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New *Ommatius* Wiedemann from the Americas with two new species groups, keys, and taxonomic notes (Diptera: Asilidae)

Aubrey G. Scarbrough
Visiting Scholar
Department of Entomology
University of Arizona, Tucson, AZ 85741

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New *Ommatius* Wiedemann from the Americas with two new species groups, keys, and taxonomic notes (Diptera: Asilidae)

Aubrey G. Scarbrough

Visiting Scholar

Department of Entomology

University of Arizona, Tucson, AZ 85741

E-mail: saubrey05@q.com

Abstract: Two species groups are proposed for *Ommatius* Wiedemann, normus and tibialis species groups, increasing the number to eight groups from the Americas. The normus group includes six species, two of which are new, *O. nebulosus* n. sp. and *O. tepui* n. sp., from Venezuela. This species group thus far extends from Venezuela southward into Paraguay and southern Brazil. *Ommatius pulcher* (Engel) is redescribed and a neotype designated. The tibialis group includes eight previously described species from eastern and southwestern United States. *Ommatius gemma* Brimley is transferred to the costatus group. Keys to the eight species groups and the species of the normus group with illustrations of diagnostic characters are provided. Notes and new distribution data are given for previously described species. The spelling of *Ommatius norma* Curran and *O. ruficauda* Curran are changed to agree in gender with the genus name, which is masculine.

Key words: Diptera, Asilidae, Robber flies, *Ommatius*, normus and costatus species groups, new species, Americas

Introduction

Ommatius Wiedemann is one of the larger genera of Asilidae in the Americas with 120 valid species (Bullington and Lavigne 1984; Martin and Papavero 1970; Scarbrough 1990, 1994, 2000, 2002, 2007; Scarbrough and Perez-Gelabert 2003, 2006; Scarbrough and Poinar 1993; Scarbrough and Rutkauskas 1983; Vieira et al. 2004, 2005). In reviewing the Neotropical fauna, Scarbrough (1990, 1994, 2000, 2003) and Scarbrough and Perez-Gelabert (2006) proposed 6 species groups. Several unplaced species from the West Indies are currently under study and will be included in a synopsis of the genus when all groupings are established. This paper proposes two additional species groups, the Neotropical normus and Nearctic tibialis groups, consisting of six and eight species, respectively. Two species of the normus group are described from Venezuela. Keys are provided for the eight species groups and the species of the normus group including illustrations of diagnostic characters. *Ommatius pulcher* (Engel) is redescribed and a neotype designated. Notes and new distribution records are given on the previously described species when data are available.

Materials and Methods

Specimens cited in this paper are housed at the following institutions (Arnett et. al 1993): (AMNH) - American Museum of Natural History, NY, USA; (ANSP) - Academy of Natural Sciences, Phil., PA, USA; (BMNH) - The Natural History Museum, London, England; (CASC) - California Academy of Sciences, San Francisco, CA, USA; (CMNH) - Carnegie Museum of Natural History, Pittsburgh, PA, USA; (CNCD) - Biosystematics Research Institute, Agriculture and Agri-Food Canada, Ottawa, Canada; (CUIC) - Cornell University, Ithaca, NY, USA; (DZUP) - Universidade Federal do Paraná, Museu de Entomologia Pe. Jesus Santiago Moure, Paraná, Curitiba, Brazil; (EMFC) Eric M. Fisher Collection, Sacramento, California, USA; (IMLA) - Universidad Nacional de Tucuman, Fundacion e Instituto Miguel Lillo, Argentina; (JMAL) - Jose Manuel Ayala Lamas, Pleasanton, CA, USA; (MCZC) - Museum of Comparative Zoology, MA, USA; (MEMC) - Mississippi Entomological Collection, Mississippi State University, MI, USA; (MCZC) - Museum of Comparative Zoology, Cambridge, MA, USA; (MIZA) - Museo del Instituto de Zoología Agrícola, University of Central Venezuela, Maracay, Venezuela; (MZSP) - Museu de Zoologia da Universidade de São Paulo, Brazil; (NMNH) - National Museum of Natural History, Smithsonian Institution, Washington, DC, USA; (OSUC) - Ohio State University Collection, Columbus, OH, USA; (UCDC) - Bohart Museum of Entomology, University of California, Davis, CA, USA; (ZMAN) - Universiteit Van

Amsterdam, Instituut voor Taxonomische Zoologie, Zoologisch Museum, The Netherlands; (ZSMN) - Zoologische Staatssammlung München, Germany.

Descriptions are based on all available specimens. Morphological terminology follows McAlpine (1981). Terminalia were removed, treated in warm KOH, and rinsed in 70% ETOH with a drop of acetic acid. They were transferred to glycerin for 2-3 days and then illustrated. Pencil illustrations were scanned and traced using Adobe Photoshop software. Later, terminalia were placed in polyethylene microvials with glycerin for permanent storage and attached to respective specimen pins. Wings were photographed attached to specimens and traced in Photoshop. Measurements were made using an ocular micrometer in the eyepiece of a Meiji dissecting microscope. Body length was measured from the foremost protrusion of the face to the apex of the terminalia. Wing length was measured from the articulated base to the apex. Data were recorded in a standard format with each line denoted by a forward slash [/] and a second label by a tilde [~]. Dates were recorded sequentially as day, month [Roman], and year. Brackets [] denote useful information not found on labels. Countries in bold full capitals are recorded only at the beginning of the data set and indicate that all following specimens are from that country; states are in lower case bold letters. Non-type and type material with museum acronyms appear in parentheses at the end of the label data. Distribution/flight season is determined from data labels of museum specimens. Abbreviations of diagnostic structures appear in the first figures unless indicated otherwise.

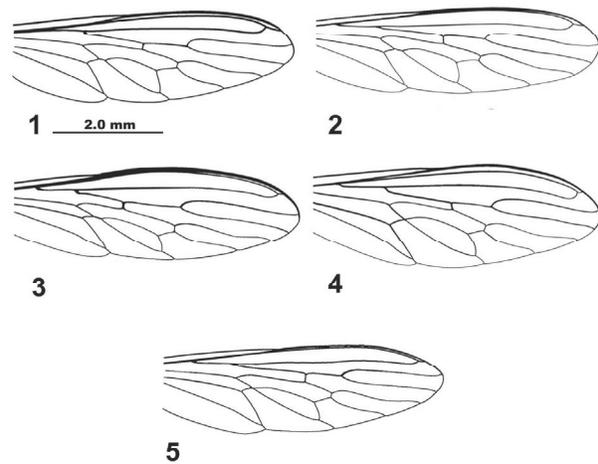


Figure 1-5. Right wing of *Ommatius* spp. **1)** *O. nebulosus* n. sp. **2)** *O. neotropicus* Curran. **3)** *O. normus* Curran. **4)** *O. pulcher* (Engel). **5)** *O. ruficaudus* Curran.

