

## New information on Limoniidae from Monte Castellaro, Italy (Upper Miocene)

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Abstract. Five new fossil species belonging to the Limoniidae are described from Monte Castellaro near Misano Adriatico (Upper Miocene, Lower Messinian): *Pilaria castellariana* n.sp., *Dicranoptycha anna* n.sp., *Gonomyia andrea* n.sp., *Limonia luca* n.sp., *Dicranomyia sergio* n.sp. The fossil genus *Miopsiloptera* GENTILINI, 1984, from same locality is revised and made a younger synonym of the subgenus *Psiloconopa* ZETT., genus *Symplecta* MG.

Key words: Miocene, Messinian, Italy, fossil, Limoniidae.

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### INTRODUCTION.

First descriptions of two fossil limoniid species and one tipulid from Monte Castellaro near Misano Adriatico (Central Italy) were presented by GENTILINI (1984, 1990). The age of this locality is estimated at 5.5 - 6.5 Ma - Lower Messinian (CASATI et al. 1976; SAVELLI and WEZEL 1979; LANDINI and SORBINI 1980; GENTILINI 1984). Among new materials collected by a junior author five further new species are distinguished.

Origin of names: the four new species names are dedicated to Wife of the junior author, Anna, and their three sons: Andrea, Sergio and Luca.

### SYSTEMATIC PART

Family: Limoniidae

Subfamily: Hexatominac

Subgenus: *Pilaria* SENTENIS

*Pilaria castellariana* n.sp.

Diagnosis: vein Rs three times as long as R<sub>3</sub> and slightly shorter than R<sub>3+4</sub> and R<sub>3</sub> taken together; cross-vein r-r (R<sub>2</sub>) terminating in R<sub>3+4</sub>; M<sub>1</sub> somewhat shorter than upper part of d cell.

Description. Body length 8.7mm, wing length 9mm.

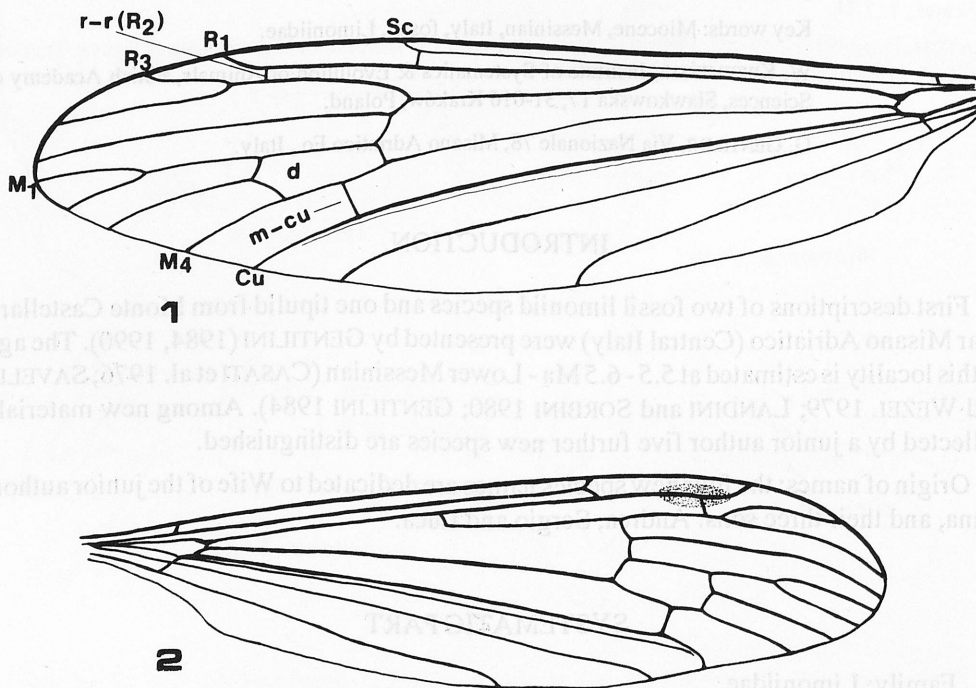
Head partially preserved, its basal part broad, characteristic for the genus. Antennae and palpi not preserved.

