veins, and by hind wings with deep cubital and vannal clefts.

MATERIAL AND METHODS

The terminology of the head and body follows Anufriev and Emeljanov (1988) and Emeljanov (1995), and male and female genitalia – Bourgoin (1993) and Gnezdilov (2003*b*).

Photographs were taken using a Canon EOS 5D Mark IV camera with the lens Canon-MP-E 65mm f/2.8 1-5X Macro and a flash Canon Macro Twin Lite MT-26EX-RT. Images were produced using Helicon Focus v. 6.7.1 and Adobe Photoshop software. The genital segments of the examined specimens were macerated in 10% KOH and figured in glycerine jelly (Brunel Micro Ltd, UK) using a Leica MZ9.5 stereomicroscope with camera lucida.

Type label information is quoted, with "/" indicating new line and "//" indicating next label.

Type series of the species described below is divided between the Naturhistoriska Riksmuseet, Stockholm, Sweden (NHRS) and the Zoological Institute of the Russian Academy of Sciences, St. Petersburg, Russia (ZIN).

TAXONOMY

Family Nogodinidae Melichar, 1898
Subfamily Colpopterinae Gnezdilov, 2003
Tribe Colpopterini Gnezdilov, 2003
Genus **Colomboga** gen. n.
http://zoobank.org/8B3E8B22-A234-4E9B-92F6-D2B22E65BF7B

Type species: *Colomboga brachyptera* sp. n., here designated.

Diagnosis. Coryphe transverse. Metope broad, weakly convex, with strong median carina. Forewings wide, weakly narrowing to widely rounded apices, with narrow hypocostal plate and few transverse veins. Forewings with distinct narrow precostal area without transverse veins. Forewing clavus long, nearly reaching wing apices, open (vein Pcu+A1 running to apex of clavus). Hind wings 3-lobed, with deep cubital and vannal clefts. Hind tibiae with a single lateral spine. Hind margins of male pygofer straight, without processes. Capitulum of style without neck, with distinct lateral tooth. Aedeagus massive, visible above the phallobase from lateral view, with long apical processes and long ventral hooks directed downwards. Dorso-lateral phallobase lobes fused dorsally. Male anal tube elongate, with two furcated processes on its apical angles directed downwards. In female, gonoplacs short, nearly triangular, with rounded angles. Female anal tube elongate, three times as long as wide basally.

Description – *Morphology*. Coryphe transverse, from dorsal view 2.5 times as wide as long medially, with weak median carina and keeled lateral margins; anterior margin straight; posterior margin concave; lateral margins weakly convex (Figs 1, 3). Fastigium nearly at right angle (in lateral view) (Fig. 4). Metope wide, roughly pentagonal from frontal view, weakly convex in lateral view, enlarged below eyes, with strong median carina running from its upper margin and continuing to postclypeus (Figs 4, 5). Upper margin of metope slightly concave; lateral margins carinae obscuring antennal base. Metopoclypeal suture weak. Eyes large, diameter of each eye 0.7 of coryphe width. Lateral ocelli present. Antennal pedicel barrel-shaped. Rostrum short and thick, 2nd and 3rd segment are nearly equal in length; 3rd segment not narrowing apically. Pronotum twice as long as coryphe at midline, without carinae; anterior margin strongly convex, with truncate apex; posterior margin concave medially. Pronotum depressed medially. Paradiscal fields of pronotum narrow behind the eyes. Paranotal lobes of pronotum elongate vertically, flat, without carinae. Mesonotum twice as long as pronotum, with two carinae joined at obtuse angle below its upper margin. Tegulae large. Forewings wide, weakly narrowed distally to widely rounded apices, with narrow hypocostal plate. Forewings with distinct narrow precostal area, well developed from wing base to almost lateral margins, lacking transverse veins, and with distinct knee bulge (bulla) (Fig. 3). Basal cell narrowly oval. Forewing vein branching sequence: R (Sc + R) 2, starting from basal cell by short common stem and furcating before knee bulge; M 2, furcating near wing middle, M_1 also furcating distally; CuA 2, furcating apically; some transverse veins. Clavus long, reaching nearly wing apices, open, with Pcu + A_1 running to its apex. Hind wings nearly as long as forewings, 3-lobed, with concave anterior margin near to coupling lobe and deep cubital and vannal clefts. Basal cell large, rounded. Hind wing vein sequence: R 2, furcating after coupling lobe; r-m 1; M 1; m-cua 1; CuA 2, furcating at its apical third; CuP 1; Pcu 1; A_1 2; A_2 1. CuA_2 and CuP fused before cubital cleft. Hind tibiae with a single lateral spine above its middle and eight apical spines. First and second metatasomeres short, nearly equal in length, with long setae ventrally. First metatasomere with two latero-apical and 6–7 intermediate spines arranged in weak arc. Second metatarsomere with two latero-apical spines. Arolium of pretarsus reaching claw apices, with straight posterior margin in dorsal view.

