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## WATER-STRIDERS OF THE SUBGENUS *STRIDULIVELIA* FROM MEXICO, CENTRAL AMERICA, AND THE WEST INDIES (HEMIPTERA: VELIIDAE)

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The subgenus *Stridulivelia* Hungerford (1929) was created to hold six new species of water-striders, genus *Velia* Latreille, five from South America and one from Panama. Although the latter species, *Velia cinctipes* Champion, lacks the mechanism for stridulation, it is unquestionably congeneric with those members of the subgenus possessing sonoric instruments. In the original subgeneric description, Hungerford designated his new *Velia raspa* as the type species.

The present paper reviews the four species of *Stridulivelia* from the West Indies, Central America, and Mexico. Only one of these four species, *Velia tersa* Drake and Harris from Trinidad, is equipped with sound-producing organs. The subgenus is not known to occur north of Mexico.

The holotype and allotype of the new species described below were selected from a long series of Mexican specimens kindly lent us by the Los Angeles County Museum. Paratypes from this same series

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are deposited in the Los Angeles County museum, the California Academy of Sciences, the U.S. National Museum, and in collections of the authors. The illustrations were made by Mrs. Patricia J. Hogue, of Arlington, Virginia.

### Subgenus *Stridulivelia* Hungerford

*Velia* (*Stridulivelia*) Hungerford, 1929, Journ. Kansas Ent. Soc., vol. 2, p. 55.

The members of this subgenus possess certain structures that clearly set them apart as a natural group from all other members of the genus *Velia*. These distinguishing features are: (1) general habitus; (2) intersegmental furrows between abdominal segments; and (3) vertical median furrows (one on each side) of abdominal pleurites II-III, II-IV, or II-V. These pleural abdominal sulci, both intersegmental and segmental, are present in both sexes. The presence or absence of the stridulatory organs and the number of abdominal pleurites bearing a median vertical furrow separate the members of *Stridulivelia* into "groups" of species.

The sound-producing mechanism consists of (1) a small subbasal filelike area on the inner face of each hind femur (pl. 1,c) and (2) a closely set row of small pegs near the upper margin of the inferior side of each connexivum (pl. 1,b). The soniferous structures, adapted for rasping performance, are paired (one of each on each side of the body) (pl. 1,b,c) and are similarly developed in both sexes.

In one of the South American members of the subgenus, *Velia alia* Drake (1957), from British and French Guianas, the parts of each pair of stridulating organs are exactly reversed in their positions. In *alia*, the connexivum is equipped with a long narrow, finely or minutely cross-striated rodlike file and the hind femur with a small elongate-oval patch of tiny pegs. Furthermore, the latter species differs from all described forms in having a prominent spiniform process at each humeral angle. The humeral hornlike processes and sound organs are the same in both sexes. The other South American members of the subgenus have the stridulating structures placed and arranged as in the Antillean *V. tersa* (pl. 1). In either type of stridulatory arrangement, sound is effected by the confriation of the stridulating structure of the hind femur with that of the connexivum on the same side of the body. The abdomen, especially the connexivum, serves as a resonator. All members of the subgenus so far described from South America are equipped with the rasping structures.

The metasternal omphalium (pl. 2, a) is large and distinctly gibbose; its hind margin is obtusely angulately rounded. The opening of the metathoracic scent glands is just beneath the median subangulate



apex of the omphalium. The ostiolar sulcus (one on each side) extends from the ostiole anteriorly along the side (note angulate projection of sulcus on each side) of the omphalium and then curves arcuately upwards on the metapleuron in front of and slightly higher than the hind acetabulum. The apex of the sulcus is provided with a tuft of brownish hairs (pl. 2).

According to the present authors' field observations in Panama, Trinidad, and Mexico, the members of the subgenus *Stridulivelia* are inhabitants of both small and large streams. The specimens were netted in flowing water, mostly among emergent vegetation or close to the shore under overhanging vegetation. More than 50 specimens of *V. tersa* were collected in a single school in a very narrow stream in Trinidad.

