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Phasmatodea of Jamaica, part II: a new genus of the Diapheromerini tribe (Phasmatodea, Occidophasmata, Diapheromeridae)

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https://zoobank.org/References/EB4B6DE5-80EF-4D50-A496-8103FF4291EB

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Abstract. – A new genus of stick insect from Jamaica is described, *Jamanistria* n. gen., which includes three species previously assigned to the genus *Clonistria* Stål, 1875, and one new species discovered by the authors in 2018, *J. xerophila* n. sp., described in both sexes and the egg. The previously unknown female and egg of *Jamanistria annulipes* (Rehn & Hebard, 1938) n. comb., male and egg of *J. simplicitarsis* (Gray, 1835) n. comb., female and egg of *J. monticola* (Rehn & Hebard, 1938) n. comb. are described here for the first time. A barcoding study based on COI gene of three species of the genus is presented and supports the species delimitations.

Résumé. – **Phasmatodea de Jamaïque, partie II : un nouveau genre de la tribu des Diapheromerini (Phasmatodea, Occidophasmata, Diapheromeridae)**. Un nouveau genre de phasme de la Jamaïque est ici décrit, *Jamanistria* n. gen., qui inclue trois espèces jusque-là rattachées au genre *Clonistria* Stål, 1875, et une nouvelle espèce découverte par les auteurs en 2018, *J. xerophila* n. sp., décrite pour les deux sexes et l'œuf. La femelle et l'œuf de *Jamanistria annulipes* (Rehn & Hebard, 1938) n. comb., le mâle et l'œuf de *J. simplicitarsis* (Gray, 1835) n. comb., la femelle et l'œuf de *J. monticola* (Rehn & Hebard, 1938) n. comb., jusque-là inconnus, sont décrits ici pour la première fois. Une étude génétique basée sur le gène COI des trois espèces présentes du genre est réalisée et soutient leur délimitation spécifique.

Keywords. – Taxonomy, morphology, egg, Caribbean region, barcoding.

After the description of *Diapherodes hennemanni* Bellanger, Jourdan, Lelong & Penet, 2021 (Bellanger *et al.*, 2021), the present study is a second step about the Phasmatodea of Jamaica. In November 2018, three members of ASPER (YB, TJ, PL) conducted an inventory of the Phasmatodea of this Caribbean island. They spent a few days in the Blue Mountains area, Cockpit Country and South-East coast, where they found various species of Phasmatodea. Among them were four large species of the tribe Diapheromerini, including three known species: *Clonistria simplicitarsis* (Gray, 1935), known from both sex; *Clonistria annulipes* Rehn & Hebard, 1938, and *Clonistria monticola* Rehn & Hebard, 1938, both only known from male specimens; and a species new to science. The extensive material collected and comparisons with other genera of the tribe allowed the authors to undertake the description of a new genus encompassing all these species.

Clonistria Stål, 1875, was historically defined to distinguish species of smaller size from genera *Bacteria* Berthold, 1827, and *Bostra* Stål, 1875, based on relative length of the median segment (Stål, 1875: 10). The distinction, while convenient with few species, proved later difficult to assess correctly when Caribbean fauna became better sampled. As a result, in their seminal paper, Rehn & Hebard (1938: 41) declared the genus *Clonistria* would require a full revision before a more satisfactory arrangement of genera can be reached. Unfortunately,

such a revision did not occur yet and the arrangement is still in use as a default option. We therefore suggest beginning a clarification of this specific issue; we can now separate three species previously placed in genus *Clonistria*, and move them into a newly described genus. In addition, a COI analysis has been produced and supports the species delimitation.

Material and methods

Measurements are given in millimeters with a precision of ± 0.1 mm for the insects, and ± 0.01 mm for the eggs and were taken with a caliper. Adults and eggs were examined under a Novex AP-8 and a Wild Heerbrugg MB binoculars. Photographs of specimens were taken with various cameras: Olympus Tough TG-5; Nikon D5200 equipped with an AF Micro Nikkor 40 mm lens (f/2.8G) and a Nikon D800 equipped with an AF Micro-Nikkor 60 mm lens (f/2.8D) and SB-R200 flash-lights. Photographs of the eggs were taken with the Nikon D800 camera equipped with an AF Micro-Nikkor 60 mm lens with 68 mm extension tubes and SB-R200 flash-lights. Focus stacking was performed with an automated rail StackShot from Cognisys and Zerene Stacker software.

We followed the recent taxonomic proposal of Simon *et al.* (2019). Listed information and data of types are mostly based on the online database Phasmida Species File (Brock *et al.*, 2019) and the paper of Rehn & Hebard (1938). The terminology of the egg capsule follows Clark-Sellick (1997).

Collecting and preserving methods are detailed in Jourdan *et al.* (2014), breeding method is presented in Bellanger *et al.* (2021). Except for one species for which we only found the female, the males were assigned to the females by direct *in situ* observations, latter supported by both breeding and barcoding.

Genomic DNA samples were isolated from pieces of tarsi suspended in ethanol. Tissue samples (all less than five years old) were sent to the Canadian Center for DNA Barcoding (CCDB) at University of Guelph for extraction, Polymerase Chain Reaction (PCR) and further barcoding. PCRs were performed using the classic primers C_LepFolF/C_LepFolR, amplifying a mitochondrial sequence from gene COI (cytochrome oxidase). The sequences were aligned with Muscle program (Edgar, 2004) and the quality of alignment was evaluated with the web-based program GUIDANCE2 (Sela *et al.*, 2015; Penn *et al.*, 2010). The consensus neighbour joining tree was inferred using MEGA X (Kumar *et al.*, 2018). The tree was rooted with an outgroup from the Phasmatidae family, *Diapherodes jamaicensis* Gray, 1835. Sequences divergence was calculated using MEGA X (Kumar *et al.*, 2018). Specimens used for the phylogeny are stored in public collections (MNHN) or in ASPER collections with their BOLD number (see in "Material examined" for each species and in table IX). Sequences are deposited in GenBank.

Abbreviations used. – **ANSP**, Academy of Natural Sciences of Philadelphia, Philadelphia, United States; **coll. ASPER**, collection of the ASPER (**PL**: housed in Philippe Lelong collection, France, Sainte-Foy-d'Aigrefeuille; **TJ**: housed in Toni Jourdan collection, France, Vallières; **YB**: housed in Yannick Bellanger collection, France, Trédias); **MHNG**, Muséum d'Histoire Naturelle de Genève, Switzerland; **MNHN**, Muséum national d'Histoire naturelle, Paris, France; **NHMJ**, Natural History Museum of Jamaica, Kingston, Jamaica; **NHMUK**, The Natural History Museum, London, United Kingdom.

Results

Taxonomy

Phasmatodea, Neophasmatodea, Occidophasmata, Diapheromeridae,
Diapheromerinae, Diapheromerini

Genus ***Jamanistria*** **n. gen.**

https://zoobank.org/NomenclaturalActs/A63D36A1-EBD2-423A-949A-F83E4060ACBB
Type-species: *Bacteria simplicitarsis* Gray, 1835, by present designation.

Species included. – *Jamanistria annulipes* (Rehn & Hebard, 1938), n. comb., *J. monticola* (Rehn & Hebard, 1938), n. comb., *J. simplicitarsis* (Gray, 1835), n. comb., *J. xerophila* n. sp.

Notes. – In their seminal paper, Rehn & Hebard (1938: 41) declared the genus *Clonistria* would require a full revision. However, we cannot fail to praise the remarkable work in their paper, which is exhaustive and well executed despite the scarcity of available material.

We acknowledge that *Bostra deplanata* Redtenbacher, 1908, from Cuba could belong to *Jamanistria*, but we had no opportunity to examine the holotype in MHNG in details; furthermore, this specimen is very damaged, especially the last three tergites, and the genitalia are unfortunately missing.

Description. – Medium-size to large members of Diapheromerinae (body length including subgenital plate: females, 103.7-192.0 mm; males, 68.3-109.9 mm). Body elongated, apterous and cylindrical. Body surface entirely inermous and glabrous. Colour of the females often faded, brown, beige, greyish; sometimes mottled or with white tasks. Males dull-coloured as well but sometimes greenish. Legs often ringed for both sexes.

Head distinctly longer than wide, almost cylindrical and parallel-sided. Vertex flat. Eyes hemispherical. Antennae filiform; in females as long as or slightly exceeding anterior legs and reaching at least median segment, sometimes up to abdominal segment III; in males very long, widely exceeding anterior legs and reaching abdominal segment VI or VII.

Thorax. Pronotum shorter than head. Mesonotum elongated, cylindrical, 3.0 to 5.0× longer than head and pronotum combined; in females, metanotum and median segment combined 0.6-0.7× the length of mesonotum. Posterior legs of males sometimes reaching but never exceeding the abdominal extremity; always exceeding the abdominal extremity in males. Profemur shorter than protibia in males, slightly shorter or equal in length in females. Anterior extremity of medio-ventral carina (females) of meso- and metafemora armed with two dentate and scale-shaped lobes, sometimes reduced to two small teeth. Metafemora of females reaching from the middle of tergite IV to its posterior extremity.

Abdomen distinctly longer than head and thorax combined in females, as long as or shorter in males. Median segment from slightly shorter to longer than metanotum. Abdominal segment II to VII cylindrical in cross section, roughly rectangular dorsally, inermous; III to VI about of same length and slightly longer than II (females). Posterior margin of tergite VI (females) generally slightly swollen and forming sometimes a bump. In males, tergite VIII very swollen in its posterior half and tergite IX as long as X or slightly longer. Praeopercular organ visible, formed by a blackish spot at the posterior extremity of sternite VII and preceded anteriorly by a more or less developed bump. Subgenital plate of females exceeding the apex of tergite X, lanceolate with an acute apex. In males, poculum pronounced, ending with two lateral flat expansions. Cerci of females short but always visible dorsally, conical and sometimes compressed dorsally in their anterior part; cerci of males about 3.0× wider basally than at their extremity, slightly arcuate and with the extremity directed inward. Epiproct of females more or less exceeding the apex of tergite X. Vomer of males well visible, simple or bifid.

Eggs small. Capsule from light brown to dark brown, 1.2-1.5× as long as high and 1.5-2.0× as long as wide; dorsal surface slightly more convex than ventral surface. Micropylar plate more or less elongated; micropylar cup and median line distinct. Operculum rimed with a more or less elevated ring; central part with an elevated structure surrounded by a crown.

Etymology. – The proposed name refers to the Jamaican origin of currently known species, and its close association with *Clonistria* Stål, 1875.

Diagnosis. – As stated above, *Clonistria* is a genus in need of a revision. The following diagnosis is based on the type species *Clonistria bartholomaea* Stål, 1875, and the extensive material of the authors from Guadeloupe, Martinique, Saint Barthélemy, Trinidad, Grenada,

Saint Lucia, Saint Vincent and Dominica. *Jamanistria* is differentiated from *Clonistria* by a larger body size for both sexes and a distinctly more elongated body in females (body length of *Jamanistria* females more than 100 mm; body length of *Clonistria* females less than 100 mm); in addition to that, in *Clonistria* females, the posterior legs almost always exceed abdominal apex, which is never the case in the species hereby assigned to *Jamanistria* n. gen.; the subgenital plate of *Clonistria* females is shorter and never reaches the abdominal extremity while it exceeds the abdominal extremity in *Jamanistria* females; however females of both genera share a lanceolate subgenital plate with an acute apex. Males of *Clonistria* have a much less prominent poculum and sternite VIII, and the three last tergites are as wide as the rest of the abdomen or only slightly wider, while they are obviously wider in *Jamanistria* males.

As the genus *Bacteria* is also in need of taxonomic revision, the following comparisons were made with type species *Bacteria ferula* (Fabricius, 1793) and *Bacteria donskoffi* (Langlois & Lelong, 1998), which is acknowledged as a "true" *Bacteria*. *Jamanistria* is distinct from *Bacteria* and *Calynda* Stål, 1875, with both sexes presenting a much longer median segment in comparison to the metanotum (ratio metanotum/median segment is more than 4 in *Bacteria* and *Calynda*, while it is less than 2 in *Jamanistria*); males of *Bacteria* and *Calynda* have more developed and arcuate cerci (which are shorter and less arcuate in *Jamanistria* in comparison). From *Bacteria*, females of *Jamanistria* differ by having a longer subgenital plate, which exceeds the abdominal extremity and with an acute apex, while it does not exceed the abdominal extremity and has a rounded or indented apex in *Bacteria*. Males of *Jamanistria* have a rounded poculum and the tergite X longer than wide, while those of *Bacteria* have a more or less pointed poculum and the tergite X distinctly wider than long and much wider than all others abdominal segments.

Females of *Jamanistria* also differ from those belonging to *Calynda* by having a much shorter subgenital plate. Males of *Jamanistria* have a more prominent poculum and the tergite X swollen in its posterior part, while in *Calynda* males the poculum is just slightly rounded and the last tergites are not distinctly wider than the others.

Distribution. – Currently to be considered endemic to Jamaica (fig. 85).

Jamanistria annulipes (Rehn & Hebard, 1938), **n. comb.**

Clonistria annulipes Rehn & Hebard, 1938: 64. Holotype: ♂, "Montego Bay, Jamaica, 1913" [ANSP]; paratype: ♂, "Montego Bay, Jamaica, 1910, E.A. Andrews" [ANSP].

Material examined (12 ♀, 16 ♂, 61 eggs). – 2 ♀ JAM18-092 and -094, 1 ♂ JAM18-093 (BOLD n°WG1PHAJA20-019) [ASPER-PL], 1 ♂ JAM18-095 (BOLD n°WG1PHAJA20-020) [MNHN], 1 ♀ JAM18-096 (BOLD n°WG1PHAJA20-018) [MNHN], 1 ♀ JAM-078 and 1 ♂ JAM18-079 [ASPER-TJ], Road between Sherwood and Windsor House, Cockpit Country, Jamaica, N18°21'22.7", W077°38'48.5", 14.XI.2018; 1 ♀ NHMJ18-003 and 1 ♂ NHMJ18-004, Jamaica, Cockpit Country, Windsor Cave, 16.XI.2018, rec. & det. ASPER (*Bellanger, Jourdan, Lelong*) [NHMJ]; 1 ♀, Walderston, Manchester, Manchester Parish, Jamaica, XI.1950, *rec. W.O. Venchipes*, det. ASPER [NHMJ]; 1 ♂, Mobay [Montego Bay], St-James Parish, Jamaica, XII.1951, *rec. H.B. Southby*, det. ASPER [NHMJ]; 3 ♀ JAM18-167, -195 and -234, 5 ♂ JAM18-156, -157, -158, -171 and -194, VII-XI.2019, elev. F1 Y. Bellanger [ASPER-YB]; 1 ♀ JAM18-166 and 1 ♂ JAM18-165, VII.2019, elev. F1 Y. Bellanger [ASPER-PL]; 1 ♀ JAM18-216 and 1 ♂ JAM18-212, IX.2019, elev. F1 Y. Bellanger [ASPER-TJ]; 1 ♀ JAM18-326 (BOLD n°WG1PHAJA20-022), 13.XII.2020, elev. F2 Y. Bellanger [ASPER-YB]; 1 ♂ JAM18-325 (BOLD n°WG1PHAJA20-021), 13.XII.2020, elev. F2 Y. Bellanger [ASPER-YB]; 2 ♂, 24.IV.2020, elev. F2 Y. Bellanger [ASPER-YB]; 1 ♂, 9.I.2021, elev. F3 Y. Bellanger [ASPER-YB]; 10 eggs, 14-18. XI.2018, from JAM18-094, -095, -096, and -078 [ASPER-YB]; 1 egg, 14-18.XI.2018, from JAM18-094, -095, -096, and -078 [ASPER-PL]; 10 eggs, VIII.2019, elev. F1 Y. Bellanger [ASPER-YB]; 10 eggs, VIII.2019, elev. F1 Y. Bellanger [ASPER-PL]; 10 eggs, VIII.2019, elev. F1 Y. Bellanger [ASPER-TJ]; 20 eggs, IX.2022, elev. Y. Bellanger [MNHN].

