

URUGUAYAN MAYFLIES

Family Leptophlebiidae: Part IV¹

by Jay R. Traver²

Genus *TRAVERELLA* Edmunds

Thraulius albertanus McDunnough, 1931. Canad. Ent. 63: 82-93.

Traver, 1935, Biology of Mayflies, 554, fig. 146.

Traverella albertana (McD.), Edmunds, 1948, Proc. Biolog. Soc. Wash. 61: 141, 148, 2 pl. Designated as genotype.

This genus is known to extend from Alberta, Canada, through Utah southward into Mexico and Central America, thence into South America as far as Argentina. Species which might be expected to occur in Uruguay are: *ehrharti* (Ulmer), 1919 p. 28, and *maculipennis* (Ulmer), 1919, p. 30, both from Brazil; *bradleyi* (Needham and Murphy), 1924 p. 45, reported from Brazil and Argentina; and *valdemani* (Esben Petersen), 1912, p.335, from Argentina. In Part III of this series I had suggested that perhaps *montium* Ulmer, 1943, a species from high Peru, might belong in this genus. Even if this should be proved to be the case, it is doubtful if it would be found in Uruguay. Of the above named species only one, *ehrharti*, has been taken to date in Uruguay.

Adults of *Traverella* are rather stout-bodied, moderately small mayflies. Eyes of male are quite large, not quite contiguous apically; eyes of the female are much smaller and widely separated. Venation of the fore wing is quite copious, with cross veins extending to the lateral margin. A few rather indistinct cross veins occur before the bulla, those in the stigmatic area being slanted, single, not anastomosed. Two rather long cubital intercalaries are present, connected to the margin and to one another by cross veins; the second intercalary runs into the first, which in turn is usually united by a cross vein to CuA. CuP is quite strongly angu-

1) Trabajo realizado principalmente sobre ejemplares de las colecciones del Departamento de Entomología de la Facultad de Humanidades y Ciencias (Universidad de la República, Montevideo, Uruguay), recolectados en excursiones financiadas con partidas del rubro "Investigaciones Originales". Por esta razón se considera que se exponen en él resultados parciales del proyecto de investigación "Identificación y Distribución de la Fauna Indígena del Uruguay" que ha recibido apoyo económico de dicho rubro. Recibido para su publicación el 30 de agosto de 1962 (Nota del editor).

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late. No sag in the stem of MA, but the fork is asymmetrical, MA2 sagging to rearward. The longitudinal veins between R2+3 and R4+5 are generally connected basally to one another and to the preceding veins. The hind wing is "small with a prominent costal projection slightly basad of the middle" (Edmunds). Sc extends slightly beyond this projection, where it ends in a cross vein. Two to several cross veins may be present in each of the costal and subcostal spaces. MP of this wing is not forked. "Male forceps three jointed, terminal joints short; a pair of caudally directed rod-like projections present on forceps base dorsad of forceps. Subanal plate of female with a small median V-shaped emargination in the apical margin" (Edmunds). An appendage is present on each lobe of the penes. Tails three; subequal in the genotype, but in *ehrharti* the middle tail is one and one-third longer than the laterals.

The following superficial key may serve to distinguish the male imagos of those four species that may be expected to occur in Uruguay.

1. a) Fore wings pale except for prominent arcuate brown areas at base, similar areas on hind wings; abdominal tergites 2-6 translucent whitish, posterior margins brown *bradleyi*
- b) Fore wings with colored areas either along the costal margin, or around the cross veins, or as an over-all tinge; abdominal tergites not as above 2
2. a) Many cross veins infuscated; costal margin with yellowish tinge; abdominal tergites 2-6 translucent yellowish tinged with russet brown, posterior margins blackish *maculipennis*
- b) No such infuscation of cross veins; abdominal tergites 2-6 translucent yellowish along anterior margins and antero-lateral areas only, remainder largely dark grayish brown 3
3. a) "Wings with an intense brown tinge" (Esb. Petersen); costal and subcostal spaces blackish brown; no dark bands on femora *valdemari*
- b) Bases of both wings and costal margin of fore wings distinctly tinged with yellowish or orange brown, almost colorless elsewhere; femora each with two dark bands *ehrharti*