### Key to the Subgenus *Stridulivelia* of Mexico, Central America, and the West Indies

1. Hind femora and connexiva equipped with stridulatory structures in both sexes (pl. 1); male parameres as in plate 3,a . . . *Velia tersa* Drake and Harris  
Hind femora and connexiva without sound-producing structures (pl. 2,b); male parameres as in plate 3,b-d . . . . . 2
2. Abdominal pleurites II-V with median vertical furrows; apical three-fifths of last antennal segment whitish, testaceous; male parameres as in plate 3,b.  
*Velia cinctipes* Champion  
Abdominal pleurites II-III or II-IV with median vertical furrows; antennal segments unicolorous . . . . . 3
3. Abdominal pleurites II-III with median vertical furrows (pl. 2,b); male parameres as in plate 3,c . . . . . *Velia epeixis*, new species  
Abdominal pleurites II-IV with median vertical furrows; parameres as in plate 3,d . . . . . *Velia pueblana* Drake

### *Velia tersa* Drake and Harris

#### PLATES 1, 3,a

*Velia tersa* Drake and Harris, 1941, Rev. Ent., vol. 12, p. 338.

BRACHYPTEROUS FORM: Dark reddish brown to chocolate brown, with connexiva and appendages yellowish brown; pronotum unicarinate, coarsely punctate, each puncture within clothed with an encircling row of extremely small silvery hairs, also with a fairly large patch of longer silvery hairs in each anterolateral angle of pronotum. Length: 4.70-5.00 mm.; width: 1.10-1.35 mm.

Measurement of antennal segments: I, 1.05 mm.; II, 0.72 mm.; III, 0.50 mm.; IV, 0.50 mm. Legs rather slender, with femora only slightly incrassate; foretibia with a short dark apical comb; middle leg with tarsal segment II much longer than III (50:30); hind femur slightly thicker in male than female, with five or six short spines on



inferior surface beyond the basal third in male, only three or four spines beyond the middle in female; tibia with short apical spur in both sexes, also with short teeth on inferior surface; tarsal segments II and III subequal, prolonged backwards into a sharp spine in both sexes.

**MACROPTEROUS FORM:** Pronotum unicarinate; hemelytra slightly longer than abdomen, with dark fuscous veins, clothed basally with silvery hairs, the cells dark fuscous.

This stridulating species is known largely from the type series, netted under the underhanging ledge of a narrow stream, in the western part of Trinidad, British West Indies. Other specimens are also at hand from Venezuela.

The stridulatory organs (pl. 1) and male parameres (pl. 3,a) separate it from all other members of the subgenus occurring in the West Indies, Mexico, and Central America. A male paratype is illustrated.

*Velia cinctipes* Champion

PLATE 3,b

*Velia cinctipes* Champion, 1898, in *Biologia Centrali-Americana*, vol. 47 (Rhynchota, Heteroptera, vol. 2), p. 143, pl. 9, fig. 9.—Hungerford, 1929, *Journ. Kansas Ent. Soc.*, vol. 2, p. 255.