Etymology – Generic name is derived from an amalgamation of "Colombia" and "Bogota". Feminine in gender.

Colomboga brachyptera sp. n.

http://zoobank.org/CCF6AC87-6772-4275-A96F-A6EC24E0D5FC

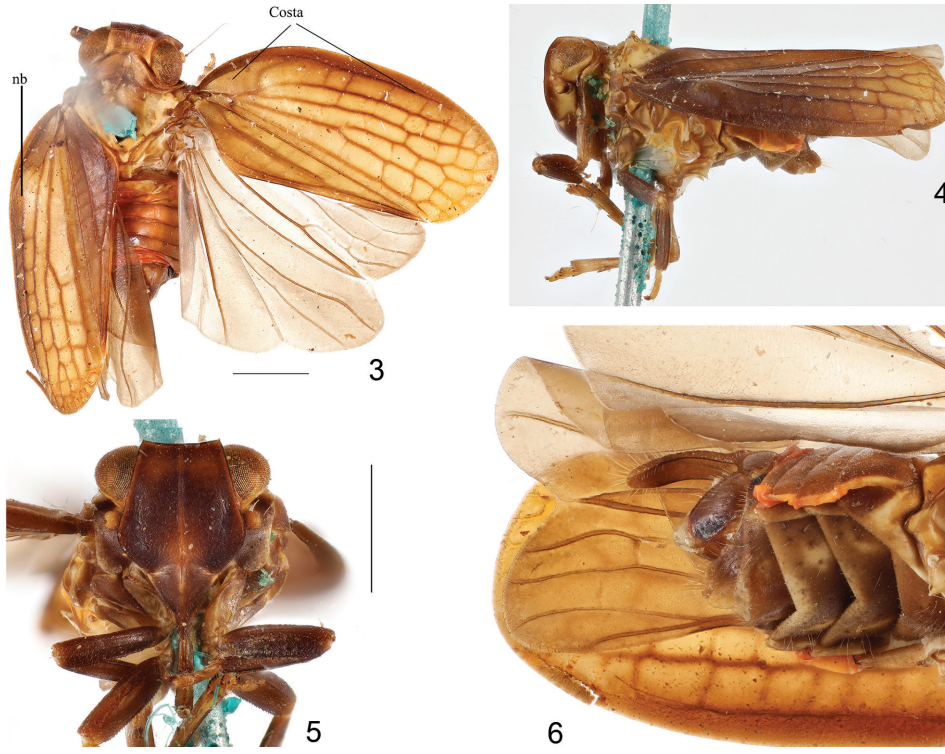
(Figs 1–23)

Description. Structure as mentioned for the genus.

Coloration. General coloration brown yellowish to dark brown on metope, clypeus, forewings, and fore and middle femora and tibiae (Figs 1–6). Pedicel dark brown proximally and light yellow distally. Hind wings opaque, with brown veins. Tarsal claws brown to dark brown. Apices of leg spines black. Abdominal sternites dark brown, each with pair of large light yellow spots laterally. Abdominal tergites light yellow to dark brown. Gonoplacs dark brown.

