

## A NEW SPECIES OF HALOPHILOUS WATER-STRIDER, *MESOVELIA POLHEMUSI*, FROM BELIZE AND A KEY AND CHECKLIST OF NEW WORLD SPECIES OF THE GENUS (HETEROPTERA: MESOVELIIDAE)

Paul J. Spangler

*Abstract.*—A new species of water strider, *Mesovelia polhemusi*, from mangrove cays in the Stann Creek District of Belize is described, illustrated by line drawings and scanning electron micrographs, and compared with *M. hambletoni* Drake & Harris, a similar species, and *M. halirrhya* Polhemus from Costa Rica, the only other described halophilous species included in *Mesovelia*. A key to males and a checklist of the 10 species presently described from the Western Hemisphere are included.

---

According to the classification of the Mesoveliidae by Andersen & Polhemus (1980), there are 23 species and subspecies of *Mesovelia* described for the world fauna; 14 from the Old World and 9 from the New World. Because it is necessary to examine many specimens of the widely distributed *M. mulsanti* to confirm or refute the infra-specific categories cited by Jaczewski (1930), only the nominate subspecies (with *bisignata* as a synonym) is included in the checklist below. The tenth New World species, *Mesovelia polhemusi*, new species, is described below.

The new species of *Mesovelia* was collected during a survey of aquatic and semi-aquatic Hemiptera and Coleoptera of mangrove, coral reef, and estuarine habitats in the Stann Creek District of Belize. Collections of a variety of water bugs were made in the Sittee River estuary at Sittee Point, in Placencia Lagoon, and on numerous cays—on Bread and Butter Cay, the reef crest at Carrie Bow Cay, Man of War Cay, Round Cay, Twin Cays, Wee Wee Cay, and cays on the Blue Ground Range.

Specimens of *Mesovelia polhemusi*, new species, were found only on the mangrove cays where they occurred on mud flats among the prop-roots of red mangrove and

the pneumatophores of black mangrove during ebb tide and on the surface of the salt water or resting on emergent vegetation when the tide was incoming or full.

The first specimen of this undescribed species was found in April 1986 while I was examining mud flats between the dense tangle of roots of the red mangrove *Rhizophora mangle* L. That find led to a concerted search for more specimens and some were ultimately found. They did not seem to be widely dispersed but some were found among pneumatophores of black mangrove, *Avicennia nitida* Jacquin. In order to obtain some information on the abundance of this species, counts of specimens were made for 8 plots of 1 m among the pneumatophores. The number of specimens from the plots varied from 0 to 18 with 6 being the mean of the sample. During the fieldwork in 1986, the bugs were difficult to find but abundant specimens were found on numerous cays during subsequent trips as listed under the type data below. During limited collecting on the mainland in freshwater estuarine habitats *Mesovelia mulsanti* White was found to be abundant but no specimens of *M. polhemusi* were obtained. This new species probably occurs widely on the many cays along the coast of Belize and perhaps

it will be found on the mainland if more intensive collecting efforts are made there.

The specimens of the type series were found on mud flats and the water surface among the prop roots of red mangrove and pneumatophores of black mangrove. Some were hiding in small cracks, fiddler crab burrows, and similar niches until flushed out of hiding. During subsequent field trips other specimens were found running about openly, usually on shaded, damp to muddy soil.

*Mesovelgia polhemusi*, new species

Figs. 1–20

*Holotype* ♂ (Figs. 1, 2).—Body form and size: Elongate; slightly widening to mid-length of abdomen then converging to end of genital capsule. Length, 2.21 mm; width (across abdomen), 0.64 mm.

Color: Ground color yellowish brown; with indication of a yellowish longitudinal vitta on midline of dorsum. Connexivia light yellowish brown. Legs light yellowish brown except each femur with darker brown subapical band. Antennal segments dark reddish brown except basal segment lighter yellowish brown. Venter yellowish except brown laterally. Body, legs, and antennae with very short yellowish brown, decumbent pubescence.

Head (Figs. 3–5): Length, 0.46 mm; broadened anteriorly to tubercles; width between tubercles, 0.35 mm. Median sulcus posteriorly reaching caudal margin, becoming evanescent anteriorly between eyes. Eyes large (width of eye/interocular space: 0.15/0.21 mm); length, 0.21 mm; with many ommatidia, converging anteriorly. Rostrum extending almost to anterior margin of metacoxae. Antenna (Fig. 19) long, slender; segment 1 stoutest; lengths of segments 1–4: 0.50 mm, 0.34 mm, 0.62 mm, 0.62 mm. Antennal segment 1 with numerous short setae and one long, anteriorly directed, thin seta at distal third. Antennal segments 2, 3, and 4 set with many long, thin setae. Cuticle

with dense plastron setae and peg plates (Figs. 3–6).