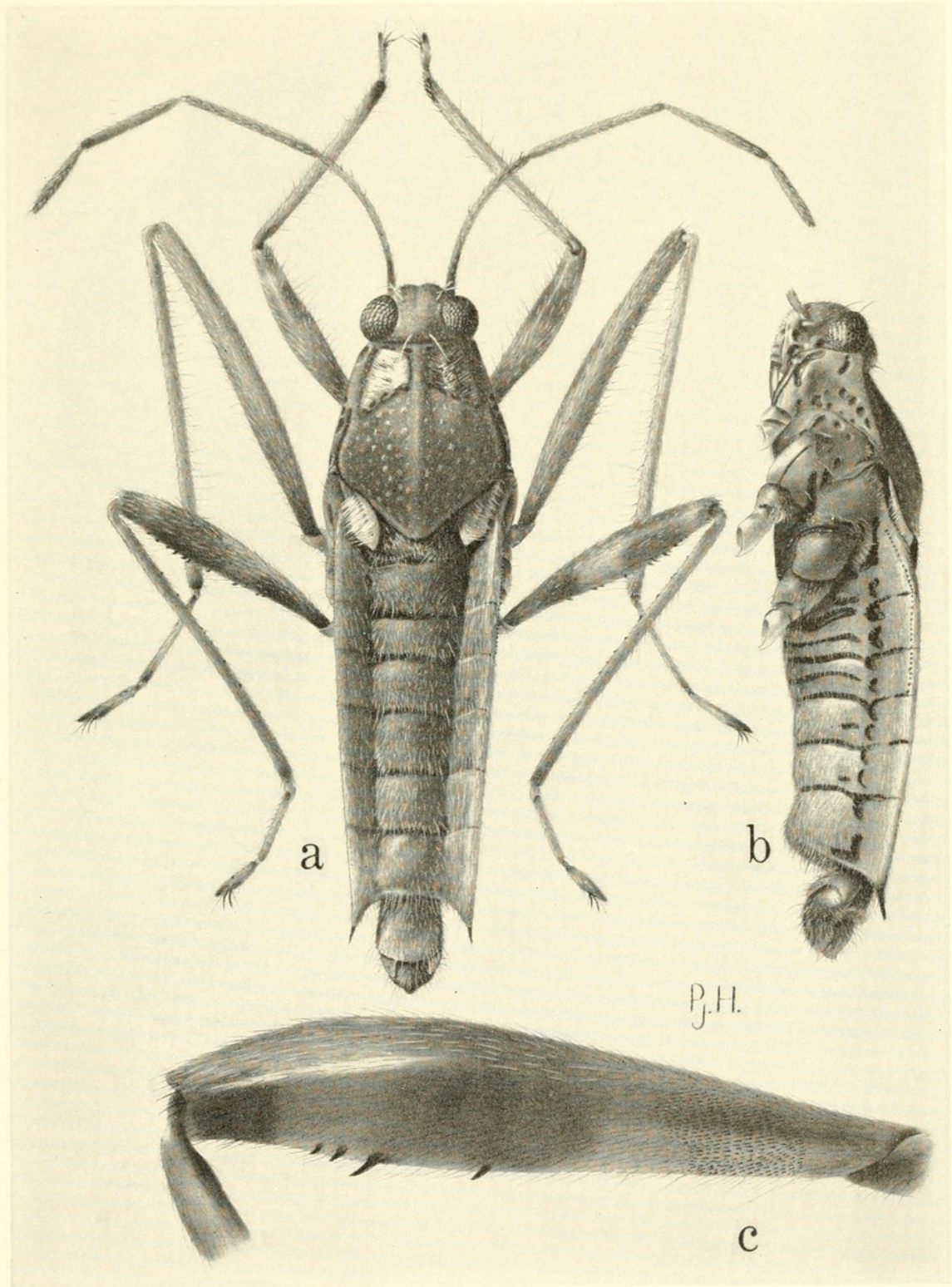
**BRACHYPTEROUS FORM:** Elongate, narrow, fuscous, with a large patch of appressed silvery hairs on each side of forelobe of pronotum; body beneath darker; wing pads small, clothed with silvery white hairs; hind femur testaceous, with wide band just behind middle, dark fuscous. Length: 4.75–5.20 mm., width: 1.50 mm.

Antennal measurements: segment I, 1.20 mm.; II, 0.95 mm.; III, 0.65 mm.; IV, 0.55 mm. Pronotum with median carina, more convex in macropterous than in brachypterous form; connexivum produced backwards apically into a sharp spine, this spine longer in male than female; abdominal pleura with a pair (one on each side) of median vertical sulci on segments II through IV; male parameres as in pl. 3,a; hind trochanter usually armed with a long spine in male, unarmed in female; hind femur slightly swollen, armed beneath with two rows of moderately large spines, the front row with a larger spine at apical third; tibia beneath with two long rows of dark, closely set teeth, also with a partial third row on basal third; female femur slightly less incrassate than in male, armature absent on basal third, otherwise with armature of both femur and tibia nearly same as in male.

**MACROPTEROUS FORM:** Front lobe of pronotum with silver patches; hemelytron dark fuscous, with yellowish and silvery hairs on corium; membrane brownish fuscous with a large subapical yellowish lunar spot.