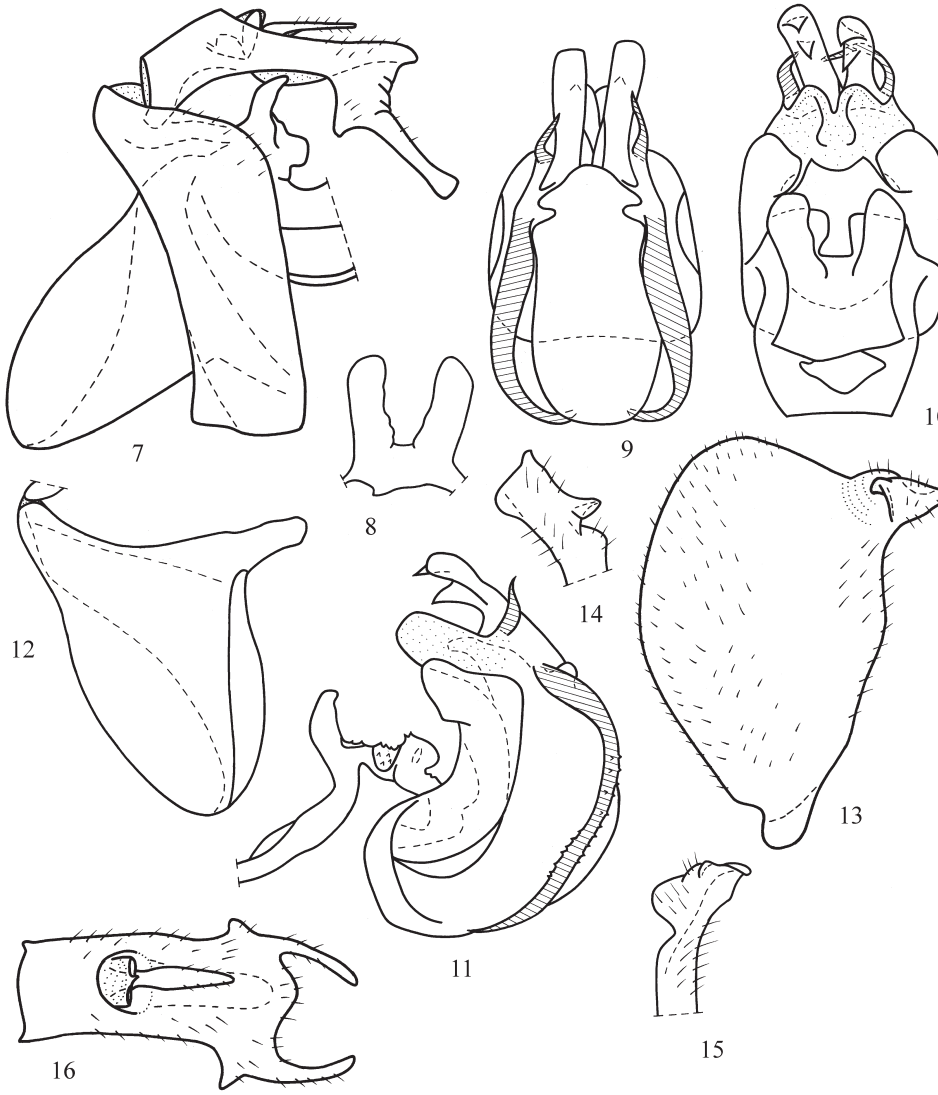
Male genitalia (Figs 2, 7–16). Pygofer roughly quadrangular in lateral view, elongate vertically, with straight hind margins, without processes (Fig. 7). Styli with large and wide plate covered by long setae on capitum and below and by short setae on main part of the plate,

Figs 1–2. *Colomboga brachyptera* gen. et sp. n., holotype, male: 1 = dorsal view; 2 = apex of abdomen, ventro-lateral view. Scale bar: 1 mm

