A NEW GENUS OF LEPTOHYPHIDAE (INSECTA: EPHEMEROPTERA)

Carlos Molineri

INSUE (CONICET) - Fundación Miguel Lillo
Miguel Lillo 252
(4000) San Miguel de Tucumán, Tucumán, Argentina

ABSTRACT

A new genus of Leptohyphidae, *Yaurina* gen. nov., is established. Males have very characteristic genitalia. Nymphs of this new genus are superficially similar to *Leptohyphes*, but can be distinguished from them by the form and length of the femoral spines, number and arrangement of denticles on the tarsal claws and abdominal gill structure among others characters. Three species are described, *Y. yuta* and *Y. mota* from male, female and nymphs from Argentina, and *Y. yapa* from a male subimago from Ecuador. Some nymphs previously assigned to *Leptohyphes* probably belong to this new genus.

INTRODUCTION

The family Leptohyphidae is presently composed of 8 genera: *Leptohyphes, Tricorythodes, Leptohyphodes, Tricorythopsis, Haplohyphes, Coryphorus*, *Cotopaxi* and *Allenhyphes*.

The most common South American genus is *Leptohyphes*, with the majority of its species described from nymphs only. The adult stage is poorly known, and the male genitalia is seldom used in the systematic of the genus. In South America, there are only a few species with both the adult and nymphal stages known: *L. maculatus*, *L. setosus* and *L. petersi* (Allen, 1967), and those species described from imagos only have little variation in the male genitalia (*peterseni* type: Traver, 1958a: 497 and Traver, 1958b). The male genitalia of *Leptohyphes indicator* Needham and Murphy (1924: 33) is very atypical for the genus (Domínguez et al., 1994: 99) and represents a distinct group that will be discussed in another paper.

In this paper is described a new genus with male genitalia characterized by the presence of two large spine-like appendages arising from the base of the penes (Figs. 1-6, 8). This character and others of the penes, forceps and styliger plate distinguish this genus from other genera of the family. Nymphs of the new genus have some of the diagnostic characters of *Leptohyphes*: rather ovoid operculate gills, a transverse row of spines on the fore femora, and hind wing pads present in males but absent in females. These characters are of little systematic value to separate different genera because they show a gradual range of variation,

Trends in Research in Ephemeroptera and Plecoptera
Edited by E. Dominguez, Kluwer Academic/Plenum Publishers, 2001

i.e. operculate gills vary from ovoid to triangular, and dorsal spines of the fore femora range from short and blunt to long and thin (setae-like) without discrete morphological gaps. Moreover, the presence or absence of hind wings in females is variable in different species or populations, thus reducing the use of these characters for generic determination.

As a result, some nymphs previously described in *Leptohyphes* may represent other genera when adults can be associated, as is the case of the recently described genus *Allenhyphes* Hofmann and Sartori (in Hofmann et al., 1999); the type species was formerly known only from nymphs as *Leptohyphes flinti* Allen. The nymphs here described as *Yaurina* gen. nov. do not agree with any of the descriptions of the *Leptohyphes* species in the literature. Diagnostic characters are given in the generic description and discussion.

