

THE SUBFAMILY LEPTOHYPHINAE. PART II: FIVE NEW SPECIES
OF TRICORYTHODES

(EPHEMEROPTERA, TRICORYTHIDAE)

JAY R. TRAVER, *University of Massachusetts, Amherst*

Characters of the genus *Tricorythodes* Ulmer have been presented adequately in previous papers (Ulmer, 1919; Needham, Traver, Hsu, 1935; Traver, 1958). The following qualification of a statement by Traver (1958) should be made in regard to the membranous processes from the wing roots extending backward from the mesonotal scutellum: in an occasional male subimago as well as in female subimagos such processes do occur but in the male are usually very short, barely long enough to show beyond tip of scutellum. In the present paper, three new species of this genus from Mexico and two from Uruguay are described.

Tricorythodes mulaiki, sp. nov.

Represented by 39 male imagos; 36 in alcohol, 3 mounted on slide. Several lack one or more legs or parts thereof.

Size.—Body 3¼-5 mm.; wing 4-5 mm.

Synopsis.—Fore claws of male similar, blunt; forceps base excavated shallowly or not at all; *hind femur longer than hind tibia and tarsus combined*; hind tibia almost 3 times length of tarsus. Abdomen paler reddish brown than thorax, colorous above and below except for slight darker shading in mid-areas only of basal and apical tergites.

Holotype male (in alcohol, parts not dissected; median as to color characters).

Head: vertex rather reddish brown, tubercles near posterior margin darker; basal half of pedicel of antenna brown, remainder yellowish; filament broken, its basal portion yellowish. **Thorax**: Pronotum yellowish in middle third, smoky gray patch occupying center of anterior margin, median line narrowly black; lateral areas bright reddish brown, with oblique black line on each side and two paler patches, the anterior of these the smaller, oval. Mesonotum very dark red-brown except for somewhat paler middle strip which in turn has a narrow median line; yellowish areas separate mesonotum from pleura and from scutellar area. Scutellum yellow-tipped, this preceded by a wide dark gray-brown transverse band. Metanotum largely reddish brown. Pleura yellowish with large reddish brown patches: one anterior to each leg, one laterad of scutellum; patch anterior to middle leg continues around on to sternum. Sternum yellowish, somewhat grayed in middle region, laterally with brown patches continued from pleura. **Legs**: Fore trochanter brownish with gray shading, two blackish dots at apex, one on each side; fore femur brownish with two longitudinal yellow streaks, narrow black line across apex preceded by grayish spot; fore tibia largely gray, knee brown, whitish area near base; tarsus missing on holotype, on several of the paratypes gray, first joint pale at base. Middle and hind coxae with reddish brown band, trochanters with black dots at apex; femora yellowish with some brown shading, narrow black band at apex; black streak on knee, tibiae elsewhere yellowish white; tarsi whitish.

Hind femur $1\frac{1}{4}$ times length of tibia and tarsus combined. **Wings:** Subcosta and radius, and costa at base, very dark gray; R_s , MA and MP_1 faintly gray, all other veins mainly silvery white.

Abdomen practically concolorous light reddish to olive brown; intersegmental areas pale; mid-dorsal line black on tergite 1, pale on middle tergites, pale line also along pleural fold. Faint grayish black shading in mid-areas only on basal tergites 7-8; basal and apical tergites darker red-brown. Two blackish patches (testes?) on sternite 9, within a dark brown triangular area. Forceps and forceps base pale yellowish white; apical margin of forceps base with very slight excavation only. Tails blackish at base for several segments; following this, several silvery white segments, grayish beyond; joinings in basal third blackish to deep gray.

Paratypes resemble holotype except for some slight differences in color, some being rather paler, others darker; some appear to have the sternites slightly deeper in color than the tergites. In these specimens, the apical margin of the forceps base varies from a very slight excavation to a straight line, and even a slight bulge outward.