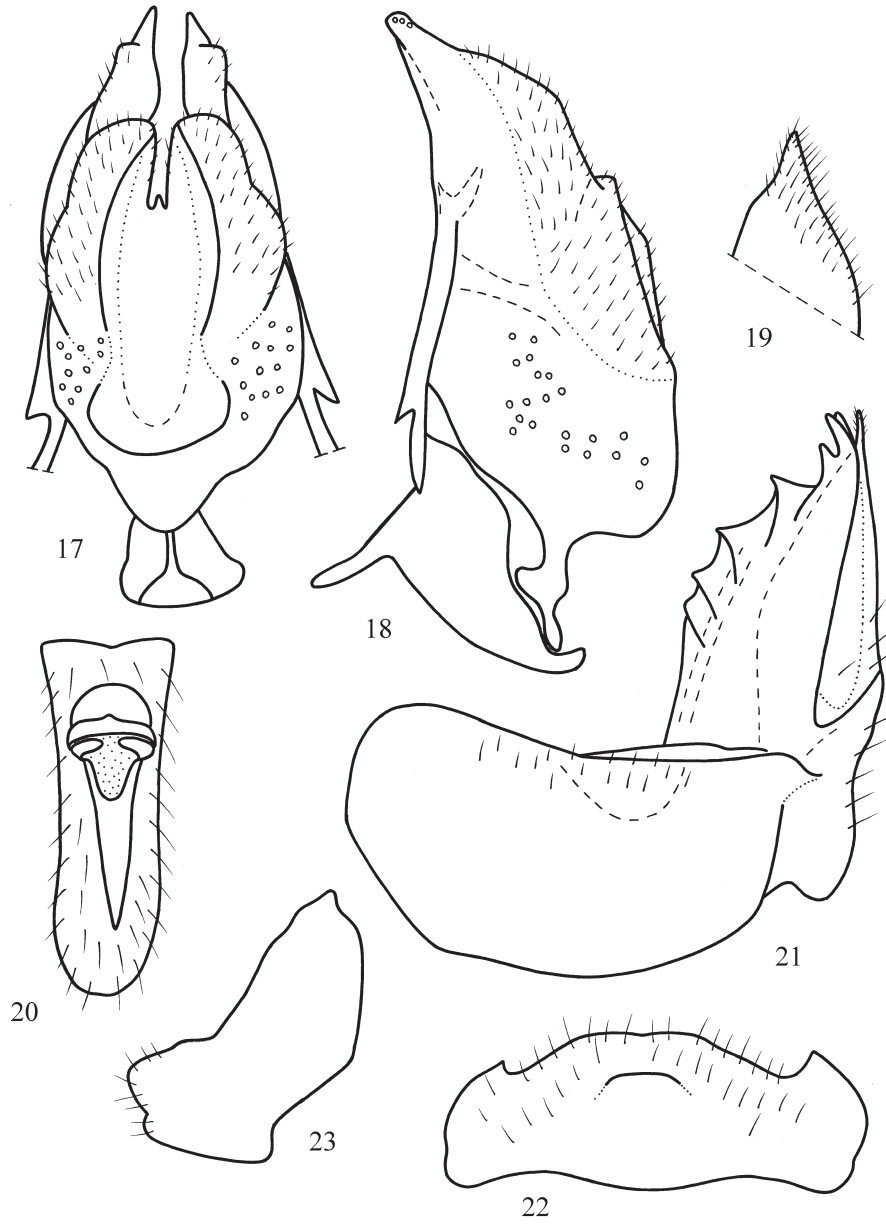


Figs 3–6. *Colomboga brachyptera* gen. et sp. n., paratype, female: 3 = dorsal view; 4 = lateral view; 5 = frontal view; 6 = apex of abdomen, lateral view. Abbreviations: Costa = costa vein; nb = knee bulge. Scale bar: 1 mm

with a comb below capitulum; hind margin straight; postero-dorsal angle widely rounded (Fig. 13). Capitulum of style without neck, narrowing apically (in dorsal view), with distinct lateral tooth (in dorsal and lateral views) and small semicircular lobe subapically (in dorsal view) (Figs 14, 15). Connective large, with big cup and short handle (Fig. 12). Penis mas-