Taxonomy

Key to *Ommatius* species groups in the Americas

1. Scutellum usually with stout marginal bristles **2**
- Scutellum usually without stout marginal bristles, if present then thin **6**

- 2(1). Stout anepimeral bristle present **3**
- Stout anepimeral bristle absent, sometimes long setae or slightly bristly setae present **4**

- 3(2). Hind femora of male with basal anteroventral bristles usually shorter and thinner than those apically, latter usually increasing in length and thickness toward apex of hind femora **holosericeus group**
- Hind femora of male with basal anteroventral bristles longer and thicker than those apically, latter usually decreasing in length and thickness toward apex of hind femora **amplicatus group**

- 4(2). Fore femora of male with abundant, small, hooked setae posteriorly; legs with unusually long bristles, at least 2/3 as long as respective tibiae or tarsi; basal tarsomere of hind tarsi swollen, about 1/4 wider than adjacent tarsomere; 2-3 sternites with unusually modified vestiture, often forming dense clusters of long dense setae or abundant bristles, bristles often erect single or fused, pencil-shaped with uniform diameters or angular, apices pointed, blunt, clubbed, or flat; sternite 8 of female much longer than wide, apical margin with narrow fissure medially; anepimeron setae sometimes bristly **lucidatus group**

- Leg and abdominal characters of male normal, not forming dense patterns or enlarged structures as listed above, bristles and setae round in cross-section with acuminate apices, former usually sparse, a few present laterally, in apical corners, or along apical margin; sternite 8 of female wider than long, apical margin without fissure medially; anepimeral setae never bristly **5**
- 5(4). Hind femora swollen, usually < 4.5 times longer than wide in anterior view, row of posteroventral bristles divided into basal and apical groups, separated by wide bare space; epandrium with 2-3 long bristly setae or bristles laterally; base of m_1 narrow, at most 1/2 as wide as diameter at basal 1/3; distiphallus usually horizontal, only slightly depressed or elevated, and tubular, wide in cross-section apically **normus group**
- Hind femora more slender, usually 5-6 times longer than wide in anterior view, row of posteroventral bristles not divided into two groups or separated by wide bare space; epandrium without long bristly setae or bristles laterally (except *O. alexanderi* Farr and *O. spinosus* Scarbrough); base of m_1 wider, usually 2/3-3/4 as wide as diameter at basal 1/3; distiphallus curved or angled ventrally, narrow in cross-section apically **costatus group**
- 6(1). Hind femora of male swollen and arched, about 3 times longer than wide medially, anteroventral bristles unusually long, about 1/3 as long as hind femora; posteroventral bristles flat with round apices; hind tibiae clubbed apically; segments 7-8 of female with several unusually long, stout bristles laterally sternite 8 of female strongly produced apically, apical margin with a prominent truncate or acuminate spine medially, transverse band of numerous long and short stout bristles present posteriorly **hanebrinki group**
- Hind femora and hind tibiae of male slender, neither swollen, arched, or clubbed apically, hind femora > 3 times longer than wide medially, bristles not unusually long, about 1/5 as long as hind femora, round in cross-section and tapered to acuminate apex; segments 7-8 of female without unusually stout bristles laterally; sternite 8 of female not strongly produced, apical margin with shallow W-shaped or U-shaped notch, V-shaped row of 8-10 bristly setae or bristles present posteriorly **7**
- 7(6). Scutellum with thin marginal bristles or setae; anepisternum sometimes with bristly setae; epandrium constricted preapically, dorsal corner abruptly projected dorsally; aedeagus thick apically, apex depressed abruptly, usually without a spine-like ventral spire (except in *O. praestigiatius* Scarbrough and *O. integerrimus* Scarbrough) **pumilus group**
- Scutellum without marginal bristles; anepisternum bare, if setae present never bristly; epandrium usually notched dorsoapically, not abruptly angled dorsally; aedeagus thinner apically, stylet-like with acuminate apex, and projecting horizontally beyond aedeagal sheath; ventral spire present **tibialis group**

Ommatius Normus SPECIES GROUP

This group consists of six species and is thus far limited to Brazil, Guyana, Paraguay, Suriname, and Venezuela. Its similarity to the costatus species group suggests that it is derived from within that lineage. The normus species group is distinguished from other congeners by the following: 1) posteroventral bristles on the hind femora are either absent or sparse; if present the bristles usually form two groups which are separated by a wide bare space, one at the extreme base and another on the apical 1/3-1/4, and usually consisting of 1-2 bristles basally and 1-5 apically; the male hind femora are usually swollen; 2) cell r_4 is horizontal, only slightly divergent with sides nearly straight, only slightly wider at the wing margin (Fig. 1-5); 3) base of cell m_1 narrow, 1/3-1/2 as wide as cell at basal 1/3 (Fig. 6, 15, 24, 33, 42); 4) epandrium with 1-3 long bristly setae or stout bristles which are longer and thicker than the surrounding setae (Fig. 1, 15, 24, 34, 43); 5) distiphallus horizontal, tubular and thick in cross-section (Fig. 12, 21, 30, 39, 48, 55), the anterior corners of the aedeagal sheath extend forward and fuse below the distiphallus, forming a transverse plate (Fig. 11-12, 20-21, 29-30, 38-39, 47-48); and 5) spermathecae usually 3-5 times longer than wide, often strongly constricted medially (Fig. 14, 23, 32, 41).

Key to species of the normus species group

1. Hind femora of male greatly swollen, 3.1-3.7 times longer than wide medially in anterior view 2
 — Hind femora of male moderately swollen, 4.0-4.7 times longer than wide medially in anterior view 5
- 2(1). Marginal scutellar bristles present 3
 — Marginal scutellar bristles absent 4
- 3(2). Femora reddish-brown or brown anteriorly; middle femora of female with numerous brown setae anteroventrally; hind femora of male with 5-6 anteroventral bristles; wing often with costa, r_1 , and r_{2+3} cells brown; epandrium short and wide apically, narrowed ventrally, curved posteriorly; ventral lamella simple, basolateral margin swollen; spermathecae 4.5-5.5 times longer than wide, with strong constriction beyond middle; terminalia as in Fig. 24-32 ***O. normus* Curran**
 — Femora mostly yellow, brown apically; middle femora of female with yellow vestiture ventrally, at most with 1-2 brown bristly anteroventral setae; hind femora of male usually without anteroventral bristles, sometimes 1-2 bristles apically; wing hyaline, at most slightly yellowish; epandrium narrow, horizontal, not curved posteriorly; ventral lamella with 2 long, narrow triangular plates ventrally, basolateral margin not swollen noticeably; spermathecae shorter, 2.5-3.0 times as long as wide, base wider, constriction absent; terminalia as in Fig. 15-23 ***O. neotropicus* Curran**
- 4(2). Wing yellowish with dense brownish-yellow microtrichia; cell r_2 wide apically, apex rounded (Fig. 4); dorsocentral bristles usually black, rarely 1-2 yellow; thoracic pleura entirely and abdomen largely yellowish-gray or gray tomentose; hind femora of male with long, stout, acuminate posteroventral bristles; terminalia as in Fig. 33-41 ***O. pulcher* (Engel)**
 — Wings hyaline with paler microtrichia; cell r_2 narrow apically, apex pointed (Fig. 5); three pairs of yellow dorsocentral bristles; thoracic pleura entirely yellow tomentose, abdomen largely yellow tomentose in males, paler in females; hind femora of male with short, peg-like posteroventral bristles, apices of 3-4 bristles rounded; terminalia not as in Fig. 33-41 ***O. ruficaudus* Curran**
- 5(1). Epandrium horizontal, apex narrow, pointed; apex of gonostylus minutely forked; mediolateral process simple, neither long or flat; aedeagal sheath narrow anteriorly, wider posteriorly; 3 times longer than wide, constriction absent (Fig. 6-14) ***O. nebulosus* n. sp.**
 — Epandrium curved dorsally, apex wider, truncate; apex of gonostylus entire; mediolateral process of gonocoxite long and flat; aedeagal sheath of uniform width dorsally (Fig. 42-48); female unknown ***O. tepui* n. sp.**

***Ommatius nebulosus* n. sp.**

Fig. 1, 6-14

Description, male. Black. Body 8.6-10.8 mm; wing 6.2-7.4 mm. *Head:* Face yellow tomentose, vestiture largely yellow setose, 4-6 thin brown bristles in 2 rows; face at antennae 1/6-1/9 as wide as head. Palpus and proboscis yellow or white setose. Antennae, frons, and ocellar tubercle brown setose; flagellum 2-2.4 times longer than wide. Frons and ocellar tubercle yellowish-brown or brown tomentose. Occiput largely gray tomentose, yellowish-gray dorsally, setae largely white; 3-4 thin brown postocular bristles above each eye, proclinate on apical 1/3-1/2.