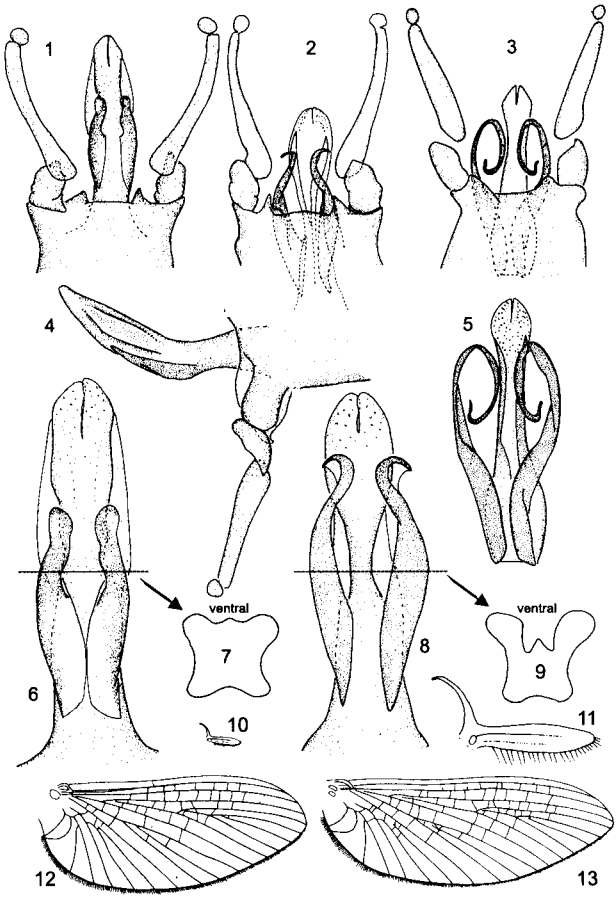
***Yaurina* Gen. nov. (Figs. 1-30)**

Type species: *Yaurina yuta* sp. nov.
Species included: *Y. yuta*, *Y. mota* and *Y. yapa*.
Distribution: Argentina and Ecuador.

Male imago: Length: body, 3.0-3.2 mm; fore wings, 2.9-3.3 mm; hind wings, 0.40-0.50 mm. *Head*: compound eyes blackish separated by a distance 3 times diameter of an eye, median ocellus 2/5 of diameter of lateral ocelli. Compound eyes blackish. Ocelli whitish basally ringed with black. Antennae: scape 1/2-1/3 length of pedicel, flagellum 3-4 times length of scape and pedicel together. *Thorax*: mesonotum with heavy sclerotized bands on anterolateral margins of mesoscutum or between these sclerites and mesonotal protuberance (fore mesonotal transverse invagination, Kluge, 1992); mesoscutellum with two membranous filaments 7 times longer than wide. Fore wings (Fig. 12): vein MP2 united basally to veins CuA and MP1 by a cross vein, base of vein IMP ending freely in wing membrane or united to vein MP2 by a cross vein, vein ICu1 united basally to veins CuA and CuP by a cross vein; fore wings fringed on hind margin. Hind wings (Figs. 10-11) present, total length of hind wings 0.13-0.15 total length of fore wings; with a pair of weak longitudinal veins and fringed posterior margin; costal projection 0.50-0.55 of wing length and curved anteriorly. Legs: fore and middle femora of similar length, hind femora 1.4 times length of fore femora; fore tibiae 1.84 times length of middle tibiae and 1.62 times length of hind tibiae; fore tarsi 2.05 times length of middle tarsi and 1.56 times length of hind tarsi. Fore tarsal claws of a pair similar, blunt; middle- and hind tarsal claws of a pair dissimilar, one blunt, paddle-like and other apically hooked. *Genitalia*: rear margin of styliger plate extended posteriorly as in Figs. 1-4. Forceps (Figs. 1-4) three-segmented, segment 1 short and stout, segment 2 inserted on apical inner margin of segment 1; segment 2 with a slightly bulbous base and 3 times length of segment 1; segment 3 small and globular. Forceps extends perpendicularly to styliger plate (Fig. 4). Penes (Figs. 5, 6, 8) long and slender, completely fused except on small apical furrow, penes with a pair of long spine-like appendages on ventral side, appendages with wide base and thinner toward apex, dorsally or dorsolaterally curved. Penes excavated laterally (Fig. 4) and ventrally; more or less quadrangular in transversal view (Figs. 7, 9). Cerci 2 1/2 times length of body, terminal filament 3 1/2 times length of body and bearing short setae.

Female imago: Length: body, 3.7-4.5 mm; fore wings, 4.3-4.5 mm. *Head*. As in male. *Thorax* as in male. Legs: in all legs, tarsal claws of a pair dissimilar, one blunt, paddle-like, other apically hooked. Wings: fore wings as in Fig. 13. Hind wings absent. *Abdomen*: ninth sternum with rounded posterior margin, very slightly emarginated apically. Cerci slightly longer than body, terminal filament 1 1/2 times the length of body.