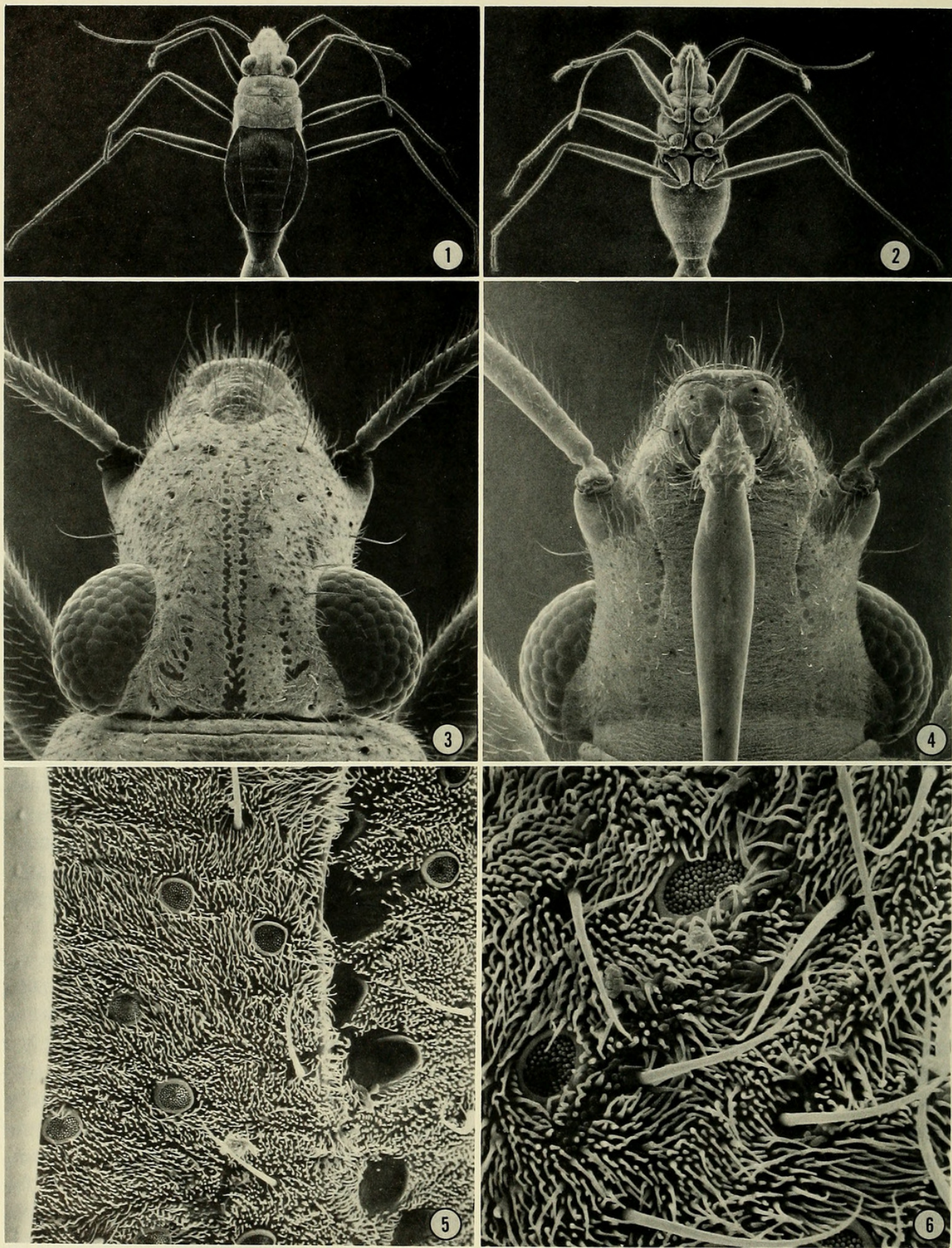
Thorax (Fig. 16): Pronotum and mesonotum granulate along hind margins; metanotum granulate on each side of midline. Pronotum short; posterior margin straight. Midline lengths of pronotum, mesonotum, metanotum = 0.21, 0.20, 0.12 mm. Prosternum with dense plastron setae (Fig. 6). Legs with numerous longer, thin, hairlike setae; metatibia with scattered stiff brown setae. Protibia with grooming comb on apex (Figs. 7, 8). Protarsus (Fig. 9) with long, slender claws (Fig. 10). Right profemur armed beneath with 11 black spines; left profemur with 9 black spines; length of spines equal  $\frac{1}{4}$  to  $\frac{1}{2}$  the width of the femur where they arise. Right mesotibia with grooming comb apically (Fig. 11). Right mesofemur armed beneath with 20 black spines (Fig. 12); left mesofemur with 15 black spines of similar length as spines of profemora. All femora moderately stout; tibia and tarsi slender.