Thorax: Largely brown tomentose, margins narrowly dull yellow or yellowish-gray; vestiture brown, setae largely absent, sparse along narrow margins; 4 lateral and 2 dorsocentral bristles. Scutellum dull yellowish-gray tomentose with sparse, short, yellowish setae and 2 blackish marginal bristles, latter

about as long as dorsocentral bristles. Pleura yellowish-gray or gray tomentose, vestiture pale; long thin anepimeral seta present, bristle absent; halter yellow or reddish-yellow.

Wing (Fig. 1): Costal margin straight, dilation absent; apical 1/3 and narrow posterior margin dense microtrichia, sparse or absent basally. Crossvein r-m just beyond middle of cell d; R_{4+5} at or just beyond base of m_1 ; base of m_1 narrow, sides much wider beyond, with basal 1/3 of cell 1.5-2.5 times wider than cell base.

Legs: Coxae yellowish-gray tomentose with abundant long, thin pale vestiture. Femora largely yellow, apical 1/3 of fore femora anteriorly and dorsally, and apical 1/3 of hind femora entirely dark brown or black; setae largely yellow, long and thin ventrally; bristles largely brown, 3 each on middle and hind femora anteriorly. Middle femora with several setae anteroventrally, usually yellow, sometimes 3-4 brown medially, bristles absent; preapical, yellow posterodorsal bristle thin. Hind femora usually with 3-4 stout, brown anteroventral bristles apically, 2-3 much longer, thinner, and yellow bristles basally; 1-2 preapical posteroventral bristles present; hind femora swollen, 4-4.5 times longer than wide. Fore and middle tibiae entirely yellow, apical 1/3 of hind tibiae brown; setae largely yellow, long ventrally, about 1/3 as long as tibiae; bristles unusually thin, largely brown, yellow on fore tibia; hind tibiae with short, asymmetrical apex, spur-like bristle. Tarsi largely brown with dark brown bristles, 1-2 yellow bristles present on basal tarsomere of fore and middle tarsi.

Abdomen: Sides parallel, only slightly wider apically. Most tergites largely brown tomentose with dark brown setae dorsally, yellowish-gray with pale setae laterally; tergite 1 and basal 1/3 of 2 gray tomentose; sternites gray or brownish-gray tomentose with pale setae.

Terminalia (Fig. 6-12): Largely brown, yellowish setose. Ventral lamella simple, not visible in lateral view. Epandrium short and narrow, apex pointed; 1 long brownish bristly seta laterally. Gonostylus flat, apical 1/3 narrow and slightly curved anteriorly, apex forked, basal 2/3 wide with numerous setae. Gonocoxite with narrow band of setae along dorsal margin, gonocoxal process simple, not unusually long or wide. Distiphallus horizontal, sheath in dorsal view narrowed anteriorly, wider posteriorly, with pair of ventral plates; distiphallus tubular, apex open dorsally. Hypandrium triangular with preapical transverse band of setae, largely brown and short, 4-5 contrastingly long, apically curved dorsally.

Female. Body 9.2-12.0 mm; wing 7.3-9.7 mm. **Legs:** Middle femora with 1-2 brown bristles medially; preapical posterodorsal bristle blackish, much thicker than in male. Hind femora with 6-7 anteroventral bristles, only 1 preapical posteroventral bristle present. Tibiae with ventral setae shorter than in male, about 1/4 as long as tibiae. Middle tibiae with apex brownish-yellow. Tarsi with only dark brown bristles. Sternite 7 with 5-6 long brown bristly setae apically.

Terminalia (Fig. 13-14): Tergite 9 narrow, emarginate anteriorly, mid-length about 1/4 as long as cercus, corners extend only to base of ventral lamella laterally. Sternite 8 produced apically, apical margin W-shaped, with rounded corners and median spur; 6 long, unusually thick, brown bristles present. Genital fork with narrow dorsal arms, each slightly arched, base narrow, 1/2 as wide as apex at junction

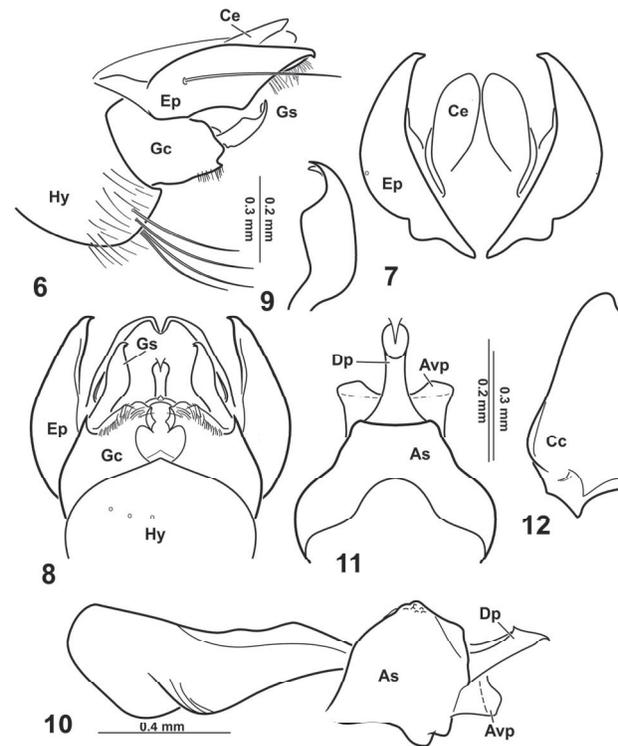


Figure 6-12. Male terminalia of *Ommatius nebulosus*, n. sp. **6-8)** Lateral, dorsal and ventral views. **9)** Left gonostylus. **10-11)** Aedeagus, dorsal and lateral views. **12)** Left side of the ventral lamella, ventral view. Abbreviations: As=aedeagal sheath; Avp=aedeagal ventral process; Vlp=Ventral lamella; Cc=cercus; Ep=epandrium; Gc=gonocoxite; Dp=distiphallus; Gs=gonostylus; Hp=Hypandrium.

of arms with base. Spermathecae tube-like, elongate, about 3 times longer than wide; base only slightly wider than rounded apex, surface with abundant annuli.

Type material examined. VENEZUELA: T.F. Amaz. [Territorio Federal Amazonas] / Cerro de la Neblina / base camp 140 m / 0°50'N 66°10'W / 10-20.ii.1985, malaise trap in / rain forest ~ P.J. and P.M. Spangler / R.A. Faitoute / W.E. Steiner (**holotype** m, NMNH). **Paratypes:** same data as holotype (5 m, NMNH); same data as holotype except 10-20.ii.1985 (2 m, 4 f, NMNH); same data as holotype except 26-31.ii.1985; no collectors listed (1 f, NMNH); same data as holotype except 17.ii.1985; second label 'malaise trap in / rain forest baited / with methyl silicate ~ P. and P. Spangler / R.A. Faitoute / W.E. Steiner' (2 f, NMNH); same data as holotype except 16.ii.1985 (1 f, NMNH); same data as holotype except 19.ii.1985 (1 f, NMNH); same data as holotype except 21.ii.1985; ~ 'malaise trap in / rain forest baited / with eugenol / P. and P. Spangler / R.A. Faitoute / W.E. Steiner' (1 m, NMNH); same data as holotype except 23.ii.1985; second label 'P. and P. Spangler / R.A. Faitoute / W.E. Steiner' (2 f, NMNH).

