1959

URUGUAYAN MAYFLIES

Family *Leptophlebiidae*: Part I [1]

by **Jay R. Traver** [2]

Mayflies of this family occupy, in the Neotropical fauna, the niche filled by members of the family Heptageniidae in the Nearctic region. Many different genera of Leptophlebiidae have been reported from Central and South America and the West Indies. Material collected in Uruguay contains representatives of five of these: *Homothraulus* Demoulin, *Ulmeritus* Traver, *Traverella* Edmunds, *Thraulodes* Ulmer, and nymphs only of *Hermanella* Needham and Murphy, subgenus *Hermanellopsis* Demoulin. A key to the adults of the Neotropical genera of this family is presented in this paper. The nymphal stages will be considered in a later publication.

Adults of this family may be characterized as follows. Numerous cross veins. Hind wing usually present, may be reduced

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1) El presente trabajo de la Dra. Jay R. Traver ha sido realizado en su mayor parte sobre materiales del Uruguay, pertenecientes a las colecciones del Departamento de Entomología de la Facultad de Humanidades y Ciencias (Universidad de la República, Uruguay). La mayoría de los insectos estudiados fueron coleccionados en los viajes de estudio al norte del país organizados por los departamentos de Zoología de Vertebrados y de Entomología de la Facultad nombrada, como parte de su proyecto conjunto de investigación denominado "Identificación y distribución de la fauna indígena del Uruguay, viajes que fueron financiados con partidas del rubro "Investigaciones originales". Por esta razón debe considerarse que se exponen en el presente trabajo, resultados parciales del mencionado proyecto de investigación. Entregado para su publicación en abril 30 de 1958. (Nota del editor).

2) University of Massachusetts, Amherst, Mass.
Drawings by R. L. DiMinno.

in size. In fore wing, MA with distinct fork;[3] CuP more or less recurved; no free intercalaries between MP2 and CuA, nor between MP2 and the long intercalary of MP. Forceps three-jointed; basal joint long, the two distal joints short. Tails three.

Key to Genera of the Family Lepthophlebiidae reported from the Neotropical Fauna

(Five genera omitted from key, for reasons stated in footnote)

1. Hind wing absent; female with long ovipositor .... *Hagenulopsis* Ulmer

— Hind wing present, may be very small; ovipositor present or absent 2

2. Female with ovipositor (Fig. 6) 3

— Female without ovipositor 4

3. In genotype, hind wing minute, shaped like bowl of spoon, two longitudinal veins only, no costal angulation (see Fig. 5); forceps very long (see Fig. 7); MA of fore wing with sag in stem, also asymmetrical fork (see Fig. 5) .... *Borinquena* Traver

— In genotype, hind wing with prominent costal angulation almost as high as width of wing beyond it (see Fig. 10); forceps not unusually long: MA of fore wing without sag in stem, fork symmetrical (see Fig. 10) .... *Hagenulus* Eaton

4. MP of hind wing forked (see Figs. 19, 20) Sc of hind wing variable 5

— MP of hind wing not forked (see Figs. 11, 17); Sc of hind wing relatively short, usually ending at or just beyond costal angulation (see Figs. 11, 18) 11

5. Claws on all tarsi similar, acute 6

— Claws on all tarsi dissimilar, one acute, one blunt 9

6. First cubital intercalary joined directly or by cross vein to CuP (see Fig. 9) 7

— First cubital intercalary not so joined to CuP 8

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3) Classification and venational nomenclature according to Edmunds and Traver, October and December 1954.

7. Subanal plate of female excavated apically .... *Massartella* Lestage

— Subanal plate of female entire apically, obtuse .... *Massartellopsis* Demoulin

8. Sag in stem of MA of fore wing, fork more or less symmetrical; 2 long cubital intercalaries converge basally, no marginal intercalaries between them; angulation of hind wing at or very near center of costal margin (see Fig. 23) .... *Atalonella* Needham & Murphy

— No sag in stem of MA of fore wing, fork symmetrical; 2 long cubital intercalaries do not converge basally, usually at least 2 short ones between them; costal angulation nearer wing base (see Fig. 3) ..... *Atalophlebia* Eaton

9. *2nd* long cubital intercalary of fore wing runs into *CuP*, with free shorter intercalary between the two long ones (see Figs. 4 and 8); subanal plate of female excavated apically; intercalaries in Rs of fore wing, between R2 + 3 and bisector of fork, form two triangles (see Figs. 4, 8) .... *Ulmeritus* Traver

— Long cubital intercalaries of fore wing not as above; subanal plate of female variable; intercalaries in Rs of fore wing, between R2+3 and bisector of fork, end free in membrane (no triangles formed). (see Figs. 1 and 12) 10

10. *1st* long cubital intercalary of fore wing runs into *CuP* (see Fig. 1); subanal plate of female entire apically, obtuse ... . *Deleatidium* Eaton

— *1st* long cubital intercalary of fore wing attached to *CuA* (see Fig. 12); subanal plate of female excavated apically ..... *Thraulodes* Ulmer

11. No sag in stem of MA of fore wing, its fork symmetrical; costal angulation of hind wing blunt (see Fig. 16) .... *Choroterpes* Eaton

— MA of fore wing either with sag in stem or with asymmetrical fork; costal angulation of hind wing acute 12

12. Penes long, slender, tuning forked-shaped structures, lacking appendages; wings as in Fig. 11 .... *Hermanella* N. & M. (*Hermanellopsis*) Demoulin