Figs 7–16. *Colomboga brachyptera* gen. et sp. n., paratype, male genitalia: 7 = anal tube, pygofer, connective, and basal part of penis, lateral view; 8 = suspensorium, posterior view; 9 = penis, ventral view; 10 = penis and suspensorium, dorsal view; 11 = penis and suspensorium, lateral view; 12 = connective, lateral view; 13 = style, lateral view; 14 = capitulum of style, dorsal view; 15 = capitulum of style, ventral view; 16 = anal tube, dorsal view. Not to scale



Figs 17–23. *Colomboga brachyptera* gen. et sp. n., paratype, female genitalia: 17 = posterior connective laminae of gonapophyses IX and gonospiculum bridge, ventral view; 18 = posterior connective laminae of gonapophyses IX and gonospiculum bridge, lateral view; 19 = apex of endogonocoxal process, lateral view; 20 = anal tube, dorsal view; 21 = anterior connective lamina of gonapophyse VIII, lateral view; 22 = sternite VII, ventral view; 23 = sternite VII, lateral view. Not to scale

sive, wide, connected with anal tube and pygofer by large suspensorium bearing denticles and two large horse-shoe-shaped processes (Figs 8, 11). Phallobase with wide dorso-lateral lobes fused dorsally (Figs 10, 11). Ventral phallobase lobe long and wide, mushroom-shaped (with pileus apically), apparently fused with an aedeagus (Fig. 9). Aedeagus massive, visible above the phallobase, with long apical processes each bearing two large teeth, two rounded weakly sclerotized lobes, pair of horn-shaped processes directed upwards, and pair of long ventral hooks covered by denticles and directed downwards (Figs 9–11). Anal tube elongate, with long furcated processes on its apical angles directed downwards (Figs 2, 7, 16). Anal column long, 0.4 as long as anal tube (in dorsal view), narrow.

Female genitalia (Figs 6, 17–23). Sternite VII with convex hind margin and step-shaped process below (Figs 22, 23). Anal tube elongate, three times as long as wide basally (Figs 6, 20). Anal column long, 0.5 as long as a whole anal tube. Gonoplacs short, nearly triangular, with rounded angles (Fig. 6). Gonocoxa VIII with nearly straight not protruding hind margin (Fig. 21). Endogonocoxal process narrowing apically (Fig. 19). Anterior connective lamina of gonapophyse VIII wide, with three large teeth in apical group and four teeth with keels in lateral group. Posterior connective laminae of gonapophyses IX with convex proximal part and nearly straight distal parts (Figs 17, 18). Median field of posterior connective laminae of gonapophyses IX convex, bilobed apically, with two elongate vertical folds, covered by dense setae.

Total length (from apex of head to apices of forewings). Males: 4.3 mm, females: 4.5–4.7 mm.

Etymology – The species named after shortened forewings, the specific name is intended as feminine in gender.

Type material – Holotype, male, 4.3 mm, [Colombia]: "Bogota." // "Lindig." // "NHRS –GULI / 000004705" (NHRS). Paratypes: 1 male, 4 females, [Colombia]: "Bogota." // "Lindig." // "NHRS –GULI / 000004732, 000004733, 000004734, 000004688, 000004691" (NHRS – 3 females [000004732, 000004734, 000004688]; ZIN – 1 male [000004733], 1 female [000004691]).

DISCUSSION

Colomboga gen. n. is placed in the tribe Colpopterini according to CuA of forewings furcating only apically and simple venation of hind wings, with Pcu and A_1 separated, Pcu curved downwards, only two transverse veins between R, M and CuA (Gnezdilov 2003*a*, Fig. 1). Deep cubital and vannal clefts of hind wings (weak in other Colpopterini) are apparently connected with shortened forewings. The new genus is peculiar within the tribe by rather short forewings, male anal tube with long distal processes and large suspensorium.

