Notes on the Tipulidae of Ecuador

(Order Diptera)

Part III

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The preceding article under this general title was published in April 1953 (Rev. Ecuat. Ent. Par. 1 (2): 6 — 15, figs. 1 — 8). In the present paper I wish to discuss the local species of the genus Epiphragma Osten Sacken, one of the most characteristic genera of Tipulidae in the Neotropics.

Epiphragma Osten Sacken

Limnophila (Epiphragma) Osten Sacken; Proc. Acad. Nat. Sci. Philadelphia for 1859: 238, 1859; (type fascipennis Say, as pavonina Osten Sacken).

Epiphragma Osten Sacken; Mon. Dipt. N. America, 4: 193 — 194, 1869.

Epiphragma Alexander; Rev. de Entomología, 19: 168 - 175, fig. 5 (venation), 1948.

The genus Epiphragma includes flies of medium size, invariably with a brown pattern on the wing, usually in the form of ocelli or annuli, these frequently broken into abundant spots and dots. The genus is characterized by the presence of a strong crossvein in cell C of the wing (Fig. 1); in the Oriental— Australasian subgenus Eupolyphragma Alexander, with approximately 25 species ranging from the Philippines southeastward to New Guinea, there are several such crossveins in this cell of the wing.

The typical subgenus is wide-spread throughout the Holarctic Region but here with relatively few species. In Tropical America it is represented by a host of forms, of which no fewer than 14 have been found in Ecuador and are discussed in this report. A further concentration of species is found in the Oriental-Australasian Region, including several species in Australia. No members of the genus have been found in the Ethiopian Region, including Madagascar, nor in New Zealand. In these latter areas and elsewhere in the World, though principally in the Southern Hemisphere, the genus is replaced by the even larger and more diversified group Austrolimnophila Alexander.

The immature stages of these primitive Hexatomine Tipulidae, including both Epihragma and Austrolimnophila, occur in wet decaying wood, sometimes temporarily submerged. Various species of Epiphragma have been reared from such a habitat in Europe (ocellaris Linnaeus), North America (fascipennis Say and solatrix Osten Sacken), and in Argentina and Uruguay (imitans Alexander).

Key to the Species

1. Legs with the femora and the broad tibial bases black, the remainder of legs yellow. 2
   Legs colored otherwise. 3

2. Wings pale yellow, with all cells abundantly dotted with brown. hirtistylata Alexander

   Wings pale, crossbanded with darker but without isolated brown dots in the cells. varia (Wiedemann)

3. Mesonotal praescutum obscure yellow, with two major polished black areas on either side.

nigroplagiata Alexander

Mesonotal praescutum not paterned as above. 4

4. Wings with a single darkened area in cell 2nd A, additional to the markings at base and apex of cell.

subsolatrix Alexander

Wings with two or more dark marginal spots in cell 2nd A. 5

5. Antennae (male) moderately elongate, approximately one-third the length of wing. 6

Antennae (male) shorter, approximately one-fourth the length of wing or less. 7

6. Antennae with scape and pedicel pale brown, the flagellar verticils small and inconspicuous; no isolated dark costal spot basad of the annulus at origin of Rs; dark spots in cell 2nd A rounded or oval in outline.

parviseta Alexander

Antennae with scape and pedicel pale brown, the flagellar verticils long and conspicuous; an isolated dark spot in cells C and Sc basad of the annulus at origin of Rs; dark spots in cell 2nd A elongate, narrow, crossing the cell. filiformis Alexander

7. Tibiae uniformly yellow. 8

Tibiae in large part darkened or blackenned. 13

8. Pleura uniform in color; antennal scape and pedicel blackened. 9

Pleura striped longitudinally with yellow and black; antennal scape pedicel yellow or only slightly infusticated. 10

9. Femora ringed with black; ground areas of wing uniformly pale. subenixa Alexander

Femora virtually unpatterned; ground areas of wing dusky, narrowly margined with yellow. interspersa sp. n.