— Penes shorter and stouter, with appendages; wings as in Figs. 2, 17, 18 13

13. Costal angulation of hind wing very high, much as in *Hagenulus;* Sc and R of this wing approximately equal in length; sag in stem of MA, but fork almost symmetrical (see Fig. 2) ..... *Neohagenulus* Traver

— Costal angulation of hind wing much lower; R of this wing considerably longer than Sc, ends nearer wing tip; no sag in stem of MA, but fork asymmetrical (see Figs. 17 and 18) 14

14. Subanal plate of female slightly excavated apically; from forceps base of male, two slender rod-like projections arise (see Fig. 15) ..... *Traverella* Edmunds

— Subanal plate of female entire apically, slightly obtuse; no such rod-like projections from forceps base (see Fig. 14) ..... *Homothraulus* Demoulin

Footnote: Genera omitted are:

Nousia Navas. Incompletely known. Claws on all tarsi acute, similar. Close to *Atalonella,* but differs (according to Navas' figure) in that MP of hind wing is not forked.

Atalophlebioides Phillips. Type species, a New Zealand form. Phillips considered this to be a subgenus of *Deleatidium,* with which Harker concurs. According to Harker (1954) adults of *Deleatidium* and *Atalophlebioides* are indistinguishable, yet the nymphs differ markedly in gill structure. Adults of Neotropical species tentatively placed in this genus have now been transferred elsewhere; there remains a single species from this region known in the nymphal stage only.

Thraulus Eaton. As indicated by Edmunds (1950) and by other workers also, the true *Thraulus* seems not to ocurr in the New World. Still listed under this genus, however, are a number of species probably belonging to genera as yet undescribed.

Paraleptophlebia Lestage. A single record (Spieth, 1943) of a nymph from Surinam; this might be due to an error in determination.

Habrophlebiodes Ulmer. Spieth (1943) reports two males of this genus from Surinam, but says of them: "the male genitalia are quite atypical for that genus as it is now described". Probably therefore these are not *Habrophlebiodes.*

Three of the genera given in the key have thus far been taken only from the West Indies, in this hemisphere, *Hagenulus* from Cuba and Haiti, *Neohagenulus and Borinquena* from Puerto Rico. It is by no means impossible that representatives of each of the other genera might be found in Uruguay. This is certainly true of such as have been reported from southern Brazil and from Argentina, perhaps also from Paraguay and Chile.

Genus *ULMERITUS* Traver

Traver- 1956- Proc. Ent. Soc. Wash. 58 (1): 1-13. Figs. 1-18.

In fore wing, double triangles formed in Rs between R2 + 3 and the bisector of the fork; no sag in stem of MA, its fork sym-

metrical; second long cubital intercalary joined basally to CuP, either directly or by a cross vein; cross veins numerous, in costal space present in basal as well as in apical portion; no marked tendency for cross veins to be arranged in series across the wing. Costal angulation present on hind wing; MP of this wing forked, one intercalary within the fork. Claws dissimilar on all tarsi. Subanal plate of female rather deeply excavated on apical margin.

Further study of a number of specimens collected in Uruguay and of representatives of a species described from Surinam, leads me to believe that the genus *Ulmeritus* comprises three subgenera, which I hereby designate as follows.

ULMERITUS, n. subgenus

Eyes of male large, contiguous apically. Costal angulation of hind wing rounded, 0,38 the distance from base to tip of wing; Sc extends almost to the wing tip, paralleling R1 at apex; 9–10 cross veins in costal space, 6 in subcostal space, about 10 between R1 and MA, 5–6 in space between MA and MP, 4 or 5 behind MP. Hind wing 0,24 as long as fore wing; 1,65 as long as its greatest width. Fore legs of male 0,7 length of fore wing; tibia 1,2 times femur, 1,56 times tarsus; tarsus circa 0,77 of femur. Joints of fore tarsus rank as 10, 35, 32,5, 17,5, and 18 respectively, if basal joint be considered to have a value of 10. Middle and hind legs relatively long, hind leg extending beyond tip of abdomen. Tibia of hind leg 1,03 times femur, 4,5 times tarsus; tarsus 0,23 as long as femur. Fore leg of female 0,6 times as long as fore wing; tibia 1,6 times femur, 3,36 times tarsus; tarsus 0,29 of femur. Proportions of hind leg much as in male. Basal forceps joint of male quite long, strongly bowed, with rounded swelling proximally; two shorter joints beyond basal, distal one of which tends to be partially subdivided. Penes possess prominent spatulate processes. See Fig. 26.

Type of subgenus: *Ulmeritus carbonelli* Traver. In reference cited under genus, above.

Ulmeritus (*Ulmeritus*) *haarupi* (Esb. Pet) n. combination

Thraulus haarupi Esben Petersen, 1912, Deutsch. Ent. Zeitschr. 1912: 337-338.
Deleatidium haarupi (Esb. Pet.). Ulmer, 1920, Stett. Ent. Zeit. 81: 115.
Atelophlebioides haarupi (Esb. Pet.). Traver, 1946, Rev. de Entomolog. 17 (3): 423.