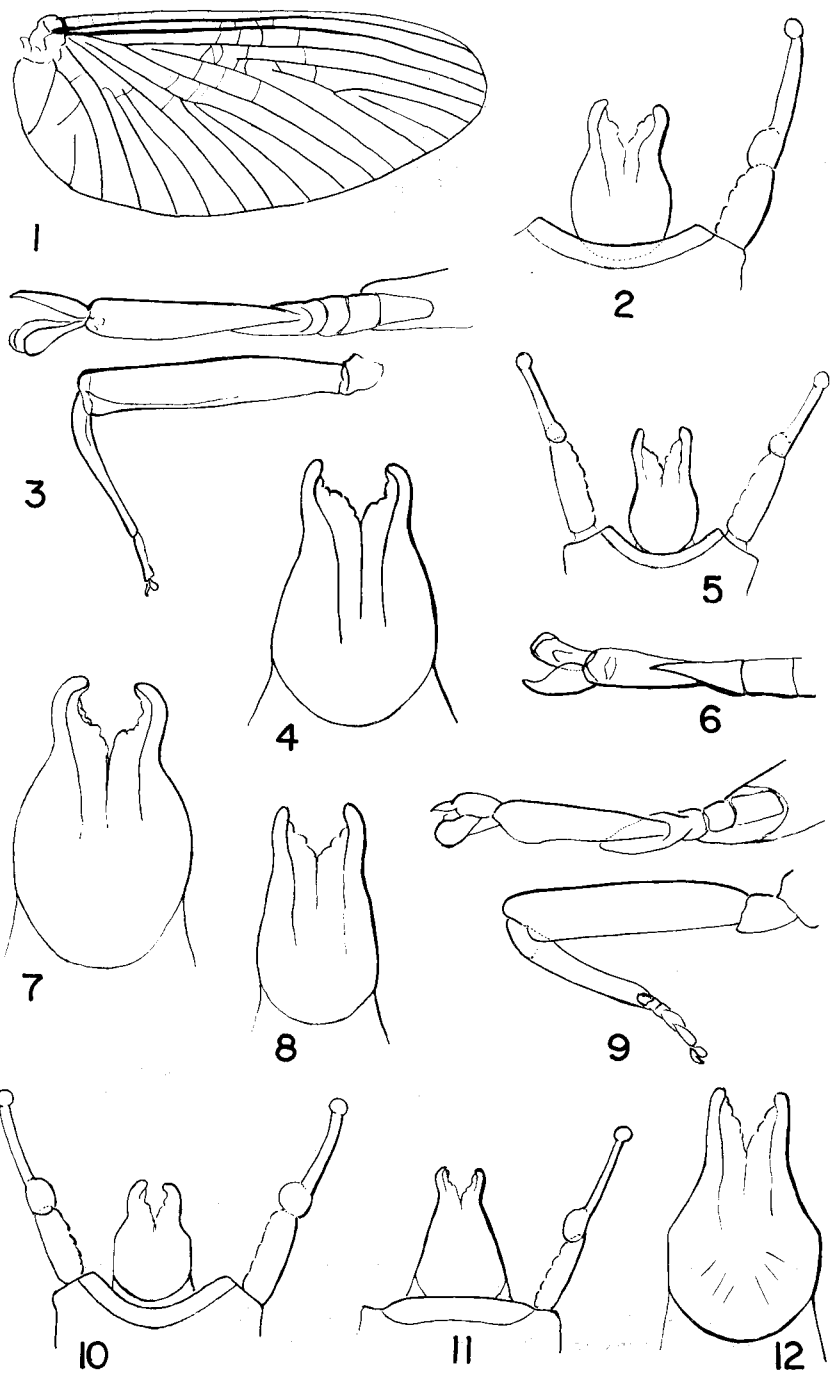
Holotype.—Male imago. Four miles south of the Rio Papagayo Bridge on Rio Zalope, Guerrero, Mexico; Jan. 4, 1948. S. Mulaik, collector. In private collection of J. R. Traver.

Paratypes.—38 male imagos. Same data. Several in collection of G. F. Edmunds Jr., Univ. of Utah. Genitalia as shown in Figs. 4 and 11.

The species is named in honor of Dr. Stanley Mulaik, of the University of Utah, who collected these and many other specimens which are now in my collection.