10. Cell Cu of wings with a series of darkened areas. 11

Cell Cu with the darkened areas sparse, usually only one or two near outer end. 12

11. Femora with two narrow clearly defined dark rings; halteres yellow, the base of knob darkened. enixa Alexander

Femora with a single narrow brown subterminal ring; halteres infuscated. oxyphallus Alexander

12. Size larger (wing, male, 12 mm.); halteres pale, the base of knob infuscated; darkened annuli of wing at arculus and at origin of Rs widely separated. diadema Alexander

Size small (wing, male, 7.5 mm.); halteres yellow; darkened annuli of wing at arculus and at origin of Rs approximated. phaeoxatha Alexander

13. Terminal segment of antenna yellow; thorax dull black, including the mesonotum; ground color of wings, especially in the basal cells, weakly infuscated, clearer yellow inmediately adjoining the darkened areas. deliberata Alexander

Antennae black, only the first or fusion segment of flagellum orange; mesonotum light brown, pleura black; ground color of wings clear light yellow. xanthomela Alexander

Certain of the species, especially hirtistylata and oxyphalus, show distinct hypopygial characters. Others have these structures more uniform and are evidently closely allied. The great majority of the species here considered were taken at and near Abitagua, Napo-Pastaza, which thus shows a surprising concentration of species in this genus. There can be little question but the many further members of the group remain to be discovered.

As was indicated in the preceding part, the various species considered throughout the entire series of papers will be numbered consecutively, the present treatment including species 13 to 26, inclusive.

13. **Epiphragma (Epiphragma) deliberata** Alexander, 1939.

Abitagua, altitude 1200 meters, April to September 1937 (Macintyre); types.

14. **Epiphragma (Epiphragma) diadema** Alexander, 1939.
Abitagua, altitude 1200 meters, April to September 1937 (Macintyre); types.

15. **Epiphragma (Epiphragma) enixa** Alexander, 1939.
Abitagua, altitude 1200 meters, April to September 1937 (Macintyre); types.

16. **Epiphragma (Epiphragma) filiformis** Alexander, 1940.
San Francisco, Rio Pastaza, altitude 1300 meters, October 1, 1938 (Macintyre); type.

Antenna (Fig. 2) 16—segmented; basal segment of flagellum about two-thirds the second segment and a little stouter; succeeding segments long-cylindrical, with long conspicuous verticils, the longest (on the intermediate segments) up to two-thirds the length of the segment; terminal segment about two-thirds as long as the penultimate. The figure shows the pedicel and first four flagellar segments of type.

Male hypopygium (Fig. 3) with the tergal lobes, 9t, unusually sclerotized, raddish brown, relatively broad, their apices obliquely truncated; lobes separated by a U—shaped nocht. Interbase, i, with its lobe slender, the apex a long recurved crooklike spine. Outer dististyle, d, small, abruptly terminating in a decurved apical spine, the outer margin near base with a low setuliferous swelling. Aedeagus, a, unusually long and sclerotized.

17. **Epiphragma (Epiphragma) hirtistylata** Alexander, 1939.
Abitagua, altitude 1200 meters, April to September 1937 (Macintyre); types.

Male hypopygium (Fig. 4) with the 9th tergite, 9t, produced into two very low obtuse lobes that are provided with very delicate setulae; surface of tergal plate back from the margin with a transverse row of setae, the more central ones smaller, the outer ones strong and powerful. Basistyle, b, stout, the outer face of the distal half with unusually long and powerful setae, the longest only a little shorter than the style itself; mesal face of style on proximal half with a further row of strong setae, the outer ones smaller and more slender. Interbase, i, with the lobe a slender spine, the apex produced into an acute deflec-

ted point. Outer dististyle, d, pale, terminating in an acute curved spine; surface of style with long conspicuous setae, those of the disk longer, deflected ventrad and mesad; inner dististyle a little longer, obtuse at tip, with setae on the lower margin and with a small concentration on the disk. Aedeagus, a, small and weak, approximately equal in size to the lobe of the interbase.