Because of the great number of cross veins in the basal costal and subcostal spaces, and the excavated subanal plate of the female, Esben Petersen wrote: "Perhaps a new genus ought to be established for the species, but without knowledge of the ma-

le I find it best to postpone it". Ulmer (1938) in discussion of the genus *Deleatidium,* indicated differences in the venation of *haarupi* and of three other Neotropical members of the genus which he recognized. Traver (1946) indicated that *sao–paulense* which was described in that paper in the genus *Atalophlebioides* had much in common with *haarupi,* and that both of these species differed in certain venational features from *Deleatidium.* In 1956 Traver transferred *sao–paulense* to *Ulmeritus,* where it will now fall into the subgenus *Ulmeritus.* Although the male of *haarupi* is still unknown, the venation as figured by Esben Petersen is so close to that of *Ulmeritus carbonelli* that I now propose the transfer of that species to the genus *Ulmeritus.*

A single adult female from Arroyo de la Invernada collected on Feb. 21, 1954 (by C. S. Carbonell and associates, in the field trips organized by the Departments of Vertebrate Zoology and Entomology of the "Facultad de Humanidades y Ciencias" of Uruguay) may be *Ulmeritus* (*U.*) *haarupi,* although it differs in certain respects from Esben Petersen's description. Body 8,5 mm.; fore wing 10,5 mm. Head yellowish; antennae yellowish with smoky tinge; wide dark brown band across head just back of lateral ocelli. Pronotum yellowish tinged laterally with reddish brown; five prominent black longitudinal streaks, lateral, submedian, median. Background color of mesonotum similar to pronotum but somewhat brighter; scutellum paler. Metanotum light reddish brown. Pleura slightly grayed; irregular black line above bases of legs; reddish brown next to sternum. Sternum reddish brown. Prosternum margined narrowly with black; median dumbbell–shaped area rather clearly defined, laterad of this on each side a pale round spot.

Venation very similar to that of *U.* (*U.*) *carbonelli.* About 12 costal cross veins before bulla, 17–18 beyond, stigmatic ones slanted, 1 to 3 of these may be partially anastomosed (See Fig. 4). Entire costal and subcostal spaces of fore wing reddish brown, this color deeper in basal portions. Membrane behind R1 faintly yellow–tinged. Longitudinal veins yellowish, in some lights faintly fawn–colored. Cross veins between costa and MP1 pale fawn–colored, heavier in costal strip and space behind R1. Cross veins in general more distinct than longitudinals, except yellow ones behind MP1. Hind wing as in Fig. 24. Compare with Fig. 20 (female of *carbonelli*). Smoky tinge at extreme base, extending into subcostal space almost to costal angulation; Sc and cross veins in this space pale fawn–colored, remaining veins yellowish.

Fore leg reddish brown. Femur with median black spot and longitudinal dark streak preceding it; narrowly black at apex and along margins. Two blackish bands on tibia, beyond base and pre–apical, apex yellow. Middle and hind legs yellow. Median black spot on second femur, apex narrowly black, incom-

plete dark penciling near base. Median spot and apical marking more pronounced on hind femur; longitudinal brown shading basad of median spot along each margin. Joints of hind tarsus very faintly brown-tinged except at base, most evident on distal joint.

Abdominal tergites pale reddish brown with distinct smoky overcast; posterior margins narrowly darker. Median line narrowly dark on basal tergites, faintly paler on middle ones. Anterior median portion of tergites paler, more yellowish; on 8 and 9, these pale areas are triangular and reach almost to the posterior margin; on basal tergites a brownish gray submedian blotch interrupts this paler area on each side; on middle tergites this blotch has lateral extensions near each margin. Laterally, a row of pale yellowish blotches, round to oval, on basal and middle tergites midway between midline and pleural fold; incomplete pale spots on anterior margin near pleural fold. Rather wide black line along pleural fold; indistinct short dark lines over stigmatic areas. Ventrally light reddish brown. Rather indistinct paler submedian dots on sternites 1–4, short pale streaks connected to these dots. On 5–7, pale submedian streaks only. On 8, a median yellow streak widest at anterior margin; faint indications of same on anterior half of sternite 9. Subanal plate somewhat emarginate apically. Tails missing.

It will be seen that the body markings resemble those of *U.* (*U.*) *carbonelli* quite closely, differing from that species in coloration of wings and legs. Differs from Esben Petersen's description of *haarupi* in these details: (1) no dark median line on mesonotum, instead 5 dark lines on pronotum; (2) median brown spot on femur not forming a complete band; (3) presence of brownish shading on basal half of hind femur; (4) cross veins in posterior half of fore wing less conspicuous than seems indicated for *haarupi;* (5) apical joint of tarsus not darker than preceding ones; (6) reddish brown of fore wing seems confined to costal strip. Body length very similar, but wing 1,5 mm. longer than given for *haarupi.*

PSEUDULMERITUS, n. subgenus

Eyes of male large, contiguous apically. Fore wing of male as in subgenus *Ulmeritus.* Hind wing as in Fig. 22; very similar to that of the following subgenus, Sc being relatively short, that of the type species ending 0,41 of distance from angulation to tip of wing; 1,5 as long as its greatest width. Fore leg of male 0.62 as long as fore wing; tibia 1,1 to 1,2 the length of femur, and subequal to tarsus; joints of tarsus rank as 10, 66, 45, 27 and 17, considering basal joint as having value of 10. In hind leg, tibia 1,15 times femur, 4 times tarsus; tarsus 0,3 of femur. For-

ceps of male longer and more slender than in subgenus *Ulmeritus;* the proximal swollen portion is higher and quite sharply angulate; no tendency for distal joint to exhibit partial subdivision; penes as in Fig. 25. Female not given in original description of type species, and none are available to me for study.

Type of subgenus: *Pseudulmeritus flavopedes* (Spieth) n. comb.

Thraulodes flavopedes Spieth, 1943, Amer. Mus. Novitat, 1244: 11.

Atalophlebioides flavopedes (Spieth). Traver, 1946, Rev. de Entomolog. 17 (3): 426. Note that intercalary in fork of hind wing was omitted, in error, in Fig. 7 of the above article.

