

TAXONOMIC NOTES ON THE GENUS *HETEROMYIA* SAY,  
AND A NEW SPECIES FROM NICARAGUA  
(DIPTERA: CERATOPOGONIDAE)

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ABSTRACT

The 2 North American species of *Heteromyia* Say (*fasciata*, *prattii*) are differentiated and illustrated, and a key is provided. A new species, *Heteromyia wokei* from Nicaragua, is described and illustrated. The pupa of *Heteromyia* is described and illustrated for the 1st time from *H. wokei* and *H. clavata* Williston. *Heteromyia rufa* Kieffer and *H. caloptera* Kieffer are junior synonyms of *H. clavata* (NEW SYNONYMY).

*Heteromyia* Say is a small genus of essentially tropical biting midges with 2 species presently known from North America. The Neotropical species were revised by Duret and Lane (1955). Some confusion as to the limits of the genus and the identities of the North American species resulted when Malloch (1915) placed some species of *Palpomyia* with swollen fore femora in *Heteromyia*. Later Johannsen (1943) correctly reallocated these to *Palpomyia* and provided a list of the North American species. Also, Johannsen (1952) published a key to the North American species, in which he considered *festiva* (Loew) and *prattii* (Coquillett) to be varieties of *fasciata* Say. Wirth (1965) synonymized *festiva* and *prattii* with *fasciata*.

A re-examination of the type series of *prattii* and a re-evaluation of the original descriptions of Loew (1861) for *festiva* and Coquillett (1902) for *prattii* prompted us to examine more closely the North American species. We found that Say (1825) had described *fasciata* as "abdomen with a silvery sericeus reflection," whereas Loew (1861) had described *festiva* as "abdomen niveo-micans" and "abdomen foeminae candido-micans." From these descriptions there can be little doubt that *festiva* is a junior synonym of *fasciata*. The description of *prattii* by Coquillett (1902) does not mention specimens with whitish pruinosity on their abdomens, but the type series includes specimens with and without whitish pruinosity. An examination of specimens with non-pruinose abdomens reveals that the segments are banded alternately with pale and dark bands. Both male and female specimens of pruinose and non-pruinose forms were mounted on slides to determine whether there were other differences. The examination of male genitalia indicated that there are differences in both the aedeagus and claspettes in the 2 forms. We conclude therefore that *fasciata* and *prattii* are distinct species; the former has a pruinose abdomen, and the latter has a banded and non-pruinose abdomen.

In this paper we provide descriptions, illustrations, and a key to the North American species, and we describe for the 1st time the pupa of *Hetero-*

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*myia*. In addition, we take this opportunity to describe a new species from Nicaragua and the pupa of *H. clavata* Williston and to synonymize *H. rufa* Kieffer and *H. caloptera* Kieffer with *H. clavata*.

Unless otherwise indicated, specimens are part of the collections of the National Museum of Natural History (USNM) in Washington where the types of our new species will be deposited. Material of *H. fasciata*, *H. prattii*, and *H. clavata* has been deposited in the Florida State Collection of Arthropods in Gainesville. For general terminology of Ceratopogonidae see Wirth (1952); terms dealing with male genitalia are those of Snodgrass (1957).

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#### Genus *Heteromyia* Say

*Heteromyia* Say, 1825: plate 35 (1859:79). Type-species, *Heteromyia fasciata* Say, by monotypy.

*Pachyleptus* Walker, 1856:426. Type-species, *Pachyleptus fasciatus* Walker, by monotypy.

*Diagnosis*.—A genus of large heteromyiine biting midges distinguished from all other ceratopogonid genera by the following combination of characters: fore femur greatly swollen with 20-30 spines; wing fasciate; hind claw of female greatly enlarged with inner claw smaller than the other.

*Description*.—Body slender, nearly bare. Eyes bare, broadly separated. Palpus slender, 5 segmented; 3rd segment without pit. Female antenna with proximal 8 flagellomeres oval, distal 5 elongate; male antenna with distal 3 flagellomeres elongate, plume sparse. Scutum robust with anterior spine. Fore femur greatly swollen, bearing 20-30 spines; fore tibia arcuate; 4th tarsomeres of male and on fore and mid legs of female cordiform, greatly elongated on hind leg of female; claws of male and fore and mid legs of female small, equal, but outer claw greatly elongated on hind leg of female with a smaller inner claw; 5th tarsomeres unarmed, those on fore leg of female slightly inflated. Wing slender, fasciate; macrotrichia absent; 1 or 2 radial cells present even within a single species; costa extending 0.75-0.80 of wing length. Female abdomen lacking gland rods; 2 well-developed spermathecae present. Male genitalia with 9th tergum tapering with small cerci; basimere and telomere elongate, slender, simple; aedeagus with short basal arch, distal portion with modified tip, basal arm well developed, short; claspettes divided, basal arm well developed, distal portion slender.