The shape of the apical margin of the forceps base places this species in the same group with *explicatus* Eaton; *fallax* Traver; *lichyi* Traver; and *minutus* Traver. It is smaller and much paler than *explicatus*; it lacks the extensive dark markings on the abdominal tergites found in *fallax* and in most specimens of *lichyi*. In general color and appearance it resembles *minutus* so closely that it would certainly have been considered the small form of that species, were it not for the differences in relative lengths of tibiae and tarsi of middle and hind legs; tails are darker at base and gray beyond base rather than brownish as in *minutus*, fore femur and tibia grayish rather than white. Moreover,

Fig. 1, *Tricorythodes santarita*, n. sp., wing of female holotype; fig. 2, *Tricorythodes arequita*, n. sp., genitalia of male (subimaginal cuticle, partially shed, not shown in figure); fig. 3, *Tricorythodes mulaiki*, n. sp., third leg of male imago (above, tarsus enlarged; below, entire leg, tarsal segmentation omitted); fig. 4, *T. mulaiki*, penes, enlarged; fig. 5, *Tricorythodes comus*, n. sp., genitalia of male imago; fig. 6, *Tricorythodes arequita*, fore leg of male, claws and distal portion of tarsus; fig. 7, *T. arequita*, penes, enlarged; fig. 8, *Tricorythodes comus*, penes, enlarged; fig. 9, *Tricorythodes santarita*; third leg of female imago (above, tarsus and base of tibia, enlarged; below, entire leg); fig. 10, *Tricorythodes angulatus*, n. sp., genitalia of male imago; fig. 11, *Tricorythodes mulaiki*, genitalia of male imago; fig. 12, *Tricorythodes angulatus*, penes, enlarged.



in both *minutus* and *lichyi* the forceps base, though shallow, is nevertheless deeper than in *mulaiki*. From all of these, as well as from all other species thus far described, *mulaiki* differs in the relative shortness of the hind tibia and tarsus, with the resultant apparent greater length of the hind femur. In all other species studied, hind femur equals tibia plus first, or first and second, joints of hind tarsus, while in *mulaiki* this femur is $1\frac{1}{4}$ times as long as tibia and tarsus combined (see Fig. 3). Likewise, in the majority of other species, the hind tibia is twice the length of the hind tarsus (varies, however, from $1\frac{1}{2}$ to $2\text{-}2\frac{2}{5}$ as long), while in *mulaiki* it is almost 3 times the tarsal length. In *mulaiki*, fore tibia is $3\frac{1}{2}$ times as long as the second tibia, varying in other species from $2\frac{1}{3}$ to 3 times its length.

Had only a single specimen been available for study, such discrepancies in proportions of leg joints would have been considered aberrant, atypical, perhaps due to injury. But when the same features are found to occur among many specimens, it seems logical to assume that one is dealing, not with aberrations, but with bona fide specific characters.

***Tricorythodes comus*, sp. nov.**

Represented by about 100 male imagos; 2 mounted, others in alcohol.

Size.—Body $3\text{-}3\frac{1}{2}$ mm.; wing $3\frac{1}{2}\text{-}3\frac{3}{4}$ mm.

Synopsis.—Fore claws of male similar, blunt; forceps base with moderately deep excavation on apical margin; pronotum black, contrasting with pale flesh-colored head; abdomen yellowish with rather limited blackish markings.

Holotype male.—**Body** 3 mm.; wing $3\frac{1}{2}$ mm. **Head** flesh-colored, no dark marking except a narrow black line anterior to lateral ocelli; antennae flesh-colored with some gray shading at base, filament absent. **Thorax**: Pronotum black with some very narrow scroll-like yellow markings. Mesonotum deep mahogany brown, antero-median lobe slightly paler, contrasting with the yellowish pleural area on each side, remainder of pleural areas pale reddish brown; tip of scutellum yellowish, preceded by smoky markings; margins, median and submedian lines of mesonotum narrowly black. Metanotum paler reddish brown. No conspicuous dark markings on pleura. Sternum reddish brown except for mid-areas, whitish on prosternum and yellowish to flesh-colored on meso- and metasterna. **Legs**. Coxae and trochanters reddish brown; two conspicuous blackish dots at apex of each trochanter. Fore femur pale reddish brown, margins darker brown, two paler areas near base; apex narrowly darker, preceded by narrow gray longitudinal streak. Fore tibia deep smoky gray, paler just beyond the dark reddish brown knee, on which is a black spot. Fore tarsus paler gray, 3rd and 4th joints still paler basally, claws and distal joint faintly brown-tinged. Femora of second and third legs pale reddish brown with slight gray shading near the dark gray upper margins; tibiae and tarsi yellowish with very pale reddish brown tinge; prominent black knee spot. **Wings**: Costa narrowly purplish brown, not margined; Sc and R purplish gray, the former widely margined except in apical fourth. Other longitudinal veins as far as CuA pale grayish, silvery white in some lights; subcostal and radial cross veins grayish, others pale, inconspicuous.