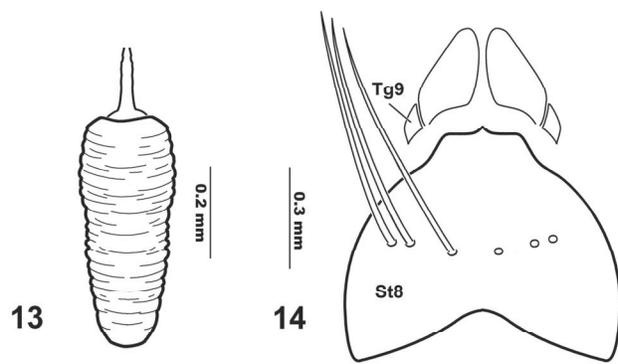


Figure 13-14. Spermatheca and ventral view of female terminalia of *Ommatius nebulosus*, n. sp. Abbreviations: Tg9=Tergite 9; St8=sternite 8.

Etymology. Latin *nebulosus* for cloudy, misty or foggy refers to the type series being captured in a cloud forest.

Distribution. Venezuela. Flight season, February.

Remarks. In addition to the characters in the key, *O. nebulosus* is distinguished from its congeners by its wing venation and characters of the terminalia (Fig. 1, 6-14).

Ommatius neotropicus Curran

Fig. 2, 15-23

Ommatius neotropicus Curran, 1928: 3. Holotype m, type locality British Guiana [Guyana]; Hull 1962: 435; Martin and Papavero 1970: 59.

Type material examined. GUYANA: (**holotype** m, AMNH). **Paratypes:** Kaieteur BG / 30.vii.1911 (allotype f, AMNH); Kaieteur BG / 11.viii.1911 (1f, AMNH); Kaieteur BG / 8.viii.1911 (1 f, AMNH); Kaieteur BG / 10.viii.1911 (1 f, AMNH); British Guiana / Bartica District / 23.iv.1924 (1 f, AMNH); Kartabo, BG / 6.viii.1922 (1 f, AMNH); Bartica 15.v.1901 (1 f, ANSP); Bello Horizonte / Minas Geraes / Brazil 6.xi / 1919 R. G. Harris (1 f, CUIC).

Additional specimens. GUYANA: Kamakusa / British Guiana / H. Lang. (1 m, 2 f, NMNH); British Guiana / Essequibo R. [River] / Mirabilis Creek / 17.ix.1929 / Oxf. Univ. Expedn. / B.M.1929-485 (1 m, BMNH). **BRAZIL:** Brazil, S. Am. / xii.1911 and / i.1912 (1 f, NMNH).

Distribution. Brazil, Guyana. Flight season, April-January.

Remarks. In addition to the characters in the key, *O. neotropicus* is further distinguished by the unique terminalia (Fig. 15-23). In addition, the vestiture below the middle femora are usually entirely yellow. Because females have 4-5 anteroventral bristles below the hind femora and largely yellow metatarsomere on the middle tarsi, they are difficult to separate from the lighter form of *O. normus*. However, the largely yellow femora, largely or entirely yellow vestiture below the middle femora, absence of a prominent con-

striction on the spermathecae and the strongly produced sternite 8 (Fig. 22-23) distinguish females of this species from similar congeners. Lastly, the base of the genital fork of *O. neotropicus* is parallel-sided whereas it is constricted medially in *O. normus*.

Ommatius normus Curran

Fig. 3, 24-32

Ommatius norma Curran, 1928: 2. Holotype f, type locality British Guiana [Guyana]; Hull 1962: 435; Martin and Papavero 1970: 59.

Type material examined. GUYANA: (holotype f, AMNH). Paratypes: Kartoabo / Bartica District / British Guiana / 17.viii.1922 (2 f, AMNH), same location except 17.viii.1922 (1 f, AMNH); same location except 19.vii.1922 (1 f, AMNH); same data except 17.v.1924 (1 f, AMNH); same data except 1921 (3 f, AMNH); same data except 20.v.1924 (1 f, AMNH); 19.v.1924 (1 f, AMNH); Bartica B.G./ 29.v.1901 (allotype m, ANSP); same location except 22.v.1901/ R.C. Crews (1 f, ANSP); same location except 18-19.v.1901 (2 f, ANSP).

Additional specimens. BRAZIL: Amazonas / Manaus x.1957 / Elias and Roppa (NMNH); BRAZIL: Lr. Amazonia / 1.iii.1896 / E.E. Austen (1 m, BMNH); Manaus - AM / Brazil vi.59 / C. Elias (4 m, DZUP). Goiás / Campinas / ii.1936 / Spitz (NMNH); Brasilia, Nova Teutonia / 5.xi.1936 / Fritz Plaumann (1 m, BMNH). Maracaju / Mato Grosso / Brasil ~ v. / 1937 ~ Servico Febre / Amerela / M.E.S. Bras. (1 m, OSUC); West border / Mato Grosso / Brazil v.31 ~ R.C. Shannon (1 m, 2 f, NMNH). Benevides, / Para, Brazil / S.M. Klages / CM Acc.6174 (1 f, CMNH); Rondonia / Fazenda Rancho Grande / 62 km S. Ariquemes / 165 m S10, 32 W62, 48 [10°32'S 62°48'W] / 12-22.xi.1991 E.M. Fisher (3 m, 10 f, EMFC); RO / 160-350 m / vic. Caucalandia / 10°32'S 62°48'W / 1.x.1991 / J. MacDonald (1 f, MEMC); same data except 10° 32'S 62° 48'W / 14.x.1991 (1 m, 1 f, MEMC); Villa Americana / [São Paulo] Brazil, ii.1924 ~ F.X. Williams (1 f, NMNH); FN-153esula / Mogi Guaçu [São Paulo] / Faz Campininha / 22-28.x.70 / J.W. Boyes (CNCD). CAYENNE: Mana River / French Guiana / iii.1917 / Acc 6008 (1 m, CMNH). GUYANA: Kalakoon / Baratica District / British Guiana 1.vii.1924 ~ collected by Stanton Crawford (1 m, CMNH); same data except 12.vii.1924 (1 f, CMNH); same data except 14.vii.1924 (1 f, CMNH); same data except (1 f, CMNH); same data except 28.vii.1924 (1 f, CMNH); Baratica, BG / 13.vi.1901 / C.W. Johnson (1 f, MCZC); same data except 12.vi.1901 (1 f, MCZC); same data except 28.vi.1901 (1 f, MCZC); Baratica, Br. Guiana / 20.v.1901 ~ H.S. Parish (1 f, OSUC); same data except 14.v.1901 ~ H.S. Parish (1 f, OSUC); Br. Guiana / v.1901 / Parish (1 f, NMNH); Br. Guiana / Parish ~ JM Aldrich (1 f, NMNH); Wismar / Brit. Guiana / 13.viii.1934 (1 f, NMNH); British Guiana / Kartabo / vi.1922 / M.D. Haviland (1 m, 1 f, BMNH); Mazaruni / Teak Plantation / 24.viii.1937 / British Guiana Richards and Smart (1 m, 2 f, BMNH). PARAGUAY: Inst. Agr. Nao. / Caacupá, Paraguay / Depto. Cordillera / 10.x.1980 ~ RD Cave / colr (1 m, NMNH). SURINAME: Marowijne River / vii.1965 E.A.M. Gale / Cambridge Exped. B.M 1965 - 516 (1 m, 1 f, BMNH); Zanderij i. / 15.xii.1950 / D. Piet (1 m, ZMAN); Kabel Station / 6.i.1951 / D. Piet (1 m, ZMAN); Paramaribo / Bot. Gard. / 25.i.1940 (1 f, AMNH). VENEZUELA: T.F. / San Carlos del Rio / Negro / 1°56'N 67°3'W / 6-12.xii.1984 / R.L. Brown (1 f, MEMC); T.F. Amazonas / Samariapon 30 km / Caño Paju / v.1979 / H. Martinez (1 m, 2 f, JMAL); Boli- / var m. ~ Rio Surukum, / Carretera Stn. / Elena