ULMERITOIDES, n. subgenus

Eyes of male not quite contiguous apically. Venation of fore wing as in subgenus *Ulmeritus.* Costal angulation of hind wing somewhat more pronounced, 0,43 of distance from base to tip of wing. Sc relatively shorter than in *Ulmeritus,* in type species ending 0,4 of distance from angulation to wing tip. Few cross veins in this wing, especially in spaces behind C, Sc and R1. Wing relatively short and wide, being 1,5 as long as its greatest width (See Fig. 19). Fore leg of male 0,63 as long as fore wing; tibia 1,32 times femur, and 1,6 times tarsus; tarsus 0,8 of femur. Tarsal joints in fore leg rank as 10, 43, 45, 28 and 32, basal joint being rated as 10. Middle and hind legs of both sexes relatively shorter than in subgenus *Ulmeritus.* Tibia of third leg of male subequal to femur, 3.5 times tarsus; tarsus 0,23 of femur. Fore leg of female 0,5 the length of fore wing; tibia subequal to femur, 2,1 times tarsus; tarsus 0,45 of femur. Proportions of hind leg as in male. Basal joint of forceps much as in *Pseudulmeritus,* the projection on proximal portion less acute; distal joint not tending to show subdivision.Penes lack spatulate processes (see Fig. 21).

Type of subgenus: *Ulmeritus* (*Ulmeritoides*) *uruguayensis.* See below.

Ulmeritus (*Ulmeritoides*) *uruguayensis,* sp. nov.

Size: Male imago, body 7–8 mm., fore wing 7–8 mm.; fore leg 4–5 mm. Female imago, body 7–7.5 mm.; fore wing 8–8,5 mm.; fore leg 4 mm.

Male imago, holotype. Antennae light reddish brown, filament narrowly paler at base. Turbinate eyes orange; almost oval. Head pale reddish brown, with narrow black median line; black rings at bases of ocelli. Thorax above rather bright reddish brown, pleural areas somewhat duller in color. Pronotum with narrow black median and two lateral lines each side. Posterior half of

mesonotum yellowish in mid-area, as is mesonotal scutellum and lateral lines anterior to scutellum. Yellowish patch on pleura of prothorax; pale reddish area on mesothoracic pleura above middle leg. Paler triangular area on mid-sternum; narrow black pencilings on pleura and sternum.

Wings white. Stigmatic area of fore wing opaque whitish, as are cross veins in that space. At base of wing a reddish brown patch on membrane and veins, including humeral cross vein on costal margin but slightly narrower behind this vein. R1 and apical portion of Sc yellowish. Blackish brown dots mark location of bullae on R2 + 3, and faintly also on R4 + 5. Longitudinal veins in disc of wing faintly yellowish at base. All other veins and cross veins white, inconspicuous. Hind wing with similar brown basal patch, this color continued along costa as far as the costal angulation. Sc and cross veins in space behind it very faintly yellow-tinged, all other veins white. Venation of both wings as in Fig. 8. Trochanter and femur of fore leg rather dark reddish brown, each with darker spot just beyond middle. Femur narrowly darker on margins and with another dark spot (almost a band) at apex; longitudinal dark shading precedes the median dark spot. Tibia widely yellowish in middle band and narrowly so at apex; two wide dark brown bands, one on each side of pale midarea; "knee" brownish, narrowly paler at joining with basal dark brown band. Fore tarsus pale smoky brown, basal joint and narrow line at bases of following joints still paler. Trochanters and femora of middle and hind legs yellowish; brown spot on trochanter; femur with brown spot just beyond middle and narrow pre-apical brown band. Hind femur with brown postbasal band, which on middle leg is reduced to narrow longitudinal shading; on hind femur, spot near middle is blackish and forms complete band. Tibiae yellowish; two dark bands on second leg in same position as on fore leg. Tarsi yellow with smoky tinge; narrow brownish streak on one margin of distal joint.

Abdomen with yellowish background considerably obscured by dark markings; apical segments tinged distinctly with reddish brown. Tergite 1 dark smoky to reddish brown; tergite 2 similar except for narrow pale anterior margin and two small pale lateral patches enclosed by dark coloration. On each side of the following tergites lateral dark patches, continuous with dark pleural fold, each patch enclosing a pale spot, leaving anterior and posterior margins pale. On 3 and 4, these dark patches meet narrowly at mid-line, but on succeeding tergites are separated medially by a triangle of the pale background color. Lateral patches on tergites 8 and 9 are triangular, base of triangle on posterior margin. On 10, patches rather indistinct but still enclosing a pale spot. Narrow black pencilings along dark pleural

fold. Sternites heavily shaded with reddish brown, leaving ganglionic areas on basal and middle segments paler; sternites 7 and 8 with narrow pale median line and pale anterior margin; 9th sternite wholly reddish brown. Basal and middle sternites appear to have the posterior margins narrowly dark laterally but pale in mid–area. Forceps yellowish white; penes pale reddish brown, forceps base even paler reddish brown. Genitalia as in Fig. 13. Tails yellowish white, basal joints faintly tinged with pale reddish brown. Joinings narrowly brown, alternately wider and narrower.

Specimen taken at Arroyo de la Invernada, Artigas Province, Uruguay, on Feb. 21, 1954 (collected by C. S. Carbonell and associates, in the field trips mentioned before in this paper) attracted by light near the stream, which here has rocky and sandy bottom, and rapids. In the collection of the Department of Entomology, Facultad de Humanidades y Ciencias of Uruguay. Body in alcohol; wings, legs and genitalia mounted on slide.