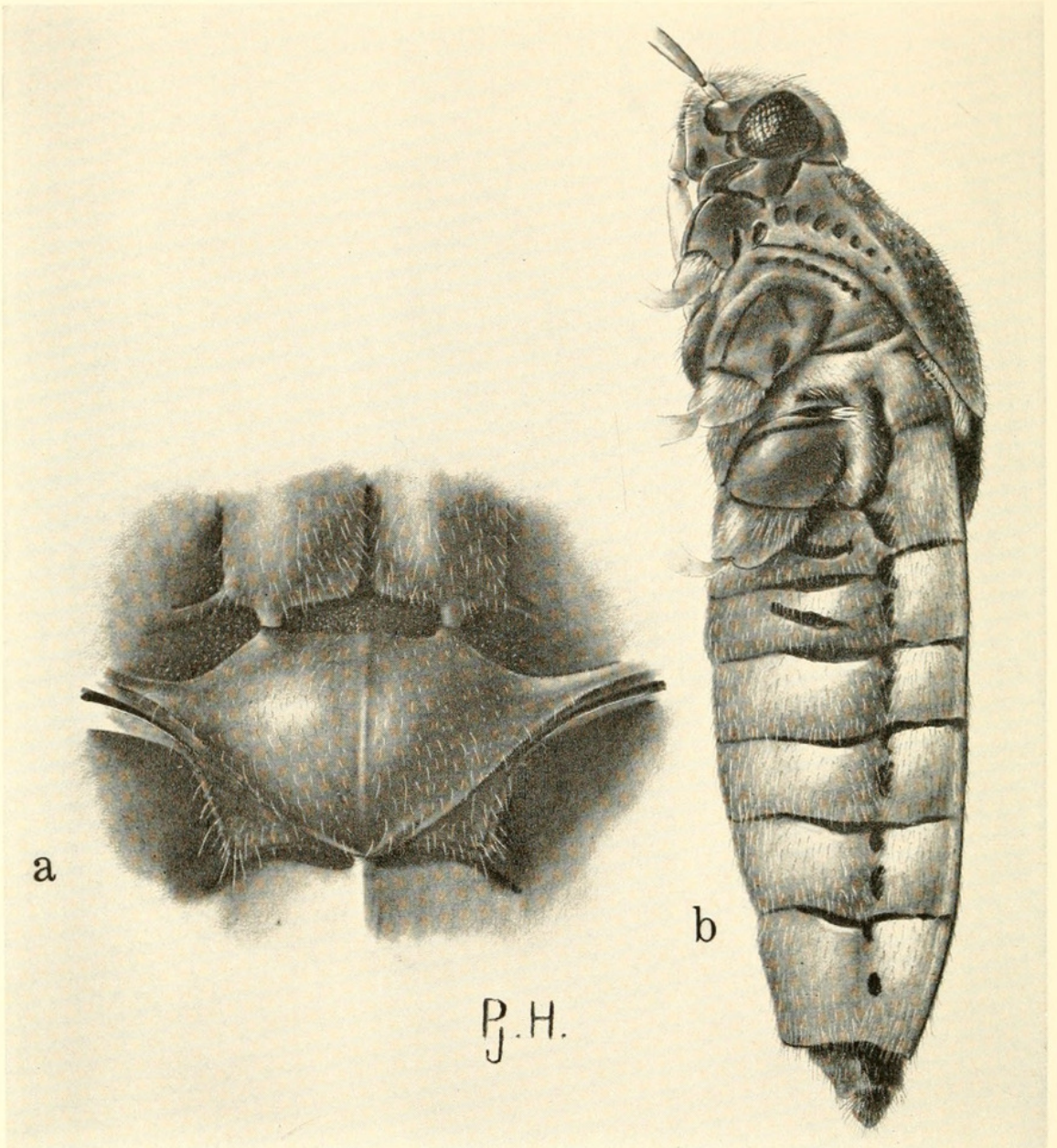
Originally described from an apterous female, netted near Panama





*Velia tersa* Drake and Harris, apterous male paratype: a, dorsal aspect; b, profile showing abdominal sulci or furrows, ostiolar canal on metapleuron, and the row of stridulatory pegs on the connexivum; c, hind femur showing armature of spines and the filelike rasping structure.