Nymphs of *Traverella* resemble in general shape and proportions of body the nymph described and figured in Part II of this series (Traver, 1960) as an unidentified species of the *Hermanella* complex. Gills, however, are more as in *Ulmeritus* (Traver, 1956, figs 3 and 7). Three species of *Traverella* nymphs are known, of which only one, that of the genotype, has been actually associated with the adult stage. Edmunds, in his paper establishing the genus, figures and describes the nymph of *albertana*,

likewise that of a second species which he terms *Traverella* sp. The latter I am here referring to as sp. a, since still a third nymph of this genus is now known from Mexico, but has not yet been described; this I refer to as sp. b. Neither sp. a nor sp. b have been associated with the adult stage, but by reason of the size and color pattern of mature nymphs of sp. a I believe that these nymphs will prove to be those of *T. presidiana* (Trayer), known as adults from Texas and Mexico in the same localities in which the nymphs were taken.

Details of structure of nymphs of the genera *Traverella*, *Hermanella* type and *Ulmeritus*, are indicated below. Since no nymph of *Traverella* has been taken as yet in Uruguay, comparisons are based on those of *albertana* from Alberta and Utah, sp. a from Texas and Mexico, and sp. b also from Mexico.

Clypeus.—At mid-line of apical margin, a slightly upturned area is present in *Hermanella* and in *T. albertana*; in *Traverella* sp. b this upturning is more pronounced, and in fully mature nymphs forms a backwardly-directed flap; in *T. sp. a*, a peculiar spatulate-shaped process arises from this region, extending forward and becoming more slender at the tip which extends well beyond the anterior margin of the labrum.

Mouthparts.

Labrum.—Wide and emarginate at center of anterior margin in *Traverella* and *Hermanella*; in these genera it is much wider than the clypeus. In *Ulmeritus*, the indentation on the apical margin is wider, deep, and contains several papillary processes; a much narrower structure than in the two preceding genera, although still as wide as the anterior margin of the clypeus.

Mandibles.—Strongly angulate on outer margin in both *Hermanella* and *Traverella*, this angulation nearer the canines in *Traverella*, the outer margin here between angulation and canines slightly bowed inward. No such angulation in *Ulmeritus*; outer margin curved regularly but quite strongly.

Maxillae.—Rather similar in all three genera, with "bottle brush" at tips of palpi and spine at inner upper angle of galealacinia; this spine relatively shorter in *Traverella*.

Hypopharynx.—Lateral tips of 'horn' rounded and upturned in *Hermanella* and *Ulmeritus*; more slender and directed laterally in *Traverella*.

Labium.—Distal joint of palpus very short in *Ulmeritus*, much longer in the other two genera; in *Traverella*, fully two-thirds as long as the second joint. General shape of body of labium very similar in all three.

Claws.—In *Hermanella*, one large tooth immediately below the one at tip, and subequal to it in size; smaller denticles in two rows beyond this large tooth. In *Ulmeritus*, a graded series of denticles below tip, the largest being nearest tip, but this is much smaller relatively than the corresponding one in *Hermanella*, and

forms part of the denticular series. No denticles near tip in *Traverella*, but a group of small ones about midway of the claw.

Gills.—Bilamellate in all three genera. In *Hermanella*, lateral margins entire, but one to three fimbriate processes at tips; general shape similar on all segments. In *Ulmeritus* and *Traverella*, margins fringed laterally as well as distally; central lamellate area wider in *Ulmeritus* and fringes more numerous. In that genus also, first four pairs of gills approximately equal in size, fifth and sixth decreasing in size, seventh smaller; lower (posterior) member of each gill pair larger than the upper (anterior) member. In *Traverella*, differences in the three known species as indicated: *albertana*; lower member of gill six fibrilliform, both members of gill seven of this type; in sp. a and sp. b; both members of gill six lamellate, fringed, while gill seven is so reduced that only the lower fibrillar portion remains.