Abdomen pale yellowish white tinged faintly below with reddish brown; apical segments reddish brown. Tergites banded with deep smoky to blackish; on 1-3 and 8-9, dark bands extend practically across the segments, but on 4-7 limited to meson; intersegmental areas and anterior margins pale. Mid-dorsal line narrowly black on tergite 1, white on 2-7. On 2, 8 and 9, a short black dash above pleural fold. Sternites pale reddish brown; intersegmental areas pale, so that sternum appears banded; some gray shading on sternite 8, sternite 9 deeper reddish brown proximally; rather indistinct narrow dark dashes next to pleural fold on basal and middle sternites. **Tails** pale gray, somewhat darker at base, where joinings are also very narrowly darker. **Genitalia** yellowish white. Forceps base moderately excavated apically, this excavated area relatively narrow.

Paratypes similar to holotype, except as noted below. Antennal filament gray, whitish at base. Abdomen may be pale fawn-colored dorsally, deeper in color ventrally. Variable amount of gray shading on tergites. In a few, inconspicuous shading is present on meson of middle tergites and apical margins of basals only; in these, the femora lack gray shading, and no dark lines are present above, on or below the pleural fold. In many others, all shading on tergites is more intense than on holotype, although similarly distributed; femora of second and third legs quite extensively gray-shaded, this shading composed of many minute dark dots closely spaced; tibiae of these legs similarly shaded; all joinings of tail joints except at extreme tip may be narrowly darker. Still other specimens have blackish shading on basal and apical tergites, gray on the middle ones. The amount of pale ground color between dark bands on the tergites likewise varies considerably; often a pale space occurs between tergites 7 and 8, and all dark bands seem well separated. Genitalia of paratypes shown in Figs. 5 and 8. In some specimens, the penes may appear relatively narrow.

Holotype.—Male imago, in alcohol, parts not dissected. Four miles south of the Rio Papagayo Bridge on Rio Zalope, Guerrero, Mexico; Jan. 4, 1948. S. Mulaik, Coll. In private collection of J. R. Traver.

Paratypes.—47 male imagos, same data. Some of these in collection of G. F. Edmunds, Jr., University of Utah.

In addition to the specimens selected as types, 54 others are held as of this species, these taken at same date, same locality. Many of these have lost one to several legs, antennal filaments, sometimes parts of wings.

Other known species having a black pronotum are *explicatus*, *atratus* McDunnough, *stygiatus* McD., *lichyi* and *peridius* Burks. From all of these except *peridius* it is distinguishable by reason of the pale head contrasting markedly with the black pronotum; from some of these species it differs in shape of wing and in color of abdomen and legs. From *peridius*, it differs as follows: no conspicuous freckles on femora or on tibiae; no black line on posterior margin of head; no subapical band on femora; larger black knee spot; smaller size. It would appear also that the excavation on the apical margin of the forceps base is deeper and narrower.

Tricorythodes angulatus, sp. nov.

Type material consists of 98 male imagos and one female imago.

Size.—*Male.* Body 3½-4 mm., wing 4-4½ mm. *Female.* Body 4½ mm., wing 5 mm.

Synopsis.—Fore claws of male similar, blunt; penes quite angulate laterally; forceps base quite deeply emarginate, this excavated area relatively narrow; abdomen yellowish to whitish, rather heavily marked with blackish; legs typically freckled with black.