*Pupa*.—The pupa of *Heteromyia* differs from that of *Clinohelea*, the only other heteromyiine genus whose pupa has been described, by its greatly elongated apicolateral processes on the abdomen, and by the small tubercles with very short setae on the operculum. The pupa of *Clinohelea bimaculata* (Loew) has normal apicolateral processes and large, greatly elevated tubercles with long setae on the operculum (Wirth 1951, Grogan and Wirth 1975).

*Relationships*.—*Heteromyia* apparently is most closely related to *Pellucidomyia* Macfie, the females of which have enlarged hind claws and lack bifid 4th tarsomeres. The wing of *Pellucidomyia* is unspotted, and it lacks swollen fore femur with spines, *Heteromyia* being the only genus in the

tribe Heteromyiini having a swollen fore femur with spines. The only other heteromyiine genus with enlarged hind claws is *Tetrabezzia* Kieffer, which, along with *Ceratobezzia* Kieffer, *Clinohelea* Kieffer, and *Metahelea* Edwards, has fasciate wings and females with bifid 4th tarsomeres bearing spines.

KEY TO THE NORTH AMERICAN SPECIES OF *Heteromyia*

1. Dorsum of female abdomen with whitish pruinosity; male aedeagus with narrow tip ..... *fasciata* Say
- 1'. Dorsum of female abdomen without whitish pruinosity; male aedeagus with expanded tip ..... *prattii* Coquillett

*Heteromyia fasciata* Say  
(Fig. 1a-e,2)

*Heteromyia fasciata* Say, 1825:plate 35 (1859:80) (no type locality: "of rather frequent occurrence"; Malloch, 1915:360 (key); Kieffer, 1917:325 (key); Johannsen, 1943:783 (list); Johannsen, 1952:163 (figs.; key); Wirth, 1965:137 (distribution; syns.: *festiva*, *prattii*).

*Ceratopogon festivus* Loew, 1861:314 (male, female; Pennsylvania).

*Heteromyia festiva* (Loew); Malloch, 1915:360 (combination; key); Kieffer, 1917:325 (key); Johannsen, 1943:783 (list); Johannsen, 1952:163 (key; variety of *fasciata*); Wirth, 1965:137 (syn. of *fasciata*).

*Diagnosis*.—Females: Wing length 2.71–3.49 mm. A large subshining species with brown legs, yellow on mid femur and distal 1/3 of hind femur; dorsum of abdomen with whitish pruinosity; wing fasciate (Fig. 1d); fore and mid claws small and equal, outer hind claw greatly elongated with a smaller, inner claw (Fig. 1e). Males: Similar to female but smaller and slightly darker aedeagus (Fig. 1b) with narrow tip; claspettes (Fig. 1c) with slender, slightly swollen, distal portions and short, slightly-expanded, basal arms.

*Distribution*.—Massachusetts south to Florida; locality records plotted in Fig. 2.

*Types*.—Types of *H. fasciata* lost. Types of *Ceratopogon festivus* Loew collected by Osten Sacken in Pennsylvania are in the Museum of Comparative Zoology, Cambridge, Massachusetts.

*Specimens Examined*.—CONNECTICUT: New London Co., Lyme, 11-VII-1918, W. S. Fisher, 1 female. FLORIDA: Baker Co., Glen St. Mary, V-1971, F. S. Blanton, light trap, 1 female. Duval Co., Jacksonville, Mrs. A. T. Slosson, 2 females. Putnam Co., Lon's Lake, V-1971, F. S. Blanton, light trap, 3 females; Redwater Lake, 27-V-1967, F. S. Blanton, 1 female. Santa Rosa Co., Blackwater River Biol. Sta., 21-V-1971, G. B. Fairchild, light trap, 1 female. MARYLAND: Prince George's Co., Beltsville, 1-VI-1916, R. C. Shannon, 1 male. MASSACHUSETTS: Barnstable Co., Woods Hole, Melander coll., 3 females. NEW JERSEY: Burlington Co., Riverton, 20-VI-1909, 1 female.