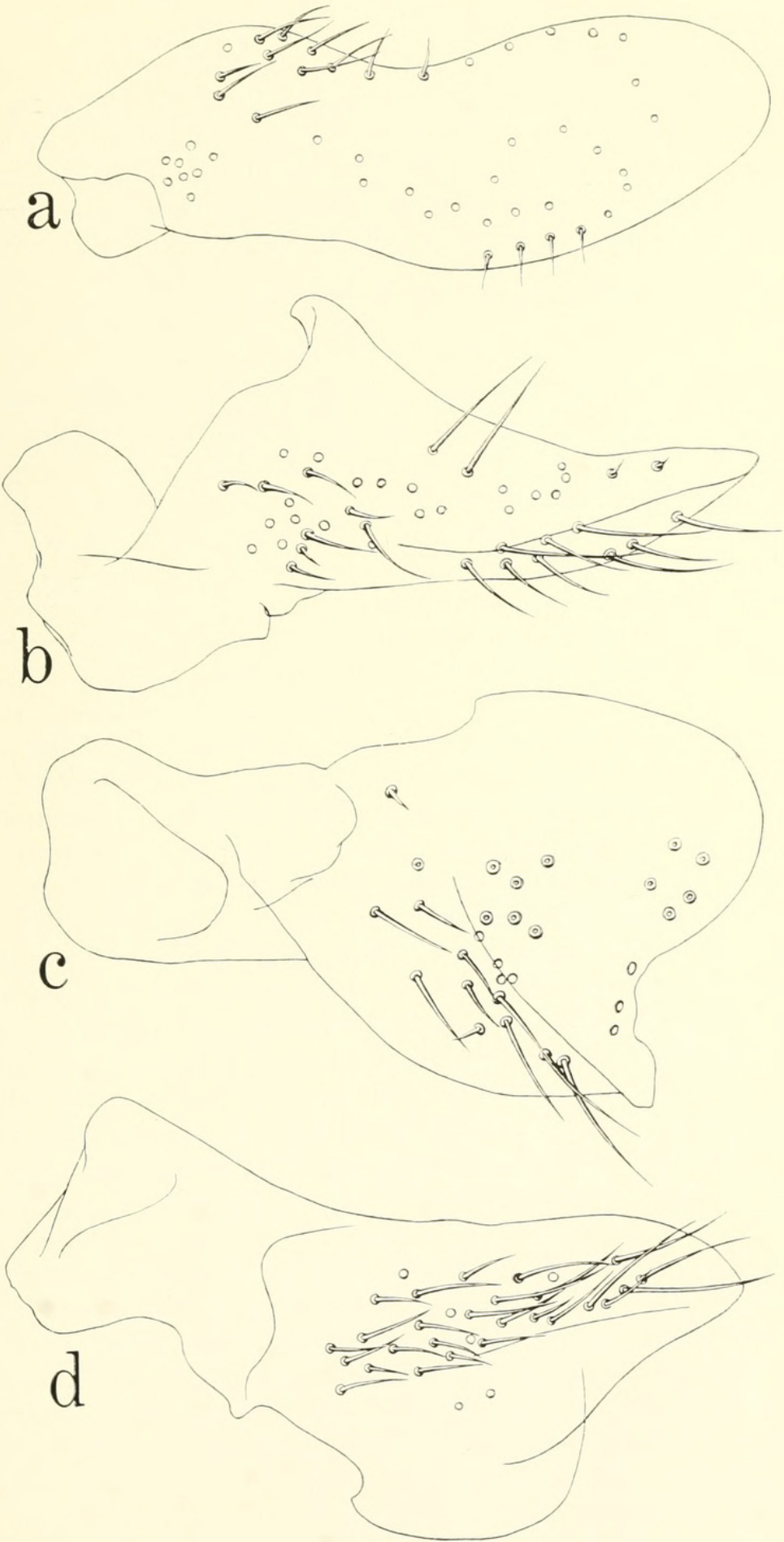




*Velia epeixis* Drake and Menke, new species, female paratype: a, ventral view of metasternal omphalium showing ostiolar canal leading from apex of omphalium to dorsum of metapleuron; b, lateral aspect showing ostiolar canal of scent glands on metapleuron (note hairs at apex of sulcus) and abdominal sulci on segments II and III.

(Explanation of plate 3)

Right parameres of: a, *Velia tersa* Drake and Harris; b, *Velia cinctipes* Champion; c, *Velia epeixis* Drake and Menke, new species; d, *Velia pueblana* Drake.



For explanation, see opposite page.



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