Holotype male.—Body 3½ mm., wing 4½ mm. **Head:** Flesh-colored, including tubercles; antennae whitish; eyes and heavy rings at base of each ocellus black; a narrow black line on posterior margin adjoining eye. **Thorax:** Pronotum yellowish in mid-area, reddish brown laterally, extensively marked with narrow black pencilings, which extend transversely over part of the pale central area. Mesonotal shield very dark reddish brown, the anterior lobe chestnut brown; shield sharply distinct from the paler yellowish pleural areas adjacent to it; scutellum grayish or yellowish at tip, preceded by small black spot; grayish bands likewise margin the hinder portion of this shield. Metanotum reddish brown in center, yellowish laterally, with some black marking. Large dark reddish brown patches on pleura precede middle and hind legs and continue down on to sternum; pale areas of pleura with a few faint dark pencilings. Prosternum yellowish with several black markings; meso- and metasterna dark reddish brown except for yellowish ganglionic areas. **Legs.** Coxae, trochanters and femora light reddish brown; some gray shading on coxae; the usual two dark brown spots at apex of each trochanter. Femora narrowly margined with blackish brown; near middle of each is a pale narrow longitudinal streak; small black dots, freckle-like, singly or in groups, on outer surface form irregular dark pencilings; on inner surface of fore femur a row of 5-7 somewhat larger black dots form an irregular line. On second femur and to a lesser extent on the third, the dots on the outer surfaces tend to occur mainly in two groups, near base and apex respectively. Fore tibia silvery to very pale pearly gray; knee brown with a prominent black spot; apex narrowly pale reddish brown; a row of black dots along outer margin in mid-area. Fore tarsus grayish white basally, fifth segment brownish; V-shaped support of claws blackish; a few scattered black dots irregularly arranged along length of tarsus. Second and third tibiae very pale brownish; black knee spot; near middle of each tibia, a group of small black dots form quite an extensive band. Tarsi of these legs likewise very pale brown except for whitish terminal joints; V-shaped support of claws faintly brown; an occasional black dot present, these scattered irregularly along each tarsus. **Wings.** Costal margin tinged with grayish lavender, most pronounced along Sc. Cross veins of subcostal, radial and first space of sector fairly distinct; pale grayish. Cubito-anal veins silvery white; other longitudinal veins very faintly gray-tinged, but appear silvery in some lights. CuP only slightly more arcuate than 1st anal, considerably less arcuate than in wing of *T. albilineatus* Berner.

Abdomen yellowish with faint reddish overcast, apical segments pale reddish brown. Tergite 1 heavily shaded with black laterally, widely yellow in center. Wide bands of grayish black occupy most of the meson of the middle tergites, leaving however a rather wide yellowish mid-dorsal line and yellow lateral areas.

Pale mid-dorsal area widest on tergite 8; posterior half of tergite 7 largely yellowish. Black dashes along pleural fold on all tergites, most prominent on 2 and the apicals; gray line along posterior margin of 7 is connected laterally to black dash on pleural fold. Gray shading on sternites in form of paired submedian dashes, most evident on apicals, and on each a dash adjacent to pleural fold; posterior margins of sternites narrowly and inconspicuously darker. **Tails:** First two segments of outer tails, and basal one only of middle tail, deep slate gray; following segments paler gray, becoming still paler toward tips. At each joining in basal half, apical end of each segment narrowly darker, basal portion of succeeding segment paler. Genitalia yellowish; structure as shown in Figs. 10 and 12. Note angulate appearance of penes.

Male paratypes differ from holotype only as indicated: In many, yellow median area of pronotum not gray-shaded, dark shading on lateral areas may be more intense. Abdomen sometimes whitish rather than yellowish; brown transverse bands on sternites may be more distinct, so that abdomen appears darker ventrally than dorsally; submedian gray streaks may be confined to apical sternites. Number and arrangement of black freckles on femora somewhat variable. Some variation also in depth of excavation on apical margin of forceps base.

Allotype female.—Body 4½ mm.; wing 5 mm. Fore legs missing, tails broken except at base. Very similar to male except for usual sex differences. Body still filled with orange-colored eggs. Markings on sternites less well defined than in most males, but gray streaks next to pleural fold present, also submedian streaks on apical sternites. All longitudinal veins and most of the cross veins dark gray. Stubs of tails yellowish.

Holotype.—Male imago. Body in alcohol, parts dissected and mounted. Rio Santa Lucia, Mexico, Dec. 28, 1947. S. Mulaik, Coll. In private collection of J. R. Traver.