Abdomen (Fig. 13): Long, slender. Segment 3 widest. Lengths of abdominal terga 1–7 = 0.12 mm, 0.15 mm, 0.12 mm, 0.15 mm, 0.14 mm, 0.17 mm, 0.23 mm. Median scent pore at anterior third of tergum 4 (Figs. 14, 15). First genital segment (8th abdominal) without spine or cluster of black spinules. Cuticle with peg plates (Fig. 17) and spiracles (Fig. 18).

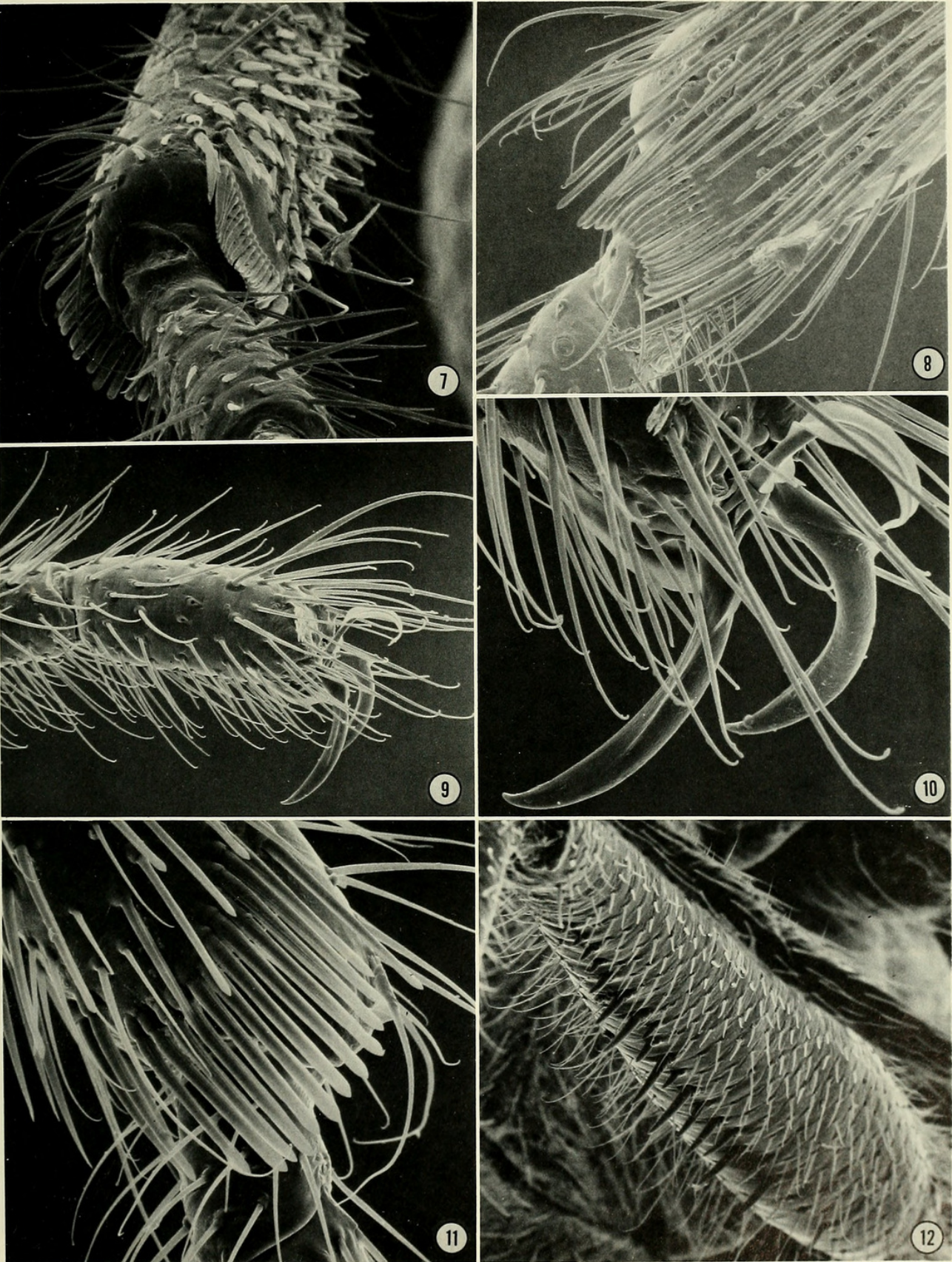
Genitalia: As illustrated (Fig. 20).

*Female*.—Length, 2.75 mm; width (across abdomen), 1 mm. Fore and middle femora armed beneath with 9 and 16 spines, respectively.