*Heteromyia prattii* Coquillett  
(Fig. 1f-h,3)

*Heteromyia prattii* Coquillett, 1902:88 (female; Virginia); Wirth, 1965:137 (syn. of *fasciata*).

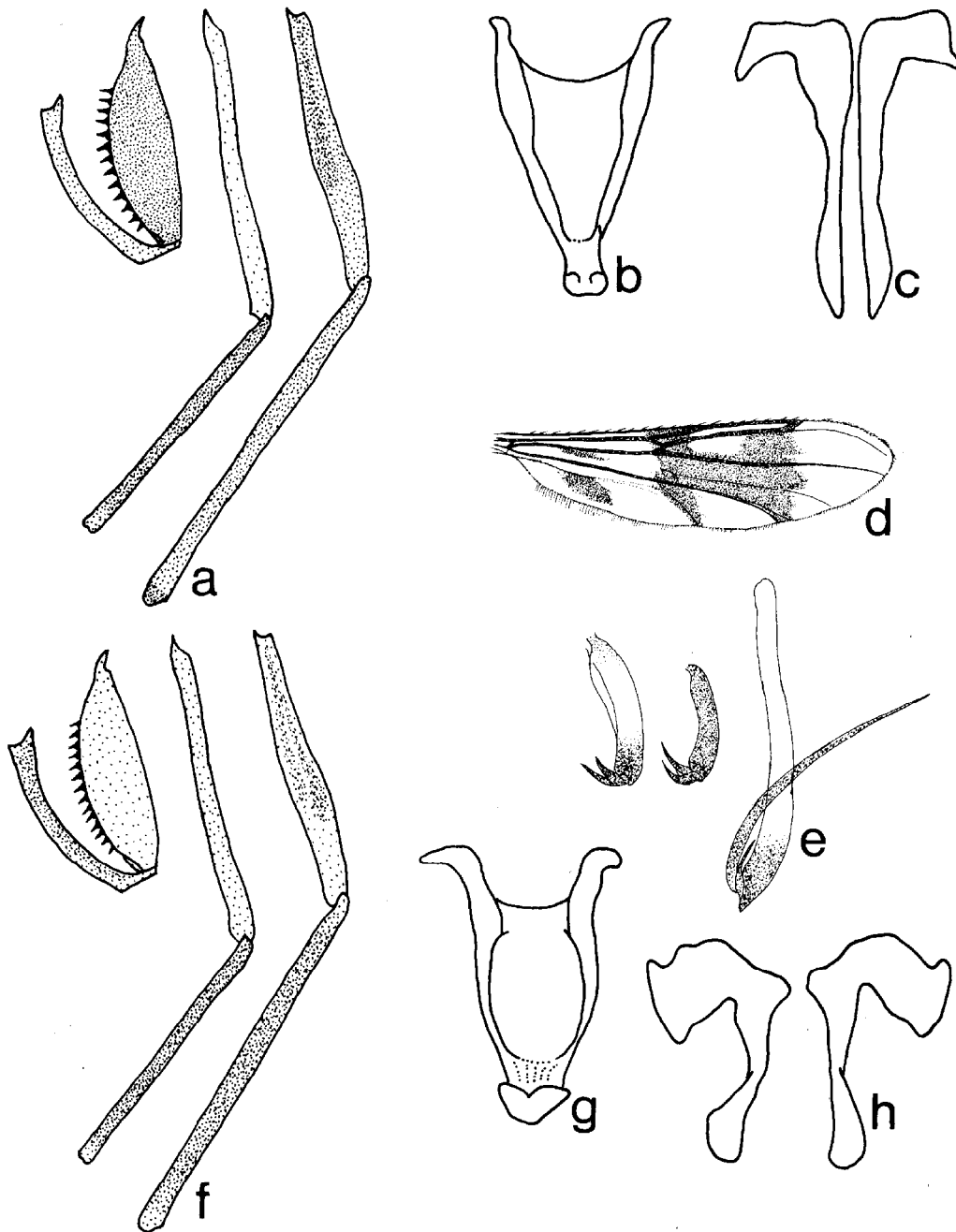


Fig. 1. *Heteromyia fasciata*: a-e. *H. prattii*: f-h. a, f, leg pattern; b, g, male aedeagus; c, h, male claspette; d, female wing; e, female 5th tarsomeres and claws.