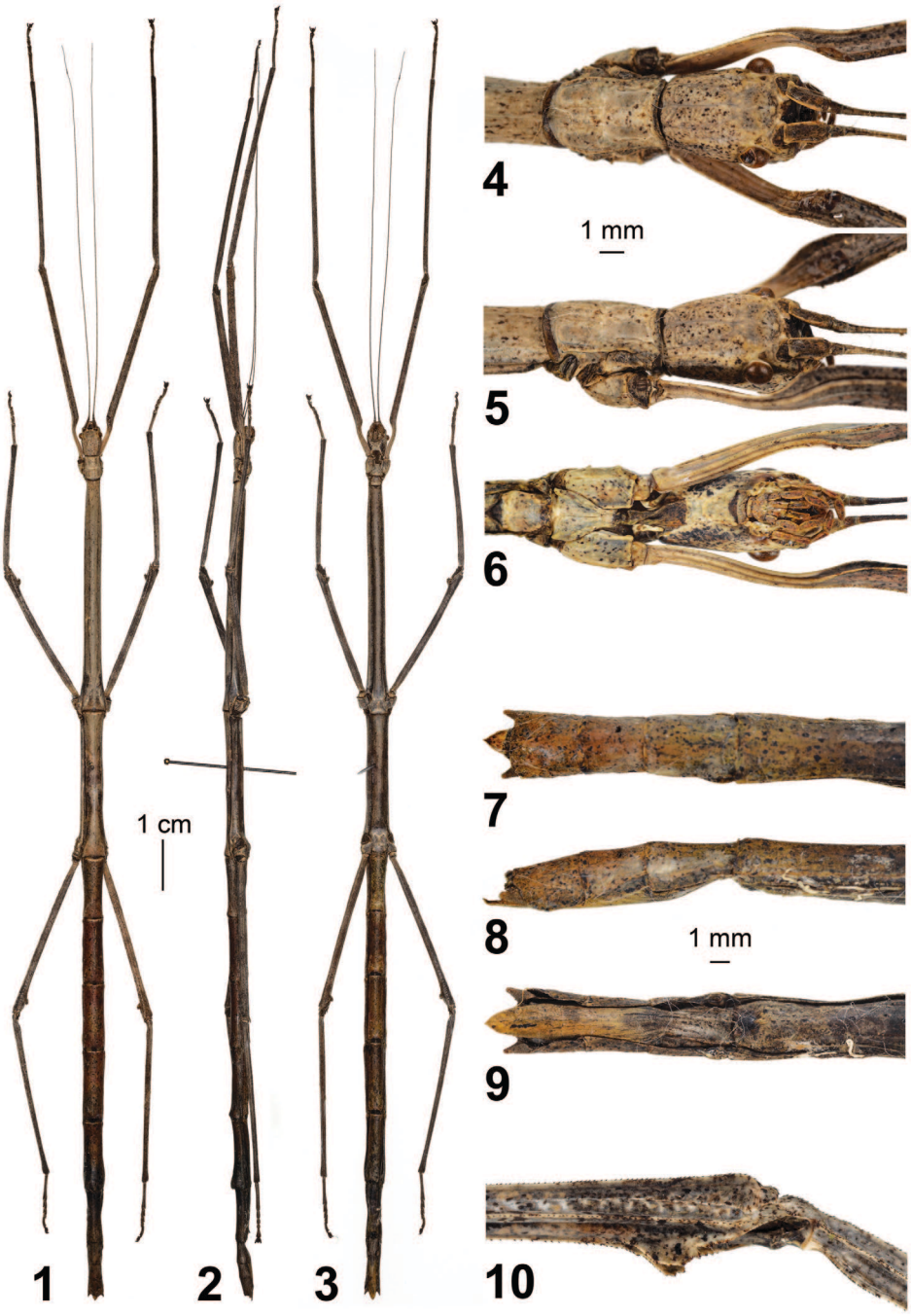

Fig. 1-10. – *Jamanistria annulipes* (Rehn & Hebard), ♀ JAM18-092. – **1-3**, Habitus (scale bar: 1 cm). – **4-6**, Head (scale bar: 1 mm). – **7-9**, Abdominal extremity (scale bar: 1 mm). – **10**, Close-up on the median femur extremity, – **1, 4, 7**, Dorsal view. – **2, 5, 8**, Lateral view. – **3, 6, 9**, Ventral view.

Notes. – This species was described by REHN & HEBARD (1938: 47) from the holotype male from Montego Bay and deposited in ANSP. The female was then unknown and the authors highlighted the important similarity with male specimen of *B. simplicitarsis*, distinguished only from genitalia examination. MOXEY (1972: 80), in his unpublished thesis, erroneously suggested to synonymize *C. annulipes* with *B. simplicitarsis*. The female and the eggs are described here for the first time. It is removed from *Clonistria* to the new genus *Jamanistria*: *J. annulipes* (Rehn & Hebard, 1938), **n. comb.**

Description of the female. – Fig. 1-10, table I. Large size for the genus (body length including subgenital plate 156.1-193.9 mm). General colour greenish, light brown or brown; legs green, light brown or brown, generally similar that of the body, sometimes more or less ringed. Scapus, pedicellus and remaining antennomeres of the same colour as the body.

Head 1.1-1.4× longer than pronotum and slightly wider at eye level (fig. 4-6). Vertex slightly rounded. Antennae hardly reaching the apex of anterior legs, often shorter (fig. 1), or reaching from the anterior of median segment to the anterior of tergite II; scapus flattened dorsally and more than 2× longer than pedicellus.

Thorax. Pronotum longer than wide, slightly narrower than head and with a distinct medio-transverse furrow. Mesonotum smooth, roughly parallel-side, slightly narrower close to the junction with pronotum and wider close to the junction with metanotum, 8.3-9.7× longer than pronotum and 1.5-1.6× longer than metanotum and median segment combined. Metanotum very slightly longer than median segment. Pro- and metafemora as long as their associated tibiae, mesofemur slightly longer than mesotibia; anterior extremity of medio-ventral carina of meso- and metafemora armed with two lobes, denticulate on anterior side (fig. 10); apex of antero- and postero-ventral carinae of femora with a sharp spine, excepted on antero-ventral carina of profemora. Probasitarsus slightly longer than the remaining tarsomeres combined; meso- and metabasitarsi as long as the remaining tarsomeres combined.

Abdomen. Median segment and tergites III-IV roughly of same length, slightly shorter than tergites V-VI, and slightly longer than tergite II; tergite VII shorter than II, and very slightly longer than the three last tergites combined; tergites IX-X roughly of same length, the shortest and slightly shorter than VIII; posterior part of tergite VI more or less inflated dorsally forming a small hump. Praeopercular organ very distinct, formed by an invagination under a black spot at the posterior apex of sternite VII, surmounted by a prominent hump. Subgenital plate elongated, lanceolate and exceeding the apex of abdomen for

Table I. – Measurements of adult females and males of *Jamanistria annulipes* (Rehn & Hebard) [mm].

	♂, HT [ANSP]*	♂, PT [ANSP]*	♀, **mean** (range) from 10 specimens**	♂, **mean** (range) from 11 specimens***
Body	82	88	**173.28** (154.7-192.0)	**100.71** (87.3-112.0)
Body (including subgenital plate)	/	/	**176.43** (156.1-193.9)	/
Antennae			**80.57** (68.8-89.9)	**89.21** (78.0-100.8)
Head			**6.04** (5.5-6.6)	**3.15** (2.7-4.0)
Pronotum			**4.86** (4.4-5.2)	**2.85** (2.5-3.2)
Mesonotum	23.9	24.7	**44.55** (39.6-49.4)	**28.31** (23.5-33.1)
Metanotum (including median segment)	15.8	16.0	**27.75** (25.4-30.6)	**17.97** (14.8-20.5)
Median segment	7.9	7.7	**12.78** (11.6-14.0)	**8.79** (7.8-10.1)
Profemora	28.3	27.8	**39.79** (35.8-44.5)	**31.41** (27.8-36.7)
Mesofemora			**29.94** (26.2-33.2)	**25.79** (22.0-31.4)
Metafemora	27.7	25.6	**33.99** (30.4-37.4)	**29.59** (25.2-35.4)
Protibiae			**39.98** (35.4-44.3)	**37.13** (33.3-42.1)
Mesotibiae			**27.2** (25.1-29.5)	**25.99** (22.0-29.5)
Metatibiae			**34.2** (31.9-37.0)	**33.18** (29.1-37.9)

* data from REHN & HEBARD (1938: 48).
** including JAM18-078, -092, -094, -096, -166, -167, -195, -216, -234 and NHMJ18-003.
*** including JAM18-079, -093, -095, -156, -157, -158, -165, -171, -194, -212 and NHMJ18-004.

≤ 2 mm, which represents less than 0.5× the length of tergite X; apex acutely pointed (fig. 7-9). Cerci wide, conical and short, only slightly visible from above. Epiproct generally visible, rounded and slightly projecting over anal segment.

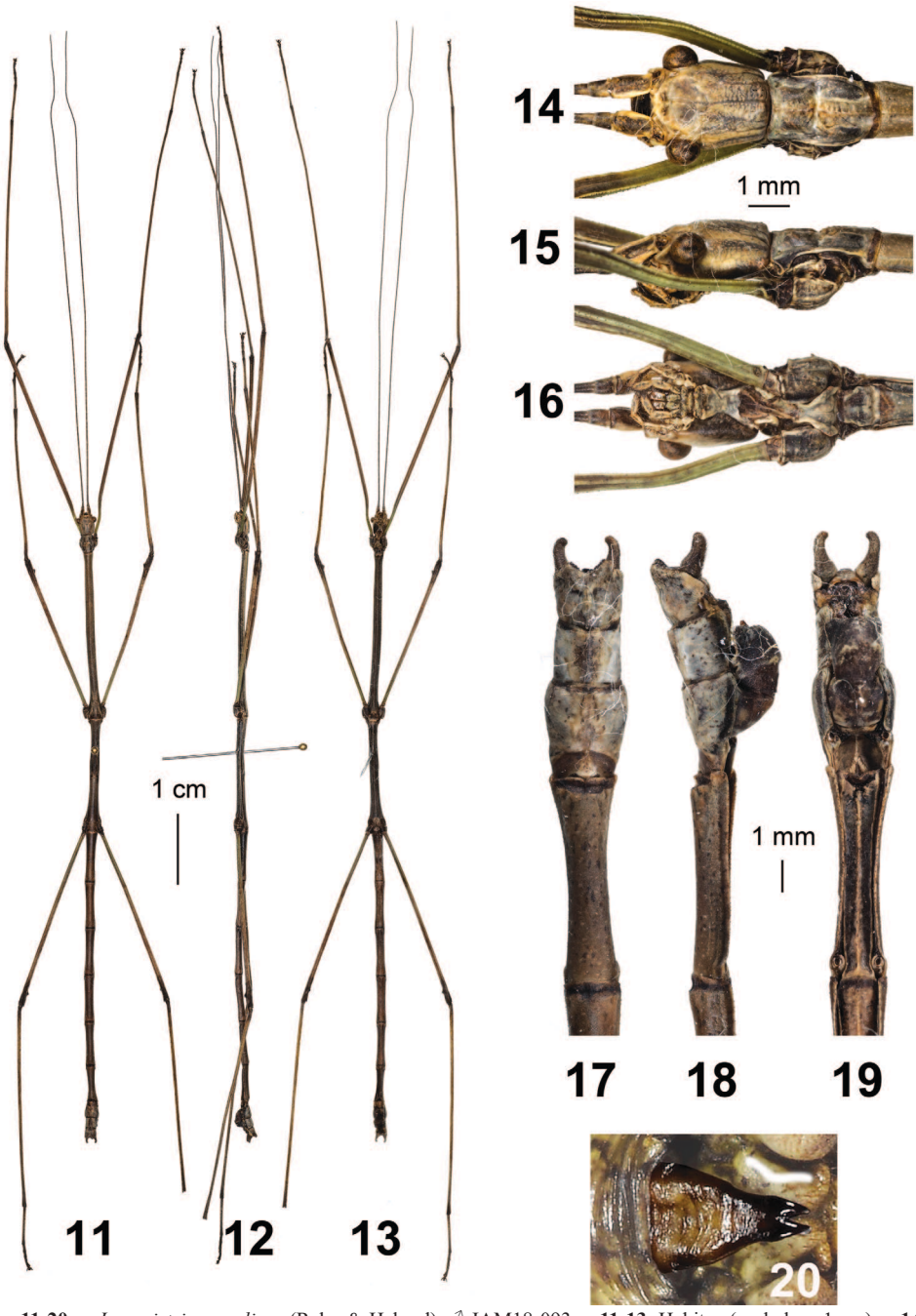

Fig. 11-20. – *Jamanistria annulipes* (Rehn & Hebard), ♂ JAM18-093. – **11-13**, Habitus (scale bar: 1 cm). – **14-16**, Head (Scale bar: 1 mm). – **17-19**, Abdominal extremity (scale bar: 1 mm). – **20**, Close-up on the vomer. – **11, 14, 17**, Dorsal view. – **12, 15, 18**, Lateral view. – **13, 16, 19**, Ventral view.

Redescription of the male. – Fig. 11-20, table I. Large size for the genus (body length 82.0-112.0 mm). General colouration of body brown to dark brown. Anterior extremity of all femora and tibiae dark brown; remaining part of meso-, metafemora, meso- and metatibiae gradually from greenish to brown, from posterior to anterior; those of profemora and protibiae brown. Scapus, pedicellus and remaining antennomeres roughly of the same colour as that of the body.

Head 1.0-1.3× longer than pronotum; its anterior half is slightly wider than pronotum (fig. 14-16). Vertex almost flat, with two small bumps posteriorly on each side of a very fine medio-longitudinal furrow. Antennae widely exceeding the anterior legs apex (fig. 11); scapus flattened dorsally, almost rectangular; pedicellus almost cylindrical and about half the length of scapus.