Allotype.—Female imago. Same data.

Paratypes.—97 male imagos. Same data. Several in collections of Dr. G. F. Edmunds Jr., Univ. of Utah, and of Dr. L. Berner, Univ. of Florida. Remainder in private collection of J. R. Traver.

This species is related to *albilineatus* and to *fictus*, as regards structure of genitalia and general color pattern. Although the name *angulatus* has been given to call attention to the angular appearance of the penes, this same feature occurs also in both of the other species just mentioned. Comparison with specimens of *albilineatus* sent to me by Dr. Berner reveals that in that species the fore claws of the male are dissimilar, one blunt, one sharp-pointed; likewise the vein CuP is considerably more arcuate than in *angulatus*. No such morphological features distinguish *angulatus* from *fictus*, however. Color differences between *angulatus* and *albilineatus* are: entire head and thorax of *angulatus* paler, with a tendency for more contrast between mesonotal shield and surrounding lateral areas; abdomen less heavily marked in most specimens; tails darker gray. As compared with paratypes of *fictus*, *angulatus* has paler head and abdomen, black shading on tergites less intense and less extensive, with paler areas therefore more extensive; pale mid-dorsal strip on dorsum of abdomen

rather wide and continuous; legs generally paler, black knee spot more conspicuous, black freckles present; cross veins in subcostal, radial and first space of sector distinct; ganglionic areas of thorax and abdomen not darkened; tails darker gray. Further, there is usually a conspicuous pale spot on middle of tergite 1, continuing on to mid-basal part of tergite 2.

Admittedly the differences which distinguish *angulatus* from *fictus* are entirely comparative, with the exceptions of the slightly smaller size of the former and the presence of black freckles on the legs, yet I believe *angulatus* to be a distinct species. Inasmuch as the size and number of these black freckles is variable, there is some question as to the value of this feature as a specific character. Such small black freckles on the legs occur also in *albilineatus*, in *peridius* and in *atratus*. The black head and pronotum of this latter species distinguish it from *angulatus*, likewise some differences in the structure of the genitalia.

In addition to the specimens selected as paratypes, several hundred others from the same locality are held under the name *angulatus*, among them 8 females. It is probable that specimens from another area in Mexico belong here also. These, collected by Dr. H. H. Hobbs and sent to me by Dr. Berner, come from Hacienda Potrero at Potrero Viejo, Paraje Nuevo, Vera Cruz, Dec. 23, 1941; all have legs and bodies heavily marked with black; fore claws of male similar, blunt. All are much faded except for the black markings; all the females are spent, their abdomens shriveled.

***Tricorythodes arequita*, sp. nov.**

Represented by three male subimagos, subimaginal cuticle partially shed.

Size.—Body $4\frac{1}{2}$ mm.; wing $4\frac{1}{2}$ -5 mm.

Synopsis.—Fore claws of male dissimilar, one blunt, one sharp-pointed; minute black dots forming bands on femora; forceps base shallowly excavated.

Holotype male.—**Head**: Pale flesh-colored, posterior margin black; antennae pale. **Thorax**: Pronotum yellowish; narrow black pencilings along anterior and lateral margins, mid-line narrowly black; triangular lateral brownish patches from which a brown streak extends down on to fore coxa. Mesonotum dark reddish brown; black triangle on scutellum. Metanotum and pleura somewhat paler reddish brown; darker markings anterior to wing bases. Persistent short extensions of wing roots protrude slightly from mesonotal scutellum, more so than in most male subimagos of this genus. Prothoracic sternum and mid-areas of meso- and metasterna pale flesh-colored; lateral margins of meso- and metasterna reddish brown. **Legs**: Coxa and trochanter of fore leg shaded with brown, margins black; dark dot at apex of each. Fore femur yellowish brown, margins and longitudinal band on outer surface dark brown; minute dark dots form partial median and incomplete preapical blackish band. Fore tibia largely dark smoky gray; knee reddish brown, narrow pale spot just beyond it; apex narrowly pale, preceded by a black subapical area. Tarsus yellowish, basal joints and base of claws shaded

with smoky. Claws dissimilar. Black dots at apices of trochanters of middle and hind legs. Middle and hind femora yellowish white; incomplete basal and pre-apical gray bands and wider gray median band formed by minute blackish dots; tibiae pale, incomplete black band on knee, black band preceding apical flange, narrow black triangle midway between base and apex. Tarsi pale yellowish white, claws faintly brown-tinged. **Wings:** Longitudinal veins of costal margin dark gray, Sc and R gray-margined, especially in basal half; R2 + 3, R4 + 5, MP and CuA narrowly gray, other longitudinals mainly pale, as are cross veins.