Male imagos, paratypes. Two specimens, one taken at same time and place as holotype, the other at Quebrada de los Cuervos, Treinta y Tres Province, on Dec. 17, 1952 (C. S. Carbonell, Coll.); attracted by light at night, on banks of Yerbal Chico stream. This latter male differs in certain details from the holotype and the first paratype. Rather pale median strip extends the length of the mesonotum (paler posteriorly), with narrow darker median and submedian lines; anterior to the scutellum, a dark brown patch on each side. Abdominal tergite 1 also has a pale lateral spot enclosed by a dark area. Posterior margins of tergites *very* narrowly dark, behind a pale strip. The dark patches on tergites 3–5 meet at mid–line. This specimen in the collection of the Department of Entomology, Facultad de Humanidades y Ciencias of Montevideo. Uruguay; that one taken with holotype, in private collection of J. R. Traver. Bodies in alcohol.

Female imago, allotype. Head pale yellowish; dark bands along anterior and posterior margins; posterior margin pale. Thorax yellowish to pale reddish brown, mesonotum brighter yellow in color than other parts, scutellum slightly paler. Pronotum with black median and oblique submedian lines, margins blackish. Wings much as in male, but basal patches of fore wing yellowish rather than reddish brown, costal space preceding humeral cross vein still paler; bases of C, Sc and R1, also humeral cross vein, pale purplish brown. Sc and R1 deeper yellow than in male, remaining longitudinal veins paler yellow, slightly more distinct than in male. Entire membrane of fore wing with *very faint* yellowish tinge. Hind wing somewhat longer and more pointed than in male. It might also be noted that on the hind wing the basal patch is pale purplish brown; C and Sc as far as angulation are very faintly tinged with same color. Legs dif-

fer slightly, as follows: fore tibia with somewhat wider pale basal and apical areas, middle area more restricted; femur of second leg with distinct narrow oblique mark preceding dark spot near middle, but not forming a complete band; basal half of third femur blackish brown with a few yellow longitudinal streaks only; faint indications of dark spot near base of third tibia. Abdominal markings resemble those of male except that the pale areas on tergites are more extensive and the dark lateral patches somewhat less extensive, and grayish brown in color. Dorsum of abdomen thus appears to have pale median triangles on middle and apical segments, with a row of more or less rounded lateral pale spots separated from mid-triangles by a zigzag grayish brown band which on tergites 6–8 may break up into triangles, and a second dark band adjoining the pleural fold. Subanal plate yellowish to pale reddish brown.

Same data for this allotype as for the male holotype. Specimen in private collection of J. R. Traver.

Female paratypes. About 40 specimens, same data as allotype; equally divided between Entomological Collection in Montevideo (Facultad de Humanidades y Ciencias) and private collection of J. R. Traver. On dark specimens of this group, the sternites are as in the male, but with small pale submedian dots on each side of the pale ganglionic areas and lateral oblique dark streaks on sternites 5–8. On paler ones, there is a very slight dark shading so that the ganglionic areas and submedian dots are less noticeable. Only a few specimens still have tails; these are rather deeper yellow than in male, the alternating dark joinings more prominent.

Subimagos of both sexes have the wings smoky with a distinct tinge of reddish brown; markings of legs, thorax and abdomen as in imagos.

Ulmeritus (Ulmeritoides) luteotinctus, sp. nov.

Resembles *U. (U.) uruguayensis* except for coloration of wings and legs. Most noticeable are the fawn-colored costal strip on the fore wing and the distinct pale fawn-colored veins of this wing. Only female imagos are known.

Female imago, holotype. Size: body 6.5 mm.; wing 8 mm.; fore leg 4 mm.

Head and thorax similar to *U. (U.) uruguayensis.* Entire membrane of fore wing yellow-tinged except costal strip which is fawn-colored. All veins and cross veins of this wing pale reddish brown, very distinct. Dark patch at base of fore wing less distinct than in *uruguayensis* because not contrasting so strongly with wing membrane and venation. Several cross veins in costal space before bulla, these rather indistinct. Basal patch of

hind wing paler than in *uruguayensis;* C and Sc faintly tinged as in that species. Membrane of hind wing appears whitish, likewise R1 and all veins behind it. Fore leg differs from that of *uruguayensis* in that the mid–area of the tibia is pale brownish rather than yellowish, hence not so sharply distinct from the blackish bands on each side. Legs 2 and 3 yellowish; femora of each with a small brown spot near middle and a single longitudinal brownish streak passing directly through this dark spot. On second leg, a short black streak on margin of femur near apex, below it but not connected to it a small brown dash. On third leg a complete dusky pre–apical band is present. *No dark shading* at base of femur on second or third leg. *Faint* dark dash on margin near apex of second tibia. Tarsal joints darker on apical margin.

Abdominal markings resemble those of *uruguayensis.* Pale median streak on middle and apical tergites; basal tergites largely pale grayish brown except for inconspicuous pale lateral spots and a narrow median line. Posterior margins of all tergites narrowly darker. Pleural fold conspicuously blackish. Sternites shaded with same grayed reddish brown as tergites; ganglionic areas mainly obscured; whitish submedian streaks on sternites 2–6. Faintly darker bands of grayed brown extend obliquely across the middle sternites, from mid–anterior to postero–lateral angles. Tails missing.

Specimen taken at Arroyo de la Invernada, Feb. 21, 1954; attracted by light near stream. Stream with rocky and sandy bottom and with rapids. In the collection of the Department of Entomology, Facultad de Humanidades y Ciencias, Montevideo, Uruguay. Collected by C. S. Carbonell y associates, in the field trips mentioned before in this paper.