Thorax including median segment longer than abdomen. Pronotum almost rectangular, median sulcus very distinct and slightly displaced toward the anterior. Mesonotum wider in its posterior part close to the junction with metanotum and slightly wider in its anterior extremity close to the junction with pronotum; 1.5-1.7× longer than metanotum and median segment combined. Metanotum as long as or very slightly longer than median segment. Pro- and metafemora 0.8-0.9× the length of their associated tibiae; mesofemur as long as or very slightly shorter than mesotibia; antero- and postero-ventral carinae of meso- and metafemora with a sharp spine at their apex, only in postero-ventral carina for profemora; anterior apex of medio-ventral carina of mesofemora dividing in two parts forming small lobes with 3-4 small, sharp and dark spines (fig. 91-a); also in metafemora but less pronounced; pro- and metabasitarsus about 2.0× longer than the remaining associated tarsomeres combined; mesobasitarsus about 1.5× longer than the remaining tarsomeres combined.

Abdomen slightly widened at the junction of each tergite. Median segment the longest abdominal segment; tergites II to IX decreasing in length; tergite X roughly as long as or very slightly longer than IX; tergite VIII the widest and slightly wider posteriorly; tergite IX almost quadrate, shorter than wide; tergite X about as long as wide, apex roundly notched with short hairs. Vomer distinct and bifid at its apex (fig. 20), reaching the apex of last tergite. Cerci wider basally, curved inward and directed downward (fig. 17-19).

Description of post-hatch nymph morphology. – Fig. 21. Body length from 14 to 15 mm, greenish dorsally, except tergite X brown; ventrally brown from mesothorax to the end of abdomen; head and prothorax ventrally greenish; head with a brown stripe posteriorly to the eye and as wide as the eye; this latter also brown. Antennae brown annulated in whitish, reaching the apex of anterior legs. Legs mostly greenish excepted anterior legs marbled in brown; all femora, meso- and metatibia, and meso- and

Fig. 21. – *Jamanistria annulipes* (Rehn & Hebard), post-hatch nymph in culture.

metabasitarsus distal extremities dark brown, as well as proximal extremity of all tibiae and meso- and metabasitarsus. Cerci wide, conical, dark brown, well visible from above and projecting laterally at an angle of about 45°.

Description of the egg. – Capsule brown to dark brown, ovoid and quite large for the genus (fig. 81, table II), 1.2-1.3× as long as high and 1.5-1.9× as long as wide; dorsal surface slightly more convex than ventral surface, polar area rounded; surface smooth and shiny. Micropylar plate elongated, distinctly widening from anterior side to posterior side, about 0.7× the length of the capsule; inner part of the same colour as the capsule, outer margin as wide as inner part and slightly lighter with the edge creamish to grey; posterior side deeply invaginated, micropylar cup distinct and median line of the same colour as outer margin. Operculum large diameter 1.25-1.35× as long as small diameter; oval, rimmed with a creamish, smooth and slightly elevated ring; central part creamish to yellowish, subconical with a closed and rounded summit, surrounded by a crenulated crown slightly curved toward the centre.

Table II. – Measurements of the egg of *Jamanistria annulipes* (Rehn & Hebard): **mean** (range) [mm], from 10 eggs (in coll. ASPER-PL).

Capsule total length (incl. operculum)	Capsule length	Capsule height	Capsule width	Operculum small diameter	Operculum large diameter	Micropylar plate length	Micropylar plate width
2.67 (2.62-2.71)	**2.40** (2.35-2.47)	**1.85** (1.79-1.90)	**1.46** (1.25-1.57)	**0.92** (0.89-0.94)	**1.21** (1.16-1.28)	**1.64** (1.53-1.73)	**0.69** (0.65-0.73)

Diagnosis. – The closest actually known species is *J. simplicitarsis* (Gray, 1935) from which the female differs in the shorter subgenital plate (fig. 97-a), which exceeds the apex of abdomen for 2 mm at most (more than 2 mm in *J. simplicitarsis*, fig. 97-c), more rounded vertex and shorter antennae which at best reach the apex of anterior legs (antennae exceed the apex of anterior legs in *J. simplicitarsis*); the male differs in the bifid apex of vomer (fig. 95-a) (simple in *J. simplicitarsis*, fig. 95-c) and in the much more developed two lobes (fig. 91-a) at the anterior apex of medio-ventral carina of mesofemora (reduced to two small blunt spines in *J. simplicitarsis*, fig. 91-c). It is distinguished from *J. monticola* (Rehn & Hebard, 1938) and *J. xerophila* n. sp. for both sexes in being much longer, having a distinctly longer metanotum than median segment (fig. 94 for the males), and in the tergite VII, which is longer or at best as long as the three following tergites combined (shorter in *J. monticola* and *J. xerophila*). The egg shares the smooth capsule like those of *J. simplicitarsis* eggs, which clearly differentiates them from the two other species in which the capsule is either rugose (*J. xerophila*) or covered with ridges (*J. monticola*). It is smaller and less elongated than the egg of *J. simplicitarsis*, and also demonstrates a much less elevated operculum.

Ecology. – *Jamanistria annulipes* was found in a relatively dry area of Cockpit Country (fig. 89), along a track with many *Psidium guajava* L., 1753 (Myrtaceae) trees on which sampled specimens were feeding. This is the only natural food plant currently known. Nymphs and adults were found from 50 cm above the ground til top of trees. In culture they were fed on *Eucalyptus* sp (Myrtaceae) and *Hypericum* spp (Hypericaceae). Incubation time of the first generation was about 3.5 months at 20°C for a hatching rate of 40%. At 18-20°C the males became adults in about 80 days while the females needed 30 more days. The female starts laying eggs 10-11 days after its last moult.

Jamanistria monticola (Rehn & Hebard, 1938), **n. comb.**

Clonistria monticola Rehn & Hebard, 1938: 45. Holotype: ♂, "Cinchona (Hill Gardens), Blue Mountains, Jamaica, July 1, 1923 (C. G. Gowdey); *Clonistria simplicitarsis* (G.), Det. C. F. Moxey 1972" [ANSP, type n°5571] (fig. 31-36).

Material examined (6 ♀, 30 eggs). – 1 ♀ JAM18-127, Catherine's Peak, Blue Mountains, Jamaica, N18°04'41.7'', W076°42'11.4'', 10.VI.2018, BOLD n°WG1PHAJA20-023 [ASPER-PL]; 2 ♀ JAM18-

222 (BOLD n°WG1PHAJA20-024) [ASPER-YB] and JAM18-223 [ASPER-TJ], X.2019, elev. F1 Y. Bellanger; 2 ♀ JAM18-310 (BOLD n°WG1PHAJA20-026) and -311 (BOLD n°WG1PHAJA20-025), VII-VIII.2020, elev. F2 Y. Bellanger [ASPER-YB]; 1 ♀ JAM18-287, Jamaica, Blue Mountains, Catherine's Peak, elev. F1 Y. Bellanger, 31.VII.2020 [MNHN]; 10 eggs, from JAM18-222 and JAM18-223, VIII.2019, elev. F1 Y. Bellanger [ASPER-YB]; 10 eggs, *idem* [ASPER-PL]; 10 eggs, *idem* [ASPER-TJ].

Notes. – This species was described by Rehn & Hebard (1938: 45) from the holotype male from Cinchona (Hill Gardens) in the Blue Mountains and deposited in ANSP. This male perfectly fits *Jamanistria* criteria, sharing the long median segment, the poculum and cerci shapes and the swollen tergite VIII. The female was unknown until this study. Moxey (1972: 80), in his unpublished thesis, erroneously suggested to synonymize *C. monticola* with *B. simplicitarsis*. This species is thus here removed from *Clonistria* and placed in the new genus *Jamanistria*: *J. monticola* (Rehn & Hebard, 1938), **n. comb.**

During the field expedition, a single female was collected near the summit of Catherine's Peak in the Blue Mountains. This specimen laid nine eggs within few days in culture. From those eggs only three nymphs hatched and two survived until adulthood, both were females. It is possible that the sampled female was only recently adult when it was found and not yet fertilized. According to the type locality of *J. monticola*, which is less than 5 km from Catherine's Peak and has similar environmental conditions, and until direct proof of the contrary with *in situ* observation, we suggest the female and the egg described here as belonging to this species. The female collected in situ (JAM18-127) is slightly smaller than the specimens obtained from rearing her eggs. The male is not redescribed herein as we did not find any during the expedition, and it was fairly well described by Rehn & Hebard (1938).

Description of the female. – Fig. 22-30, table III. Medium size for the genus (body length without subgenital plate 109.0-117.2 mm). General colour of body variable from brown, dark brown and greenish, sometimes marbled in creamish on posterior side of median segment and tergite VI. Legs generally of same colour as the body and annulated.

Head 1.0-1.2× longer than pronotum; as wide a pronotum, or very indistinctly wider (fig. 25-27). Vertex slightly rounded, with two small bumps posteriorly. Antennae distinctly exceeding the anterior legs apex for more than 10 mm, or reaching from the posterior of tergite III to the anterior of tergite IV; scapus flattened dorsally, almost rectangular; pedicellus cylindrical and about half the length of scapus.

Thorax including median segment 0.8× the length of abdomen without the subgenital plate. Pronotum almost roughly rectangular, 1.1-1.3× longer than wide, median sulcus distinct. Mesonotum gently narrowing toward the anterior, 1.40-1.56× longer than metanotum and median segment combined. Metanotum 0.9-1.1× the length of median segment. Profemur as long as or slightly shorter than protibia; mesofemur 1.0-1.2× longer than mesotibia; metafemur 0.9-1.1× the length of metatibia; anterior extremity of medio-ventral carina of meso- and metafemora armed with two diverging lobes, denticulate on posterior side; apex of antero- and postero-ventral carinae of femora with a sharp spine, except on antero-ventral carina of profemora; posterior side of antero- and postero-dorsal carinae of femora more or less elevated, sometime with a short lobe.

Abdomen with a more or less visible dorsal bump on posterior side of tergite V, and a distinct and elevated dorsal bump on posterior side of tergite VI (fig. 29). Median segment roughly of same length as tergites III to VI, and the longest; tergites II and VII slightly shorter and about of same length, as long as tergites VIII to X combined; tergite IX the shortest, about 0.8× the length of tergite X and 0.5-0.6× the length of tergite VIII. Tergite X roughly quadrate with the posterior side very slightly wider and the apex very gently notched medially; epiproct more or less visible from above. Gonapophysis flattened and broad, slightly exceeding the apex of tergite X from above. Cerci triangular and thick, with a rounded apex and gently oriented laterally. Subgenital plate lanceolate, exceeding the apex of abdominal extremity for about half the length of tergite X, with the apex curving upward (fig. 28-30). Praeopercular organ formed by a prominent black spot anteriorly surmounted with a very distinct bump, on the posterior extremity of sternite VII (fig. 29-30).

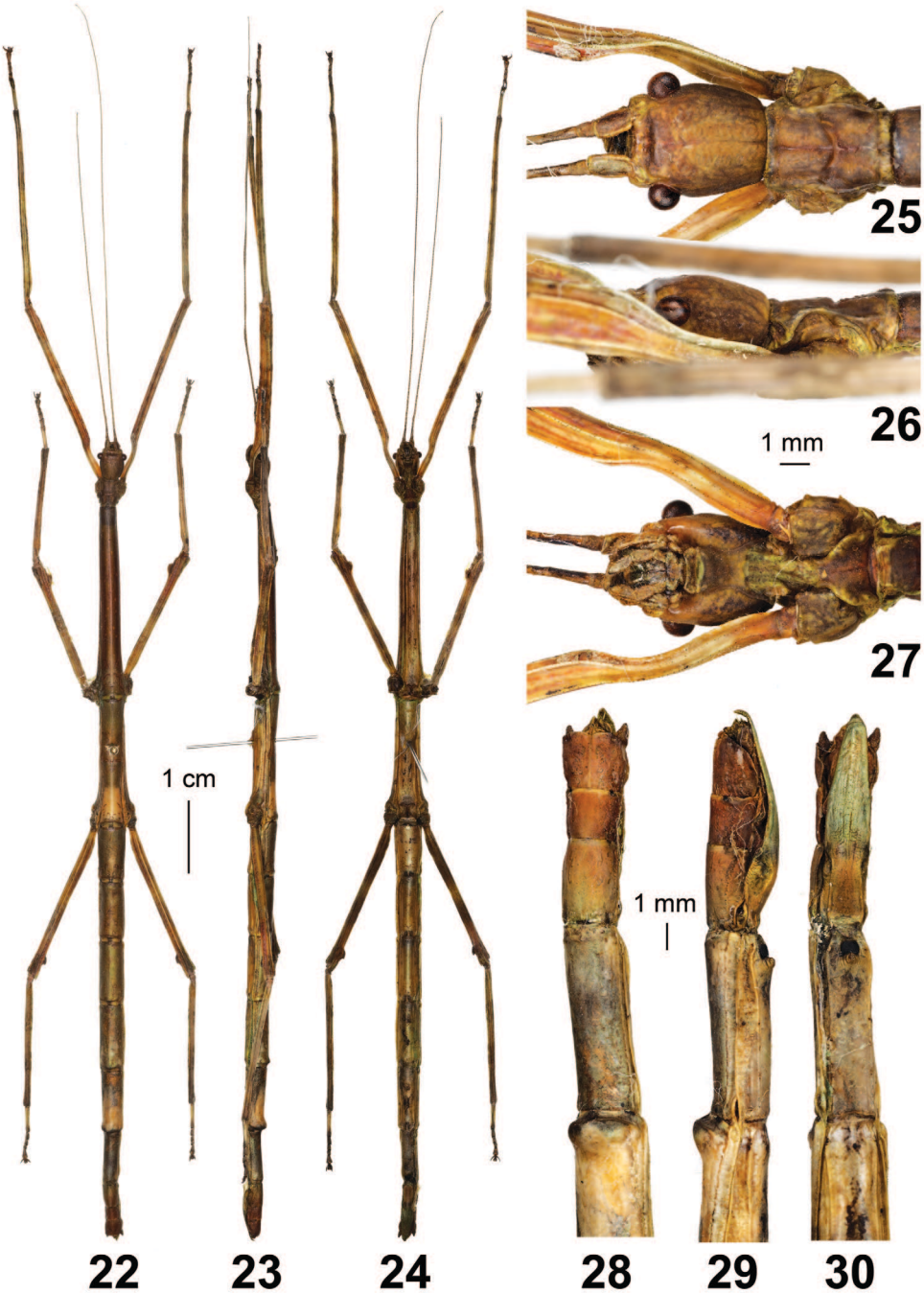

Fig. 22-30. – *Jamanistria monticola* (Rehn & Hebard), ♀ JAM18-297. – **22-24**, Habitus (scale bar: 1 cm). – **25-27**, Head (scale bar: 1 mm). – **28-30**, Abdominal extremity (scale bar: 1 mm). – **22, 25, 28**, Dorsal view. – **23, 26, 29**, Lateral view. – **24, 27, 30**, Ventral view.