*Heteromyia prattii* Coquillett; Malloch, 1915:360 (key; Wisconsin record); Johannsen, 1943:783 (list); Johannsen, 1952:163 (key; variety of *fasciata*).

*Diagnosis*.—Very closely related to *H. fasciata* but a slightly larger and darker species lacking whitish pruinosity on the dorsum of the ab-

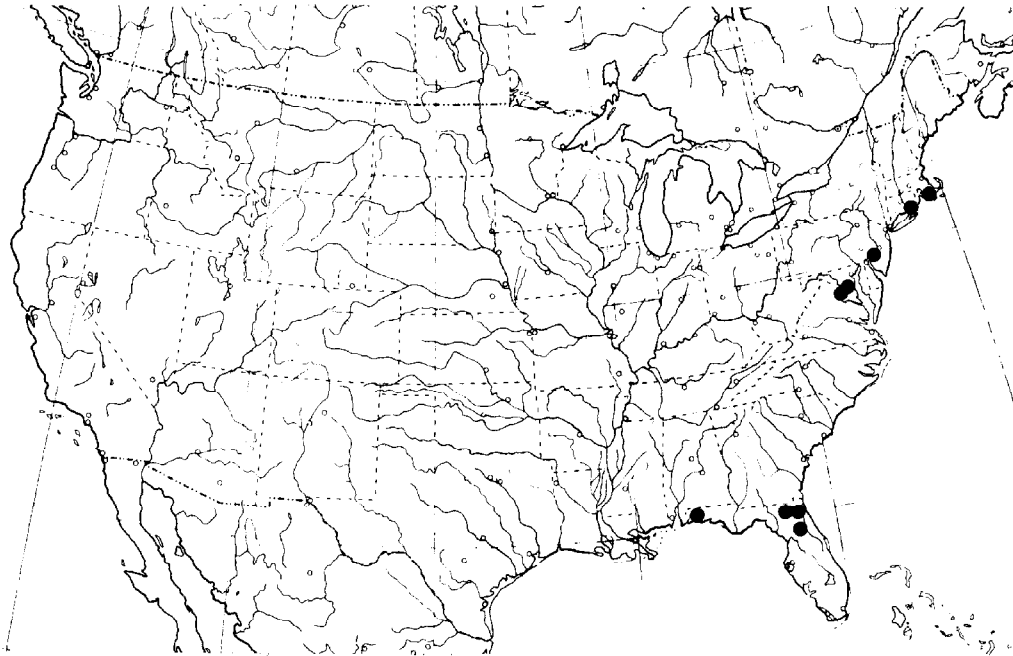


Fig. 2. North American locality records of *Heteromyia fasciata*.

domen. Females: Wing length 2.95-3.77 mm. Legs (Fig. 1f) yellowish brown; proximal 2/3 of hind femur dark brown; mid and hind tibiae dark brown to blackish. Abdomen with conspicuous segmental alternating pale and dark bands. Males: Similar to female but smaller and slightly darker; aedeagus (Fig. 1g) with expanded tip; claspettes (Fig. 1h) with expanded distal portions and very broad basal arms.

*Distribution.*—Illinois east to Massachusetts and south to Florida; locality records plotted in Fig. 3.

*Types.*—Syntypes, 4 females, St. Elmo, Alexandria, Virginia, 9-22-VI-1901, F. C. Pratt. Lectotype (Type no. 6163, USNM) here designated, a large female collected 91VI-1901, F. C. Pratt, scutum entirely black, mid and hind femora extensively brown, and abdomen non-pruinose.

*Specimens Examined.*—FLORIDA: Hardee Co., Ona, VII-1970, E. Irons, light trap, 2 females. Highlands Co., Archbold Biological Station, 13-19-IV-1970, W. W. Wirth, 1 male. Wakulla Co., Ochlockonee River St. Park, 29-IV-1970, W. W. Wirth, light trap, 9 females. ILLINOIS: McHenry Co., McHenry, VI-1900, 1 female. MASSACHUSETTS: Middlesex Co., Framingham, 6-VII-1950, C. A. Frost, 1 female. MICHIGAN: Grand Traverse Co., 10-VI-1949, R. R. Dreisbach, 1 female. Manistee Co., 27-VI-1957, R. and R. Dreisbach, 1 female. Mason Co., 7-VII-1951, R. Dreisbach, 1 female. NEW YORK: Suffolk Co., Greenport, L. I., 2-IX-1951, R. Latham, 1 female. VIRGINIA: Alexandria, St. Elmo, 9-VI, F. C. Pratt, 1 female (lectotype); same, 22-VI, 3 females. Alexandria, 11, 14, 29-VI-1952, 6-VII-1952, W. W. Wirth, 1 male, 12 females.