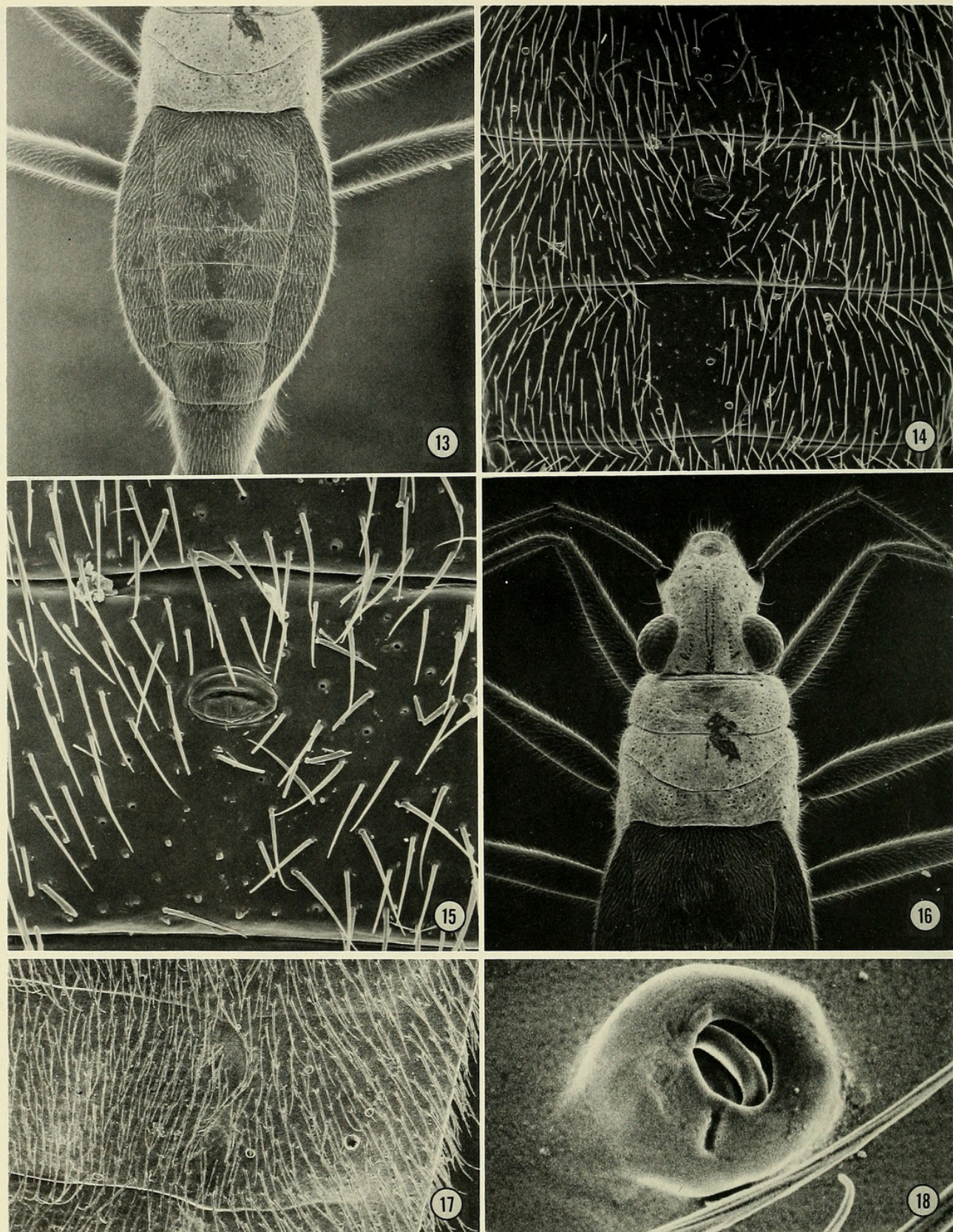
*Variations*.—The number of spines on the femora was found to be variable. The femoral spines varied as follows ( $n = 20$  for each sex). Profemoral: males, 5–12 ( $\bar{x} = 10$ ); females, 1–12 ( $\bar{x} = 7$ ). Mesofemoral: males, 14–21 ( $\bar{x} = 17$ ); females, 6–17 ( $\bar{x} = 11$ ). Males ( $n = 20$ ) ranged in length from 2.11–2.40 mm ( $\bar{x} = 2.14$ ) and in greatest width from 0.64–0.78 mm ( $\bar{x} = 0.71$ ). Females ( $n = 20$ ) ranged in length from 2.33–2.75 mm