Table III. – Measurements of adult females and males of *Jamanistria monticola* (Rehn & Hebard) [mm].

	♂, HT [ANSP] *	♀ **mean** (range) ** from 8 specimens
Body	74.0	**113.4** (109.0-117.2)
Body (including subgenital plate)	/	**114.4** (109.8-118.3)
Antennae		**63.2** (56.6-70.8)
Head		**4.5** (4.4-4.6)
Pronotum		**4.1** (3.5-4.4)
Mesonotum		**27.0** (25.6-27.9)
Metanotum	5.7	**9.1** (8.7-10.0)
Median segment	8.0	**9.2** (8.4-9.9)
Profemora	23.9	**26.2** (22.7-27.8)
Mesofemora		**18.9** (16.2-21.1)
Metafemora	20.6	**22.4** (18.6-23.7)
Protibiae		**26.8** (24.5-29.1)
Mesotibiae		**16.4** (15.4-18.5)
Metatibiae		**20.6** (19.4-22.3)

* data from REHN & HEBARD (1938: 46).
** including all specimens from the ASPER and MNHN collections.

Description of the egg. – Small and ovoid (fig. 82, table IV), 1.2-1.3× as long as high and 1.5-1.7× as long as wide. Dorsal surface slightly more convex than ventral surface, polar area rounded. Capsule brown and slightly shiny, covered with irregular in shape and in length darker ridges. Micropylar plate almost parallel-sided, about 0.5× as long as capsule and 1.8-2.1× longer than wide; outer margin creamish and interior portion brown to dark brown. Operculum oval and yellowish, large diameter 1.2-1.3× as long as small diameter; rimmed with a wide and smooth but embossed ring, gradually elevating toward its centre; central part creamish and bulging, forming a granulose and radiant star-shaped structure, surrounded by a dented crown.

Diagnosis. – This species is distinguished from *J. annulipes* and *J. simplicitarsis* for both sexes in their much smaller size; female in having the mesonotum less than 8.0× the length of the pronotum (fig. 96-b); male in having a median segment distinctly longer than metanotum (fig. 94-b). From *J. xerophila*, the female differs in having a much smaller subgenital plate (fig. 97-b) and the tergite X longer than IX (equal in length in *J. xerophila*); male in having the poculum and sternite VIII not fused (fused in *J. xerophila*), the tergite IX as long as X (fig. 93-b) (longer than X in *J. xerophila*, fig. 93-d). The egg is smaller than those of the others species, its capsule is covered with ridges (smooth in *J. simplicitarsis* and *J. annulipes*; very slightly rugose in *J. xerophila*), and its micropylar plate length is about 0.5× as long as the capsule while the same ratio is around 0.6-0.7× in the others species.

Ecology. – The only specimen sampled during the expedition is a female which was collected in the wet forest near Catherine's Peak summit (fig. 88), about 1500 meters above sea level. This female was found on *Eugenia marchiana* Griseb. (Myrtaceae), which is a natural food plant, confirmed with the rearing during field work. As stated above this female might not have mated before capture, we thus consider the following information as data for a

Table IV. – Measurements of the egg of *Jamanistria monticola* (Rehn & Hebard): **mean** (range) [mm], from 10 eggs (in coll. ASPER-PL).

Capsule total length (incl. operculum)	Capsule length	Capsule height	Capsule width	Operculum small diameter	Operculum large diameter	Micropylar plate length	Micropylar plate width
2.30 (2.25-2.39)	**2.03** (1.94-2.11)	**1.61** (1.54-1.68)	**1.28** (1.25-1.32)	**0.84** (0.81-0.86)	**1.04** (1.00-1.10)	**1.00** (0.94-1.06)	**0.50** (0.48-0.52)

parthenogenetic culture. The incubation time was about 120 days at 20°C, for a hatching rate of 33%. The females of the first generation became adults in 125 days at 18-20°C, fed mainly on *Eucalyptus sp*. (Myrtaceae) and with access to *Hypericum spp*. (Hypericaceae). The female starts laying eggs about 9-10 days after her last moult.

Fig. 31-36. – *Jamanistria monticola* (Rehn & Hebard), ♂ holotype. – **31**, Habitus. – **32**, Head dorsal view. – **33-35**, Abdominal extremity. – **33**, Dorsal view. – **34**, Lateral view. – **35**, Ventral view. – **36**, Close-up on the vomer. *(Pictures: O. Conle and F. Hennemann).*

Jamanistria simplicitarsis (Gray, 1835), **n. comb.**

Bacteria simplicitarsis Gray, 1935: 43. Holotype: ♀, locality unknown, BMNH #844529 [NHMUK]. Westwood, 1859: 21. Kirby, 1904: 355. Redtenbacher, 1908: 417.

Clonistria simplicitarsis (Gray); Rehn & Hebard, 1938: 48. Moxey, 1972: 80 [unpublished]. Otte & Brock, 2005: 108. Brock *et al*., 2016: 195.

Material examined (14 ♀, 15 ♂, 69 eggs). – 2 ♀ JAM18-083 and -84, Irish Town, Blue Mountains, Jamaica, 13.XI.2018 [ASPER-PL]; 1 ♀ JAM18-081 (BOLD n°WG1PHAJA20-013), 1 ♂ JAM18-082 (BOLD n°WG1PHAJA20-014), Irish Town, Blue Mountains, Jamaica, 13.XI.2018 [MNHN]; 1 ♀ JAM18-080, Irish Town, Blue Mountains, Jamaica, 13.XI.2018 [ASPER-YB]; 1 ♀ JAM18-063 (BOLD n°WG1PHAJA20-015), Road between Section and Silver Hills, Blue Mountains, Jamaica, 12.XI.2018 [ASPER-TJ]; 1 ♂ Jack Hills, St-Andrew Parish, Jamaica, 26.VII.1951, *rec. J.V. Neisl*, det. ASPER [NHMJ]; 1 ♂, Jamaica, W.I., St. Andrew, Stony Hill, 2.VII.1962, Kent Eldemire, det. ASPER [NHMJ]; 1 ♂ Old Stony Hill Road, St-Andrew Parish, Jamaica, 12.VIII.1959, *rec. Walter Hamilton*, det. ASPER [NHMJ]; 1 ♂ Jamaica W.I., St Catherine, Sligoville, 21.V.1983, *rec. R. King*; det. ASPER [NHMJ]; 1 ♀, Jamaica B.W.I., St. Andrew, Stony Hill, 5.XI.1959, det. ASPER *(authors note: right midleg missing)* [NHMJ]; 2 ♀ JAM18-186 and -187, ♂ JAM18-185, Jamaica, Irish Town, 6.VIII.2019, elev. F1 Y. Bellanger [ASPER-YB]; 2 ♂, JAM18-168 and -172, Jamaica, Irish Town, VII.2019, elev. F1 Y. Bellanger [ASPER-YB]; 1 ♂ JAM18-193, Jamaica, Irish Town, 12.VIII.2019, elev. F1 Y. Bellanger [ASPER-YB]; 1 ♀ JAM18-209 and ♂ JAM18-208, Jamaica, Irish Town, VIII.2019, elev. F1 Y. Bellanger [ASPER-TJ]; ♂ JAM18-238, Jamaica, Irish Town, 15.XII.2019, elev. F1 Y. Bellanger [ASPER-YB]; 1 ♀ JAM18-248, Jamaica, Irish Town, 24.I.2020, elev. F1 Y. Bellanger [ASPER-YB]; 1 ♀ JAM18-292 and ♂ JAM18-291, Jamaica, Irish Town, 7.VIII.2020, elev. F2 Y. Bellanger [ASPER-YB]; 1 ♂ JAM18-321 (BOLD n°WG1PHAJA20-017) and 1 ♀ JAM18-322 (BOLD n°WG1PHAJA20-016), Jamaica, Irish Town, 30.X.2020, elev. F2 Y. Bellanger [ASPER-YB]; 1 ♂, Jamaica, Irish Town, 30.X.2020, elev. F2 Y. Bellanger [ASPER-YB]; 1 ♀ JAM18-178 and 1 ♂ JAM18-177, Jamaica, Irish Town, VIII.2019, elev. F1 Y. Bellanger [ASPER-PL]; 1 ♂, Jamaica, Irish Town, 19.VII.2021, elev. F3 Y. Bellanger [ASPER-YB]; 2 ♀, Jamaica, Irish Town, 6.VIII.2021 and 8.VIII.2021, elev. F3 Y. Bellanger [ASPER-YB]; 10 eggs, 7-13.XI.2018, from JAM18-080, -081, 83, and -084 [ASPER-YB]; 8 eggs, 12.XI.2018, from ♀ JAM18-063 [ASPER-YB]; 1 egg, 7-13.XI.2018, from JAM18-080, -081, 83, and -084 [ASPER-PL]; 10 eggs, VIII.2019, elev. F1 Y. Bellanger [ASPER-YB]; 10 eggs, VIII.2019, elev. F1 Y. Bellanger [ASPER-PL]; 10 eggs, VIII.2019, elev. F1 Y. Bellanger [ASPER-TJ]; 20 eggs, IX.2022, elev. Y. Bellanger [MNHN].

Notes. – This species was described very briefly by Gray (1835: 43) as *Bacteria simplicitarsis* from a female of unknown origin and deposited in NHMUK. Westwood (1859: 21) documented a slightly more detailed description, briefly taken over by Redtenbacher (1908: 417). In their paper on Mantidae and Phasmidae from West Indies, Rehn & Hebard, (1938: 48) transferred the species in the genus *Clonistria*, while describing the male for the first time and adding details about the female, from an adult pair and a female nymph found in the Blue Mountains, and deposited in ANSP. Moxey (1972: 80), in his unpublished thesis, erroneously suggested to synonymize *Clonistria annulipes* and *Clonistria monticola* with *Clonistria simplicitarsis*. It is here removed from *Clonistria* and placed in the new genus *Jamanistria*: *J. simplicitarsis* (Gray, 1835), **n. comb.**

Redescription of the female. – Fig. 37-46, table V. Large body size for the genus (body length including subgenital plate ranging 149.2-169.0 mm). General colour light brown to brown; legs generally of the same colour as the body but sometimes lighter and indistinctly annulated; head often slightly lighter than body; scapus and pedicellus of the same colour as the body, remaining antennomeres indistinctly annulated.

Head 1.1-1.4× longer than pronotum and very slightly wider to eye level (fig. 40). Vertex flat. Antennae exceeding the apex of anterior legs, or reaching from posterior of tergite II to anterior of tergite IV; scapus flattened dorsally and more than 2.0× longer than pedicellus.

Thorax. Pronotum longer than wide, slightly narrower than head and with a distinct medio-transverse furrow, and a medio-longitudinal furrow fading on the anterior and the posterior extremities.

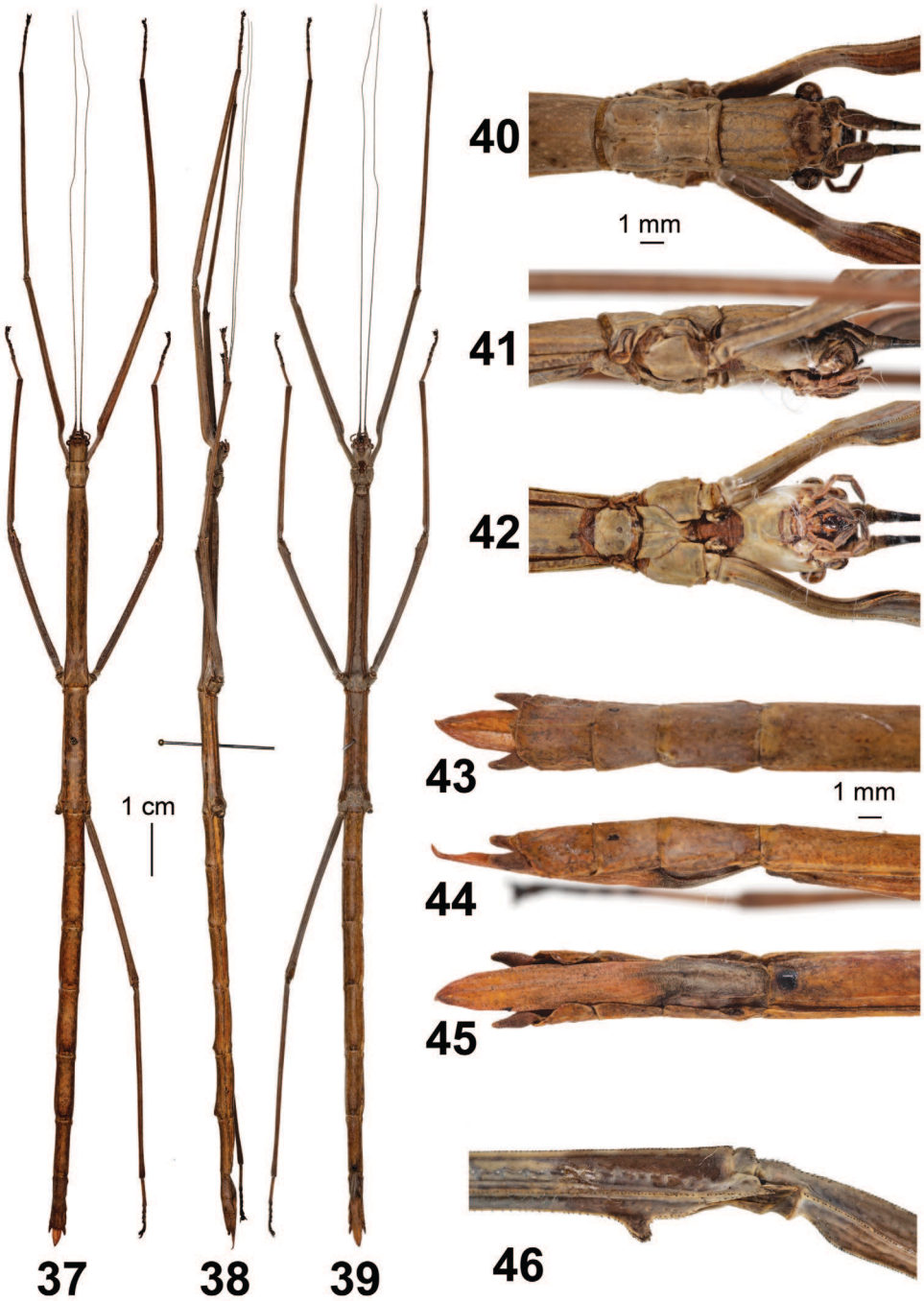

Fig. 37-46. – *Jamanistria simplicitarsis* (Gray), ♀ JAM18-084. – **37-39**, Habitus (scale bar: 1 cm). – **40-42**, Head (scale bar: 1 mm). – **43-45**, Abdominal extremity (scale bar: 1 mm). – **46**, Close-up on the median femur extremity. – **37, 40, 43**, Dorsal view. – **38, 41, 44**, Lateral view. – **39, 42, 45**, Ventral view.

Table V. – Measurements of adult females and males of *Jamanistria simplicitarsis* (Gray) [mm].