*Heteromyia wokei* Wirth and Grogan, NEW SPECIES  
(Fig. 4a-f)

*Diagnosis.*—Females with reddish-brown legs, yellow on apex of mid femur, distal 1/5 of hind femur, subapical 1/2 of mid tibia, base and sub-

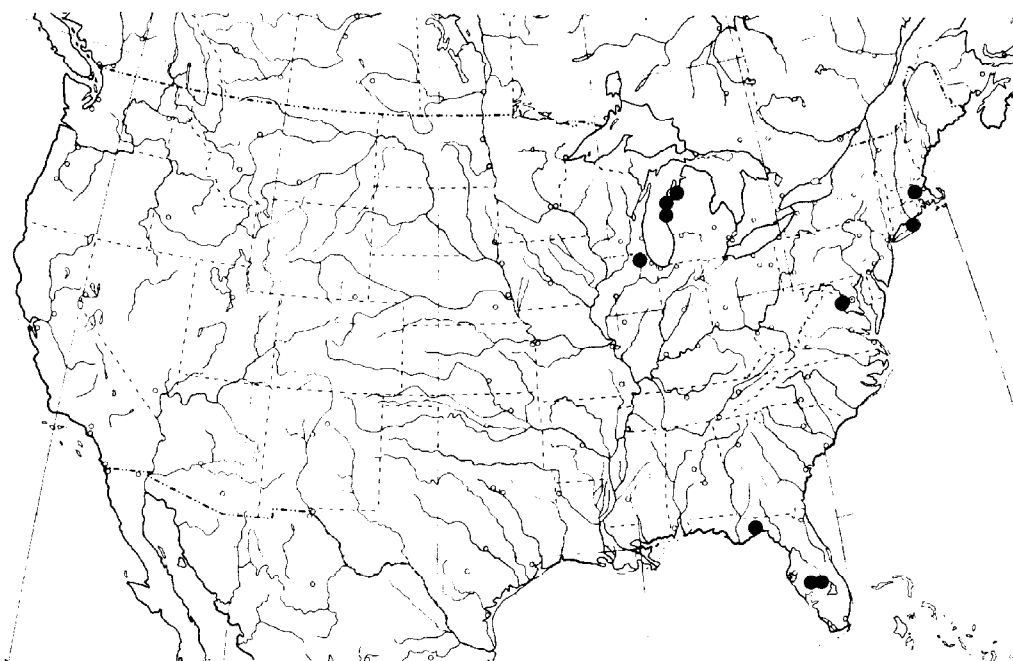


Fig. 3. North American locality records of *Heteromyia prattii*.

apical 1/3 of hind tibia, and tarsi except hind 4th tarsomere; male claspettes with slender, nearly straight basal arms.

*Holotype Female*.—Wing length 3.20 mm; breadth 0.92 mm.

Head: Dark yellowish brown. Proximal 8 flagellomeres pale yellow on basal 1/2, distal 5 flagellomeres pale yellow basally; flagellomeres with lengths in proportion of 13-9-8-8-8-8-8-9-18-17-18-19-22; antennal ratio 1.31. Palpus brown, slender; segments with lengths in proportion of 6-9-15-10-19. Mandible with 8 large teeth on inner margin; outer margin with about 5 small, widely-spaced teeth.

Thorax: Scutum, scutellum, postscutellum dark reddish brown; pleura and sterna lighter reddish brown. Legs (Fig. 4a) reddish brown; apex of mid femur, distal 1/5 of hind femur, subapical 1/2 of mid tibia, base and subapical 1/3 of hind tibia, and tarsi except hind 4th tarsomere yellow; fore femur with 26-27 spines. Wing as in *H. fasciata* (Fig. 1d), costal ratio 0.79. Halter pale.

Abdomen: Brown. Spermathecae small, subequal, ovoid with short necks.