18. **Epiphragma (Epiphragma) interspersa** sp. n.

Size medium (wing, male, over 11 mm.); mesonotal praescutum with the sides darkened, the disk with confluent paler brown stripes; antennal scape and pedicel black, the fusion segment light yellow; femora brownish yellow, the tip clearer yellow; wings pale brown, crossbanded with darker brown, the bands narrowly margined by light yellow; male hypopygium with the posterior border of the ninth tergite produced into two small submedian setuliferous lobes; outer dististyle curved at apex into an acute point; aedeagus small and simple, shorter than the lobe of the interbase.

Male.— Length about 100 mm.; wing 11.5 mm.; antenna about 2.2 mm.

Rostrum and palpi dark brown. Antennae with scape and pedicel black, the former pruinose; fusion segment of flagellum light yellow, the remainder of organ black; fusion segment involving two segments, the remaining flagellar segments with long conspicuous verticils. Head fulvous brown, the vertex with a narrow darker median vitta.

Pronotum brown medially, the anterior part more yellowed. Mesonotal praescutum with the sides extensively dark brown, the disk occupied by confluent paler brown stripes; scutum reddish brown, the central area darker; scutellum and postnotum somewhat more pruinose. Pleura almost uniformly dark brown. Halteres obscure yellow, the base of knob darker. Legs with the coxae dark brown; trochanters yellow; femora brownish yellow, the tip paling to clearer yellow; tibiae and tarsi yellow. Wings (Fig. 1) with the ground pale brown, with more extensive darker brown areas, appearing as almost entire crossbands, the paler ground areas narrowly bordered by pale yellow margins that separate them from the darkened crossbands; costal re-

gion with the brown bands still darker, becoming paler behind, the third such area lying at the supernumerary crossvein in cell C; cell 2nd A with about six dark areas that are more extensive the pale interspaces; veins obscure yellow, somewhat darker in the patterned areas, dark brown in the costal darkenings. Venation: Cells R2 subequal in extent at margin; cell R2 long and narrow; m-cu at near one-third the length of cell lst M2.

Abdomen chiefly dark brown, the basal sternites more yelowed; hypopygium brownish yellow. Male hypopygium (Fig. 5) with the posterior border of the 9th tergite, 9t, transverse, produced into two small submedian lobes, their surface with microscopic setulae. Lobe of the interbase, i, unusually slender, its tip broken in type. Outer dististyle, d, simple, curved at apex into an acute point, the surface and especially the enlarged base densely setuliferous, with a few larger setae; inner dististyle longer, flattened, the apex obtuse. Aedeagus, a, small and simple, shorter than the lobe of the interbase.

Holotype, male, Abitagua, Napo-Pastaza, altitude 1800 meters, April 15, 1940 (Macintyre).

This fly is most similar in its wing pattern to Epiphragma (Epiphragma) persancta Alexander (Venezuela, Brazil), differing evidently the virtually unpatterned legs. The present fly is apparently the species that I had called E. (E.) fabricii Alexander (Proc. U. S. Nat. Mus., 44: 537 — 538, pl. 68, fig. 33 (wing), 1913), a re-naming of the preocupied. E. (E.) maculata (Fabricius). It now appears that the Fabrician species is not the same as the present fly and the latter has remained undescribed to this time. The identity of the Fabrician species still remains in question and his identity can be settled only by an examination of the type. Concerning the present species, I am uncertain at this time as to whether the Ecuadorean material is identical with other similar materials from various parts of South America and due to this uncertainty prefer to restrict the description to the actual holotype specimen.

19. **Epiphragma (Epiphragma) nigroplagiata** Alexander, 1939.

Abitagua, altitude 1200 meters, March to September 1937 (Macintyre); types.