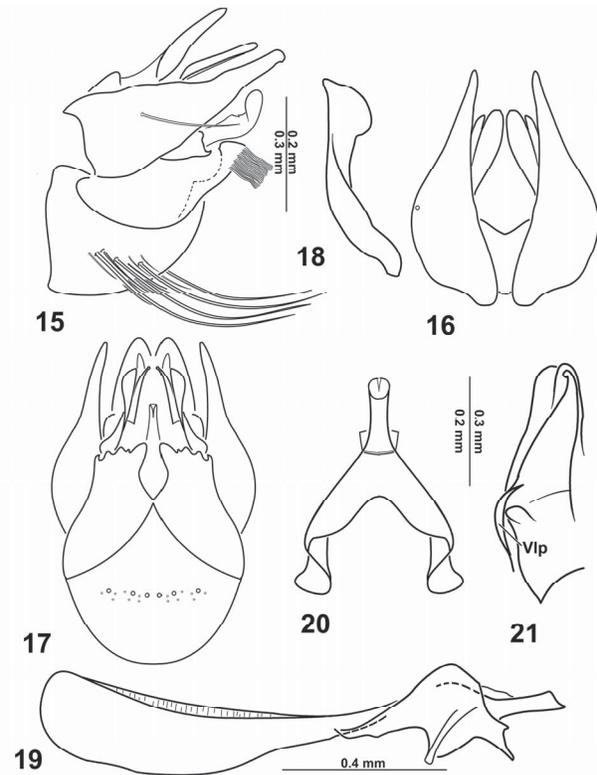


Figure 15-21. Male terminalia of *Ommatius neotropicus* Curran. **15-17)** Lateral, dorsal and ventral views. **18)** Left gonostylus. **19-20)** Aedeagus, dorsal and lateral views. **21)** Left side of the ventral lamella, ventral view.

Icabaru / 850 m 19-3.i.85 ~ F. Fernandez Y / Anibal Chacon / Jurg Demarmels (2 f, JMAL); Bolivar / Rio Guaniamo / 160 m, 25-29.v.79 / J. Clavijo, A. Chacon, G. Yepez (1 m, MIZA); Canaima, Edo. Bolivar / 14.ii.1972 / J.M. Ayala -Sra (1 f, JMAL); Edo Bolivar / El Manteco / 18.v.1983 / R. Mattei (1 m, JMAL); El Manteco Bol. / iv.1983 (1 f, JMAL).

Distribution. Brazil, Cayenne, Guyana, Paraguay, Suriname, and Venezuela. Flight season, January-December.

Remarks. In addition to the characters in the key, *O. normus* is further distinguished from similar congeners by the combined characters of the terminalia (Fig. 24-26). In females, the apical margin of sternite 8 is only slightly produced whereas it is usually strongly produced in congeners; the apical 1/3 of spermathecae is wider than the basal 2/3, with the two areas separated by a strong constriction (Fig. 31). In addition, the radial cells in the wing of males are often brownish medially. Curran (1928) stated that the dark metatarsus of the middle tarsi and the several brown anteroventral setae on the middle femora distinguish females from congeners. These characters work well in dark specimens but are unreliable for distinguishing the paler, more common, Brazilian specimens in collections. In these, the basal tarsomere of the middle tarsi is yellow and the femora are largely yellow with mostly or entirely yellow anteroventral setae. Lastly, the shapes of sternite 8 and spermathecae are also useful in distinguishing the paler females from Brazil.

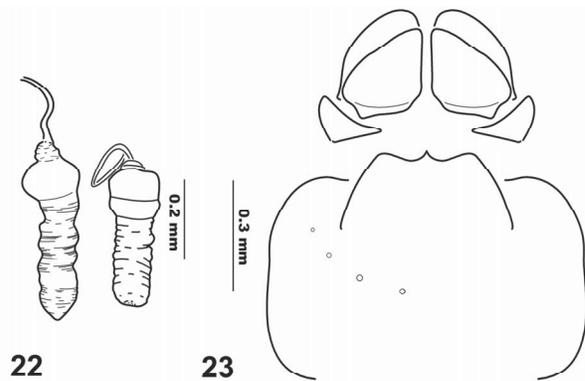


Figure 22-23. Spermatheca and ventral view of the female terminalia of *Ommatius neotropicus* Curran.

Ommatius pulcher (Engel)

Fig. 4, 33-41

Emphysomera pulchra Engel, 1885: 146. Syntype m, type locality Brazil, Minas Gerais, São Poão del Rei Distr.; Hull 1962: 437.

Ommatius pulchra (Engel). Curran 1928:1. Combination

Ommatius pulcher (Engel), Martin and Papavero 1970: 60. Catalogue, emend.

Redescription, male. Body 8.3-11.0 mm, wing 6.2-8.3 mm. Body dark brown. *Head:* Face bright yellow tomentose, setae short and sparse dorsally, more abundant and longer on ventral 1/3-1/2; 2-4 thin, brown bristles or setae on dorsal 1/3; face at antennae narrow, 1/5-1/6 as wide as head. Antennae, frons and ocellar tubercle blackish setose, occasionally 1-2 yellow setae below scape. Frons brown or reddish-brown tomentose. Flagellum short, 1/4 longer than wide. Palpus and proboscis yellowish setose. Occiput pale yellowish tomentose dorsally, grading to white ventrally with similarly colored setae; 3-6 dark brown moderately thick postocular bristles per side dorsally, 3-4 strongly proclinate on apical 1/3.

Thorax: Pronotum brownish-gray tomentose, vestiture pale. Scutum with wide median stripe and two lateral spots, dark brown tomentose, yellow or yellowish-gray tomentose laterally and in transverse grooves, prescutellum grayish tomentose; setae sparse, largely brown, yellow laterally; bristles dark brown, 4 laterals and 3 dorsocentrals, latter sometimes weak and yellowish. Scutellum grayish tomentose, setae sparse, pale; marginal bristles absent. Pleura yellowish-grey or gray tomentose, setae and bristles pale, katatergal bristles sometimes dull brownish-yellow. Halteres yellow, knob slightly brownish-yellow.

Wing (Fig. 4): Yellowish, darker anteriorly with dense microtrichia; costal margin straight, not dilated, vein C not noticeably thickened. Crossvein r-m at apical 1/3 of cell d; base of cell r_4 just beyond d. Base of cell m_1 narrow, about 1/3 as wide as cell at basal 1/3, preapical constricted just before wing margin. Cell r_3 pointed apically.

Legs: Coxae yellow to yellowish gray tomentose, vestiture largely thin and yellowish; hind coxa sometimes with 1-2 black bristles anteriorly. Femora largely brownish-yellow, usually dark brown on apical 1/3-1/2 or 3/4 anteriorly and dorsally; setae pale ventrally, long below anterior two femora, bristles dark brown or black; middle femora with thin preapical dorsoposterior bristle, anteroventral bristles absent, bristly setae usually yellow, 1 or 2 sometimes dark brown; hind femora with 7-10 anteroventral bristles; 3-5 posteroventral bristles present, usually 1-2 basally and 3-4 apically with wide bare space medially; hind femora swollen, 3.1-4.0 times longer than wide. Tibiae largely yellow with slight tint of brown, especially anteriorly, narrow apex of each tibia brown; bristles largely brown, those laterally on anterior two tibiae yellow; hind tibiae with short spur-like apically. Basal tarsomere of all tarsi yellow, apex of each narrowly brown; bristles mostly black, 4 yellow bristles on fore tarsi.

Abdomen: Clavate, about 1/4 wider apically than at junction of segments 2-3; largely yellowish-gray to whitish tomentose with pale setae; tergites largely brown tomentose dorsally with brown setae.

