

Article II.—FOSSIL DIPTERA FROM FLORISSANT,
COLORADO.

BY T. D. A. COCKERELL.

PLATE I.

Syrphus willistoni sp. n. (Syrphidæ.)

Length about 10 mm.; wings clear, with reddish-brown veins; the head and thorax were apparently black; the abdomen pallid, with three broad transverse, and a narrower median longitudinal, bands, which as preserved are pale reddish-brown, somewhat iridescent, with green tints. This is a typical *Syrphus*, of the group in which the yellow areas on the first three abdominal segments are all large, much broader than the dark bands, and wholly interrupted in the middle. The abdomen is comparatively broad (breadth about 3 mm.), the general build of the insect being much as in *S. arcuatus*, although the large quadrate pale areas on segments 2 and 3 are very unlike the arched bands of *arcuatus*. Professor Melander, to whom I submitted a photograph, remarks on the close resemblance to the European *S. vittiger* Zett.

The venation is like that of *S. arcuatus* (specimen from Beulah, New Mexico, compared) with the following exceptions:—

(1) The anterior cross-vein in *willistoni* is not so far from the apex of the second basal cell.

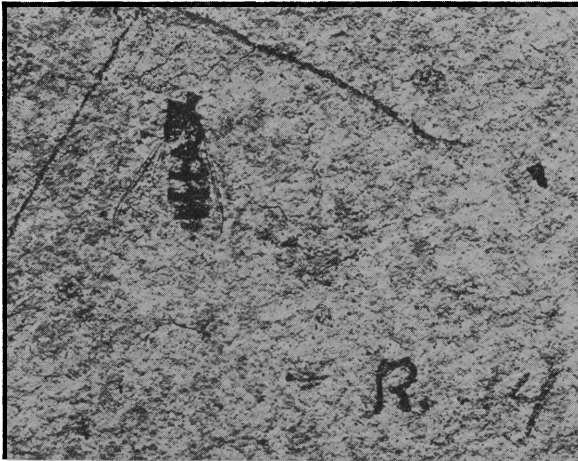


Fig. 1. Type of *Syrphus willistoni*. ♂.

(2) The second vein (R_{2+3}) is straighter,— less distinctly arched.

(3) The third vein is much straighter; thus it results that the first submarginal cell is not narrowed in the subapical region, as it is in *S. arcuatus*.

Hab.— Miocene shales at Florissant, Station 14 (S. A. Rohwer, 1907); also two from Sta. 13 (W. P. Cockerell). I showed a lantern slide of this species to Dr. Williston, who confirmed the opinion that it was a strictly typical *Syrphus*.

***Psilocephala scudderi* sp. n.** (Therevidæ.)

Plate I, Fig. 3.

Length (exclusive of antennæ) about 10½ mm.; wing about 6. Head, thorax and legs black; abdomen very dark red-brown, its width near base about 2 mm.; wings dark fuliginous, the apical half distinctly darker than the basal; face apparently bare, certainly not conspicuously hairy; antennæ a little over 1 mm. long, stout, with a long third joint; venation normal, the fourth posterior cell closed. The costa and radius (vein 1) are strong, black and bristly; the other veins weak and not very easy to see. Vein 1 is very distinctly bent near the end of its basal third, and the extremely weak auxiliary vein follows it closely, as in Williston's figure in N. Am. Dipt., 3rd ed., p. 207, instead of diverging as in *P. agilis* Meunier from amber. The second vein, as in Williston's figure, turns upward at the end; in *P. agilis* it is merely faintly curved. The second submarginal cell is distinctly longer, and therefore narrower in proportion than in Williston's figure; its length is barely short of 2 mm. The anterior cross-vein is about the middle of the discal cell, certainly not beyond the middle, as it is in Williston's figure (in *P. agilis* it is a short distance before the middle); the discal cell is conspicuously longer and narrower than in Williston's figure, herein agreeing better with *P. agilis*. The fuliginous wings are like those of *P. johnsoni* Coquillett, from Florida.