Mature nymph (Fig. 14): Body length (without cerci), 3.1-4.5 mm. *Head*: hypognathous. Antennae 1.25 times width of head. Mouthparts (Figs. 20-25): clypeus with convergent lateral margins, anterior margin as wide as labrum; width of labrum (Figs. 20-21) 1.8-1.9 times maximum length, lateral margins straight, anteromedian emargination broad and shallow; long setae present on dorsum of lateral and anterior margins (Fig. 20), with submedian longitudinal rows of setae ventrally as in Fig. 21. Mandibles as in Figs. 24-25. Maxillae (Fig. 22) with galea-lacinia completely fused except on apical furrow; inner



Figs. 1-13. *Yaurina* gen. nov. *Yaurina mota* sp. nov.: 1, male genitalia, v.v.; 4, same, lateral v.; 6, penes, enlarged, v.v.; 7, transversal view of penes; 10, male hind wing; 11, same, enlarged; 12, male fore wing; 13, female fore wing. *Yaurina yuta* sp. nov: 2, male genitalia, v.v.; 8, penes, enlarged, v.v.; 9, transversal view of penes. *Yaurina yapa* sp. nov.: 3, male genitalia, v.v.; 5, detail of penes, v.v.

margin near apex with row of 6-7 spines, a second row of 5-6 long spines at midpoint; outer margin with 5 long setae at basal half and numerous long curved setae at apex; maxillary palpi 2-segmented, segment 1 half length of segment 2. Lingua of hypopharynx rectangular with anterior margin slightly concave; superlinguae elongated and oval with setae on anterior margin. Labium (Fig. 23) with maximum width of submentum 3.2 times maximum width of mentum; labial palpi 3-segmented, segment 1 2.26 times length of segment 2, segment 2 1.25 times length of segment 3; outer margin of segment 1 and 2 of palpi and paraglossae with long setae, shorter setae on glossae; glossae and paraglossae fused almost completely, with rounded margins. *Thorax* with anterior margin of pro- and mesonotum with short denticles; base of coxae with long setae. Legs (Figs. 15-17): femora of fore legs with a transverse row of spines extending as in Fig. 17, spines long and flattened distally as in Fig. 18; tibiae with a double row of thick setae on anterior margin; tarsi with a row of setae on anterior margin; tarsal claw of all legs acute and slightly curved apically, with a row of 5-6 blunt marginal denticles at middle and a palisade of 6-7 submarginal slender denticles on distal half (Fig. 19). Middle and hind femora (Figs. 16 and 15 respectively) with spines on

posterior margin, spines similar to those on dorsum of fore femora; middle and hind tibiae with a double row of thick setae on anterior margin and a single row on posterior margin, middle tibiae with an additional row of setae on ventral side; middle and hind tarsi with a ventral row of setae; proportions of middle femora 1.2-1.3 times length of fore femora, hind femora 1.6-1.7 times length of fore femora; middle tibiae 1.3 times length of fore tibiae and hind tibiae 1.9 times length of fore tibiae; length of fore femora 2.6 times maximum width. Gills (Figs. 26-30): gills on segments II-VI, gills II-V formed by three lamellae (Figs. 26b-29), gills VI by a single one (Fig. 30). Dorsal lamellae of gills II operculate elongate-ovoid (Figs. 26a, 26b) covering remaining gills almost completely; gills II with a ventral pair of lamellae of different shape and position (Fig. 26b), inferior one placed perpendicularly to dorsal lamella (operculate part of the gill) and elongated, forming (together with lateral projections of abdominal terga III-VI) the base of a cavity where remaining gills lie (the roof of the cavity being formed by operculate lamella); ventral upper lamella small and elongated as in Fig. 26b. Lamellae of gills III-VI ovoid, smaller posteriorly (Figs. 27-30). Abdominal segments III-VII laterally expanded, lateral margins of VII narrower. Small posterolateral spines present on abdominal segments II-VII, smaller on VII. Posterior margins of terga I-IX with short denticles. Terminal filament slightly longer than cerci, 0.8 times length of body, with whorls of spines at articulations.

Etymology: "Yaurina", from a Quechua voice for "fishing hook", because of the form of the spine-like appendages of penes.

Discussion: Yaurina gen. nov. is distinguished principally by adult characters and is distinct from all described species of Leptohyphidae known from male imagos. However, because the male imago of the type species *Leptohyphes eximius* Eaton was unknown, it became necessary to rear *L. eximius* to confirm that it was not *Yaurina*. This description will be published separately. For purposes of this paper, I can report that the male genitalia of *L. eximius* is clearly of the type conventionally attributed to *Leptohyphes*: the *peterseni*-type of Traver (1958a,b) and that the nymph is conespecific with that described by Kluge (1992).