Terminalia (Fig. 33-39): Dark reddish-brown or blackish. Epandrium narrowed along ventral margin to apex, apices turned inward, often overlapping medially, apical margin round in dorsal view; 2-3 short, thick, brown bristles laterally, about twice as long as surrounding setae. Ventral lamella with ventrolateral process produced moderately, visible in lateral view. Gonostylus narrow apically, somewhat angled anteriorly. Each gonocoxite with 3 prominent denticles along inner margin. Aedeagus sheath wide in dorsal view, horizontal distiphallus tubular, thick in cross section. Hypandrium triangular anteromedially; sparse bristly setae medially.

Female. Differences include: body 9.6-10.8 mm, wing 6.5-10.5. **Head:** Antennae entirely dark brown setose; face at antennae 1/4.6-1/5.6 as wide as head. **Legs:** Hind femora not noticeably swollen, 5-6 times longer than median width; 1 black or yellow posteroventral bristle present basally, 2 or 3 apically. Hind tibiae without spur-like bristle apically. **Abdomen:** Only slightly clavate, never as pronounced as in male.

Terminalia (Fig. 40-41): Tergite 9 short medially in dorsal view, about 1/7 as long as cercus. Medioapical margin of sternite 8 produced with V-shaped row of 1 long thin bristles medially. Spermathecae tubular, surface annulate, with constrictions before apical 1/2, latter much wider than constriction area on basal 1/2; lateral spermatheca slightly pointed, median spermatheca slightly longer, apex more rounded.

Type material examined. BRAZIL: (syntypes, *O. pulchra*: 1 m, 2 f, ZSMN).

Additional specimens. BRAZIL: Mangabeira, **Alagoas** / x-xi.1952 / C.A. Camargo (1 f, MZSP). D.F. **Brazilia** / L. Paranoa / 4-5.i.1974 / L. Knutson (2 m, 2 f, NMNH); Roadside Fed. / Dist. Goiás St. near / Gadelha Farm / 25.iv.1972 / L. Knutson (1 f, NMNH); **Goiás**, Corumbá / H.R. Levy xi.1945 (1 f, MZSP); Goiás, Corumbá / Monjolinho / xi.1945 / Barretto (1 m, 2 f, MZSP); Goiás, Anápolis / 5.i.1937 (1 f, MZSP); **Minas Gerais** / Bel Horizonte i.1956 / A.B. Machado (1 m, 1 f, MZSP); Varginha / M. Gerais, Brasil / i.1960 / Seabra E. Alvarenga (1 f, MZSP); Sete Lagoas / Brazil 4.v.1908 / S.D. Haseman / C.M. Acc. 3564 (1 f, CMNH); Diamantina, Minas / Gerais Brazil / 14-18.xi.1919 Cornell / University Exped (1 m, CUIC); Itatiaia 700 m / Est. do Bio. / 4.ii.1950 / W. Zikán ~ *Ommatius pulchra* / M. Carrera 1961 (1

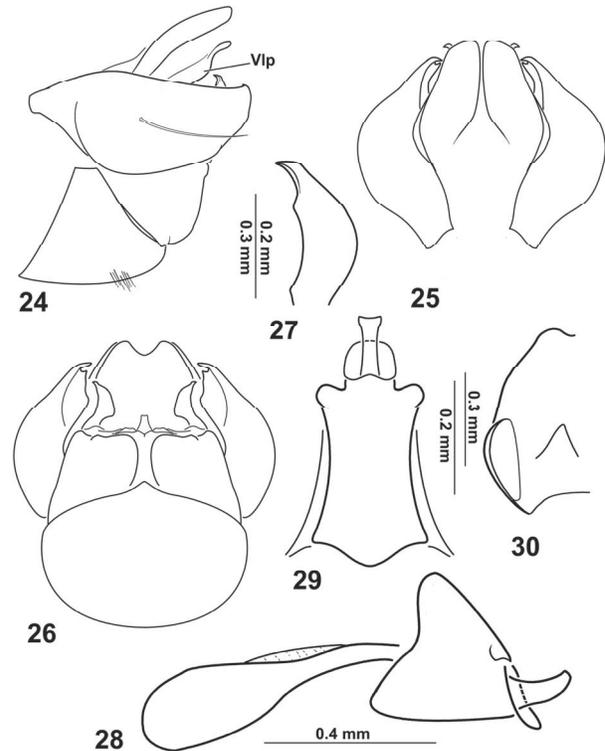


Figure 24-30. Male terminalia of *Ommatius normus* Curran; 24-26. Lateral, dorsal and ventral views; 27. Left gonostylus; 28-29. Aedeagus, dorsal and lateral views; 30. Left side of the ventral lamella, ventral view.

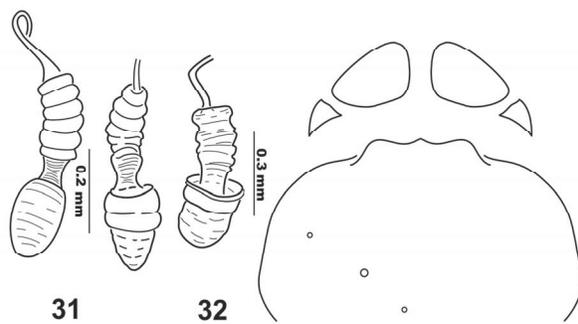


Figure 31-32. Spermatheca and ventral view of female terminalia of *Ommatius normus* Curran.