Female paratypes. Fourteen imagos. Dark specimens as above; paler ones with abdominal markings more grayed, less well defined. Pale median streak on middle and apical tergites may form triangular blotches. Tails missing from all specimens. Localities at which taken: same data as for holotype; Timbaúba, Artigas Province, Dec. 25, 1954 and Feb. 20, 1955, on banks of Tres Cruces Stream, along its lower course, where botton of stream is rocky and muddy, mayflies attracted by light; others from Sepulturas, Artigas Province, Jan. 15, 1952, attracted by light along the banks of the Cuareim River near its headwaters, where the stream bottom is sandy and rocky (Collector, C. S. Carbonell). Specimens equally divided between collection of the Department of Entomology, Facultad de Humanidades y Ciencias, Montevideo and private collection of J. R. Traver.

Three subimagos, two males and one female, which are believed to be of this species because of the markings on legs and abdomens, have smoky wings with all veins and cross veins dis-

tinct because paler than the wing membrane. One male still has its tails; these are yellow, the basal joints narrowly darker at joinings, alternate joinings with wider bands; in middle area joinings are but faintly darkened, beyond middle no darkening is visible. One male and one female were collected by C. S. Carbonell at Arapey, Salto Province, Dec. 20, 1954; attracted by light, at night, on banks of Arapey River in its lower course, where bottom of stream is of rock and silt. The second male, also collected by C. S. Carbonell, is from Rio Cebollatí, Lavalleja Province, Jan. 5, 1957, locality known as "Picada de Rodriguez". Here the water of the river is clear, its bottom of sand and rock, a series of rapids alternating with deep pools and quiet water.

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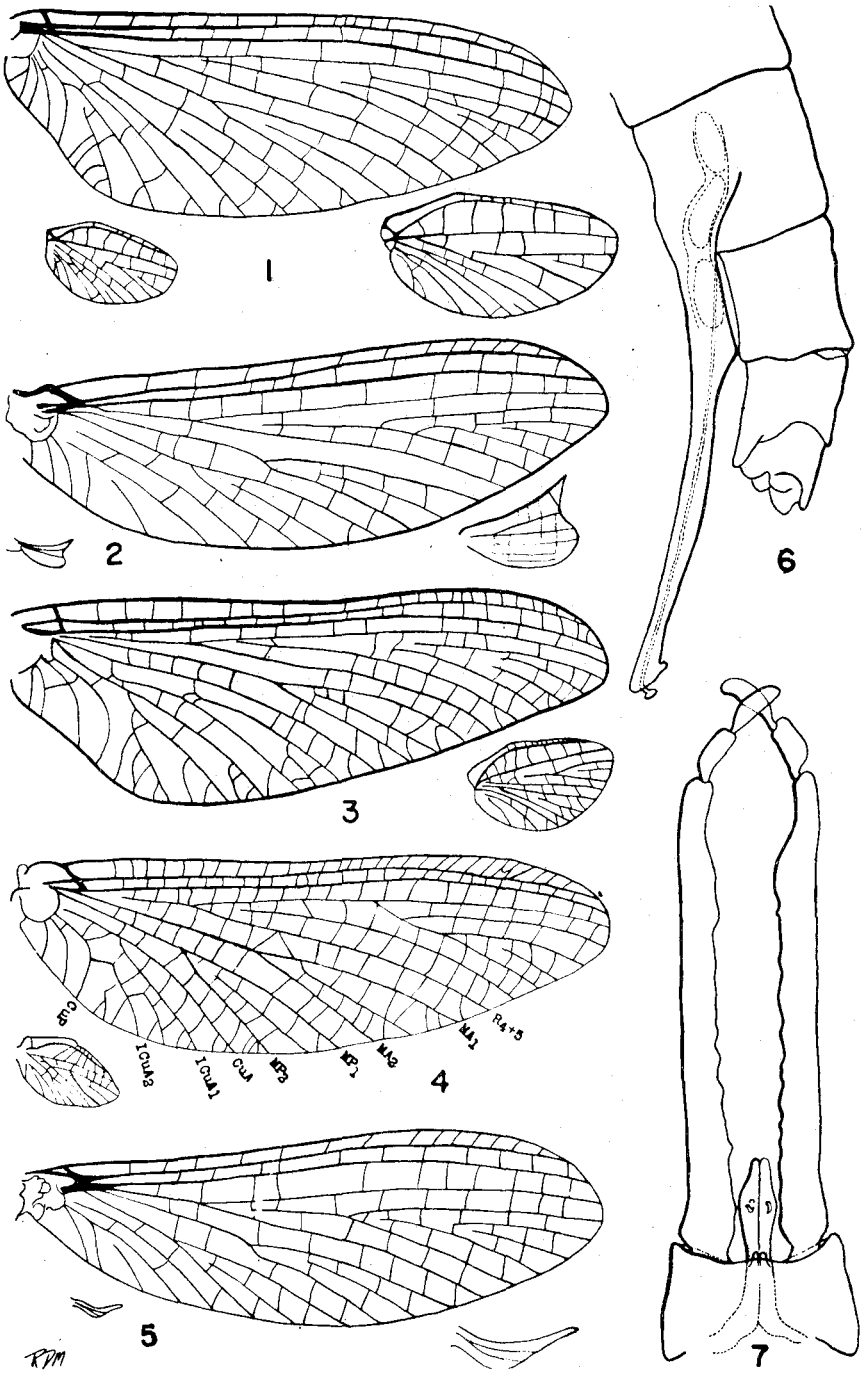
PLATE I

EXPLANATION OF FIGURES

Specimens taken in Uruguay, unless otherwise stated.