It is more difficult to distinguish the nymph of *Yaurina* from other species described only from nymphs, and several known species may eventually prove to belong to *Yaurina*, as for example *Leptohyphes* sp. A of Traver (1944: 15), *L. tinctus* Allen (1973), *L. viriosus* Allen (1973), and *L. spinosus* Allen and Roback (1969). Other nymphs which may be confused with *Yaurina* are *Tricorythodes* sp. of Demoulin (1966: 20) and *T. sierramaestrae* Kluge and Naranjo (1990), but they can be distinguished from *Yaurina* by the characters discussed below. Also, the nymphs of *Allenhyphes flinti* are similar, but they can be distinguished by the number of denticles on the tarsal claws and the presence of bipectinate setae on the labrum, labium, and hind tibiae. Among the three subgenera established for *Tricorythodes* nymphs by Allen and Murvosh (1987), only *T. (Homoleptohyphes)* has obovate opercular gills, and it can be separated from *Yaurina* by the form of the legs, fore femoral bands of spines, and the tarsal claws.

Kluge (1992) listed thoracic characters that distinguish *Leptohyphes* from *Tricorythodes*. Some of them are: form of "posterior scutal protuberances (PSP)" (divergent in *Leptohyphes*, convergent in *Tricorythodes*), "transverse mesonotal suture" (present in *Leptohyphes*, absent in *Tricorythodes*), and "inferior dorsoventral suture of lateropostnotum" (forming a straight line with the "superior dorsoventral suture" in *Tricorythodes* but not in *Leptohyphes*). In *Yaurina*, the PSP are almost parallel, the "transverse mesonotal suture" is absent or slightly marked and the "inferior dorsoventral suture of lateropostnotum" is also slightly marked but is otherwise similar to *Leptohyphes*.

Yaurina can be separated from the other genera of the family, including all the taxa discussed above, by the following combination of characters. In the male imagos: 1) hind wings present (Figs. 10-11); 2) length of costal projection 0.50-0.55 of hind wings length (Figs. 10-11); 3) forceps 3-segmented (Figs. 1-4); 4) styliger plate extended posteriorly at base of forceps as in Figs. 1-4; 5) penes completely fused except on small apical furrow (Figs. 5, 6, 8); and 6) penes with a pair of long ventral spine-like appendages arising from the base (Figs. 5, 6, 8). In the nymphs: 1) gills present on abdominal segments II-VI (Figs. 26-30); 2) gills on abdominal segment II formed by an operculate dorsal lamella, elongated and oval in shape,

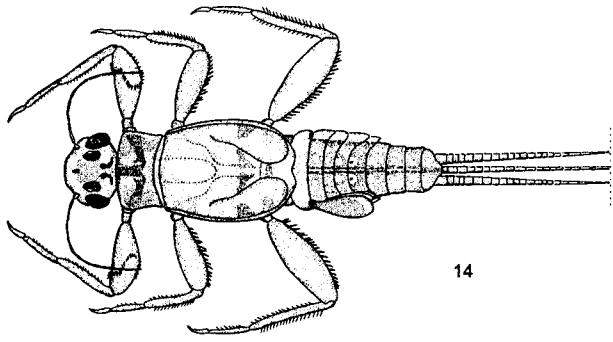


Fig. 14. *Yaurina* gen. nov. *Yaurina yuta* nymph, dorsal view.

and with the inferior ventral lamella perpendicular to it (Fig. 26b); 3) long, thin and distally flattened spines on the fore femora (Fig. 18); 4) maxillary palpi 2-segmented (Fig. 22); 5) maximum width of submentum 3.2 times maximum width of mentum (Fig. 23); and 6) tarsal claws with a row of 5-7 blunt marginal denticles at middle and an apical palisade of 4-7 submarginal slender denticles (Fig. 19).

Yaurina yuta sp. nov. (Figs. 2, 8, 9, 14-25)