m, MZSP); Barbacena / M. Gerais Brasil / ii.1962 m. Alvarenga (3 m, 19 f, DZUP); Maracaju, **Mato Grosso [do Sul]** / Brasil, v.1937 / Serviço Febre / Amarela MES BRAS. (1 f, MZSP); Tres Lagoas, MT **[do Sul]** / Marg esprio Sucuriu / Faz Canãa i.1967 / F. Lane (1 f, MZSP); M.G. **[Mato Grosso]** Brazil / 15.iv.1989 / Oliveira, A.B. / Rice Crop 8 (1 f, MZSP); same data except Martins, A.B. (1 m, MZSP); same data except 18.iii.1989 / Lagoa, M.H. Rice Crop 5 (1 m, MZSP); IBIA MG Brasil / 11-18.iii.1965 / C. Elias (1 m, DZUP); Passos -MG / Brasil 5.xii.1963 / C. Elias (2 m, DZUP); Campo. (grasslands) Brasil / Mato Grosso Base Camp. / 12°50'S 51°45'W / 10-28.iii.1968 / B.E. Freeman (BMNH); **Paraná**, Curitiba / i.56 / J. Lang (1 m, MZSP); DPT° Zool. UF - Paraná / Chap. Gus Maraes - MT / (C.A. Buriti) / 08.xi.1986 / Pe. Moure and Gorayeb (1 f, DZUP); Curitiba - PR / Brasil 16.xi.1966 / C Ext.O.Z.UFP (1 f, DZUP); Paraná / Vila Vehla / 19.i.1969 / J. and L. Strange (1 f, IMLA); Paraná / Jaquaralaia / i.29.1974 / J.G. Rosen / F.C. Thompson / J.S. Moure (1 m, AMNH); same location except Vila Velha / 20.i.1974 (1 m, 3 f, AMNH); same location except 5.ii.1974 / J.G. Rosen / F.C. Thompson / J.S. Moure (3 m, 3 f, AMNH); same location except Andradas.23.i.1974 (1 f, AMNH); Ponta Grossa PR / Brasil 12.xii.1966 / T.B. Mitchell (1 m, DZUP); Laranjeira da sul / PR- Brasil i.62 / S. Sakagami (1 f, DZUP); V. Velha, Brasil / PR, iii.1965 Moure / Mitchell Laroça (1 f, DZUP); Vila Velha PR / Brasil 21.xi.1965 / Mitchell- Moure (1 f, DZUP); Curitiba / [no date] / G. Kurowski / # 173 (1 m, DZUP); DPT° Zool. UF Paraná / RIB. PRETO - São Paulo / Brasil 31.x.1973 / Pe. Moure (1 f, DZUP); **Sto [Santa] Catarina** / Nova Teutonia / F. Plaumann (1 f, CASC). S. Paulo **[São Paulo]** / Americus /11-14.i.1977 / L. Knutson (2 m, 8 f, NMNH); S. Paulo / Rio Claro / 14.i.1977, L. Knutson (1 f, NMNH); Rio Claro - SP / i.1977 / N. Papavero (2 m, 13 f, MZSP); same location / i.1941 / Pde. Pereira (7 m, 8 f, MZSP); São Paulo Ypiranga / 26-31.iii.1936, 3.iv.1936 / L. Morretes (5 m, MZSP); same location except iii.1946 / M. Carrera, E.F. Lane (1 f, MZSP); same location except 1.i.1940 / F. Lang (1 m, MZSP); São Paulo / St [Santo] Amaro, ii.1949, ii.1950 / J. Lang (3 m, 8 f, MZSP); São Paulo / Severinia / xii.1940 / A.G. Silva (15 m, 12 f, MZSP); São Paulo / M. das Cruses / M. Carrera / i.1939 (11 m, 4 f, MZSP); same location except ii.1940 (4 m, 3 f, MZSP); same location except iii.1940 (1 m, MZSP); same location except i.1939 M. Carrera, Lane, Pauialli (1 m, 1 f, MZSP); São Paulo / Gautaparã / i.1945 / M. Carrera (2 f, MZSP); Mairipora, SP / Brasil / 4-13.i.1967 / C. Costa (1 f, MZSP); Est. Biol. Boraceia / Mun. [Municipalidade] Salesopolis, SP / Brasil i.1949 / M.P. Barretto (1 m, MZSP); São Paulo, Jundiai / i.1953 / M.A.V.A. (1 m, MZSP); São Paulo, Guaianales / ii.1950 / M. Carrera (1 m, MZSP); SP / Campinas / 24.i.1976 / R.M. Bohart (2 m, UCDC); São Paulo / Onda Verde Faz. / São João / i.1946 F. Lane (2 m, one with abdomen missing, IMLA); Baueri, São Paulo Brasil / 3.ii.1958, 15.i.1966, 22.i.1967 / F. Lang (2 m, 1 f, MZSP); Faz. Monte Alegre / Ribeirão Piêto, SP / Brasil x.1953 / M.P. Barretto (1 m, 1 f, MZSP); São Paulo / Araraquara 17-18.i.1941 / M. Carrera (1 m, MZSP); São Paulo / Penkal xii.1920 (1 f, MZSP); São Paulo / Onda Verde / Faz. São Joao / i.1946 / F. Lane (2 m, 10 f, MZSP); R. Spitz coll. / Campinas i.1936 / Est. Goyas (2 m, 1 f, MZSP); São Paulo / Tamoio xii.1944 / M. Barretto (3 m, 5 f, MZSP); Batatais SP / Brasil ii.1946, x.1946 / Pe. Pereira (19 m, 25 f, MZSP); same location / colls. xii.1946 (1 m, 1 f, MZSP); Est. S. Paulo / Cajuru / Coqueiros ii.1947 / Barretto (2 m, 1 f, MZSP); Cassia Dos Coqueiros / Cajuru SP / Brazil iii.1955 / M. Barretto (1 f, MZSP); Goras, Campinas / Spitz Col xii.1935 (3 f, MZSP); Brasil: nr. Cosmopolis / São Paulo / 8.iv.1964 / C.E. and E.S. Ross (1 m, CASC); São Paulo / Andes / ii.1955 / M. Carrera (1 m, CASC); São Paulo / Onda Verde / Faz. São João / i.1946 / F. Lane (1 f, CASC); S. Paulo - Ypiranga / iii.1940 M. Carrera / F. Lane (1 f, CASC); S. Paulo / x.? Sto. Amaro J. Lane (1 m, CASC); Campinas-Goyaz / Borgmeier et S. Lopes / xii.1935 ~ *Ommatius pulchra* / Eng. 8.37 Det H.S. Lopez (1 m, MZSP). **PARAGUAY:** Paraguari / Dept Ybycui (25km SE) / in Ybycui / National Park / 12-24.iv.1980 / P.J. Spangler (2 m, 1 f, NMNH); Paraq. Nac. / Cerro Coro / Departamento Amamabay / 23.ii.1981 R.D. Cave Colr. (1 m, 1 f, NMNH).

Distribution. Brazil, Paraguay. Flight season, October-May.

Remarks. In addition to the characters in the key, *O. pulcher* is distinguished from congeners by the wing venation and combined characters of the terminalia (Fig. 4, 33-41). Engel described *Ommatius pulcher* based on specimens from Minas Gerais, Brazil and deposited in ZSMN. The three syntypes of *O. pulcher* were sent to me for study but were destroyed during transit. As many parts as possible of the 3 specimens were placed in vials and attached to the specimen pins. However, the fragments are insufficient to diagnose the species. Thus a specimen from Minas Gerais, Brazil, is designated **NEOTYPE** here to stabilize the name of the species. The data labels below the neotype are as follows: BRAZIL, Minas Gerais / 23.i.1974 / J.G. Rosen / F.C.Thompson / J.S. Moure ~ NEOTYPE / *Ommatius pulcher* (Schiner) / det. A. Scarbrough, 2007 (1 m, NMNH).

Ommatius ruficaudus Curran

Fig. 5

Ommatius ruficauda Curran, 1928: 5. Holotype m, type locality Brazil, Chapada; Hull 1962: 435; Martin and Papavero 1970: 437.

Type material examined. BRAZIL: Chapada [tableland or plateaus landscape, no data] (**holotype** m, allotype f, AMNH).

Distribution. Brazil. Flight season ?

Remarks. Curran based the description of *O. ruficaudus* upon two specimens from Chapada, Brazil. The holotype lacks the middle legs and hind left tibiae and tarsi and significant parts of the terminalia are damaged. The style and flagellum of the allotype are absent and its body is largely covered with fungi. Hence, the terminalia of the types were not dissected and additional specimens of the species have not been located. However, wing venation (Fig. 5), bristle pattern on the hind femora and parts of the exposed male terminalia suggest it is a distinct species. It is very similar to *O. pulcher*, and may be that species, but must await new material to clarify its status.

Ommatius tepui, n. sp.

Fig. 42-48

Description, male. Dark brown. Body 11.5 mm; wing 8.4 mm. *Head:* Face golden yellow tomentose with mostly yellow vestiture; 5-6 brown bristles in 2 rows; face at antennae 1/10 as wide as head. Palpus and proboscis white or yellow setose. Antennae brown setose; flagellum 2.5 longer than wide. Frons yellowish-brown tomentose, setae fine, short, brown. Occiput largely gray tomentose, white setose, yellowish dorsally; 4-5 postocular bristles per side of head, thin, 2 proclinate on apical 1/3.