Wing (Fig. 1) spotless; long and rather narrow; stigma invisible. Vein Sc terminates opposite Rs fork; cross-vein sc-r at Sc tip; R<sub>1</sub> long, terminates just beyond R<sub>3+4</sub> fork; cross-vein r-r (R<sub>2</sub>) ending three its lengths before R<sub>1</sub> tip; Rs long, only a little shorter than R<sub>3+4</sub> and R<sub>3</sub> taken together. R<sub>3+4</sub> very long, more than twice as long as R<sub>2</sub> and equal R<sub>4</sub>; upper part of d cell equal M<sub>1+2</sub> and slightly longer than M<sub>1</sub>; d cell long and narrow; cross-vein m-cu in 1/3 of d cell base; A<sub>2</sub> long and rather straight.

Legs not preserved.

Abdomen well preserved; male genitalia small and narrow, with dististyles delicate and rather short, but their exact shape cannot be reconstructed. Aedeagus invisible.

Material examined: Holotype No 287, male, coll. G. GENTILINI, Monte Castellaro (Central Italy), Upper Miocene (Lower Messinian). Housed in Museo Civico di Storia Naturale, Verona, Italy.



Figs. 1 - 2. Wing: 1 - *P. castellariana* n.sp.; 2 - *P. discicollis* (MG.).

Remarks. Distinguishing even the recent Limoniidae of the tribe Limnophilini is very difficult, especially on a species level. The specimen described is assigned the genus *Pilaria* on the basis of broad head base, small and narrow genitalia with delicate dististyles. The vein  $R_{3+4}$  is long also in some recent species (compare *Pilaria discicollis* MG.- Fig. 2).

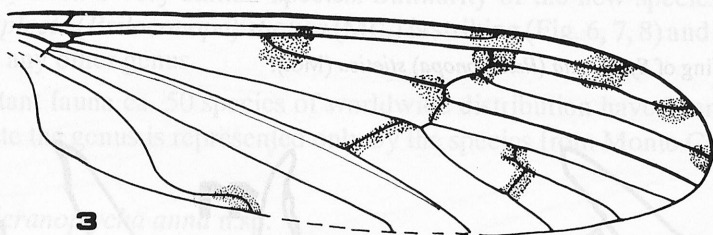
The genus *Pilaria* comprises ca. 30 recent species distributed in Holarctic, Oriental and Neotropical Region. The fossil species were described from Baltic amber (ALEXANDER, 1931).

Subfamily: Eriopterinae

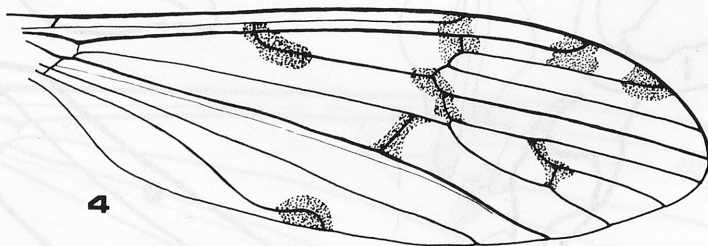
Genus: *Symplecta* MG.

*Symplecta (Psiloconopa) savchenkoi* (GENTILINI, 1984)

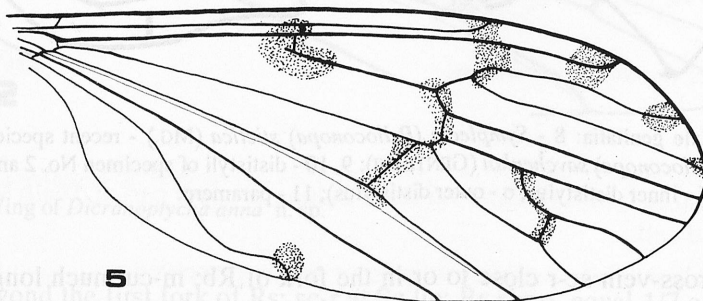
*Miopsiloptera savchenkoi* GENTILINI, 1984:175-180.