*Allotype Male*.—Smaller, similar to female with the following differences: Antennal pedicel dark brown; proximal 12 flagellomeres light brown, distal 3 flagellomeres dark brown; plume brown. Femora and tibiae dark brown except light brown on broad subapical band of mid tibia. Genitalia as in Fig. 4b. Ninth sternum about twice as broad as long, base slightly curved with a shallow caudomedian excavation; 9th tergum tapering gradually distally, straight on distal 1/4; cercus short, extending well beyond basimere. Basimere nearly straight, about twice as long as broad; telomere slightly longer than basimere, tapering distally with a slightly hooked, pointed tip. Aedeagus lightly sclerotized, about 1.3 times longer than broad; membrane spiculate; basal arm more heavily sclerotized, slightly recurved; distal portion with tip as figured. Claspettes divided;

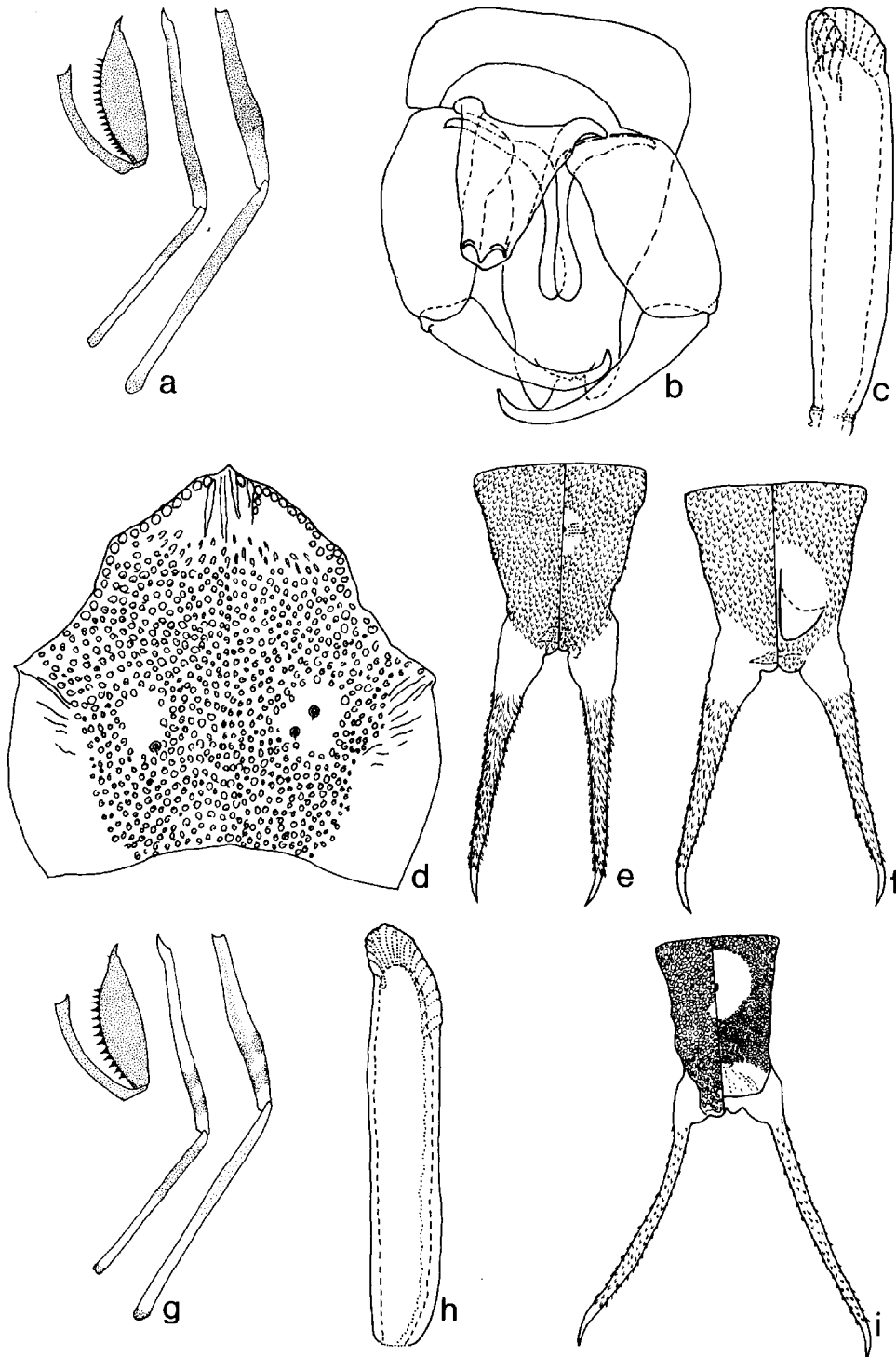


Fig. 4. *Heteromyia wokei*: a-f; *H. clavata*: g-i. a, g, leg pattern; b, male genitalia; c, h, pupal respiratory horn; d, female operculum; e, i, female pupal terminal segments; f, male pupal terminal segment.

distal portion lightly sclerotized with rounded, slightly-bulbous tip; basal arm slender, more heavily sclerotized.

*Pupa*.—Dark brown. Respiratory horn (Fig. 4c) about 5 times longer than broad, surface slightly wrinkled; apex with about 12 spiracles. Female operculum (Fig. 4d) slightly broader than long, surface covered with small, rounded, sclerotized tubercles except as figured; anterior portion with apical, sclerotized striations, tip pointed; central portion with 2 small, circular, slightly-elevated areas bearing 2 tubercles with tiny setae; posterolateral areas slightly raised with light wrinkles; posterior margin concave. Male operculum lost. Female terminal segment (Fig. 4e) 2.5 times longer than broad; dorsum covered with small, pointed tubercles; venter covered with small, pointed tubercles except for a small, circular, central area; apicolateral processes very slender, divergent, covered with small, pointed tubercles as figured. Male terminal segment (Fig. 4f) similar to that of female, differing as follows: ventral genital processes small, surface smooth; apicolateral processes moderately divergent.