Thorax: Scutum largely brown tomentose dorsally, pale yellowish-brown or grayish laterally and posteriorly; vestiture brown, setae sparse, most abundant along anterior and lateral margins; four lateral

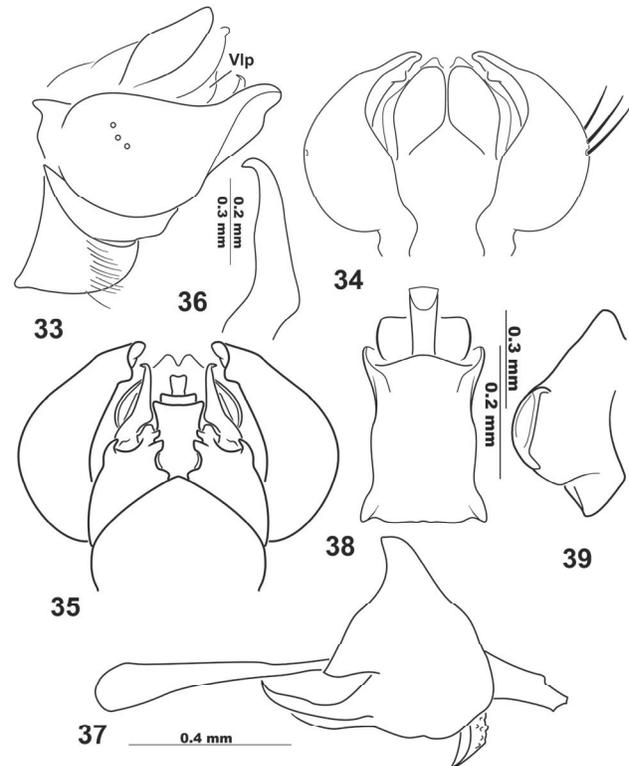


Figure 33-39. Male terminalia of *Ommatius pulcher* (Engel). **33-35)** Lateral, dorsal and ventral views. **36)** Left gonostylus. **37-38)** Aedeagus, dorsal and lateral views. **39)** Left side of the ventral lamella, ventral view.

and two dorsocentral bristles present, lateral bristles slightly stronger and longer than dorsocentrals. Scutellum gray tomentose, setae sparse, 2 marginal bristles, about 3 times as long as setae. Pleura gray tomentose with largely yellow vestiture; anepimeral bristle absent, long thin setae present. Halter yellow.

Wing: Identical to *O. nebulosus* (see Fig. 1).

Legs: Coxae gray tomentose, vestiture pale yellowish. Fore and middle femora largely yellow, apical 1/3 anteriorly and dorsally brown; hind femora with apical 1/3 and dorsal 1/2 brown. Fore femora with row of thin yellowish setae ventrally. Middle femora with brown setae and bristles anteriorly; 7 brown anteroventral setae present, 2-3 of these setae in middle of row thick; several long thin yellowish setae posteroventrally; preapical posterodorsal bristle thin. Hind femora with brown bristles, 3 anteriorly, 6-7 anteroventrally, and 3 posteroventrally, 2 of these apically and 1 basally; swollen, 4.5 times longer than wide. Tibiae largely yellow, apices of fore and middle tibiae narrowly pale brown; apical 1/2 of hind tibiae brown with peg-like bristle apically, apex of bristle wide and round. Tarsi largely brown, basotarsomere of fore and middle tarsi yellow; bristles brown except 1 yellow bristle on fore tarsi.

Abdomen: Increasingly wider beyond segment 3, slightly spatulate. Tergites largely brown tomentose with short brown setae; apical corners tergites 3-6 with 2 moderately thick yellow bristles, sides of tergites otherwise with thin, long yellowish setae; sternites brownish-gray or gray tomentose, setae pale.

Terminalia (Fig. 42-48): Dark brown, largely yellowish setose. Ventral lamella with ventrolateral process strongly produced. Epandrium curved about 80 degrees dorsally on apical 1/3, somewhat concave medially, apex truncate; long thin yellow bristle laterally. Gonostylus flat, apex contrastingly narrow, hooked. Aedeagus sheath wide in dorsal view, distiphallus horizontal, tubular, with sclerotized plate ventrolaterally. Gonocoxal process long and flat, somewhat hooked with short apical spine in posterior view. Hypandrium triangular apically, vestiture brown with 2-3 bristly setae.

Female: Unknown.

Type material. VENEZUELA: T.F. Amazonas [Territorio Federal Amazonas], Puerto Ayacucho (40 km S.) El Tobogan, Canocoromoto, 26.i.1989, by malaise, P.J. Spangler, R.A. Faitoute and C.B. Barr (holotype m, NMNH).

Etymology. The name *tepui* refers to the towering mesas in the Territorio Federal Amazonas, Venezuela.

Distribution. Venezuela. Flight season, January.

Remarks. *Ommatius tepui* is distinguished from congeners by the characters in the key and the combined characters of the male terminalia (Fig. 42-48), especially the apically flattened, slightly up-turned epandrium with a truncate apex, and the long, wide, flattened gonocoxal process.

Ommatius Tibialis SPECIES GROUP

Thirteen species of *Ommatius* have been recorded in North America, largely from the southern United States (Stone et. al. 1965; Bullington and Lavigne 1984). Of these, eight (*O. floridensis* Bullington and Lavigne, 1984; *O. maculatus* Banks, 1911; *O. oklahomensis* Bullington and Lavigne, 1984; *O. ouachitensis* Bullington and Lavigne, 1984; *O. parvulus* Schaeffer, 1916; *O. texanus* Bullington and

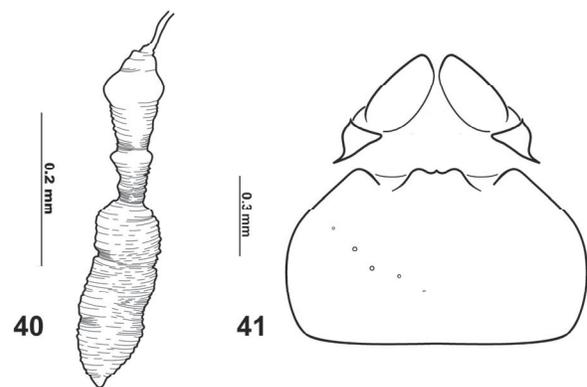


Figure 40-41. Spermatheca and ventral view of female terminalia of *Ommatius pulcher* (Engel).

Lavigne, 1984; *O. tibialis* Say, 1823; *O. wilcoxi* Bullington and Lavigne, 1984) constitute the tibialis species group. The Nearctic species are distinguished as follows: 1) absence of marginal scutellar and anepimeral bristles; dorsoapical margin of the epandrium abruptly narrowed or notched, apex narrow and broadly or acutely pointed; 2) horizontal, stilet-like distiphallus; 3) aedeagus with a spine-like ventral process, e.g. ventral spire (Bullington and Lavigne 1984); 4) sternite 8 in the female strongly produced anteriorly, the apical margin broadly rounded and bearing a short point medially.

Acknowledgments

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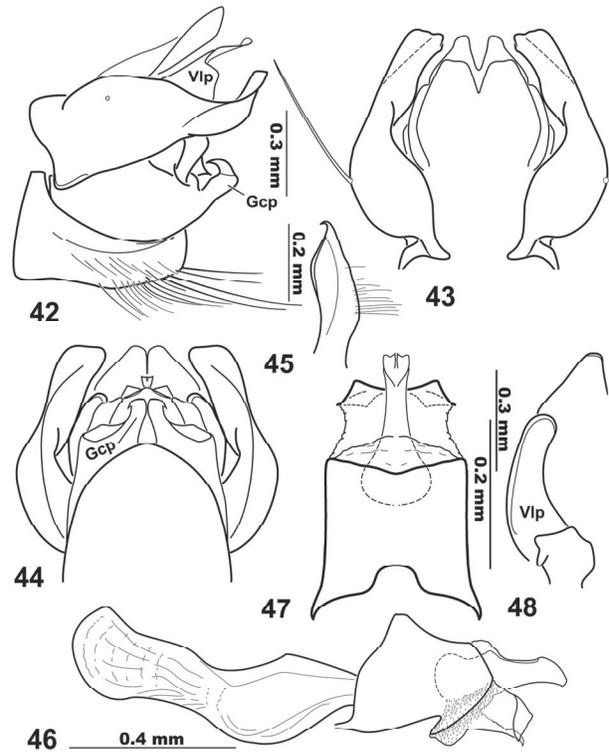


Figure 42-48. Male terminalia of *Ommatius tepui*, n. sp. 42-44) Lateral, dorsal and ventral views. 45) Left gonostylus. 46-47) Aedeagus, dorsal and lateral views. 48) Left side of the ventral lamella, ventral view. Abbreviations: Gcp=Gonocoxal process.

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