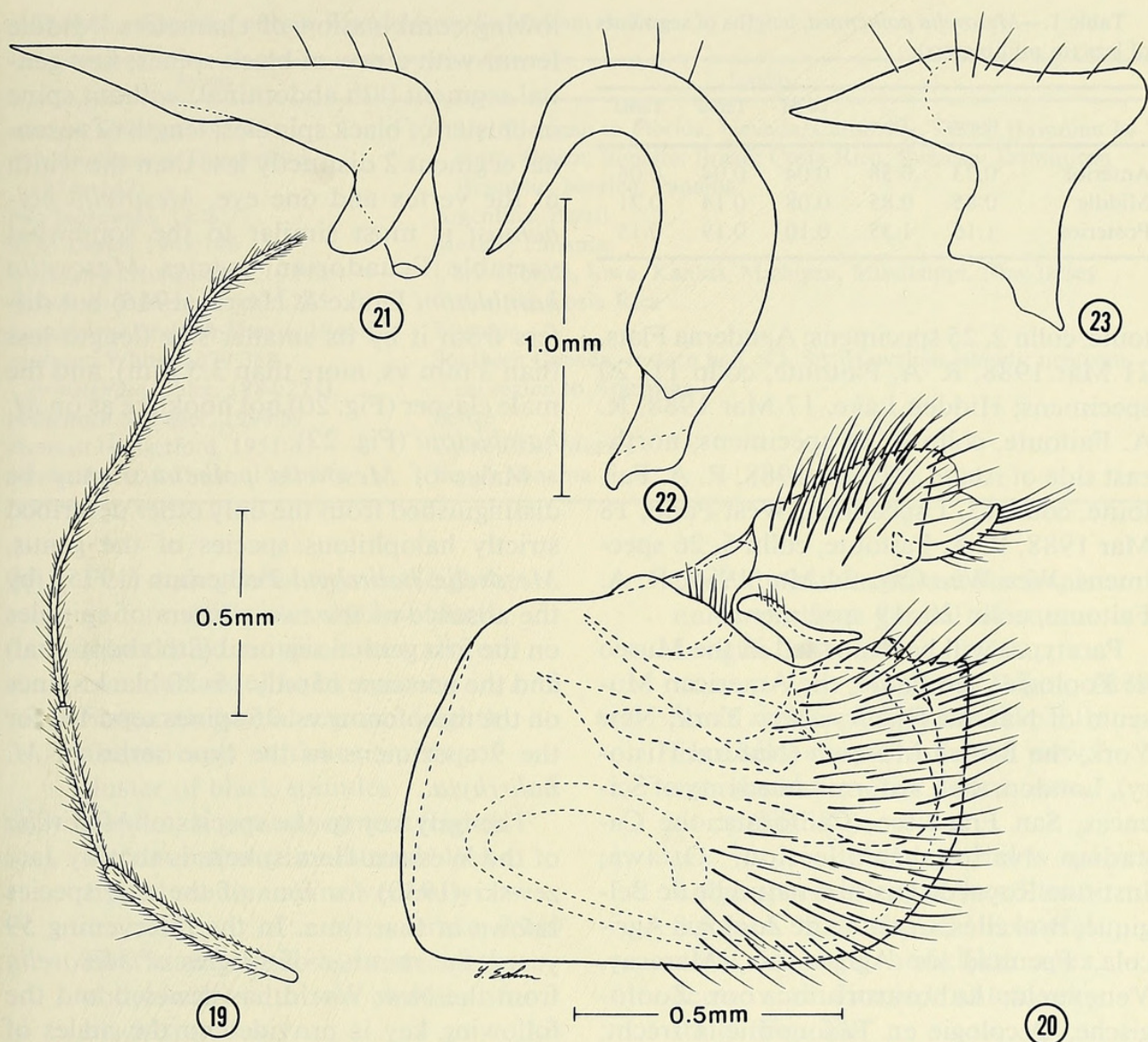
Figs. 1-6. *Mesovelgia polhemusi*, n. sp. 1, habitus, dorsal,  $\times 23$ ; 2, habitus, ventral,  $\times 22$ ; 3, head, dorsal,  $\times 150$ ; 4, head, ventral,  $\times 170$ ; 5, plastron setae, ventral surface of head,  $\times 1100$ ; 6, plastron on prosternum,  $\times 2800$ .



Figs. 7-12. *Mesovelia polhemusi*, n. sp. 7, protibial grooming comb,  $\times 700$ ; 8, protibial grooming comb,  $\times 800$ ; 9, protarsus,  $\times 500$ ; 10, protarsal claws,  $\times 1300$ ; 11, mesotibial grooming comb,  $\times 1000$ ; 12, mesofemur,  $\times 350$ .



Figs. 13-18. *Mesovelia polhemusi*, n. sp. 13, abdominal terga,  $\times 60$ ; 14, abdominal tergum 4 and scent gland orifice,  $\times 250$ ; 15, abdominal scent gland orifice,  $\times 600$ ; 16, head and thorax,  $\times 60$ ; 17, peg plates and spiracle, side of abdomen,  $\times 300$ ; 18, spiracle,  $\times 5000$ .