Male imago (in alcohol): Length: body, 3-3.2 mm; fore wings, 3.1-3.3 mm; hind wings, 0.40-0.45 mm. General coloration light yellowish-orange, abdomen whitish translucent. *Head*: whitish, widely shaded with gray except ventrally. Antennae light yellowish-white. *Thorax*: dorsal portion of pronotum whitish shaded with gray, mediolateral zones yellowish-white with black margins and a black sublateral irregular band. Mesonotum light yellowish-orange, turning whitish-yellow at middle and yellowish-orange between mesonotal protuberance and mesoscutum; shaded diffusely with gray; mesoscutellum yellowish translucent; mesopleura whitish-yellow, shaded with gray anterior to insertion of wings, base of coxae grayish; lateral sclerites of meso- and metathoracic sterna yellowish-orange, median sterna whitish shaded with gray. Metanotum light yellowish-orange slightly shaded with gray. Legs yellowish-white, darker on margin except fore tibiae and fore tarsi whitish translucent, diffusely shaded with gray on all coxae and fore tibiae and fore tarsi. Wings (similar to Figs. 10-12): membrane of fore wings hyaline slightly tinged with yellow, darker in C and Sc sectors; longitudinal veins yellowish-orange, transverse veins diffusely tinged with yellow turning darker toward fore margin. Membrane of hind wings slightly yellowish, costal projection darker, longitudinal vein hyaline. *Abdomen*: whitish translucent shaded with gray on terga I-X almost evenly, except on a longitudinal median line on II-IX and a pair of semicircular anterosubmedian marks on III-IX. Sterna diffusely shaded with gray except on semicircular submedian marks on anterior margin of II-VIII. *Genitalia* (Figs. 2, 8, 9): styliger plate whitish except on posterior margin between forceps, yellowish; slightly shaded with gray; basal segment of forceps yellowish-white, second and third segments whitish translucent; penes (Fig. 8, 9) whitish translucent except lateral spines light yellowish-orange; spines shorter than penes, with apex curved outward as in Fig. 8. Cerci whitish translucent.

Female imago: Unknown.

Female subimago (in alcohol): Length: body, 3.7-4.5 mm; fore wings, 4.3 mm. General coloration light whitish-brown, abdomen yellowish. *Head* as in male except antenna: scape and pedicel whitish, flagellum shaded with light brown. *Thorax*: pronotum whitish-yellow, shaded extensively with gray except on sublateral zones; propleura and prosternum whitish diffusely washed with gray. Mesonotum as in male. Legs: fore legs yellowish-white shaded with brown; middle and hind legs whitish. Fore wings as in male. Hind wings absent.

Abdomen: whitish translucent shaded with gray almost completely except on a medio-longitudinal line on terga VI-IX, sterna as in male; eggs yellowish. Terminal filament whitish translucent [cerci broken off and lost].

Mature nymph (in alcohol) (Fig. 14): Body length 3.4 mm, cerci length 1.8 mm (male); body length of female larvae 4.3-4.5 mm. General coloration pale light yellowish-brown. *Head*: whitish-yellow shaded diffusely with gray between and behind lateral ocelli, around base of and between antennae, and on irregular marks near posterior margin. Compound eyes blackish. Ocelli whitish rounded with black. Antennae whitish washed with brown on flagellum. Mouthparts (Figs. 20-25) yellowish except incisive and molar surfaces of mandibles orangeish-brown and labrum yellowish-brown. *Thorax*: pronotum pale yellowish shaded with gray as in male imago, pleura and sternum whitish-yellow. Mesonotum pale yellowish shaded with gray on mesoscutellum, pleura and sternum whitish-yellow shaded with gray at base of coxae and sternum. Metanotum whitish-yellow shaded with gray at base of hind wingpads. Legs (Figs. 15-17). Whitish-yellow with yellowish spines, tarsal claws with yellowish apex. *Abdomen* yellowish, shaded with gray as in male except below gills, whitish. Gills: gills II yellowish-white tinged with gray almost completely except on distal and lateral margins (similar to Fig. 26a), remaining gills whitish washed with gray at base. Cerci whitish-yellow with whorls of setae at articulations.

Material: Holotype male imago, ARGENTINA, Salta, Estancia Jakúlica (near Parque Nac. Baritú), Arroyo de la Casa, 25-II-1989, E. Domínguez col.. Paratypes: 37 male imagos same data as holotype, 2 reared male subimagos from ARGENTINA, Salta, Río Piedras, Ruta 18 to Isla de Cañas, 25-XII-1997, C. Molineri Col.; 2 reared females subimagos and 1 nymph same data as holotype except date and collector: 26 to 28-XII-1997, C. Molineri Col. Holotype and paratypes deposited in the Entomological Collections of Instituto-Fundación Miguel Lillo, Tucumán, Argentina, except 5 paratypes male imagos in Florida A and M University, Tallahassee, Florida, USA and 5 paratypes male imagos in Musée de Zoologie, Palais de Rumine, Place dela Riponne 6, Lausanne, Switzerland.