Fig. 1. *Deleatidium* sp. Wings of female (Patagonia).
Fig. 2. *Neohagenulus julio.* Wings of male (Puerto Rico).
Fig. 3. *Atalophlebia* sp. Wings of male (Patagonia).
Fig. 4. *Ulmeritus* (*Ulmeritus*) *?haarupi.* Wings of female.
Fig. 5. *Borinquena carmencita.* Wings of male (Puerto Rico).
Fig. 6. Same. Ovipositor of female (Puerto Rico).
Fig. 7. Same. Genitalia of male (Puerto Rico).

Nomenclature of veins labeled on Fig. 4: *R4+5,* branch 4 and 5 of radial sector; *MA1* and *MA2,* anterior median vein; *CuA,* anterior cubitus; *ICuA,* intercalaries of CuA; *CuP,* posterior cubitus.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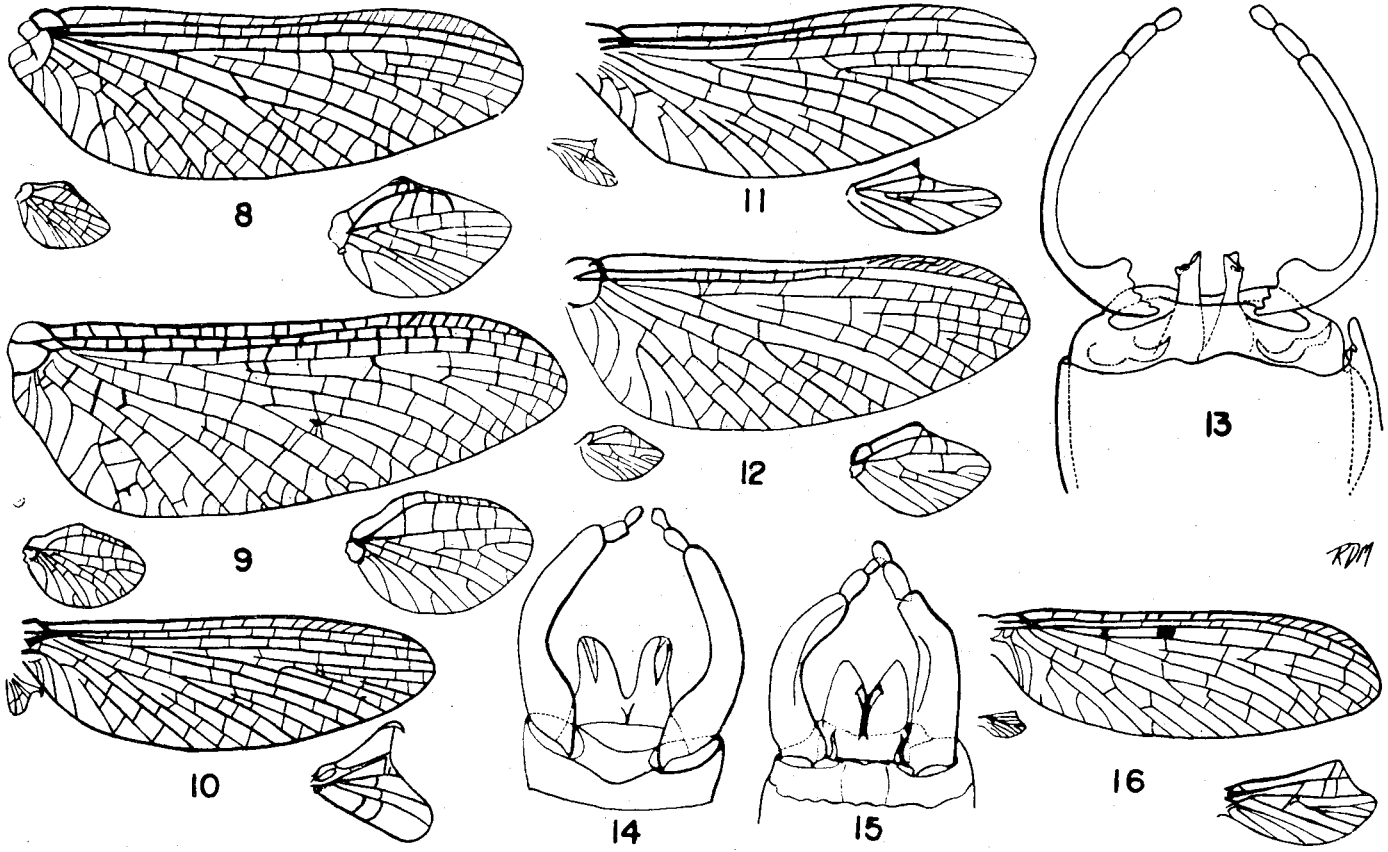
CuP
1CuA2
1CuA1
CuA
MP3
MP1
MA2
MA1
R4+5
RDM

PLATE II

EXPLANATION OF FIGURES

Specimens taken in Uruguay, unless otherwise stated.