Figs. 19–23. *Mesovelioidea polhemusi*, n. sp. 19, antenna; 20, genital capsule with clasper. 21, *Mesovelioidea amoena* Uhler, male clasper. 22, *Mesovelioidea hambletoni* Drake & Harris, male clasper. 23, *Mesovelioidea cryptophila* Hungerford, male clasper.

( $\bar{x}$  = 2.32) and in greatest width from 0.80–1.01 mm ( $\bar{x}$  = 0.93).

*Type data.*—Holotype, apterous male: Belize: Stann Creek District: Twin Cays, 18 May 1986, P. J. Spangler and R. A. Faitoute; deposited in the U.S. National Museum of Natural History, Smithsonian Institution. Allotype: Same data as holotype.

Paratypes: Belize: Stann Creek District: Same data as holotype, 37 specimens. Blue Ground Range, 9 Nov 1987, P. J. Spangler and R. A. Faitoute, colln 20, 35 specimens. Bread and Butter Cay, 25 Mar 1988, R. A.

Faitoute, colln 25, 15 specimens. Man of War Cay, 16 May 1986, P. J. Spangler and R. A. Faitoute, colln 6, 1 specimen; 8 Nov 1987, P. J. Spangler and R. A. Faitoute, colln 16, 31 specimens. Round Cay (S of Coco Plum), 23 Mar 1988, R. A. Faitoute, colln 19, 7 specimens. Twin Cays: Aanderaa Flats, 19 May 1986, P. J. Spangler and R. A. Faitoute, colln 11, 38 specimens; Aanderaa Flats, 7 Nov 1987, P. J. Spangler and R. A. Faitoute, colln 12, 12 specimens; Aanderaa Flats, 8 Nov 1987, 20 specimens; Aanderaa Flats, 17 Mar 1988, R. A. Fai-

Table 1.—*Mesovelvia polhemusi*, lengths of segments of legs (in millimeters).

	Femur	Tibia	Tarsal 1	Tarsal 2	Tarsal 3
Anterior	0.73	0.58	0.04	0.04	0.06
Middle	0.85	0.85	0.08	0.14	0.21
Posterior	1.16	1.35	0.10	0.19	0.15

toute, colln 2, 25 specimens; Aanderaa Flats, 21 Mar 1988, R. A. Faitoute, colln 11, 20 specimens; Hidden Lake, 17 Mar 1988, R. A. Faitoute, colln 4, 36 specimens; north-east side of island, 21 Mar 1988, R. A. Faitoute, colln 12, 1 specimen; West Pond, 18 Mar 1988, R. A. Faitoute, colln 5, 26 specimens. Wee Wee Cay, 24 Mar 1988, R. A. Faitoute, colln 20, 19 specimens.

Paratypes will be deposited in the Museo de Zoologia, Sao Paulo; the American Museum of Natural History, New York, New York; the British Museum (Natural History), London; the California Academy of Sciences, San Francisco, California; the Canadian National Collection, Ottawa; Institute Royal de Histoire naturelle de Belgique, Bruxelles; Instituto de Zoologia Agricola, Facultad de Agronomia, Maracay, Venezuela; Laboratorium voor Zoologische, Oecologie en Taxonomie, Utrecht; the Museum National de Histoire Natural, Paris; Museo Argentina de Ciencias naturales, Buenos Aires; Universidad Nacional de La Plata, La Plata; the National Museum of Natural History, Smithsonian Institution, Washington, D.C.; the Snow Entomological Museum, University of Kansas, Lawrence, Kansas; Zoologische Sammlung Bayerischen Staates, München; and the collection of John T. Polhemus, Englewood, Colorado.

*Etymology.*—This new species, *Mesovelvia polhemusi*, is dedicated to my colleague and indefatigable aquatic heteropterist, John T. Polhemus, who has greatly increased our knowledge of these fascinating insects.

*Comparative notes.*—The male of *Mesovelvia polhemusi*, new species, may be separated easily from its congeners by the fol-

lowing combination of characters. Middle femur with a row of black spines; first genital segment (8th abdominal) without spine or cluster of black spinules; length of antennal segment 2 distinctly less than the width of the vertex and one eye. *Mesovelvia polhemusi* is most similar to the somewhat variable Ecuadorian species *Mesovelvia hambletoni* Drake & Harris (1946) but differs from it by its smaller size (length less than 3 mm vs. more than 3.5 mm), and the male clasper (Fig. 20) not hooklike as on *M. hambletoni* (Fig. 22).