Abdomen yellowish white. Pale gray transverse bands on basal and apical tergites, on middle tergites confined mainly to posterior margins; lateral margins pale, bounded above by narrow dark line. Large blackish blotch on tergite 3 and continuous on part of 4, near pleural fold; smaller black dots on tergites 5 and 6. Mid-dorsal line black, complete on basals and apicals, incomplete on middle tergites; short black stigmatic mark on each basal and middle segment. Sternites pale, some slight brownish shading next to pleural fold; black dot preceding each ganglionic area, smaller on middle sternites. Apical sternites deeper yellow than those preceding; reddish brown line laterally on 9, paralleling pleural fold; *very narrow* blackish transverse lines across each sternite, probably along tracheae. **Tails** yellowish white, pale gray basally; joinings narrowly darker at base, pale beyond. Genitalia as in Figs. 2 and 7; forceps base only shallowly excavated.

Paratype males differ somewhat from holotype, as follows: Pronotum paler, dark markings less distinct; in one, meso- and metanota paler red-brown, in the other a pale band precedes mesonotal scutellum, which lacks the black triangle. Fore femur slightly red-tinged. Basal and middle abdominal tergites paler; gray bands almost obsolescent; mid-dorsal line marked by small black dots, or by a line on tergite 1 and no dots on 2-6; black dots only on mid-dorsum of 7-9, or mid-line narrowly blackish on these tergites. Black blotches on 3-4, as in holotype. In one paratype a dark dot also on 5. Tails on one specimen faintly darker at joinings.

Holotype.—Male subimago, cuticle partially shed. In Entomological Collection of the Department of Entomology, Facultad de Humanidades y Ciencias of Uruguay. Lavalleja, Arequita, Uruguay, Jan. 2, 1951; attracted by light at night, on banks of Santa Lucia River. Collected by Dr. C. S. Carbonell and associates, in field trips organized by the Departments of Zoology and Entomology, Facultad de Humanidades y Ciencias, Uruguay.

Paratypes.—2 male subimagos, shedding cuticle. Same data as holotype. One in Entomological Collection of Dept. of Entomology, Uruguay, as above; the second, in private collection of J. R. Traver.

Because of the dissimilarity of the fore claws, a feature uncommon in the genus *Tricorythodes*, the erection of a new species for these specimens seems justified, especially as each of the three males has almost completed the change to the imago state. It is doubtful if any marked differences in color or structure would be found in the mature imago. The species resembles *albilineatus* in this unlikeness of the fore claws,—it might perhaps be considered the South American counter-

part of that North American species. Aside from the important difference in geographical distribution, *arequita* may be distinguished from *albilineatus* by these features: Forceps base much less deeply excavated, CuP less arcuate; Sc and R somewhat less heavily shaded; black dots on legs smaller, not freckle-like; tibiae of middle and hind legs with black median triangle and black apices; black markings on abdominal tergites much less extensive, black blotch on 3 and 4 more prominent, mid-dorsal line black instead of white.

***Tricorythodes santarita*, sp. nov.**

Represented by a single female imago, which is distinctively marked.

Size:—Female imago, body $2\frac{3}{4}$ mm.; wing $3\frac{3}{4}$ mm.

Synopsis.—Basal third of wing heavily gray-shaded; vein which seems to represent CuP arises further from base than normal and does not reach margin; meso- and metathorax seem unusually large.