Fig. 8. *Ulmeritus (Ulmeritoides) uruguayensis.* Wings of male, paratype (holotype similar except for a few minor differences in cross veins).
Fig. 9. *Massartella brieni.* Wings of male (Patagonia).
Fig. 10. *Hagenulus caligatus.* Wings of male (after Eaton), (Cuba).
Fig. 11. *Hermanella (Hermanellopsis) incertans.* Wings of male (British Guiana).
Fig. 12. *Thraulodes bomplandi.* Wings of male.
Fig. 13. *Ulmeritus (Ulmeritoides) uruguayensis.* Genitalia of male, holotype.
Fig. 14. *Homothraulus misionensis.* Genitalia of male.
Fig. 15. *Traverella ehrhardti.* Genitalia of male.
Fig. 16. *Choroterpes atramentum.* Wings of male (Costa Rica).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RDM
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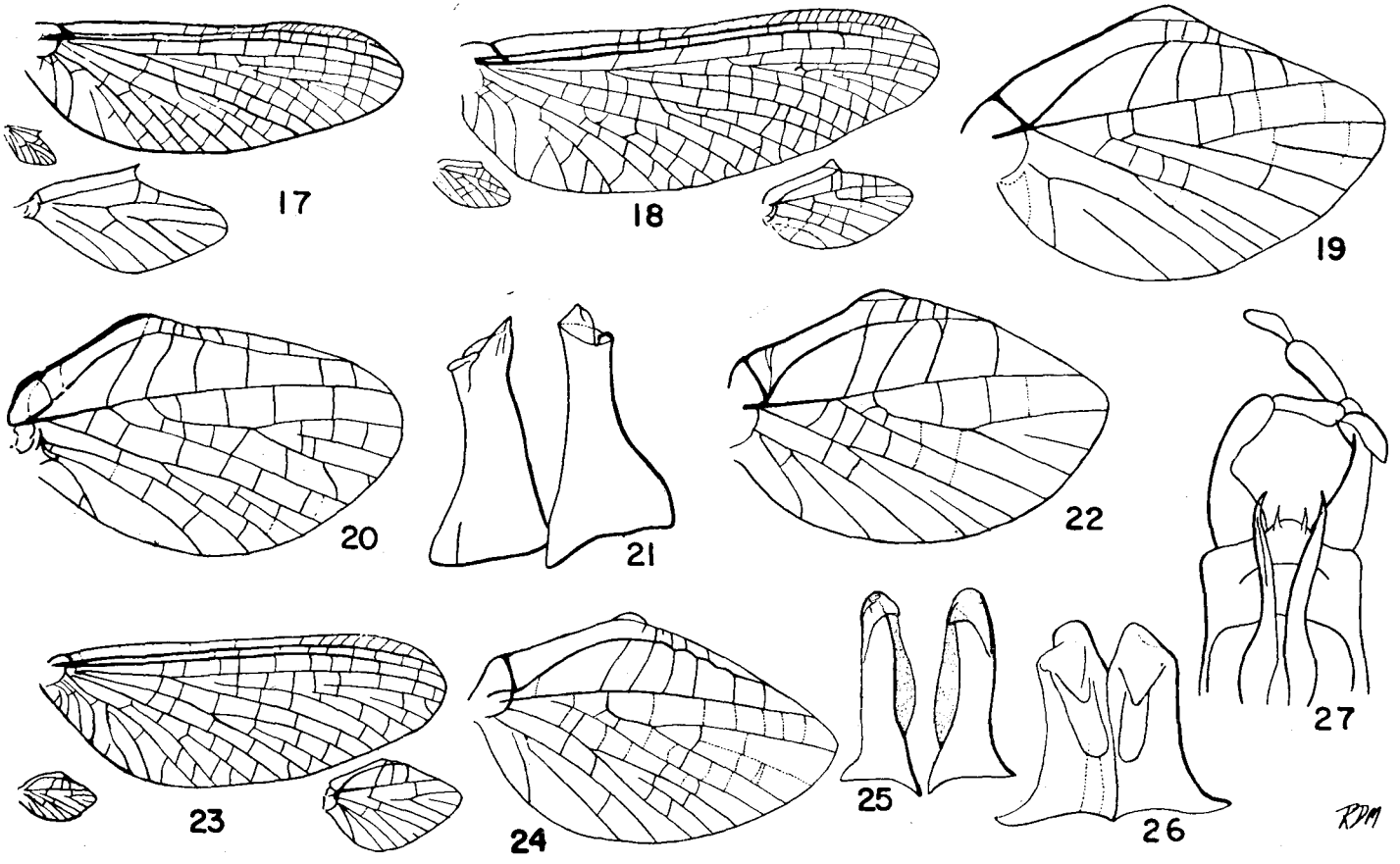
PLATE III

EXPLANATION OF FIGURES

Specimens taken in Uruguay, unless otherwise stated.

Fig. 17. *Homothraulus misionensis*. Wings of male.
Fig. 18. *Traverella ehrhardti*. Wings of male.
Fig. 19. *Ulmeritus* (*Ulmeritoides*) *uruguayensis*. Hind wing of male, enlarged.
Fig. 20. *Ulmeritus* (*Ulmeritus*) *carbonelli*. Hind wing of female, enlarged; allotype.
Fig. 21. *Ulmeritus* (*U.*) *uruguayensis*. Penes of male, enlarged; holotype.
Fig. 22. *Ulmeritus* (*Pseudulmeritus*) *flavopedes*. Hind wing of male, enlarged (Surinam).
Fig. 23. *Atalonella ophis*. Wings of male. (Chile).
Fig. 24. *Ulmeritus* (*Ulmeritus*) ? *haarupi*. Hind wing of female, enlarged.
Fig. 25. *Ulmeritus* (*P.*) *flavopedes*. Penes of male, enlarged (Suriman).
Fig. 26. *Ulmeritus* (*U.*) *carbonelli*. Penes of male. holotype, enlarged.
Fig. 27. *Hermanella* (*Hermanellopsis*) *incertans*. Genitalia of male (British Guiana).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RDM