Male hypopygium (Fig. 6) with the basistyle, b, provided with setae of normal length. Interbase, i, with its lobe unusually slender, at apex bent at a right angle into an acute point. Outer dististyle, d, slender, straight, at apex curved into a long acute point; surface with pale inconspicuous setae. Inner dististyle a little longer, narrowest near base, thence slightly expanded, the apex obtusely rounded. Aedeagus, a, very small and slender, about one-half as long as the lobe of the interbase.

20. **Epiphragma (Epiphragma) oxyphallus** Alexander, 1939.

Abitagua, 1200 to 1800 meters, March to September 1937 (Macintyre); types.

Male hypopygium (Fig. 9) unusually distinct within the genus. Ninth tergite, 9t, with the posterior border produced into two slender submedian lobes that are separated by a U—shaped notch, the lobes glabrous with narrowly obtuse tips. Basistyle, b, with surface very densely setuliferous, with a relatively few long scattered setae, smaller but more abundant along mesal face near apex, again longer and more abundant near base. Interbase, i, slender, at apex narrowed into a recurved spine or hook. Outer dististyle, d, broadest just beyond base, the outer basal angle produced into a small curved hook; beyond this point the style narrows gradually into a long gently curved terminal spine; inner dististyle larger, nearly parallel-sided, very broadly obtuse at tip. Phallosome, p, very distinctive, appearing as a compressed flattened blade that narrows into a long slender terminal point, the entire structure in a position of rest decurved; at base of phallosome with a flattened plate with its margin microscopically serrulate.

21. **Epiphragma (Epiphragma) parviseta** Alexander, 1941.

Mount Tungurahua, Tungurahua, altitude 2600 meters, april 1939 (Macintyre).

Antenna (Fig. 7) apparently only 15— segmented; basal flagellar segment about three times as long as thick and not appearing to represent a fusion element; succeeding segments long-cylindrical, seven or eight times as long as thick, with a dense erect pubescence and a few slightly longer scattered verticils, the longest of these about

one-third the segment. The figure shows the pedicel and the first three flagellar segments of type.

Male hypopygium (Fig. 8) with the tergal lobes, 9t, relatively narrow, obtuse at tips, separated by a U-shaped notch. Setae of outer face of basistyle, b, strong but not unusually abundante or conspicuous setae; inner dististyle longer, obtuse at tip, with small weak the apex a long recurved spine. Outer dististyle, d, pale, gradually narrowed and curved into a long spine; surface with small pale inconspicuous setae; inner dististyle longer, obtuse at tip, with small weak marginal setae, especially at apex, and a small group of longer setae on disk near base. Aedeagus relatively long, only a little shorter than the lobe of the interbase.

22. **Epiphragma (Epiphragma) phaeoxantha** Alexander, 1944.

Cunibunda, Abitagua, altitude 1100 meters, March 1940 (Macintyre). The hitherto unknown female was taken above Abitagua, altitude 1800 meters, April 15, 1940, by Macintyre, and is here characterized as allotype.

Female.— Length about 9 mm.; wing 9 mm.

As was the case with the holotype male, the outermost flagellar segments of the antennae are broken and it cannot be stated as to whether the organ is uniformly blackened or possibly pale at apex, as in some members of the genus. Fusion segment whitened, paler than the scape or pedicel; flagellar segments long and slender, the entire organ fully as long as in the male. Darkened femoral rings relatively pale and narrow, narrower than the outer yellow rings. Wings colored much as in the male but with no darkened spot in cell Cu connecting the ocellate ring at origin of Rs with the solidly darkened spot at end of vein 2nd A. Venation: Cell lst M2 longer and relatively narrower than in male, with m-cu more than its own length beyond the fork of M. Abdominal tergites dark brown, paler laterally; sternites almost uniformly light yellow, the extreme lateral parts vaguely darkened. Genital shield fulvous yellow; cerci slender, upcurved to the acute tips.

23. **Epiphragma (Epiphragma) subenixa** Alexander, 1939.

Abitagua, altitude 1200 meters, September 1937 (Macintyre); Type.

24. **Epiphragma (Epiphragma) subsolatrix** Alexander, 1939.