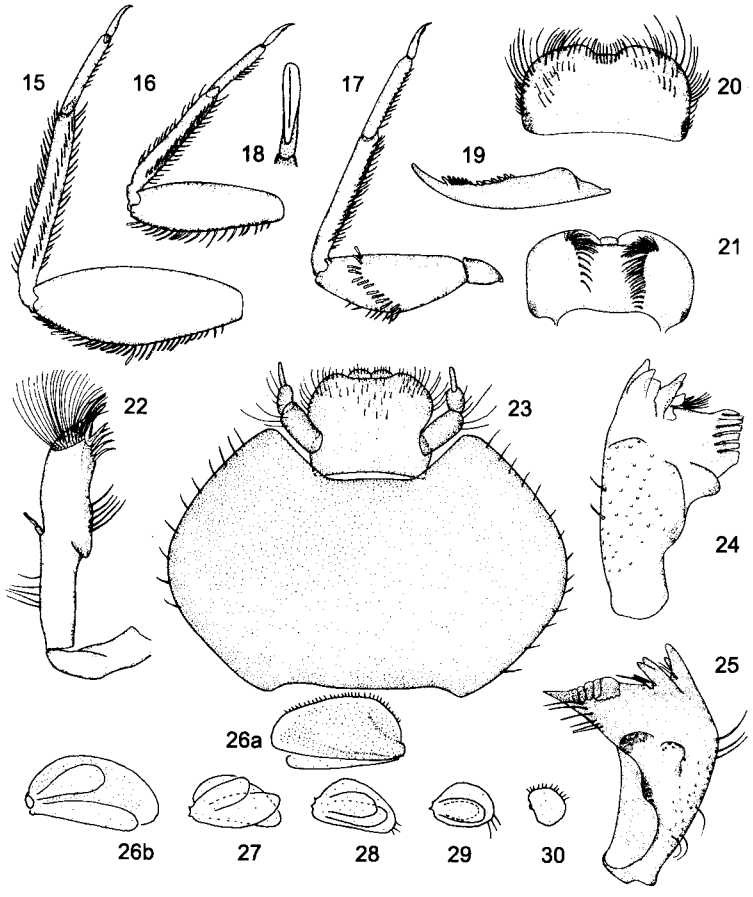
Life cycle associations: Association between nymphs and adults was made by rearing nymphs of both sexes.

Etymology: "Yuta", from a Quechua voice meaning "shortened", because the spine-like appendages do not reach the apex of penes.

Discussion: Males of *Yaurina yuta* can be distinguished from the other males of the genus because the spine-like appendages of penes are slightly shorter than penes (0.68 times the total length of penes) and their apices are acute and laterally curved (Fig. 8). The nymphs here described as *Y. yuta* and *Y. mota* are not distinguishable at this time.

Yaurina mota sp. nov. (Figs. 1, 4, 6-7, 10-13)

Male imago (in alcohol): Length: body, 3.2-3.6 mm; fore wings, 3.6-3.8 mm; hind wings, 0.5 mm. General color whitish light brown. *Head* yellowish-white suffused with light brown almost completely except on frons (between antennae and median ocellus), on a paler transverse line between lateral ocelli, and on a pair of submedian small circular sclerites on the occipute. Antennae whitish translucent. *Thorax*. Pronotum almost completely shaded with brown, except on three paler circular marks at each side; propleurae and prosternum whitish washed with light brown. Mesonotum yellowish light brown, darker on anterolateral corners and FMI (fore mesonotal transverse invagination); mesopleurae and sternum paler. Metanotum whitish tinged with light brown medially and shaded with gray at wing base. Wings. Membrane of wings hyaline, slightly tinged with brown. Fore wings (Fig.12): longitudinal veins grayish-brown, cross veins light brown. Hind wings as in Figs. 10-11. Legs yellowish-white, tinged with light brown on fore legs, middle and hind legs paler. *Abdomen* whitish translucent tinged with brownish gray dorsally, darker on a pair of submedian longitudinal lines, median line between them paler. *Genitalia* (Figs. 1, 4, 6, 7): styliger plate whitish, forceps and penes yellowish-white except spine like appendages of penes, orangeish. Caudal filaments whitish.