	♀, HT [NHMUK]*	♀ **mean** (range) ** from 9 specimens	♂ **mean** (range) ** from 8 specimens
Body:	165.0	**154.6** (147.30-160.00)	**100.8** (92.00-105.43)
Body (including subgenital plate):	169.0	**157.8** (149.20-164.80)	/
Antennae:	-	**86.4** (69.20-101.10)	**86.5** (68.40-94.90)
Head:	6.0	**5.7** (5.10-7.00)	**3.0** (2.70-3.30)
Pronotum:	5.5	**4.7** (4.30-5.00)	**2.7** (2.50-3.00)
Mesonotum:	42.0	**38.3** (37.00-39.80)	**27.6** (25.00-28.92)
Metanotum (including median segment):	26.5	**23.9** (22.50-25.40)	**18.5** (17.10-19.20)
Median segment:	-	**10.5** (9.10-11.15)	**8.9** (8.50-9.30)
Profemora:	38.0	**34.6** (28.10-36.90)	**30.8** (26.30-33.10)
Mesofemora:	33.0	**27.5** (23.60-29.90)	**24.9** (20.80-27.80)
Metafemora:	29.5	**31.6** (28.40-34.00)	**29.0** (24.10-30.80)
Protibiae:	-	**39.4** (30.80-42.50)	**35.8** (30.50-39.10)
Mesotibiae:	37.0	**27.8** (22.60-29.90)	**25.5** (21.40-28.20)
Metatibiae:	30.0	**33.9** (29.90-37.90)	**32.4** (26.90-36.30)

* measurements made by Judith Marshall (NHMUK).
** including all specimens from the ASPER and MNHN collections.

Mesonotum smooth, roughly parallel-side, slightly narrower close to the junction with pronotum and wider close to the junction with metanotum, 7.3-8.6× longer than pronotum and 1.5-1.6× longer than metanotum and median segment combined. Metanotum distinctly longer than median segment (about 1.1-1.5× longer). Profemur shorter than protibia, mesofemur about as long as mesotibia, metafemur very slightly shorter than metatibiae and sometimes of same length; anterior extremity of medio-ventral carina of meso- and metafemora armed with two small lobes, denticulate on anterior side (fig. 46); apex of antero- and postero-ventral carinae of femora with a sharp spine, except on antero-ventral carina of profemora. Probasitarsus slightly longer or as long as the remaining tarsomeres combined; meso- and metabasitarsi slightly shorter than the remaining tarsomeres combined.

Abdomen. Median segment and tergites III-IV roughly of same length, slightly longer than tergites II and VII, distinctly shorter than tergite V which is the longest tergite, and slightly shorter than tergite VI; tergite VII slightly shorter or as long as the three last tergites combined; tergite X shorter than VIII and very slightly longer than IX which is the shortest; posterior part of tergite VI more or less inflated dorsally forming a small hump; posterior angles of tergites X truncated. Praeopercular organ only consisting in a black spot at the posterior apex of sternite VII, surmounted by a small hump (fig. 44-45). Subgenital plate elongated, lanceolate and exceeding the apex of abdomen for ≥ 2 mm, which represents more than 0.5× the length of tergite X; apex acutely pointed with the tip curved dorsally (fig. 44). Cerci wide, conical and distinctly exceeding the apex of tergite X, well visible from above and projecting exteriorly at about 45°. Epiproct visible, rounded and slightly projecting over anal segment.

Description of the male. – Fig. 47-56, table V. Large size for the genus (body length 92.0-105.43 mm). General colour of body and legs brown to dark brown. Anterior extremity of all femora slightly darker, legs sometimes dark brown. Dorsal surface of scapus, pedicellus and first antennomeres often dark brown, sometimes of the same colour as the body.

Head 1.0-1.2× longer than pronotum; its anterior half slightly wider than pronotum. Vertex almost flat, very slightly bulging posteriorly. Antennae widely exceeding the anterior legs apex (fig. 47); scapus flattened dorsally, almost rectangular; pedicellus almost cylindrical and about half the length of scapus.

Thorax including median segment longer than abdomen. Pronotum almost rectangular, median sulcus very distinct and roughly central, and a medio-longitudinal sulcus fading toward posterior. Mesonotum wider in its posterior part close to the junction with metanotum and slightly wider in its anterior extremity close to the junction with pronotum; 9.2-11.3× longer than pronotum; 1.4-1.5× longer

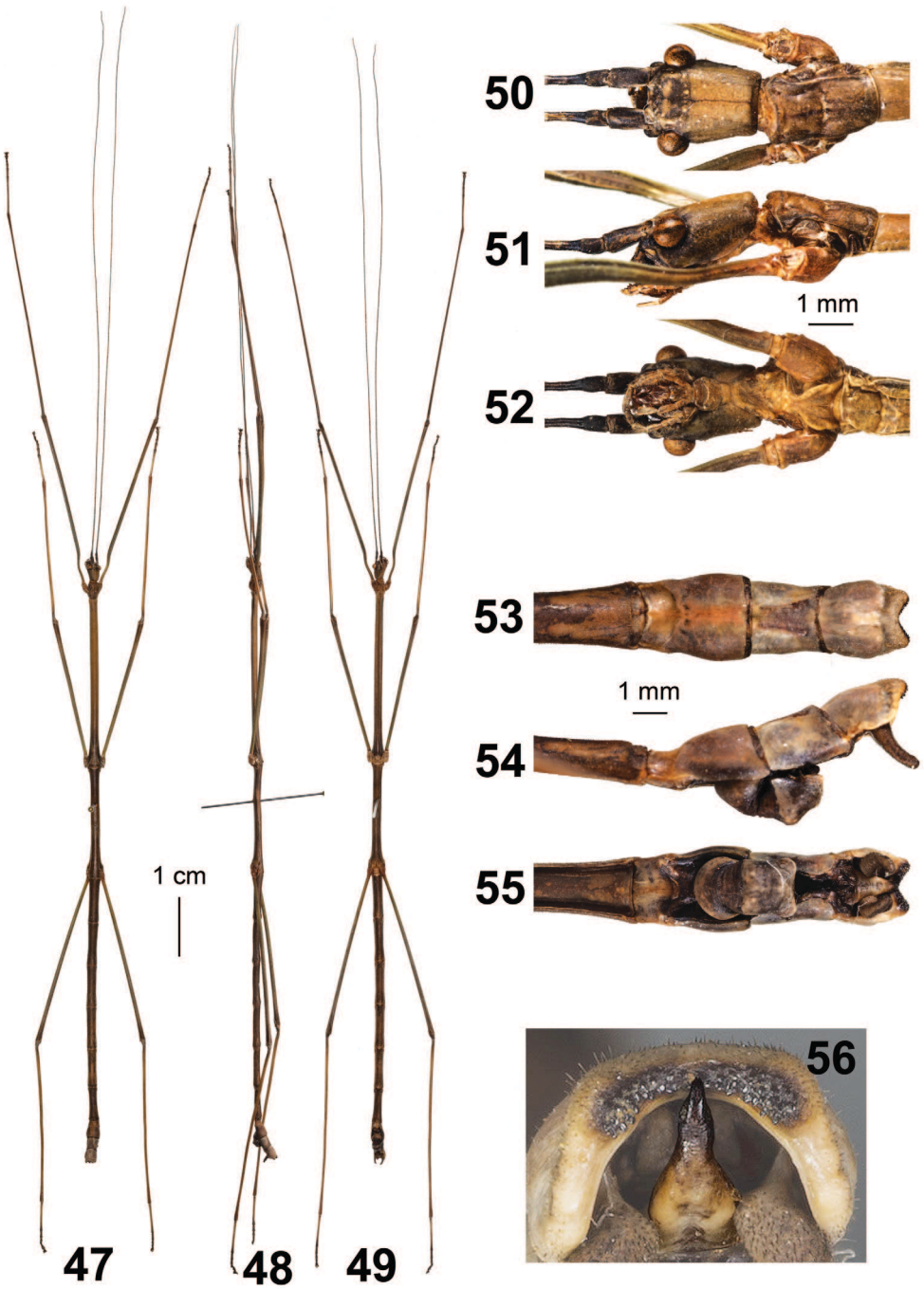

Fig. 47-56. – *Jamanistria simplicitarsis* (Gray), ♂ JAM18-177. – **47-49**, Habitus (scale bar: 1 cm). – **50-52**, Head (scale bar: 1 mm). – **53-55**, Abdominal extremity (scale bar: 1 mm). – **56**, Close-up on the vomer. – **47, 50, 53**, Dorsal view. – **48, 51, 54**, Lateral view. – **49, 52, 55**, Ventral view.

than metanotum and median segment combined. Metanotum as long as or very slightly longer than median segment (1.0-1.1× longer). Pro- and metafemora 0.8-0.9× the length of their associated tibiae; mesofemur as long as or very slightly shorter than mesotibia; antero- and posteroventral carinae of meso- and metafemora with a sharp spine at their apex, only in posteroventral carina for profemora; pro- and metabasitarsus about 2.0× longer than the remaining associated tarsomeres combined; mesobasitarsus about 1.5× longer than the remaining tarsomeres combined.

Abdomen slightly widened at the junction of each tergite. Median segment the longest abdominal segment; tergites II and V roughly of same length, slightly shorter than median segment and slightly longer than tergites III and IV which are of similar length; tergites VI to IX shorter and decreasing in length; tergite X slightly longer than IX and shorter than VIII; tergite VIII the widest and slightly wider posteriorly; tergites IX and X slightly longer than wide (fig. 53); apex of tergite X roundly notched with short hairs. Vomer distinct and simple at its apex (fig. 56), reaching the apex of last tergite. Cerci elongated, wider anteriorly, curved inward and directed downward.

Description of post-hatch nymph morphology. – Fig. 57. Body length about 15mm, greenish dorsally and ventraly, excepted tergite X brown dorsaly; head with a brown stripe posteriorly to the eye and as wide as the eye, extending over lateral of prothorax. Antennae creamish annulated in brown, slightly exceeding the apex of anterior legs. Meso- and metafemora and meso- and metatibiae green; basal third of profemora green, distal two-third marbled in brown; protibiae brown; tarsi light brown excepted basitarsi creamish. Cerci wide, conical, dark brown, well visible from above and projecting laterally at an angle of about 45°.

Description of the egg. – Capsule brown to dark brown, ovoid and large for the genus (fig. 83, table VI), 1.4-1.5× as long as high and 1.8-2.0× as long as wide; dorsal surface slightly more convex than ventral surface, polar area rounded; surface smooth and shiny. Micropylar plate elongated, slightly widening from the anterior to the posterior, 0.6-0.7× the length of the capsule; inner part of the same colour as the capsule, outer margin as wide as inner part and light brown to grey; posterior side deeply invaginated, micropylar cup distinct and median line of the same colour as outer margin. Operculum large diameter 1.0-1.2× as long as small diameter; suboval to circular, rimmed with a brown, smooth, thick and elevated ring; central part orange to brown, only slightly exceeding the ring described above, with a flattened or slightly rounded summit, surrounded by an irregular and scalloped structure.

Diagnosis. – The closest currently known species is *J. annulipes* (Rehn & Hebard, 1938) from which the female differs in the longer subgenital plate (fig. 97-c), which exceeds the apex of abdomen over more than 2 mm (less than 2 mm in *J. annulipes,* fig. 97-a), the longer

Fig. 57. – *Jamanistria simplicitarsis* (Gray), post-hatch nymph in culture.

Table VI. – Measurements of the eggs of *Jamanistria simplicitarsis* (Gray): **mean** (range) [mm], from 10 eggs (in coll. ASPER-PL).

Capsule total length (incl. operculum)	Capsule length	Capsule height	Capsule width	Operculum small diameter	Operculum large diameter	Micropylar plate length	Micropylar plate width
3.15 (3.08-3.23)	**2.75** (2.68-2.84)	**1.83** (1.78-1.88)	**1.49** (1.42-1.56)	**0.99** (0.90-1.06)	**1.09** (1.05-1.15)	**1.86** (1.74-2.01)	**0.73** (0.66-0.80)

cerci and longer antennae which exceed the apex of anterior legs (antennae at best reach the apex of anterior legs in *J. annulipes*); the male differs in having a simple apex of vomer (fig. 95-c) (bifid in *J. annulipes,* fig. 95-a) and in having two blunt spines (fig. 91-c) at the apex of the medio-ventral carina of mesofemora (two small lobes with 3-4 sharp spines in *J. annulipes*, fig. 91-a). Both sexes differ from *J. monticola* (Rehn & Hebard, 1938) and *J. xerophila* n.sp. in being much longer and having a longer metanotum than median segment (fig. 94-c). The egg shares the smooth capsule with those from *J. annulipes*, which differentiates them from the two other species in which the capsule is either rugose (*J. xerophila*) or covered with ridges (*J. monticola*). It is longer and more elongated than the egg of *J. annulipes*, and also shows a much more elevated operculum.

Ecology. – *Jamanistria simplicitarsis* seems to be widely distributed in the mesophilic forests of the Blue Mountains area (fig. 87) but also in the lower areas of Jamaica (centre and north of the island). The authors found specimens of this species only in the Blue Mountains, in Irish Town and on the road from Section to Silver Hills. Incubation time at 20°C was 180-190 days. The males of the first generation became adult in about 80 days and the females in about 95 days. The female starts laying eggs 11 days after her last moult; a female can lay up to 9 eggs every 24 h. Culture was possible mainly with *Eucalyptus sp.* (Myrtaceae) and *Hypericum spp.* (Hypericaceae), but *Rosa sp.* (Rosaceae) was also accepted. *In natura*, specimens were feeding on *Psidium guajava* L., 1753 (Myrtaceae) and an additional unidentified bush.

***Jamanistria xerophila* n. sp.**

https://zoobank.org/NomenclaturalActs/7B5AFBFC-05E9-4991-B6B5-1F7269A9A51C

Holotype: ♀, NHMJ18-10, Jamaica, Bull Bay, Eleven Miles, 19.XI.2018, rec. & det. ASPER (*Bellanger, Jourdan, Lelong*) [NHMJ].

Paratypes (4 ♂, 2 ♀, 1 egg): 2 ♂, NHMJ18-11 & -12, Jamaica, Bull Bay, Eleven Miles, 19.XI.2018, rec. & det. ASPER (*Bellanger, Jourdan, Lelong*) [NHMJ]; 2 ♀ JAM18-138 and -133, 2 ♂ JAM18-141 and -128 Jamaica, Bull Bay, Eleven Miles, N17°56'0.85'', W076°37'48.05'', 19-20.XI.2018 [MNHN]; 1 egg, Jamaica, Bull Bay, Eleven Miles, 19-20.XI.2018, rec. & det. ASPER (*Bellanger, Jourdan, Lelong*) [MNHN].