Males of *Mesovelvia polhemusi* may be distinguished from the only other described strictly halophilous species of the genus, *Mesovelvia halirrhyta* Polhemus (1975), by the absence of the two clusters of spinules on the first genital segment (8th abdominal) and the presence of only 15–20 black spines on the mesofemur vs. 25 spines reported for the 9 specimens in the type series of *M. halirrhyta*.

The only key to the species of *Mesovelvia* of the Western Hemisphere is that by Jaczewski (1930) for four of the five species known at that time. In the intervening 59 years, the number of species of *Mesovelvia* from the New World has doubled and the following key is provided to the males of the 10 species presently recognized from this hemisphere. Because of similarities between *M. polhemusi* and *M. hambletoni* as well as between *M. cryptophila* and the wide-ranging *M. amoena*, the diagnostic male claspers of these taxa are illustrated and referred to in the key. A complete clasper (Fig. 23) of *M. cryptophila* is also illustrated because Hungerford’s (1924b) “freehand sketches of the left genital claspers of male Mesovelias” did not include the base and is misleading.

Key to Males of *Mesovelvia* of the Western Hemisphere

1. Mesofemur with a row of prominent black spines ventrally . . . . . 2
- Mesofemur without row of black spines . . . . . 7

Table 2.—Checklist of New World *Mesovelgia* Mulsant & Rey.

Species	Locality
<i>amoena</i> Uhler, 1894:218 (= <i>douglasensis</i> Hungerford, 1924a:142)	USA: Michigan to Florida, Nevada, California, Texas, Hawaiian Islands; Belize; Bonaire; Brazil; Costa Rica; Curacao; Dominican Republic; Mexico; Panama
<i>bila</i> Jaczewski, 1928:77	Argentina; Brazil
<i>blissi</i> Drake, 1949:146	Mexico; Panama
<i>cryptophila</i> Hungerford, 1924b:454	USA: Florida, Iowa, Kansas, Michigan, Mississippi, New Jersey
<i>halirrhyta</i> Polhemus, 1975:245	Colombia; Costa Rica
<i>hambletoni</i> Drake & Harris, 1946:8	Ecuador
<i>mulsanti</i> White, 1879:268 (= <i>bisignata</i> Uhler, 1884:274)	Southern Canada; eastern half of USA, Hawaiian Islands; neotropical region to Argentina
<i>polhemusi</i> Spangler, 1990:87	Belize
<i>thomasi</i> Hungerford, 1951:33	Guatemala; Mexico
<i>zeteki</i> Harris & Drake, 1941:276	Brazil; Panama

- 2(1). First male genital segment (eighth abdominal) with subbasal black-tipped median spine ventrally or two clusters of black spinules ... 3

First male genital segment (eighth abdominal) without spine or cluster of black spinules ..... 6

3(2). First male genital segment (eighth abdominal) with a subbasal black-tipped median spine ventrally .  
..... *blissi* Drake, 1949

First male genital segment (eighth abdominal) with two clusters of black spinules ..... 4

4(3). First male genital segment (eighth abdominal) with two patches of widely separated black spinules ventrally; each patch with about 40 to 50 spinules .....  
..... *thomasi* Hungerford, 1951

First male genital segment (eighth abdominal) with two tightly packed clusters of coarse or thin spinules ..... 5

5(4). Mesofemur with 25 black spines ventrally. Males with two widely separated rows of thin spinules on first genital sternum; each row with three to five spinules. Length, 2.5–2.75 mm .....  
..... *halirrhyta* Polhemus, 1975

Mesofemur with 8 to 15 black spines. Males with two tightly
- packed clusters of stout black spinules on first genital sternum. Length, 3–4 mm .....  
..... *mulsanti* White, 1879

6(2). Small species; length less than 3.0 mm. Male clasper, in lateral view, not hooklike; apex blunt anteriorly (Fig. 20) .....  
..... *polhemusi*, new species

Large species; length more than 3.5 mm. Male clasper, in lateral view, strongly hooklike; apex acute and directed anteroventrally (Fig. 22) .....  
.. *hambletoni* Drake & Harris, 1946

7(1). Sixth male abdominal sternum with posteromedial fringe of black spinules ..... 8

Sixth male abdominal sternum without posteromedial fringe of black spinules ..... 9

8(7). Seventh male abdominal sternum with two clusters of black spinules ..... *bila* Jaczewski, 1928

Seventh male abdominal sternum without black spinules ...  
..... *zeteki* Harris & Drake, 1941