Postero-lateral spines on abdominal segments. Short spines on segments eight and nine only, in *Traverella* and *Hermanella*. In *Ulmeritus*, an inconspicuous short spine on segment four, relatively small spines on five and six, larger spines on seven to nine, those on seven and eight tending to flare outward somewhat from the body.

Traverella ehrhardti (Ulmer)

Thraulius ehrhardti Ulmer, 1919. Arch. f. Natu.g. 85: 28-30.

1943, Ulmer Stett. Ent. Zeit. 104: 28 and 33.

Traverella ehrhardti (Ulmer). 1950, Edmunds. Rev. de Entomolog. 21(3): 557.

1959, Traver. Rev. Soc. Uruguaya Ent. 3: 4; figs. 15 and 18.

The following descriptions of imagos of this species are drawn from specimens preserved in alcohol and collected in Uruguay by Dr. C. S. Carbonell. These specimens have been compared with imagos and subimagos of both sexes which Dr. Ulmer sent to me some time ago, as well as with his descriptions of the species.

Male imago: Turbinate portion of eyes large, almost circular in dorsal aspect, not contiguous apically. Ocelli whitish, widely black-ringed at base. Antennae light reddish brown. Head reddish brown; blackish band between eyes, interrupted by a narrow pale median line which in turn may be margined narrowly by black lines. Posterior margin of head shaded with grayish black. Thorax very dark reddish brown. Pronotum margined laterally with black; median and oblique paramedian black lines. Mesonotum very dark red-brown; margins of sclerites narrowly black; scutellum black-margined, preceded by a yellowish patch. Black lines on pleura above and behind leg bases; rather extensive paler areas between sclerites. Metanotum rather bright red-brown, scutellum darker. Sternum without conspicuous markings.

Fore femur very dark red-brown, with wide median and apical black bands; slightly paler at base. Tibia also dark red-brown,

becoming paler apically, tip yellowish. Tarsus yellow with faint reddish tinge. Femora of legs two and three much as in fore femur; tibiae pale red-brown at base, yellow beyond; tarsi yellow, joinings very narrowly darker. In fore wing, C, humeral cross vein, Sc and R_1 orange to orange brown, becoming paler apically; costal and subcostal spaces tinged with yellowish orange, this color deepest in basal half of subcostal space, very pale in costal space. Entire wing appears to have a faint yellowish tinge. Stigmatic area rather opaque, whitish; circa 20 slanted cross veins beyond bulla, single, not anastomosed. Before the bulla, only six or seven very indistinct cross veins are usually seen. Longitudinal veins behind R_1 paler orange, as are a few of the cross veins, especially those in space behind R_1 and in disc of wing; other cross veins paler. Orange brown shading at bases of both fore and hind wings. Hind wing with yellowish cross veins. Wings as figured by Traver (1959).

Abdominal tergite one mostly deep grayish brown, posterior margin narrowly darker. Tergites two to six narrowly translucent yellowish along anterior margins and antero-lateral angles; posterior margins grayish black; narrow incomplete pale mid-dorsal streak beginning back of anterior margin and ending at start of dark posterior border, flanked by grayish black submedian lines. Two small black spots above and parallel to pleural fold, which in these specimens appears grayish. Remainder of tergite mostly reddish brown with quite heavy gray shading. On some males, paler paramedian streaks from anterior margin extend backward into the dark background area; also indistinct paler blotches may be present near or above the postero-lateral angles. Tergites seven to nine similar to two to six, but body of sclerite more reddish, with less gray shading; mid-dorsal pale streak wider, wedge-shaped, submedian marks on each side now wider and more diffuse. Tergite ten dark red-brown, posterior margin blackish. Quite a bit of variation in the intensity of the dark gray shading on tergites, and of the extent of the paler areas, in different males. Sternites reddish brown, deepest in color on basals and apicals; joinings pale, so that sternum appears ringed; little or no gray shading. Sternite eight with rather wide dark posterior border. Genitalia pale reddish brown; see figure in Traver (1959). Tails missing from most specimens; yellow, only a few of the basal segments narrowly reddish at joinings.