Other material examined (8 ♀, 10 ♂, 4 eggs). – 2 ♀ JAM18-131, and -132, 2 ♂ JAM18-129 and -130 [ASPER-PL], 3 ♀ JAM18-134, -135 (BOLD n°WG1PHAJA20-027), and -139 (BOLD n°WG1PHAJA20-030), 3 ♂ JAM18-136 (BOLD n°WG1PHAJA20-028), -137 (BOLD n°WG1PHAJA20-029) and -140 [ASPER-YB], 2 ♀ JAM18-142 and -143, 2 ♂ JAM18-144 and -145 [ASPER-TJ], Jamaica, Bull Bay, Eleven Miles, N17°56'0.85'', W076°37'48.05'', 19-20.XI.2018; 1 ♂, Jamaica, St. Andrew, Half Way Tree, II.1956, *A. Churchill*, det. ASPER [NHMJ]; 1 ♂, Jamaica B.W.I., St. Andrew, Long Mountain, 28.IV1957, *R. P. Bengry*, det. ASPER [NHMJ]; 1 ♂, Mountain View, St-Andrew Parish, Jamaica, XI.1957, *rec. R. B. Penso*, det. ASPER [NHMJ]; 1 ♀, Jamaica B.W.I., St. Andrew, Half Way Tree, 15.VII.1956, *rec. R.P. Bengry*, det. ASPER [NHMJ]; 2 eggs, Jamaica, Bull Bay, Eleven Miles, 19-20.XI.2018 [ASPER-YB]; 2 eggs, Jamaica, Bull Bay, Eleven Miles, 19-20.XI.2018 [ASPER-PL].

Description of the female. – Fig. 58-67, fig. 79-80, table VII. Medium size for the genus (body length without the subgenital plate ranging 103.7-138.3 mm). General colour of body variable: uniformly fade green (fig. 79) to brown (fig. 80), brown marbled with greyish or light brown marbled with dark brown. Legs of the same colour as the body and annulated.

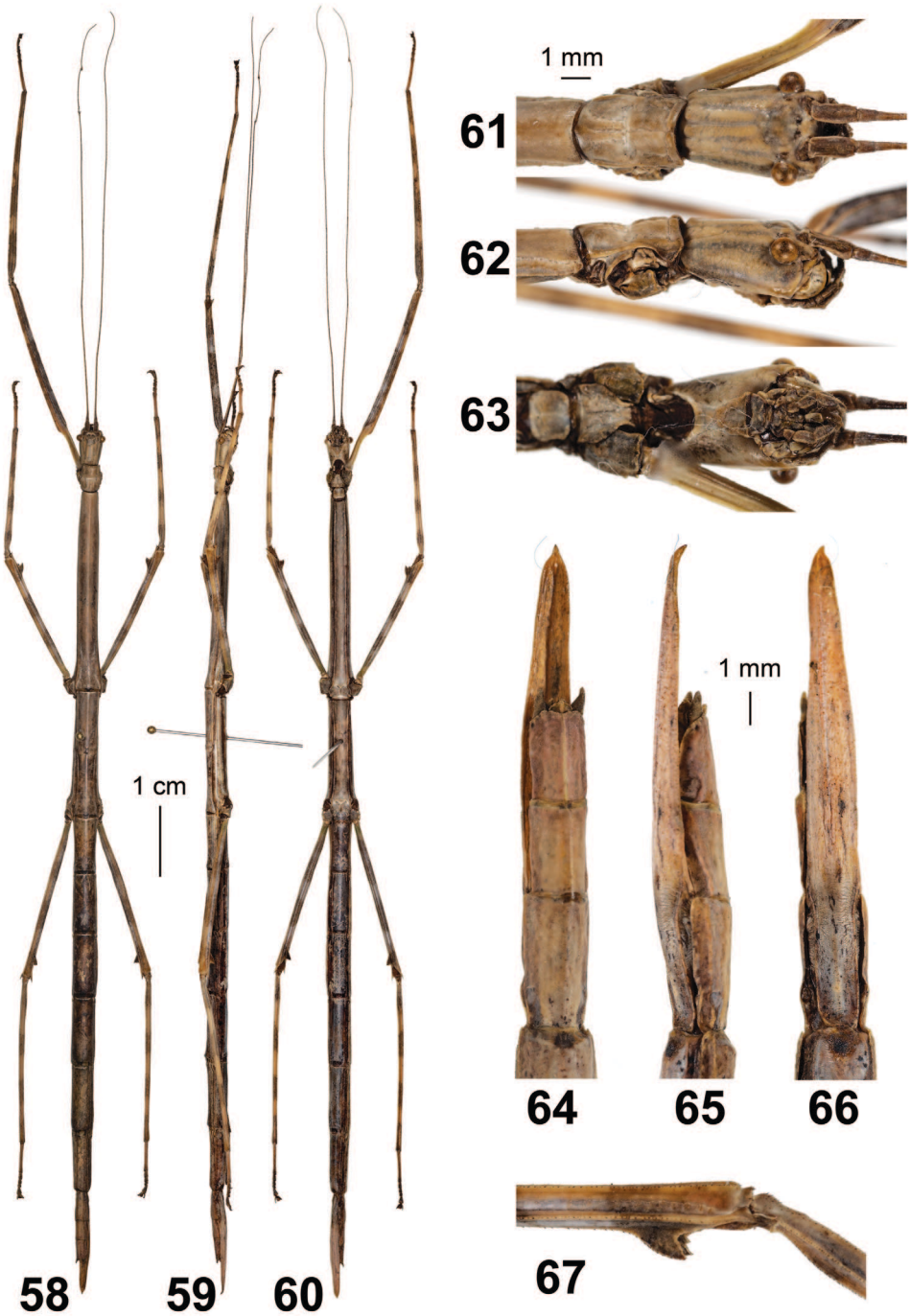

Fig. 58-67. – *Jamanistria xerophila* n. sp., ♀ JAM18-132. – **58-60**, Habitus (scale bar: 1 cm). – **61-63**, Head (scale bar: 1 mm). – **64-66**, Abdominal extremity (scale bar: 1 mm). – **67**, Close-up on the median femur extremity. – **58, 60, 64**, Dorsal view. – **59, 62, 65**, Lateral view. – **60, 63, 66**, Ventral view.

Head 1.4-1.5× longer than pronotum (fig. 61-62); its anterior half much wider than pronotum width. Vertex almost flat, with two small bumps posteriorly, sometimes hidden by the pronotum anterior edge. Antennae just slightly exceeding the anterior legs apex, or reaching from the middle of tergite II to the middle of tergite III; scapus flattened dorsally, almost rectangular; pedicellus almost cylindrical and less than half the length of scapus.

Thorax including median segment almost 0.8× the length of the abdomen without the subgenital plate. Pronotum almost rectangular, 1.2-1.3× longer than wide, median sulcus very distinct. Mesonotum gently narrowing toward the anterior, 1.47-1.62× longer than metanotum and median segment combined. Metanotum about 0.9× the length of median segment. Pro- and mesofemora roughly of same length than their associated tibiae; metafemora very slightly shorter than metatibiae; apex of antero- and postero-ventral carinae of femora with a sharp spine, except on antero-ventral carina of profemora; anterior extremity of medio-ventral carina of meso- and metafemora armed with two more or less dentate and scale-shaped lobes (fig. 67).

Abdomen. Median segment longer than tergite II; tergites III, IV and VII about of same length and slightly longer than II; tergites V and VI the longest and roughly of the same length; tergites IX and X the shortest, about of same length, and slightly shorter than VIII. Posterior of tergite VI sometimes gently bulged; apex of tergite X gently notched medially; epiproct distinctly visible. Gonapophysis flattened and broad, generally exceeding the apex of tergite X from above then their rounded extremity being visible. Cerci roughly triangular and hairy, with the apex very slightly curved inward, projecting exteriorly at about 45°. Subgenital plate elongated with an acute apex, exceeding the abdominal extremity for more than the length of tergite X (fig. 64-66); ventrally with a medio-longitudinal carina in its posterior 2/3. Praeopercular organ reduced to a blackish spot on the posterior extremity of sternite VII.

Description of the male. – Fig. 68-78, table VII. Medium size for the genus (body length 71.2-81.0 mm). General colour of body brown to dark brown; last three tergites light brown to greyish. Legs of the same colour as the body and slightly annulated. Scapus, pedicellus and remaining antennomeres roughly of the same colour as the body.

Head 1.1-1.5× longer than pronotum; its anterior half much wider than pronotum width. Vertex almost flat, with two small bumps posteriorly, sometimes hidden by the pronotum anterior edge. Antennae distinctly exceeding the anterior legs apex (fig. 68), reaching from the middle to the posterior edge of tergite VII; scapus flattened dorsally, almost rectangular; pedicellus almost cylindrical and about half the length of scapus.

Thorax including median segment around 0.9× the length of the abdomen. Pronotum almost rectangular, 1.4-1.5× longer than wide, median sulcus very distinct. Mesonotum wider only in its posterior part close to the junction with metanotum, 1.5-1.7× longer than metanotum and median segment

Table VII. – Measurements of adult females and males of *Jamanistria xerophila* n. sp. [mm].

	♀, HT [NHMJ]	♀ **mean** (range) * from 9 specimens	♂ **mean** (range) * from 11 specimens
Body	121.1	**118.75** (103.7-138.3)	**76.30** (71.2-81.0)
Body (including subgenital plate)	125.2	/	/
Antennae	70.0	**64.06** (60.2-69.5)	**69.45** (63.5-74.6)
Head	5.0	**5.5** (4.4-6.2)	**2.90** (2.3-3.3)
Pronotum	3.8	**3.74** (3.2-4.4)	**2.06** (1.8-2.2)
Mesonotum	28.4	**27.61** (23.3-33.2)	**20.17** (17.7-22.2)
Metanotum	8.4	**8.39** (6.7-9.9)	**5.17** (4.2-6.0)
Median segment	9.2	**9.25** (7.5-10.6)	**7.53** (6.2-8.4)
Profemora	28.9	**28.05** (25.1-31.2)	**26.72** (25.4-28.3)
Mesofemora	21.0	**19.83** (18.4-21.4)	**19.97** (18.3-21.3)
Metafemora	24.4	**23.32** (21.6-25.7)	**23.93** (22.5-25.5)
Protibiae	30.8	**30.13** (28.0-33.7)	**31.21** (29.1-33.9)
Mesotibiae	22.5	**20.78** (19.8-23.0)	**23.11** (20.9-25.4)
Metatibiae	26.0	**26.10** (24.1-28.6)	**29.05** (27.6-32.4)

* including all paratypes and specimens from the ASPER collection.

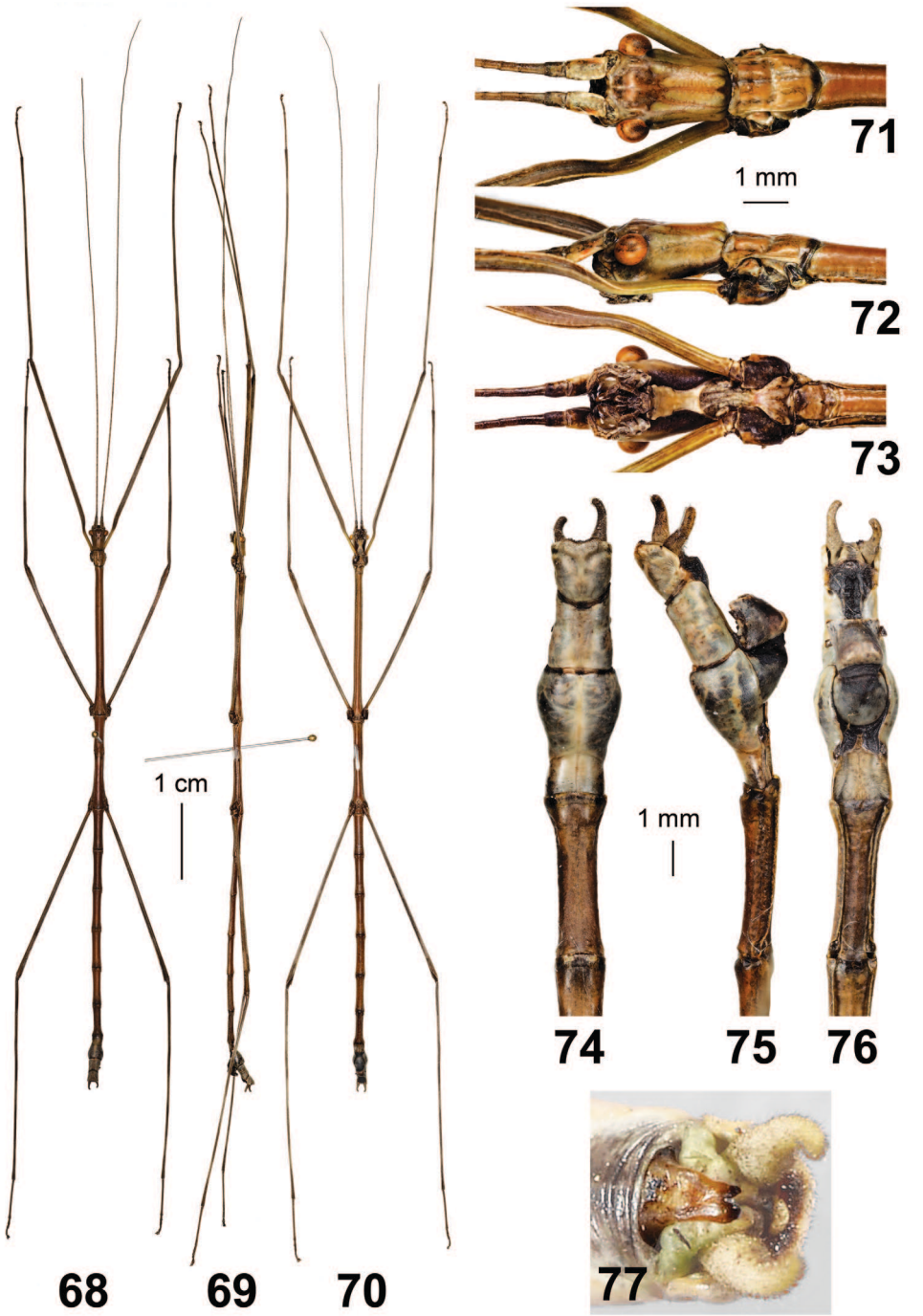

Fig. 68-77. – *Jamanistria xerophila* n. sp., ♂. – **68-70**, Habitus (scale bar: 1 cm). – **71-73**, Head (scale bar: 1 mm). – **74-76**, Abdominal extremity (scale bar: 1 mm). – **77**, Close-up on the vomer. – **68, 71, 74**, Dorsal view. – **69, 72, 75**, Lateral view. – **70, 73, 76**, Ventral view.

combined. Metanotum 0.5-0.8× the length of median segment. Pro- and metafemora distinctly shorter than their corresponding tibiae; mesofemora longer than mesotibiae; antero- and posteroventral carinae of meso- and metafemora with a sharp spine at their apex, only in posteroventral carina for profemora; pro- and metabasitarsus about 2.0× longer than the remaining associated tarsomeres combined; mesobasitarsus about 1.5× longer than the remaining tarsomeres combined.