Holotype female.—**Head** dark grayish brown, heavily marbled with black above except for frontal area. Eyes black, ocelli black-ringed at base. Antennae grayish. **Thorax:** Pronotum heavily shaded with black except for four somewhat oval yellowish areas laterally, each of which is surrounded by black. Unsclerotized area between head and pronotum wide, yellowish. Mesonotum very pale reddish brown; wide black median stripe except on anterior lobe; grayish black shading all around mesonotal shield; scutellum and adjoining carinae black. Metanotum yellowish with black shading. Black markings on pleura on each side of anterior lobe of mesonotum, and narrowly above bases of legs, elsewhere without gray shading. Thoracic sternum pale reddish brown, ganglionic areas slightly paler. **Legs:** Pale yellow, very heavily shaded with grayish black. Coxae and trochanters each with two black streaks; usual two dark dots at apices of trochanters. Wide dark preapical band on femora, still wider but incomplete median band; small spot at base of each; margins prominently gray-shaded. Tibiae with wide dark median band, two dark longitudinal streaks, black knee spot. Middle tarsal joints black shaded. Third leg as in Fig. 9. **Wings:** *Membrane of entire basal region of wing shaded* with purplish gray, including almost half of the costal area and most of the anal lobe, although space between MP_1 and CuA is paler. Entire costal space gray. Note the unusual arrangement of veins (presumed to be cubital intercalaries and CuP), as shown in Fig. 1. Venation normal for the genus in other respects.

Abdomen: Tergites yellowish with slight reddish tinge; heavily shaded with black except for lateral portions of middle segments, pale area on posterior margin of 9, paler submedian areas anteriorly on 10. Blackish brown median stripe on 10, posterior margin brown. Pleural fold distinctly black margined on basal tergites, and on 7-9; short black dash only, on middle tergites. Sternites very similar in color to thoracic sternum, but a trifle paler; no dark shading. Abdominal segments 7, 8 and 9 rather wide and well extended laterally (specimen is spent). **Tails** broken off a short distance beyond base; parts remaining are yellowish white, not darker at joinings. Subanal plate appears to be *slightly emarginate* on apical margin,—in most females of this genus, slightly obtuse.

Holotype.—Female imago, spent. In alcohol. Paysandú, Santa Rita, (Rio Uruguay), Uruguay, Nov. 8, 1955. C. S. Carbonell, Coll. Dr. Carbonell's notes: "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' ". In Entomological Collection of the Department of Entomology, Facultad de Humanidades y Ciencias of Uruguay.

Ordinarily it is not good policy to describe a species from a single female specimen. In this case it seems admissible to do so, because of (1) the unusual extent of the dark shading on the wings; (2) the peculiar disposition of veins in the cubito-anal region; and (3) the emarginate character of the subanal plate. Although differing from the usual conditions found in the genus *Tricorythodes* by each of the three features enumerated, it seems best to consider the species an aberrant member of that genus, as in the case of *T. australis* (Banks). It cannot be placed in any of the other known genera of the subfamily Leptoxyphinae, in which group it unquestionably belongs. The alternative,—the erection of a new genus for a single female specimen,—certainly is not warranted.

REFERENCES

- Needham, J. G., J. R. Traver and Y. C. Hsu, 1935. The Biology of Mayflies. Ithaca, N. Y., Comstock Publ. Co. xiv + 759 pages.
- Traver, J. R., 1958. The subfamily Leptoxyphinae (Ephemeroptera: Tricorythidae). Part I. Annals Ent. Soc. America 51(5):491-503, 2 pls.
- Ulmer, Georg, 1920. Neue Ephemeropteren. Arch. Naturgesch. 1919, 85 A (11): 1-80, 56 figs.

BOOK NOTICE

OBLIGATORY AND FACULTATIVE INSECTS IN ROSE HIPS, by W. V. Balduf. Illinois Biological Monographs, No. 26, 194 pp., 12 plates. The University of Illinois Press, 1959.

Dr. Balduf's book is the culmination of 15 years of observations and research on the insect community of rose hips. It is especially valuable to the interested biologist in outlining the details of the bionomics of the primary phytophagous inhabitants as well as that of their parasites and inquilines, and discusses in detail the relation of the various rose species to their visitors. A rather comprehensive bibliography based on the world literature is another valuable feature of the volume. The illustrations are excellent.—

RICHARD H. FOOTE, *Entomology Research Division, ARS, U. S. Department of Agriculture, Washington, D. C.*