By general structure of posterior connective laminae of gonapophyses IX (convex proximal part, not curved distal parts, median field convex, bilobed apically, with two elongate vertical folds) *Colomboga* gen. n. is close to *Colpoptera* Burmeister, 1835 (Gnezdilov & O'Brien 2008, Figs 60, 61), but well differs by wider female anal tube and peculiar male genitalia structure mentioned above. By forewing venation (Sc + R starting from basal cell by short common stem) *Colomboga* gen. n. is close to *Bumerangum* Gnezdilov, 2012, *Caudibeccus* Gnezdilov et O'Brien, 2008, *Dozierana* Gnezdilov, 2018, and *Ugoa* Fennah,

1945 (Gnezdilov 2012, Fig. 29), however, well distinguished by distinct precostal area well developed from wing base to almost lateral margins (distinct at wing middle, but undeveloped at wing basement in most Colpopterini except *Dozierana*), not elevated mesonotum, the presence of lateral spine of hind tibia, and nearly triangular gonoplacs.

Apparently further study of the materials from other parts of Central and South America will bring to our knowledge much more new taxa of the Colpopterinae as this group of planthoppers is very abundant in the canopy vegetation in Neotropics (Barringer *et al.* 2019, Fernández-Barrera *et al.* 2022).

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REFERENCES

Anufriev, G. A. & Emeljanov, A. F. (1988): Suborder Cicadinea (Auchenorrhyncha). Pp. 12–495. *In*: Lehr, P. A. (ed.): *A key to the insects of the Far East of the USSR. Vol. 2. Homoptera and Heteroptera*. – Nauka, Leningrad. [in Russian]

Bahder, B., Myrie, W., Helmick, E. E., van Dam, A. R. & Bartlett, C. R. (2023): A new species of planthopper in the genus Jamaha (Hemiptera: Fulgoroidea: Nogodinidae) from the Northeastern coast of Jamaica. – *Zootaxa* **5263**(2): 261–271. https://doi.org/10.11646/zootaxa.5263.2.5

Barringer, L. E., Bartlett, C. R. & Erwin, T. L. (2019): Canopy assemblages and species richness of planthoppers (Hemiptera: Fulgoroidea) in the Ecuadorian Amazon. – *Insecta Mundi* **726**: 1–16.

Bourgoin, T. (1993): Female genitalia in Hemiptera Fulgoromorpha, morphological and phylogenetic data. – *Annales de la Société entomologique de France (N.S.)* **29**(3): 225–244. https://doi.org/10.1080/21686351.1993.12277686

Bourgoin, T. (2023): FLOW (Fulgoromorpha Lists on the Web): a world knowledge base dedicated to Fulgoromorpha. Version 8. http://www.hemiptera-databases.org/flow/ – [accessed 7.11.2023].

Emeljanov, A. F. (1995): On the problem of classification and phylogeny of the family Delphacidae (Homoptera, Cicadina) taking into consideration larval characters. – *Entomologicheskoe obozrenie* **74**(4): 780–794. [In Russian, with English summary]. English translation published in *Entomological Review* **75**(9): 134–150.

Fernández-Barrera, M., Córdova-Lara, I., Chan-Rodríguez, J. I., Castillo-Vera, A., Blanco-Rodríguez, E., Nic-Matos, G., Oropeza-Salín, C. & Sáenz-Carbonell, L. (2022): Detection of 16SrIV-A phytoplasma DNA in Colpoptera sp. (Hemiptera:

Nogodinidae) insects in Yucatan Peninsula, Mexico. – *Brazilian Journal of Biology* **84**, e257470: 1–8. https://doi.org/10.1590/1519-6984.257470

Gnezdilov, V. M. (2003*a*): A new tribe of the family Issidae (Homoptera, Cicadina) with comments on the family as a whole. – *Zoosystematica Rossica* **11**(2): 305–309. https://doi.org/10.31610/zsr/2002.11.2.305