Fig. 76-78. – *Jamanistria xerophila* n. sp. *in vivo*, not to scale. – **78**, Male. – **79-80**, Females: **79**, green colouration; **80**, brown colouration.

Abdomen slightly widened at the junction of each tergite. Median segment distinctly the longest abdominal segment; tergites decreasing in length toward posterior, excepted III and IV of similar length; tergite VIII bulgy, 2.0× wider posteriorly than anteriorly; tergite IX narrowing towards the posterior; tergite X about as long as wide, apex gently and roundly notched with short hairs. Poculum and sternite VIII fused. Vomer distinct and bifid at its apex (two blunt spines, the dextral one being slightly larger, fig. 77), reaching the apex of last tergite. Cerci extremity incurved inward.

Description of the egg. – Small and ovoid (fig. 84, table VIII), 1.4-1.5× as long as high and 1.9-2.0× as long as wide. Dorsal surface very slightly more convex than ventral surface, polar area rounded. Capsule brown, slightly shiny and very slightly rugose. Micropylar plate almost parallel-sided, elongated, slightly wider posteriorly, about 0.7× as long as capsule and 3.0-3.5× longer than wide; outer margin creamish and as broad as interior portion which is brown to dark brown; micropylar cup small; median line well distinct and elongated, of the same colour as outer margin. Operculum large diameter 1.25-1.3× as long as small diameter; entirely creamish; rimmed with a wide bright smooth ring, thick and gradually elevating toward its centre; central part elevated forming a rounded ring with an invaginated depression in its centre, and surrounded by a crown of petal like structures.

Etymology. – The name refers to the xerophilic biotope where the species was collected.

Diagnosis. – The female differs from the similar *J. monticola* in the longer subgenital plate (fig. 97-d), which exceeds the apex of abdomen over more than 1.2× the length of tergite X

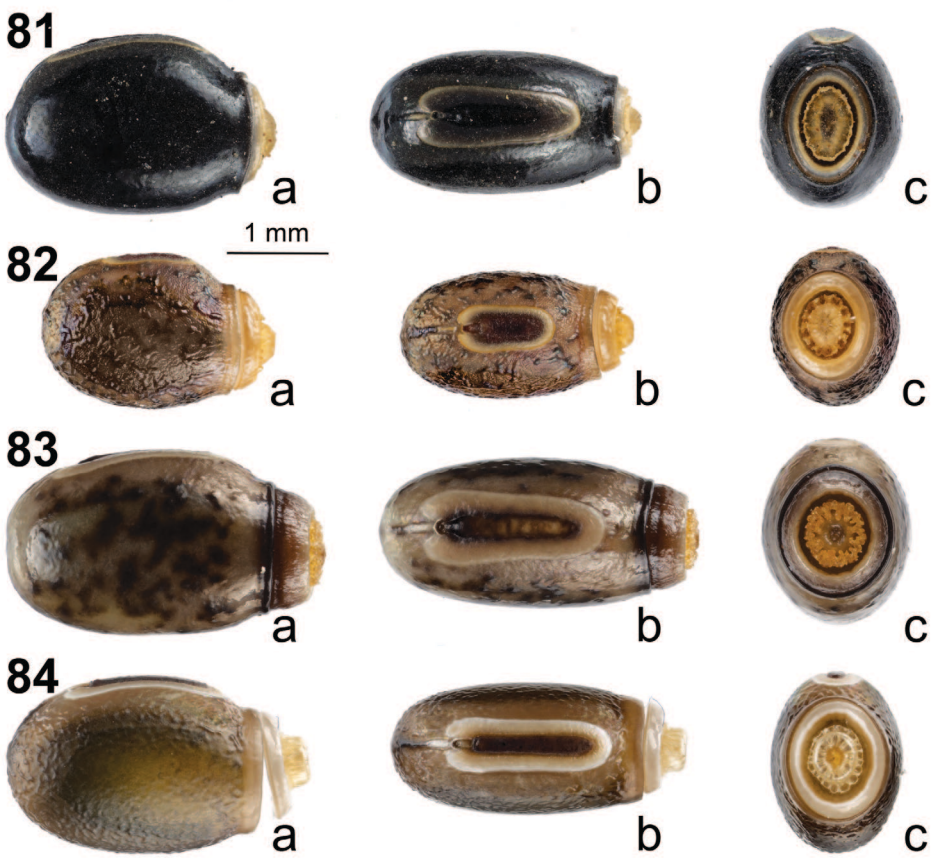

Fig. 81-84. – *Jamanistria spp*., eggs (scale bar: 1 mm). – **81**, *J. annulipes* (Rehn & Hebard). – **82**, *J. monticola* (Rehn & Hebard). – **83**, *J. simplicitarsis* (Gray). – **84**, *J. xerophila* n. sp. – **a**, Lateral view. – **b**, Dorsal view. – **c**, Apical view of operculum.

Table VIII. – Measurements of the egg of *Jamanistria xerophila* n. sp.: **mean** (range) [mm], from 5 eggs (in coll. ASPER-YB, coll.ASPER-PL and MNHN).

Capsule total length (incl. operculum)	Capsule length	Capsule height	Capsule width	Operculum small diameter	Operculum large diameter	Micropylar plate length	Micropylar plate width
2.72 (2.64-2.80)	**2.50** (2.42-2.60)	**1.71** (1.68-1.75)	**1.25** (1.21-1.30)	**0.97** (0.95-1.00)	**1.20** (1.08-1.30)	**1.70** (1.63-1.75)	**0.53** (0.50-0.57)

(less than 0.6× in *J. monticola,* fig. 97-b), in the tergite IX roughly of same length as X (longer than X in *J. monticola*) and in the longer head (fig. 61-63, fig. 96-d) which is 1.4-1.5× longer than pronotum (1.0-1.2× longer in *J. monticola,* fig. 25-27, fig. 96-b); the male differs in having a longer head (fig. 71-73, fig. 92-d) which is 1.4-1.5× longer than pronotum (1.× longer in *J. monticola,* fig. 92-b), in the fused poculum and sternite VIII (not fused in *J. monticola*) and in the tergite IX longer than X (tergite IX and X roughly of same length in *J. monticola*) (fig. 93-b, -d).

Both sexes differ from *J. annulipes* and *J. simplicitarsis* in their smaller size; furthermore, the female differs in the less elongated mesonotum (fig. 96-d) which is less than 8.0× longer than pronotum (more than 8.0× longer in *J. annulipes* and *J. simplicitarsis,* fig. 96-a -c); the male differs in the median segment distinctly longer than metanotum (slightly shorter or of same length in *J. annulipes* and *J. simplicitarsis*) (fig. 94-a, -c, -d).

The egg is differentiated from those of the other species in its rugose capsule, which is smooth in *J. simplicitarsis* and *J. annulipes*, and covered with ridges in *J. monticola*. Another differentiating feature is the almost parallel-sided micropylar plate, which is also more elongated, being 3.0-3.5× longer than wide while it's never more than 2.8× in the three other species.

Ecology. – All the specimens were collected in the dry forest from South-East coast of Jamaica, in the hills of Eleven Miles (fig. 90). They were all found in bushes along the trails and it was the only species of Phasmatodea observed in that locality, but they were locally abundant. Incubation time was about 130 days at 20°C for a hatching rate nearly 74%. Unfortunately, the nymphs did not accept as feed any of the substitute food plants which were offered to them: *Rosa sp.* (Rosaceae), *Prunus sp.* (Rosaceae), *Hypericum spp.* (Hypericaceae), *Eucalyptus sp.* (Myrtaceae), *Symphoricarpos albus* (L.) S.F. Blake, 1914 (Caprifoliaceae), *Ligustrum vulgare* L., 1753 (Oleaceae) and *Lonicera sp.* (Caprifoliaceae).

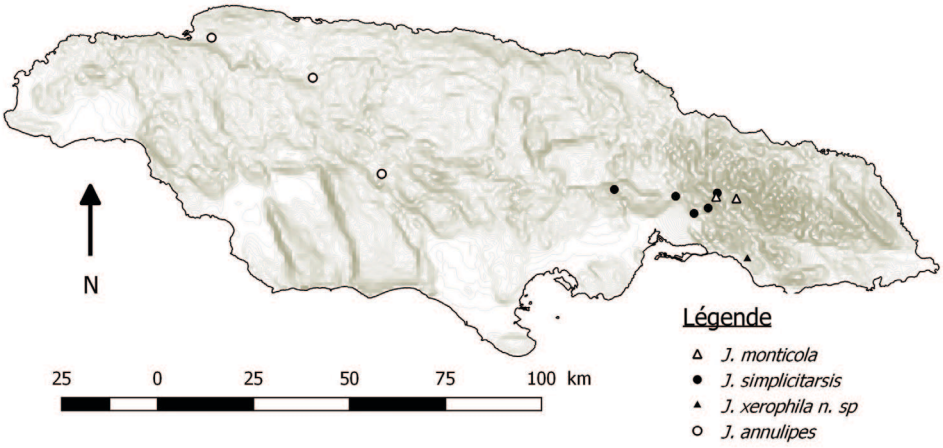

Fig. 85. – *Jamanistria spp*., distribution map.

GENETIC ANALYSIS

Thirteen specimens from three species have been successfully sequenced for COI gene (table IX): *J. annulipes* (5), *J. monticola* (4) and *J. simplicitarsis* (4). The neighbour joining tree (fig. 86) shows the distances between the sequenced specimens of these species with an outgroup sequence of *Diapherodes jamaicensis* Gray, 1835. Unfortunately, one DNA sample of *J. simplicitarsis* and all four DNA samples of *J. xerophila* failed to be amplified.

Interspecific distances within *Jamanistria* species are ranging between 9.8 and 14.5% and thus appear to be high (table X). Intraspecific divergence was very low (0.0-0.2%) because all study sample DNA originated from few specimens and their offspring from the same locality.

Our results tend to confirm species status for the three tested groups, as they are clearly differentiated from their respective COI sequences. This held true for both *J. annulipes* and *J. simplicitarsis*, which are morphologically very similar yet demonstrated the highest level of sequence divergence (14.2-14.5%), and for *J. simplictarsis* and *J. monticola* (13.5%), which are sympatric species from Blue Mountains. The genetic distances were slightly lower between *J. annulipes* and *J. monticola* (9.8-10.0%).

KEY TO THE SPECIES OF *JAMANISTRIA*

Males

1. Median segment slightly shorter or as long as metanotum (fig. 94-a, -c); total length usually more than 85 mm **2**

– Median segment distinctly longer than metanotum (fig. 94-b, -d); total length usually less than 85 mm **3**

2. Vomer bifid (fig. 95-a) tergites II to IX decreasing in length; tergite X roughly as long as or slightly longer than IX (fig. 93-a); anterior apex of medio-ventral carina of meso-femur with two small lobes bearing 3-4 sharp spines (fig. 91-a) ..... ***J. annulipes*** (Rehn & Hebard)

– Vomer simple (fig. 95-c) tergite X slightly longer than IX and shorter than VIII (fig. 93-c); anterior apex of medio-ventral carina of meso-femur with only two blunt spines (fig. 91-c) .... ***J. simplicitarsis*** (Gray)

3. Head 1.1× longer than pronotum (fig. 92-b); poculum and sternite VIII not fused; tergite IX as long as X (fig. 93-b) ..... ***J. monticola*** (Rehn & Hebard)

– Head 1.4-1.5× longer than pronotum (fig. 92-d); poculum and sternite VIII fused; tergite IX longer than X (fig. 93-d) ..... ***J. xerophila*** n. sp.

Table IX. – List of successfully barcoded specimens from this study (in alphabetical order).

Species	BOLD number	Sex and collection number	Deposit	GenBank accession number
Jamanistria annulipes	WG1PHAJA20-018	♀, JAM18-096	MNHN	OP620931
Jamanistria annulipes	WG1PHAJA20-019	♂, JAM18-093	ASPER-PL	OP620925
Jamanistria annulipes	WG1PHAJA20-020	♂, JAM18-095	MNHN	OP620924
Jamanistria annulipes	WG1PHAJA20-021	♂, JAM18-325	ASPER-YB	OP620928
Jamanistria annulipes	WG1PHAJA20-022	♀, JAM18-326	ASPER-YB	OP620919
Jamanistria monticola	WG1PHAJA20-023	♀, JAM18-127	ASPER-PL	OP620926
Jamanistria monticola	WG1PHAJA20-024	♀, JAM18-222	ASPER-YB	OP620929
Jamanistria monticola	WG1PHAJA20-025	♀, JAM18-311	ASPER-YB	OP620923
Jamanistria monticola	WG1PHAJA20-026	♀, JAM18-310	ASPER-YB	OP620922
Jamanistria simplicitarsis	WG1PHAJA20-013	♀, JAM18-081	MNHN	OP620921
Jamanistria simplicitarsis	WG1PHAJA20-014	♂, JAM18-082	MNHN	OP620927
Jamanistria simplicitarsis	WG1PHAJA20-016	♀, JAM18-322	ASPER-YB	OP620930
Jamanistria simplicitarsis	WG1PHAJA20-017	♂, JAM18-321	ASPER-YB	OP620932
Diapherodes jamaicensis	WG1PHAJA20-005	♂, JAM18-001	ASPER-YB	OP620920

Females

1. Mesonotum > 8.0× longer than pronotum (fig. 96-a, -c); total body length without subgenital plate more than 140 mm **2**
– Mesonotum < 8.0× longer than pronotum (fig. 96-b, -d); total body length without subgenital plate less than 140 mm **3**
2. Subgenital plate exceeding the apex of abdomen for ≤ 2 mm, which is less than 0.5× the length of tergite X (fig. 97-a); antennae at best reaching the apex of anterior legs ... ***J. annulipes*** (Rehn & Hebard)
– Subgenital plate exceeding the apex of abdomen for ≥ 2 mm, which is more than 0.5× the length of tergite X (fig. 97-c); antennae exceeding the apex of anterior legs ..... ***J. simplicitarsis*** (Gray)
3. Tergite X 1.2-1.3× longer than IX (fig. 97-b); subgenital plate exceeding the apex of abdomen for ≤ 1.5 mm, which is less than 0.6× the length of tergite X (fig. 97-b); head 1.0-1.2× longer than pronotum (fig. 96-b) ..... ***J. monticola*** (Rehn & Hebard)
– Tergite X about as long as IX (fig. 97-d); subgenital plate exceeding the apex of abdomen for ≥ 3 mm, which is more than 1.2× the length of tergite X (fig. 97-d); head 1.4-1.5× longer than pronotum (fig. 96-d) ..... ***J. xerophila*** n. sp.