Abitagua, altitude 1200 meters, August to November 1937 (Macintyre); types.

25. **Epiphragma (Epiphragma) varia** (Wiedemann, 1828).

At present known form Panama, Ecuador, Peru, Brazil and Venezuela.

26. **Epiphragma (Epiphragma) xanthomela** Alexander, 1939.

Abitagua, altitude 1200 meters, April 1937 (Macintyre); type. Still known only from the unique type female. As indicated at time of description of the species, it is probable that the male of this species will be found to have the antennae more or less lengthened.

EXPLANATION OF PLATE

Fig. 1. Epiphragma (Epiphragma) interspersa sp. n.; venation.

Fig. 2. Epiphragma (Epiphragma) filiformis Alexander; antenna.

Fig. 3. Epiphragma (Epiphragma) filiformis Alexander; male hypopygium.

Fig. 4. Epiphragma (Epiphragma) hirtistylata Alexander; male hypopygium.

Fig. 5. Epiphragma (Epiphragma) interspersa sp. n.; male hypopygium

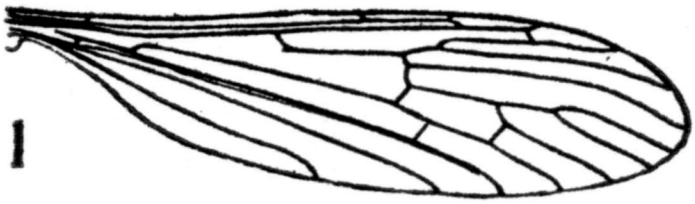
Fig. 6. Epiphragma (Epiphragma) nigroplagiata Alexander; male hypopygium.

Fig. 7. Epiphragma (Epiphragma) parviseta Alexander; antenna.

Fig. 8. Epiphragma (Epiphragma) parviseta Alexander; male hypopygium.

Fig. 9. Epiphragma (Epiphragma) oxypallus Alexander; male hypopygium.

(Symbols: ant, antenna; b, basistyle; d. dististyles; i, interbase; p, phallosome; t, tergite).



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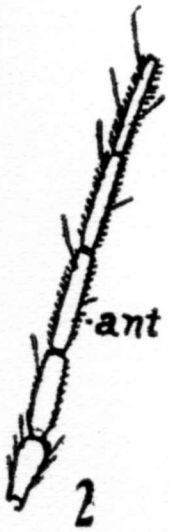

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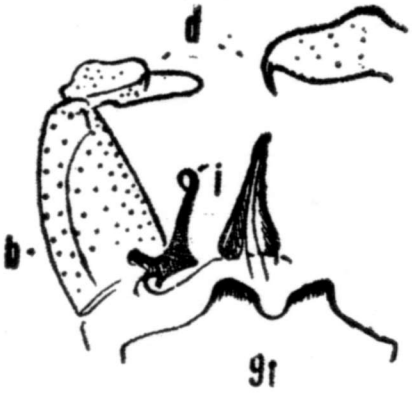

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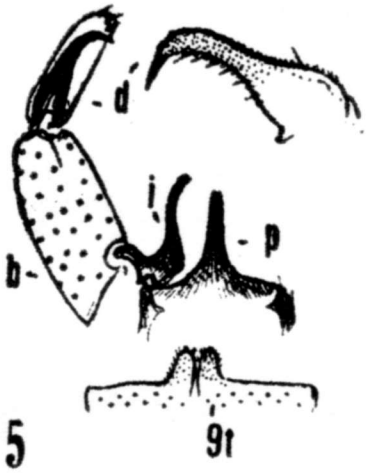

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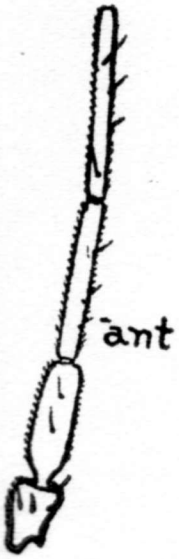

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