*Variation*.—The 2 female paratypes agree with the holotype in size, form and coloration.

*Etymology*.—The species is named in honor of Paul H. Woke who collected the type series, in recognition of his pioneer work on the biology of Neotropical biting midges.

*Distribution*.—Nicaragua.

*Types*.—Holotype, female with its pupal exuviae, allotype male, Bluefields, Nicaragua, 25-VIII-1943, P. A. Woke (Type no. 71162, USNM). Topoparatypes, 2 females, 3 female pupal exuviae, 1 male pupal exuvium.

*Heteromyia clavata* Williston  
(Fig. 4g-i)

*Heteromyia clavata* Williston, 1900:225 (female; Vera Cruz, Mexico); Malloch, 1915:361 (notes; key).

*Heteromyia rufa* Kieffer, 1917:325 (male; Baranquilla, Colombia); Edwards, 1933:87 (descriptive notes; Argentina); Duret and Lane, 1955:36 (key; Argentina). NEW SYNONYMY.

*Heteromyia caloptera* Kieffer, 1919:192 (unnecessary new name for *H. rufa* Kieffer, not Loew 1861). NEW SYNONYMY.

*Diagnosis*.—A yellow-legged species with a pair of dark, narrow, sub-apical bands on mid and hind femora (fig. 4g).

*Pupa*.—Dark brown. Respiratory horn (Fig 4h) nearly 5 times longer than broad, surface smooth; apex with 20-25 spiracular papillae. Operculum lost. Female terminal segment (Fig. 4i) 3 times longer than broad; dorsum covered with small, rounded tubercles; venter covered with small, rounded tubercles except as figured; apicolateral processes greatly divergent, covered with small, pointed tubercles.

*Distribution*.—Mexico south to Argentina.

*New Records*.—BRAZIL: Amazonas, Rio Madeira, Parana Madeirinha, 10-IX-1960, E. J. Fittkau, at light, 1 female. Ilha Parintuis, Patucho, Rio Amazon, 11-IX-1969, H. A. Wright, at light, 13 females. MEXICO: Vera Cruz, San Rafael, C. H. T. Townsend, coll., 1 female. PANAMA: Almirante, Bocas del Toro Prov., 15-IV-1953, F. S. Blanton, light trap, 1 female. Rio Trinidad, 2-VI-1912, A. Busck, 1 female. Canal Zone, Juan Mina Sta-



tion, 3-VI-1939, G. B. Fairchild, reared from *Cabomba* (Nymphaceae), 1 female with pupal exuvium. Canal Zone, 5 mi. up Rio Chagas, 24-VIII-1918, H. Morrison, 2 females.

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