Gnezdilov, V. M. (2003*b*): Review of the family Issidae (Homoptera, Cicadina) of the European fauna, with notes on the structure of ovipositor in planthoppers. – *Chteniya pamyati N. A. Kholodkovskogo (Meetings in memory of N. A. Cholodkovsky), St. Petersburg* **56**(1): 1–145. [In Russian, with English summary]

Gnezdilov, V. M. (2012): Revision of the tribe Colpopterini Gnezdilov, 2003 (Homoptera, Fulgoroidea, Nogodinidae). – *Entomologicheskoe obozrenie* **91**(4): 757–774 + 4 photo plates. [In Russian, with English summary]]. English translation published in *Entomological Review* **93**(3): 337–353. https://doi.org/10.1134/S0013873813030081

Gnezdilov, V. M. (2017): Notes on higher classification of the family Nogodinidae (Hemiptera: Auchenorrhyncha: Fulgoroidea), with description of new tribe and new species. – *Far Eastern Entomologist* **347**: 1–21. https://doi.org/10.25221/fee.347.1

Gnezdilov, V. M. (2018): New genus for Thionia gibbicollis Dozier, 1931 (Hemiptera: Auchenorrhyncha: Fulgoroidea: Nogodinidae) from Haiti. – *Proceedings of the Zoological Institute RAS* **322** (4): 457–462. https://doi.org/10.31610/trudyzin/2018.322.1.45

Gnezdilov, V. M. & O'Brien, L. B. (2008): New taxa and new combinations in Neotropical Issidae (Hemiptera: Fulgoroidea). – *Insecta Mundi* **31**: 1–26.

Lethierry, L. (1890): Voyage de M.E. Simon au Venezuela (Décembre 1887 – Avril 1888). 9e Mémoire (1). Hémiptères Homoptères. – *Annales de la Société entomologique de France (Ser. 6)* **10**: 147–160.

Melichar, L. (1898): Monographie der Ricaniiden (Homoptera). – *Annalen des K. K. Naturhistorischen Hofmuseums* **13**: 197–359, Taf. IX–XIV.

Metcalf, Z. P. (1958): Issidae. General catalogue of the Homoptera. Fulgoroidea. Vol. 4, Pt.15. – Waverly Press, Baltimore, 561 pp.

Moncada, B., Coca, L. F., Díaz-Escandón, D., Jaramillo-Ciro, M., Simijaca-Salcedo, D., Soto-Medina, E. & Lücki, R. (2022): Diversity, ecogeography, and importance of lichens of Colombia, Pp. 77–90. *In:* de Almeida, R. F., Lücking, R., Vasco-Palacios, A. M., Gaya, E. & Diazgranados, M. (eds): *Catalogue of fungi of Colombia*. – Kew Publishing, Royal Botanic Gardens, Kew.

Poinar, G., Vega, F. E. & Stroiński, A. (2021): Jatoba gen. nov. (Hemiptera: Fulgoromorpha: Nogodinidae), a new genus of planthoppers from Dominican amber. – *Historical Biology* **33**(12): 3291–3296. https://doi.org/10.1080/08912963.2020.1862107

Szwedo, J., Drohojowska, J., Popov, Yu. A., Simon, E. & Wegierek, P. (2019): Aphids, true hoppers, jumping plant-lice, scale insects, true bugs and whiteflies (Insecta: Hemiptera) from the Insect Limestone (latest Eocene) of the Isle of Wight, UK. – *Earth and Environmental Science Transactions of the Royal Society of Edinburgh* **110**: 331–396. https://doi.org/10.1017/S175569101900001X

Szwedo, J., Bonino, E., Tettamanzi, L. & Stroiński, A. (2022): Yobuenahuaboshka gen. nov. of Colpopterini (Hemiptera: Fulgoromorpha: Nogodinidae) from the Lower Miocene Dominican amber. – *Annales Zoologici (Warszawa)* **72**(4): 991–1004. https://doi.org/10.3161/00034541ANZ2022.72.4.014

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