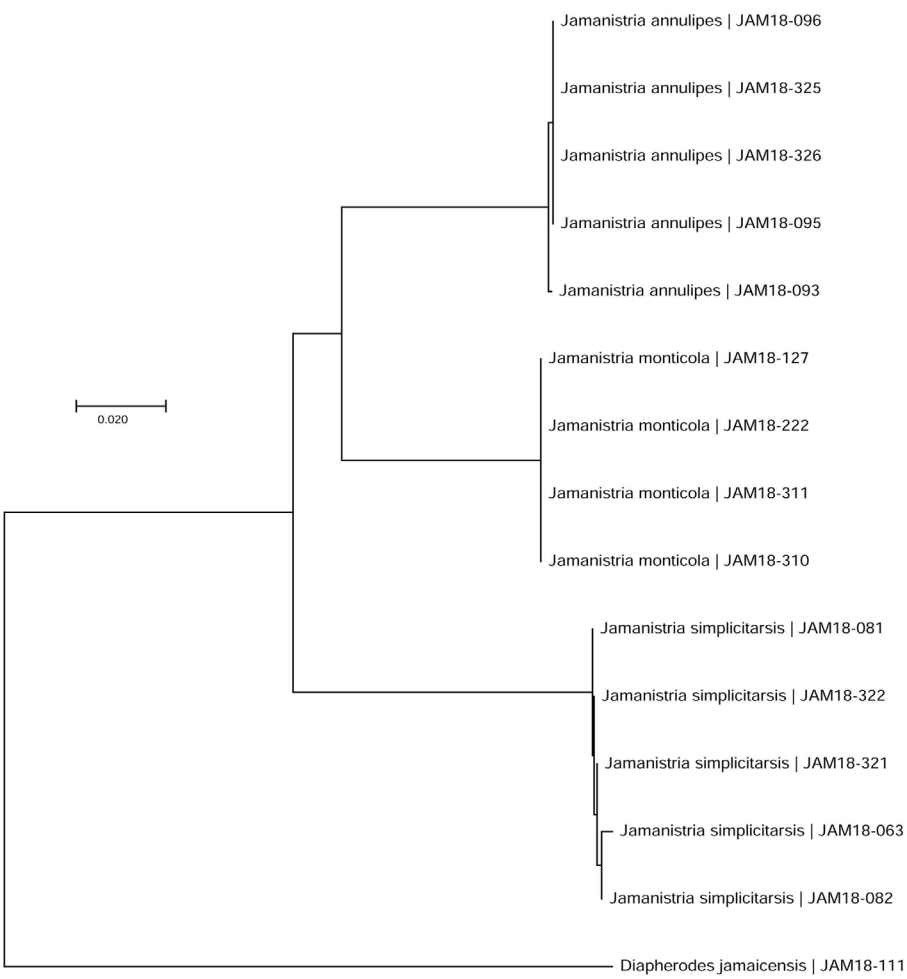

Fig. 86. – *Jamanistria spp*., neighbour joining tree based on COI genes.

Fig. 87-88. – *Jamanistria spp*., view of the biotopes of, – **87**, Blue Mountains around Irish Town. – **88**, Hygrophilic forest close to the top of Catherine's Peak.

Discussion

In the present study, we created the genus *Jamanistria* n. gen. to begin clarifying the currently indiscriminate genus *Clonistria*. Four species, namely *J. annulipes* n. comb., *J. monticola* n. comb., *J. simplicitarsis* n. comb. and *J. xerophila* n. sp., matched perfectly with the genus, thus giving strength to our choice to introduce a formal group. We will discuss further below

Fig. 89-90. – *Jamanistria spp*., view of the biotopes. – **89**, Tree plantations along the road and hills of the Cockpit Country in background near Sherwood Content. – **90**, Xerophilic forest in the coastal hills of Eleven Miles in Bull Bay.

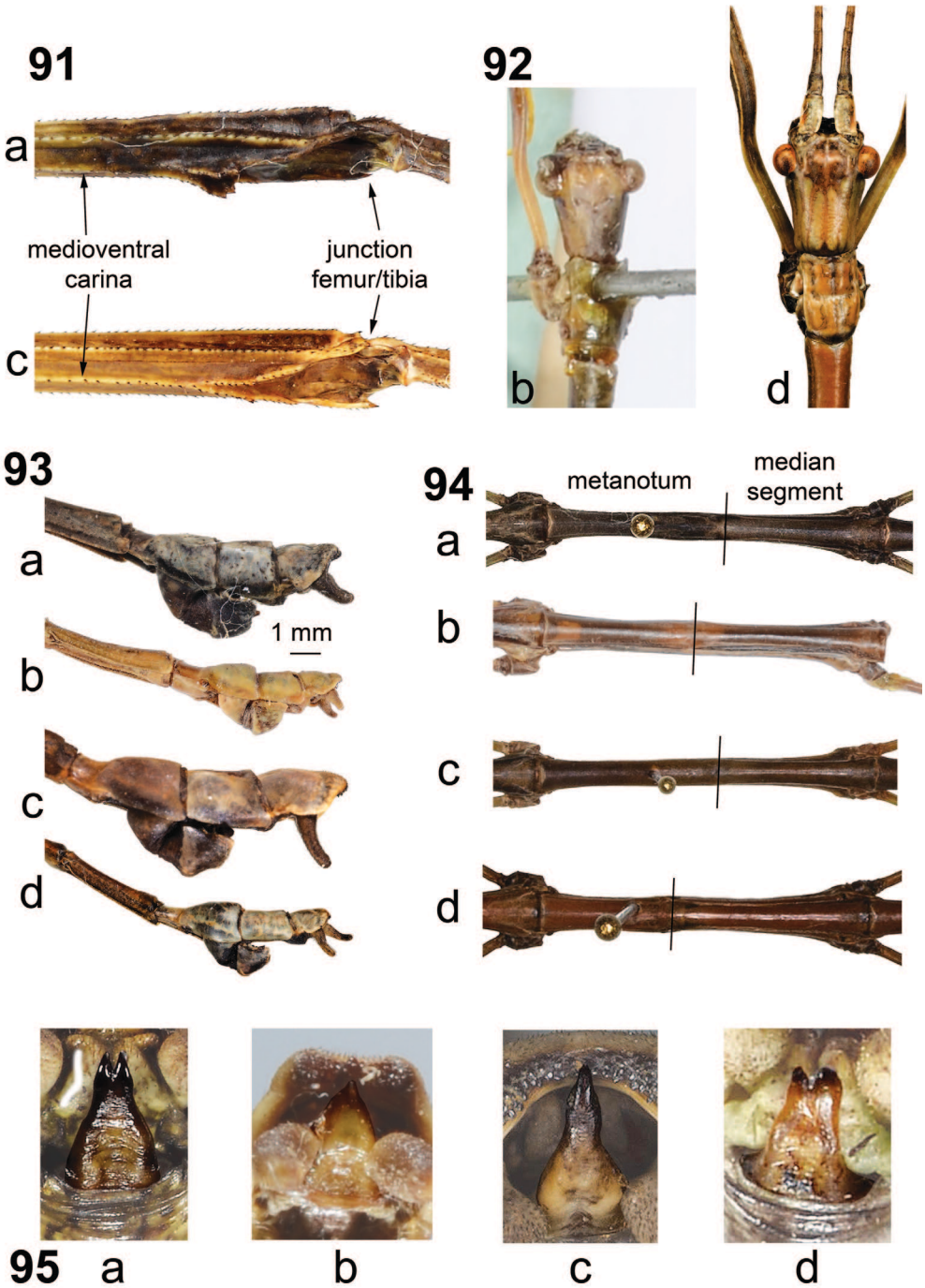

Fig. 91-95. – *Jamanistria spp*., comparison of males, – **91**, Close-up on the median femur extremity. – **92**, Head and pronotum. – **93**, Abdominal extremity. – **94**, Metanotum versus median segment length. – **95**, Close-up on the vomer. – **a**, *J. annulipes* (Rehn & Hebard). – **b**, *J. monticola* (Rehn & Hebard). – **c**, *J. simplicitarsis* (Gray). – **d**, *J. xerophila* n. sp.

consequences for ongoing clarification of the genus *Clonistria*, and potential range of further discovery of *Jamanistria* species.

Redefining *Clonistria* was long expected, because original characteristics proved more hazardous with increased sampling of regional species (Rehn & Hebard, 1938: 41). The present study is a first step in that direction, though further studies will deal with a hard

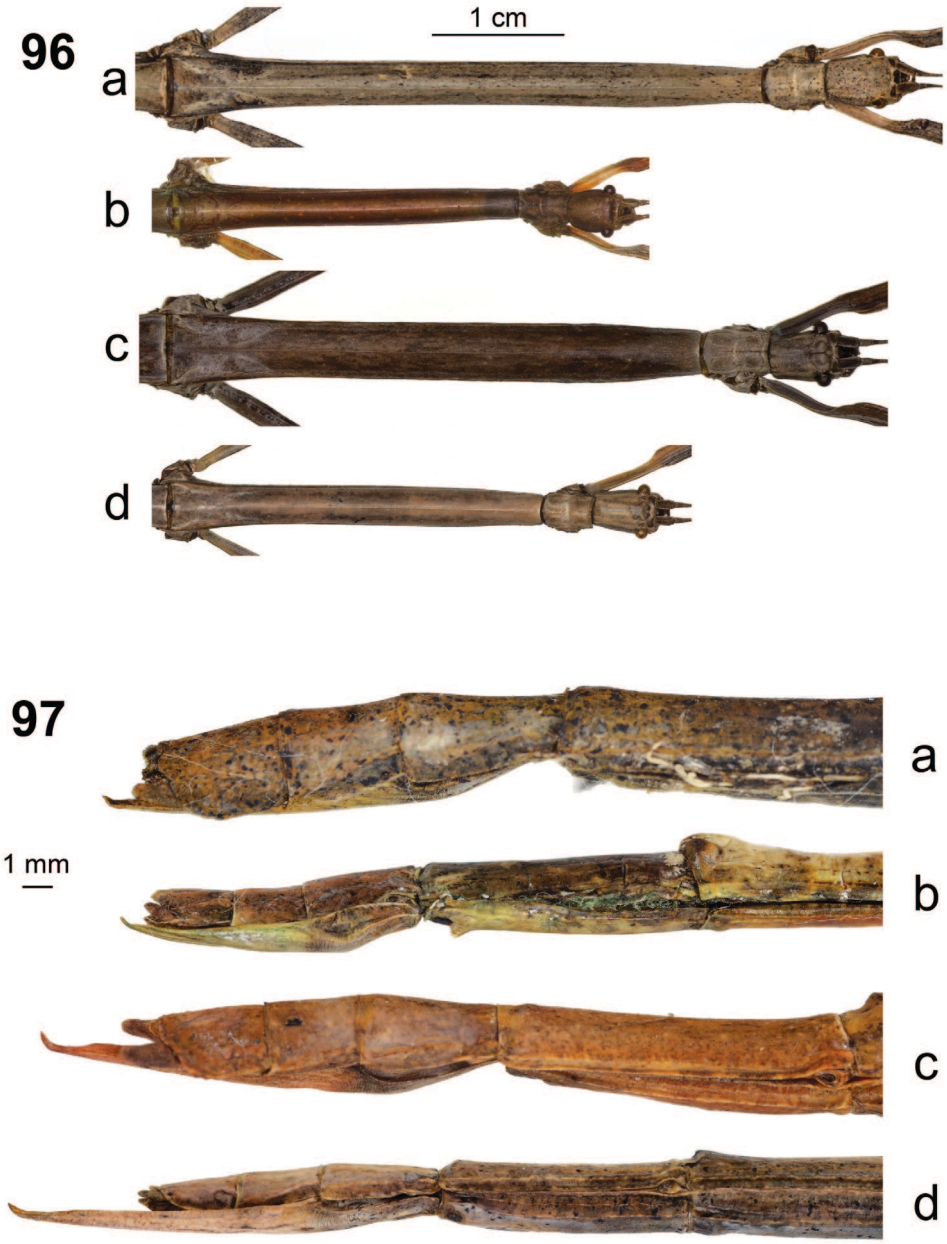

Fig. 96-97. – *Jamanistria spp*., comparison of females. – **96**, Mesonotum, pronotum and head. – **97**, Abdominal extremity. – **a**, *J. annulipes* (Rehn & Hebard). – **b**, *J. monticola* (Rehn & Hebard). – **c**, *J. simplicitarsis* (Gray). – **d**, *J. xerophila* n. sp.

issue regarding distinguishing actual *Clonistria* species within the Caribbean region. Indeed, morphological differences in adults, especially for males, are sometimes tenuous, though egg-based taxonomy might help establishing true species when insect morphology proves difficult to acknowledge (Clark, 1976: 374). The issue is similar here for *Jamanistria*, where eggs are clearly different, while adult males are more difficult to assign easily to their corresponding species. We hypothesize that redefining *Clonistria* will grossly result in keeping a pool of otherwise smaller species throughout Caribbean islands. Remaining *Clonistria* may be best dealt as a species complex with different radiation pools on different islands, and species may group based on morphology (or least based on molecular data) between close islands. A messier situation with sparse and geographically disjunct entities may nevertheless be observed if the interplay between dispersal and local extinction events had a strong effect on current range. Anyhow, a broad sampling of the region will be required to clarify taxonomy of these species.

The current four species of *Jamanistria* are all originating from Jamaica, and the genus might thus be considered endemic until proved otherwise, as is frequently the case in the Caribbean due to insularity (Hennemann *et al.*, 2016). As highlighted above, *Bostra deplanata* Redtenbacher, 1908, from Cuba might actually be a member of the genus outside Jamaica, though this requires careful examination of the type species. Other species of genus *Jamanistria* might indeed be expected from Cuba or Haiti, following current views on local colonization path and highlighted for other zoological groups (Burskik, 1985), as naturally hypothesized by vicariant biogeography theory (i.e., species range will match for both proximity and discontinuity). Additionally, the four species in the genus are clearly reflecting the diversity of habitats and most probably a result of allopatric speciation, a phenomenon already highlighted for Jamaica in the genus *Diapherodes* Gray, 1835 (Bellanger *et al.*, 2021). As a last hypothesis, ancestral species for *Jamanistria* may also prove of Central American origin; in this case, we would expect species from the genus to be distributed more evenly throughout Jamaica, possibly without close relative on other neighbouring islands. Phylogenetic analysis including continental species may reveal such a situation with several independent origins for Caribbean stick insect fauna.

The discovery of *Jamanistria xerophila* n. sp., very abundant in its type locality, which is a very accessible area, as well as the small but significant morphological differences between *J. simplicitarsis* and *J. annulipes*, is suggesting that unknown species of the genus might occur in the island, waiting to be discovered. The field expedition of the authors focused on only two regions and only a few localities were therefore explored for Phasmatodea, we can thus easily expect more species to be discovered and assigned to the genus.

Conclusion

This new genus currently accounts for four known species, including the new species herein described. More investigation and field collecting could reveal more species in Jamaica and also in the neighbouring islands. As the differences between the species are sometimes fairly small (e.g. between *Jamanistria simplicitarsis* and *J. annulipes*), entomologists have to carefully examine the collected specimens, including the eggs, which proved quite different for each species. Furthermore, the distribution of the current known species is likely to be improved, as many areas of Jamaica are still poorly prospected, like the Eastern part of the island. In a forthcoming paper the authors will continue to clarify the status of several *Clonistria* species from Jamaica, including description of species new to science.

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