9(7). Prothoracic and mesothoracic pleura and nota (at least laterally) broadly pruinose, with numerous minute shiny black spots. Anterior lobe of pronotum without distinct depressions on each side

of midline. Propleuron without longitudinal light streak behind eye. Male clasper, in lateral view, short and robust (Fig. 23) . . . . .  
 . . . . . *cryptophila* Hungerford, 1924b  
 Prothoracic and mesothoracic pleura and nota not broadly pruinose, without numerous, minute, shiny, black spots. Anterior lobe of pronotum with a distinct depression (apodeme) on each side of midline. Propleuron usually with longitudinal light streak behind eye. Male clasper, in lateral view, long and slender (Fig. 21) . . . . . *amoena* Uhler, 1894

### Acknowledgments

I thank Klaus Ruetzler and the other administrators of the Smithsonian Institution's Caribbean Coral Reef Ecosystem Project for financing the survey of the halophilic Hemiptera and Coleoptera in Belize during which time this undescribed species was discovered. I also thank Young T. Sohn for the line drawings; Robin A. Faitoute for SEM photomicrographs and assistance with the fieldwork in 1986 and 1987 and all of the specimens collected in March 1988; Susann Braden for SEM photomicrographs; John T. Polhemus for constructively reviewing the manuscript; and Phyllis M. Spangler for typing the manuscript into a word processor. This is contribution 284, Caribbean Coral Reef Ecosystems (CCRE) Program, Smithsonian Institution.

### References Cited

Andersen, N. M., & J. T. Polhemus. 1980. Four new genera of Mesoveliidae (Hemiptera; Gerromorpha) and the phylogeny and classification of the

- family.—*Entomologica Scandinavica* 11:369–392.
- Drake, C. J. 1949. Two new Mesoveliidae with check list of American species (Hemiptera).—*Boletín Entomologia Venezolana* 7(3–4):145–147.
- , & H. M. Harris. 1946. A new mesoveliid from Ecuador (Hemiptera; Mesoveliidae).—*Bulletin of the Brooklyn Entomological Society* 41(1):8–9.
- Harris, H. M., & C. J. Drake. 1941. Notes on the family Mesoveliidae (Hemiptera) with descriptions of two new species.—*Iowa State College Journal of Science* 15(2):275–277.
- Hungerford, H. B. 1924a. A new *Mesovelina* with some biological notes regarding it (Hemiptera-Mesoveliidae).—*The Canadian Entomologist* 56:142–144.
- . 1924b. A second new species of *Mesovelina* from the Douglas Lake, Michigan region (Hemiptera-Mesoveliidae).—*Annals of the Entomological Society of America* 17(4):453–456.
- . 1951. A new *Mesovelina* from Mexico and Guatemala.—*Journal of the Kansas Entomological Society* 24(1):32–34.
- Jaczewski, T. 1928. Mesoveliidae from the state of Paraná.—*Annales of the Musei Zoologici Polonici* 7(2–3):75–81.
- . 1930. Notes on the American species of the genus *Mesovelina* Muls. (Heteroptera, Mesoveliidae).—*Annales Musei Zoologici Polonici* 9(1):3–15.
- Polhemus, J. T. 1975. New estuarine and intertidal water-striders from Mexico and Costa Rica (Hemiptera: Gerridae: Mesoveliidae).—*Pan-Pacific Entomologist* 51:243–247.
- Uhler, P. R. 1884. Order IV. Hemiptera. Pp. 204–206 in J. S. Kingsley, ed., *Standard natural history*. S. E. Cassin & Co., Boston, vii + 555 pp.
- . 1894. On the Hemiptera-Heteroptera of the island of Grenada, West Indies.—*Proceedings of the Zoological Society of London* 1894:167–224.
- White, F. B. 1879. List of the Hemiptera collected in the Amazons by Prof. J. W. H. Trail, MA., M.D., in the years 1873–1875, with descriptions of the new species.—*Transactions of the Entomological Society of London* 267–276.

Department of Entomology, National Museum of Natural History, Smithsonian Institution, Washington, D.C. 20560.



Spangler, Paul J. 1990. "A new species of halophilous water-strider, *Mesovelia polhemusi*, from Belize and a key and checklist of New World species of the genus (Heteroptera: Mesoveliidae)." *Proceedings of the Biological Society of Washington* 103, 86–94.

**View This Item Online:** <https://www.biodiversitylibrary.org/item/107575>

**Permalink:** <https://www.biodiversitylibrary.org/partpdf/45213>

**Holding Institution**

Smithsonian Libraries and Archives

**Sponsored by**

Biodiversity Heritage Library

**Copyright & Reuse**

Copyright Status: In copyright. Digitized with the permission of the rights holder.

Rights Holder: Biological Society of Washington

License: <http://creativecommons.org/licenses/by-nc-sa/3.0/>

Rights: <https://biodiversitylibrary.org/permissions>

This document was created from content at the **Biodiversity Heritage Library**, the world's largest open access digital library for biodiversity literature and archives. Visit BHL at <https://www.biodiversitylibrary.org>.