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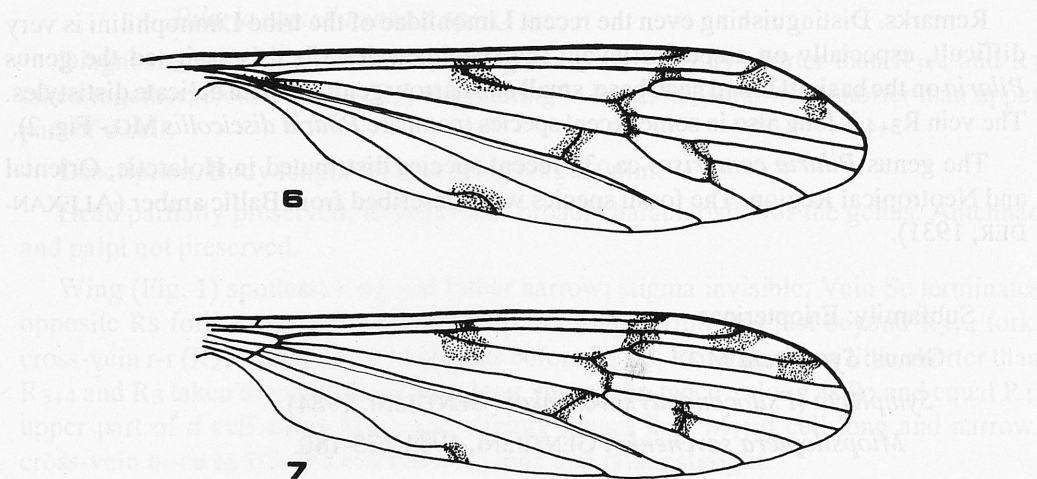


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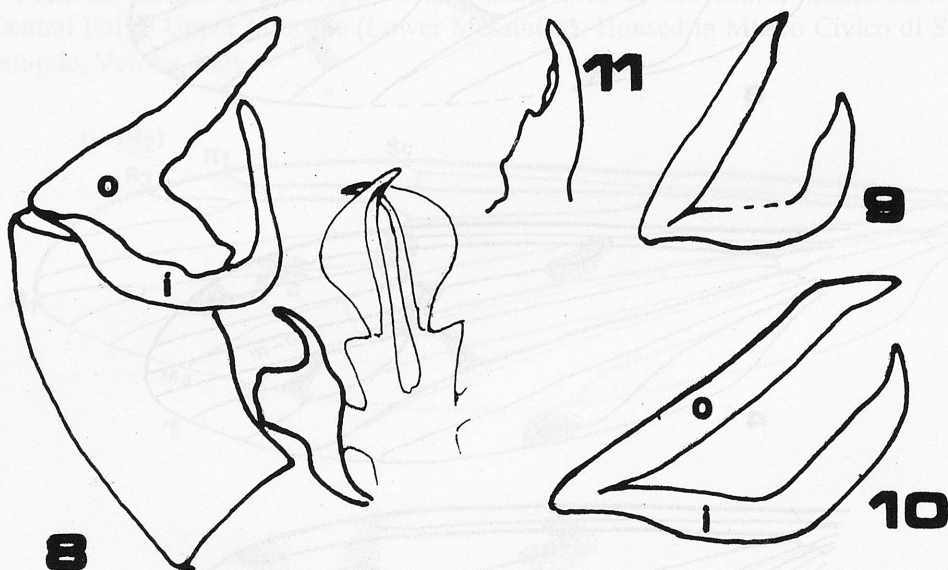


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Figs. 3 - 5. Wing of *Symplecta (Psiloconopa) savchenkoi* (GENTILINI) from Upper Miocene (3 - specimen No. 21, 4 - specimen No. 93, 5 - specimen No.8).



Figs. 6 - 7. Wing of *Symplecta (Psiloconopa) stictica* (MG.).



Figs. 8 - 11. Male genitalia: 8 - *Symplecta (Psiloconopa) stictica* (MG.) - recent species; 9-11 - *Symplecta (Psiloconopa) savchenkoi* (GENTILINI): 9, 10 - dististyli of specimen No. 2 and No. 26, respectively (i - inner dististylus, o - outer dististylus); 11 - paramere.

Diagnosis: cross-vein sc-r close to or in the fork of Rb; m-cu much longer than its distance to fork of Mb.

Redescription: wing 6.2 - 7.5mm long, spotted (Figs.3-5). Vein Sc ending opposite cross-vein r-r; sc-r close to or in the first fork of Rb; R4 equal 1.5 of Rs length; R3+4 very

short, equal  $1/11$  of  $R_3$  length; d cell length equal  $1/6$  of wing length, with deep incision in its upper part; m-cu positioned close to the fork of Mb (this distance is always shorter than m-cu length);  $A_2$  conspicuously subsinuous.