Figs. 15-30. *Yaurina* gen. nov., nymph. *Yaurina yuta* sp. nov.: 15, hind leg; 16, middle leg; 17, fore leg; 18, detail of femoral spine; 19, fore tarsal claw, enlarged; 20, labrum, d.v.; 21, labrum, v.v.; 22, right maxilla, d.v.; 23, labium, v.v.; 24, left mandible, d.v.; 25, right mandible, d.v. *Yaurina mota* sp nov., abdominal gills: 26a, gill II, d.v.; 26b, gill II, v.v.; 27 gill III, v.v.; 28, gill IV, v.v.; 29, gill V, v.v.; 30, gill VI, v.v.

Female imago (in alcohol): Length: body, 3.7-4.0 mm; fore wings (Fig. 13), 4.3-4.5 mm. As in male imago except abdomen yellowish when full of eggs.

Mature nymph (in alcohol): Length: body, 3.0-3.2 mm; cerci 2.4 mm; terminal filament, 2.7 mm. General color yellowish-white to yellowish light brown with gray markings. *Head* yellowish light brown shaded with gray between antennae and a pair of oblique bands extended from posterior margin of each eye to lateral ocelli; occipute with a slightly marked semicircular band. Antennae and mouthparts yellowish translucent. *Thorax* yellowish with gray markings, ventrally paler. Legs yellowish-white, spines yellowish. *Abdomen* yellowish-white, turning yellowish toward rear segments; shaded with gray dorsally, ventrally paler. Gills (Figs. 26-30): opercular gills translucent yellowish-brown, margins hyaline, remaining gills whitish. Caudal filaments yellowish white.

Material: Holotype male imago from ARGENTINA, Jujuy, El Carmen, Camino de Cornisa Km 1658, S 24° 27' 17"-W 65° 17' 48", A° Las Lanzas, 1250 m, 12-III-2000, Domínguez and Molineri Cols. Paratypes: 32 male imagos, 26 female imagos, 1 reared male subimago with its nymphal cuticle, and 10 nymphs, same data as holotype. Holotype and paratypes deposited in the Entomological Collections of Instituto-Fundación Miguel Lillo,

Tucumán, Argentina, except 5 paratypes male imagos and 5 paratypes female imagos in Florida A&M University, Tallahassee, Florida, USA.

Life cycle associations: Female and male adults were captured at the same time and share color patterns and wing venation. Nymphs and adults were associated by a reared nymph.

The adults were captured with a light trap just before sunrise. Swarms occur at early morning and last just a few minutes.

Etymology: From the Quechua voice "mota", that means "short and blunt", for the form and relative length of the spine-like appendages of penes.

Discussion: Males of *Y. mota* can be distinguished from the other members of the genus by the relatively shorter spine-like appendages of penes, that are apically blunt (length of spines 0.54 length of penes) as in Fig. 6. At this time it is impossible to distinguish the nymphs of this species from the other of the genus.

***Yaurina yapa* sp. nov. (Figs. 3, 5)**

Male subimago (in alcohol, wings and genitalia on slides): Length: body, 3.0 mm; fore wings, 2.9 mm; hind wings, 0.4 mm. General coloration yellowish, abdomen whitish. *Head*: yellowish-white shaded with gray behind lateral ocelli and around antennae. Antennae. Scape and pedicel whitish, flagellum yellowish-white. *Thorax*: pronotum whitish translucent diffusely shaded with gray, stronger on anterior margin and on a sublateral oblique band. Mesonotum yellowish with anterolateral margins of mesoscutum orangeish-brown; mesopleura and mesosternum yellowish-white diffusely shaded with gray. Metanotum yellowish, shaded with gray on base of coxae. Fore wings similar to that in Fig. 12; veins C, Sc and R1 yellowish, remaining veins whitish. Hind wings similar to that in Fig. 10. *Abdomen*: whitish except segments IX-X yellowish-white, diffusely shaded with gray. *Genitalia* (Figs. 3, 5): styliger plate yellowish-white, forceps whitish, penes whitish translucent except spine-like appendages light yellowish-orange. Appendages of penes (Fig. 6) long and coiled distally, total length surpassing that of penes.

Female and nymph: Unknown.

Material: Holotype male subimago from ECUADOR, Past. Puyo, 30-I-1976, black light, Spangler et al. Cols. In National Museum of Natural History, Smithsonian Institution, Washington D.C., USA.