Size: fore wing 9 mm.; body 8-9 mm.

Female imago: Quite similar to male aside from the usual sex differences, except as noted. Head paler, yellowish to yellowish brown; extensive dark gray shading on posterior margin and between eye and lateral ocellus. Mesonotum paler red-brown than in male; anterior and antero-lateral margins grayish; middle sclerites outlined in creamy yellow, a spot of same color laterad of and anterior to the yellow area preceding scutellum. Most cross

veins of fore wing, except in the cubito-anal region, more distinct than in male; yellowish orange. Rather more cross veins in the hind wing. More extensive yellowish areas on middle tergites, both anteriorly and laterally. Posterior margin of sternite seven narrowly darker. Subanal plate slightly emarginate on apical margin, as is usual in this genus. In some but not all specimens, sternites shaded lightly with gray or grayish brown. Tails missing on all available imagos from Uruguay. Subimaginal females have yellowish tails as in the male imago; presumably the tails of the imago will be similar.

Size: fore wing 10-10½ mm.; body 8-9 mm.

A few minor differences between these Uruguayan specimens and Ulmer's Brazilian forms may be noted. These seem all to be the sort of variations that might be expected even among specimens taken at one time in any given area. (1) In Ulmer's specimens, the costal margin of the fore wing seems more evenly tinged with orange in both costal and subcostal spaces and does not become quite as pale apically as in those from Uruguay in which the color in the costal space is definitely very pale (sometimes barely visible), but very deep in the basal portion of the subcostal space. (2) In the hind wing of the female from Brazil, Ulmer notes two S-shaped cross veins in the costal cell, while in both sexes there is a faint network of cross veins in the anal region of this wing. In none of the Uruguayan females which I examined closely (only a few, to be sure) did I see these two S-shaped costal cross veins, but several specimens of both sexes show the indistinct network of veins in the anal area. (3) Pleural fold in his specimens described as being dark brown. (4) Tails of the Brazilian types said to be yellowish or reddish gray. Size very similar, in both sets of specimens.

Both sexes are represented, imagos as well as subimagos, among the Uruguayan specimens collected by Dr. C. S. Carbonell. The localities from which he took representatives of this species, with his observations on such things as time of capture and conditions in the adjacent stream, are indicated below. A total of 75 or more specimens is represented in his collections. The nymph of this species of *Traverella* is as yet unknown.

Arequita, Lavalleja Province, Jan. 2, 1951: "Mayflies attracted by light at night, banks of Santa Lucia River". Sepulturas, Artigas Province, Jan. 11 and 13, 1952: "Attracted by light, at night, banks of Cuareim River". Salto Chico, Salto Province, Apr. 19, 1951: "Flying over the waters of Uruguay River, after sunset, near waterfall". Santa Rita, Paysandu Province, (Rio Uruguay), Nov. 8, 1955: "River very deep and wide. In this particular spot, bottom of rock or mud at the banks. Sandy islands nearby. The exact locality is called "Puerto de Pepe Aji". Salto Grande (Rio Uruguay), Salto Province, Nov. 10, 1955: "River very wide, interrupted by waterfall about 10 feet high at this time of the year. Bot-

tom of rock, very eroded and full of holes and crevices". Of the above, the Santa Rita collection, which yielded 15 or more imagoes of both sexes, was the best "catch" of all.

REFERENCES

- Includes only those not previously listed in Parts I, II or III of this series of papers.
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