Male genitalia (Figs.9-11): outer dististylus rather straight, broad, sharply cut and pointed apically; no specimen has any trace of process on it. Inner dististylus strongly curved, in the holotype more narrow than the outer dististylus, while in specimen No.2 both dististyli are of equal width.

Holotype is housed in Museo Civico di Storia Naturale, Verona, Italy.

New material examined: No. 2, male; No. 87; No.21; No. 53 (sex unknown) - all housed in Institute of Systematics & Evolution of Animals, Polish Academy of Sciences, Kraków, Poland.

Remarks: the differences observed in the wing venation and in inner dististylus are interpreted here as an intraspecific variation; however, it is probable that the specimens represent 2 or even 3 very similar species. Similarity of the new species to the recent species, *Symplecta (Psiloconopa) stictica* (MG.) is striking (Fig. 6, 7, 8) and does not allow to place it in any other genus.

In the extant fauna ca. 50 species of worldwide distribution have been described; in the fossil state the genus is represented only by the species from Monte Castellaro.

*Dicranoptycha anna* n.sp.

Diagnosis:  $R_s$  very short, equal  $1/7$  of  $R_{3+4}$  length.

Description. Only single wing preserved, about 8 mm long, faintly spotted (Fig.12).

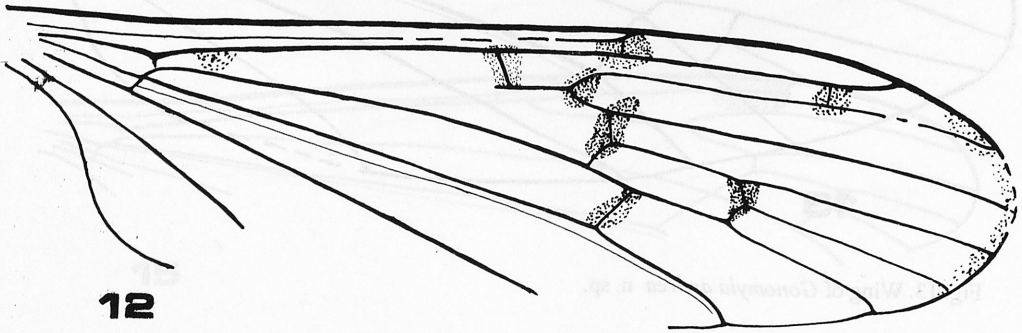


Fig. 12. Wing of *Dicranoptycha anna* n. sp.

Vein Sc beyond the first fork of  $R_s$ ; sc-r at Sc tip;  $R_s$  short, equal  $1/7$  of  $R_{3+4}$  length; d cell long ( $1/7$  of wing length) and narrow; medial veins long and straight; m-cu in  $1/3$  of d cell base; anal veins only partially preserved.

Material examined: holotype No. 36, coll. G. GENTILINI, Monte Castellaro, Upper Miocene. Housed in Museo Civico di Storia Naturale, Verona, Italy.

Remarks: *Dicranoptycha anna* n.sp. mostly resembles *D. lignica* STATZ 1934, but differs from it (and from all the remaining species of the genus) in having a very short Rs.

In the extant fauna ca. 70 species of worldwide distribution are known. Four fossil species have been described so far.

Genus: *Gonomyia* EDWARDS

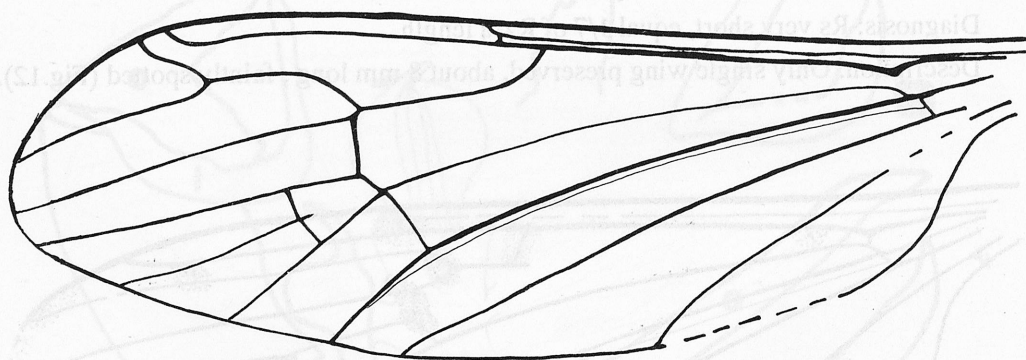
*Gonomyia andrea* n.sp.