Etymology: "Yapa", from a Quechua voice for "something more" or "aggregate" because the spine-like appendages are longer than penes.

Discussion: Although only a single subimago is known, the characteristic male genitalia of this species permits rapid identification. On *Y. mota* and *Y. yuta*, the relative length of the spine-like appendages do not change between the subimaginal and imaginal stages, suggesting that imaginal genitalia of *Y. yapa* should not differ from the subimaginal one, here described. None of the *Leptohyphes* nymphs described from Ecuador by Mayo (1968) or Wang et al. (1998) have the diagnostic characters of *Yaurina*, suggesting that the nymph of *Y. yapa* has not been described yet. Males of *Y. yapa* can be distinguished from the other males of the genus because the spine like appendages of penes are very long (if extended, longer than penes) and curled dorsally as in Figs. 3 and 5 (subimaginal cuticle omitted in the figures).

ACKNOWLEDGMENTS

I wish to thank E. Domínguez, W. L. and J. G. Peters and J. M. Elouard for valuable comments on this manuscript. I also want to thank C. Hofmann and M. Sartori for the loan of *Allenhyphes* material used for comparison. This manuscript was completed while the author was supported by a fellowship from the Argentine National Council of Scientific Research (CONICET) and this support is greatly acknowledged.

REFERENCES

Allen, R. K. 1967. New Species of New World Leptohyphinae (Ephemeroptera: Tricorythidae). Canad. Ent., 99 (4): 350-375.

Allen, R. K. 1973. New Species of *Leptohyphes* Eaton (Ephemeroptera: Tricorythidae). Pan-Pac. Ent., 49 (4): 363-372.

Allen, R. K. and C. M. Murvosh. 1987. Mayflies (Ephemeroptera: Tricorythidae) of the Southwestern United States and Northern Mexico. Ann. ent. Soc. Amer., 80 (1): 35-40.

Allen, R. K. and S. S. Roback. 1969. New Species and Records of New World Leptohyphinae (Ephemeroptera: Tricorythidae). J. Kans. ent. Soc., 42 (4): 372-379.

Demoulin, G. 1966. Contribution a l'Etude des Ephemeropteres du Surinam. Bull. Inst. r. Sci. Nat. Belg., 42 (37): 1-22.

Domínguez, E., M. D. Hubbard and M. L. Pescador. 1994. Los Ephemeroptera en Argentina. Fauna de Agua Dulce de la Republica Argentina, 33 (1): 142 pp.

Hofmann, C., M. Sartori and A. Thomas. 1999. Les Ephéméroptères (Ephemeroptera) de la Guadeloupe (petites Antilles françaises). Mém. Soc. Vaud. Sc. Nat., 20 (1):1-96.

Kluge, N. Yu. and J. C. Naranjo. 1990. Mayflies of the family Leptohyphidae (Ephemeroptera) of Cuba. Rev. Ent. URSS, 69 (3): 564-578.

Kluge, N. Ju. 1992. Redescription of *Leptohyphes eximius* Eaton and diagnoses of the genera *Leptohyphes* and *Tricorythodes* based on the structure of pterothorax (Ephemeroptera: Tricorythidae, Leptohyphinae). Opusc. Zool. Flumin., 98: 1-16.

Mayo, V. K. 1968. Some New Mayflies of the Subfamily Leptohyphinae (Ephemeroptera: Tricorythidae). Pan-Pac. Ent. 44 (4): 301-308.

Needham J. G. and H. E. Murphy. 1924. Neotropical Mayflies. Bull. Lloyd Lib. 24, Ent. Ser. No. 4: 1-79.

Traver, J. R. 1944. Notes on Brazilian Mayflies. Bol. Mus. nac., Zool. 22: 2-53.

Traver, J. R. 1958a. The Subfamily Leptohyphinae (Ephemeroptera: Tricorythidae). Ann. ent. Soc. Amer., 51 (5): 491-503.

Traver, J. R. 1958b. Some Mexican and Costa Rican Mayflies. Bull. Brooklyn ent. Soc., 53 (4): 81-89.

Wang, T. Q., R. W. Sites and W. P. McCafferty. 1998. Two new species of *Leptohyphes* (Ephemeroptera: Leptohyphidae) from Ecuador. Florida Ent. 81: 68-75.