Diagnosis: d cell very small, its length equals 1/13 of wing length; Rs 1/7 shorter than  $R_{3+4}$ .

Description. Wing length 5mm.

Head and antennae partially preserved, palpi invisible.

Wing (Fig.13): Sc short, ending opposite 1/4 of Rs length; sc-r poorly visible, at the Sc tip; Rs of medium length (1/7 shorter than  $R_{3+4}$ ), its basal section arcuated, escaping in  $R_1$ . Cross-vein r-r ( $R_2$ ) absent;  $R_3$  short, equals 1/3 of  $R_4$  length; d cell small, cross-vein



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Fig. 13. Wing of *Gonomyia andrea* n. sp.

m-cu just before d cell;  $M_{1+2}$  almost 3.5 times as long as upper part of d cell;  $M_3$  continues to the inside of d cell.

Abdomen only partially retained, ovipositor poorly preserved.

Material examined: Holotype No. 291, female, Monte Castellaro (Central Italy), Upper Miocene (Lower Messinian), coll. G. GENTILINI. Housed in Museo Civico di Storia Naturale in Verona (Italy).

Remarks: the genus *Gonomyia* comprises 250 species of worldwide distribution. Twelve fossil species have been described till now.

Subfamily Limoniinae

Genus *Dicranomyia*

*Dicranomyia* (s.str.) *sergio* n.sp.

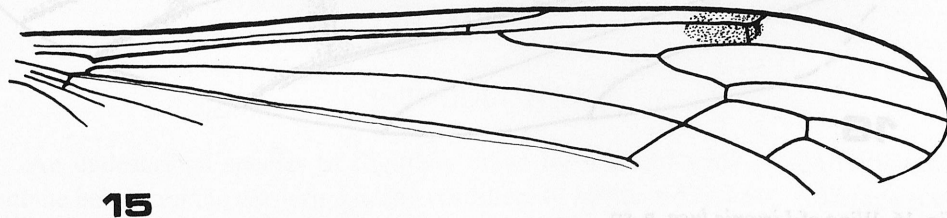
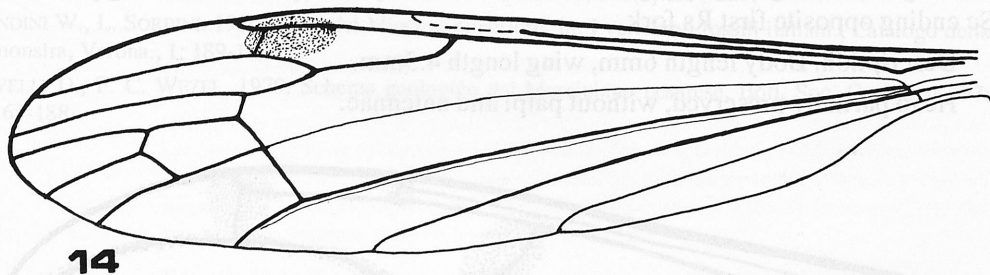
Diagnosis: Rs as long as half of  $R_{3+4}$ ;  $M_4$  equals base of d cell.

Description. Body length 8mm, wing length 7mm.

Head preserved without palpi and antennae. Thorax partially preserved.

Legs lacking.

Wing (Figs. 14, 15) long and narrow, spotless, with distinct stigma and strong veins.



Figs. 14-15. Wings of *Dicranomyia* (s. str.) *sergio* n. sp.: 14 - holotype, 15 - specimen No. 1203.

Sc faint, ending opposite  $1/3$  of Rs length; sc-r invisible in the holotype;  $R_1$  ending opposite  $1/3$  of  $R_{3+4}$  length; Rs twice shorter than  $R_{3+4}$ ; medial veins short, upper part of d cell twice shorter than the remaining of  $M_{1+2}$ ,  $M_4$  slightly shorter than d cell base; cross-vein m-cu straight, in the first fork of Mb;  $A_2$  long and straight.

Male genitalia partially preserved, resembling other species of the genus *Dicranomyia* (s.str.), however, the processes on outer dististyli are invisible; inner dististyli hooked. Penis narrow and rather long, parameres invisible.

Materials examined: Holotype No. 290, male and specimen No. 1203 (sex unknown); Monte Castellaro (Central Italy), Upper Miocene (Lower Messinian), coll. G. GENTILINI. Housed in Museo Civico di Storia Naturale, Verona, Italy.

Remarks: recently genus *Dicranomyia* comprises numerous species of worldwide distribution: only the number of Palaearctic species exceeds 170. Fossil species are frequently found in Tertiary deposits; till now ca. 30 are recorded. They are extremely difficult to determine as they differ - as the extant ones - mainly in genitalia which are rarely in sufficiently good condition.

Genus: *Limonia* MG.

*Limonia luca* n.sp.

Diagnosis: wing heavily pigmented, with distinct spots. Rs short and strongly arcuated; Sc ending opposite first Rs fork.

Description. Body length 6mm, wing length 4.5mm.

Head partially preserved, without palpi and antennae.

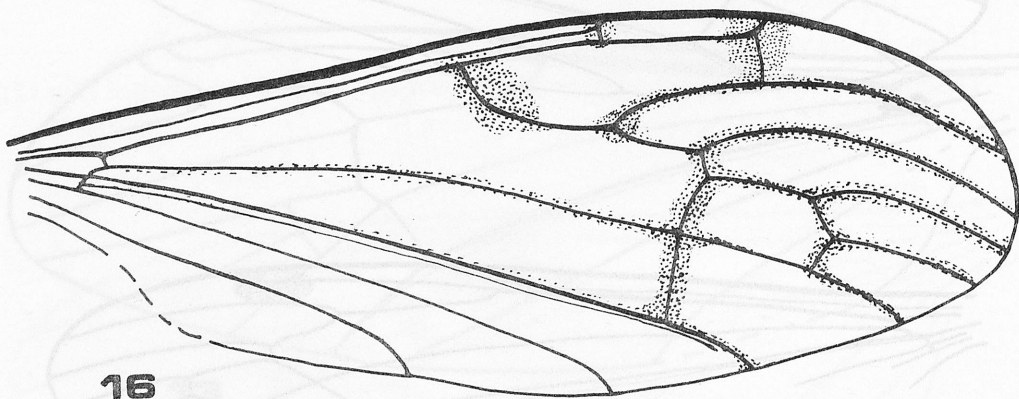


Fig. 16. Wing of *Limonia luca* n. sp.

Legs lacking.

Wings thorn off the body, only one in good condition. Sc ending opposite first Rs fork; cross-vein sc-r at Sc tip; R<sub>1</sub> ending before midth of R<sub>3+4</sub>; Rs rather short and strongly arcuated; upper part of d cell twice shorter than the remaining of M<sub>1+2</sub>; M<sub>4</sub> shorter than d cell base; d cell large, its length equals 1/7 of d cell length; cross-vein m-cu straight, in the first fork of Mb; A<sub>2</sub> rather long and straight.

Male genitalia in poor condition. IX tergite with distinct, deep notch. Dististyles and penis with parameres cannot be reconstructed.

Materials examined: Holotype No. 292 (+-), male, Monte Castellaro (Central Italy), Upper Miocene (Lower Messinian). Coll. G. GENTILINI. Housed in Museo Civico di Storia Naturale, Verona, Italy.

Remarks: the genus *Limonia* comprises 90 recent species. The representatives of this genus were not reported only from the Neotropical region. Three fossil species have been described.

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## INTRODUCTION

An undescribed species of flightless crane fly was collected in pan-traps set in a montane habitat on the western Andean cordillera of northern Ecuador. Although species with micropterous females and males with fully functional wings are not uncommon in Neotropical Tipulinae (species of *Tipula* (Eumicrotipula), this new species represents one of the few tipuline species in South America with both sexes apterous. The new species is morphologically modified due to aptery, with a greatly reduced thorax and enlarged coxae.

### *Leptotarsus* (*Longurio*) *byersi* YOUNG & GELHAUS, new species

Diagnosis: *Leptotarsus byersi* can be separated morphologically from the other species in this genus by the following combination of characters: subaptery in both sexes,