Hab.— Miocene shales of Florissant, Station 14. (1907.) Scudder indicated the presence of Therevidæ in the Florissant shales, but did not describe any.

***Megacosmus* gen. nov.** (Bombyliidæ.)

Large, with ample wings and an elongate abdomen, the general build suggestive of Leptidæ; body and legs with comparatively little hair. In Williston's table (N. A. Dipt., 3rd Ed.) it runs to *Paracosmus*, but it is much larger than the species of that genus or *Desmatomyia*, and the end of the second vein curves backwards to meet the costa at an angle even a little more obtuse than that seen in *Pantarbes*. Two submarginal cells and four posterior, all these, as well as the anal, open; anterior cross vein much beyond middle of discal cell; separation of second and third veins basad of base of discal cell; discal cell elongate, with its side on the third posterior cell long, about one fourth longer than its side on fourth cell (the proportions not very different from those in *Bombylius*); upper branch of third vein curving upwards, to meet the costa at an obtuse (inner) angle.

A related genus is *Alepidophora* Ckll. ined., also from the Florissant shales. The following table exhibits the main differences:—

Megacosmus mirandus.

Length of wing 13 mm.
Basal part of upper branch of third vein regularly curved, with no rudiment of cross-vein.
Abdominal somites much longer in proportion to their breadth.

First posterior cell more widely open.

Alepidophora pealei.

Length of wing 6½ mm.
Basal part of upper branch of third vein bent at a right angle, with a rudiment of the cross-vein running basad.

It seems that during Miocene times the nearly naked, long-bodied Bombyliidae were varied and probably numerous. I believe that the short hairy types may have invaded the country from Eurasia, with the result that the long-bodied genera are now represented by few species, and these rare, in remote and peripheral parts of America. The comparative prosperity of *Systropus*, and its wide distribution, may be due to its imitation of the fossorial wasps.

Megacosmus mirandus sp. nov.

Plate I, Fig. 1.

♂. Length about 17 mm.; wing 13 mm.; width of thorax 4 mm.; of abdomen near base $4\frac{1}{4}$ mm.; length of third abdominal somite $1\frac{1}{2}$ mm.; breadth (depth) of wing 4 mm. Head missing in type; thorax and legs black not hairy, although with the compound microscope the tibiae are seen to be quite thickly covered with appressed coarse hairs, about $150\ \mu$ long, while the femora have some short outstanding hairs beneath. Abdomen elongate, dark red-brown, the sutures pallid; at first sight, the abdomen seems practically hairless, but a strong lens or the compound microscope reveals coarse black bristles along the hind-marginal region of the segments, especially at the sides; on the hind margin of the sixth segment these are very dense, though short. Genitalia apparently large and much as described in *Paracosmus*, though I am not able to make out the details. Wings long and ample, a rather dilute fuliginous, with pale nervures (in *Alepidophora* they are hyaline, with dark nervures). The following wing-measurements are in micromillimeters:—

Distance on costa from end of second vein to end of upper branch of third	2210.
Distance from separation of second and third veins to level of basal end of discal cell	935.
Upper side of discal cell anterior to anterior cross-vein	3910.
Upper side of discal cell posterior to anterior cross-vein	1410.
Discal cell on second posterior	612.
“ “ “ third posterior (allowing for curve)	2720.
Width of first posterior cell at apex	442.
“ “ anal cell at apex	340.
Discal cell on second basal	765.
Width of anal cell at level of basal corner of fourth posterior	578.

The fourth posterior here is morphologically fourth and fifth combined.

The outer angle made by the second vein with the costa is not over 50° , that made by the upper branch of the third vein is about 65° or 70° .

Hab.—Miocene shales of Florissant, Sta. 14 (*W. P. Cockerell*, 1907).

Sciomyza florissantensis sp. nov. (Sciomyzidae.)

Plate I, Fig. 2.

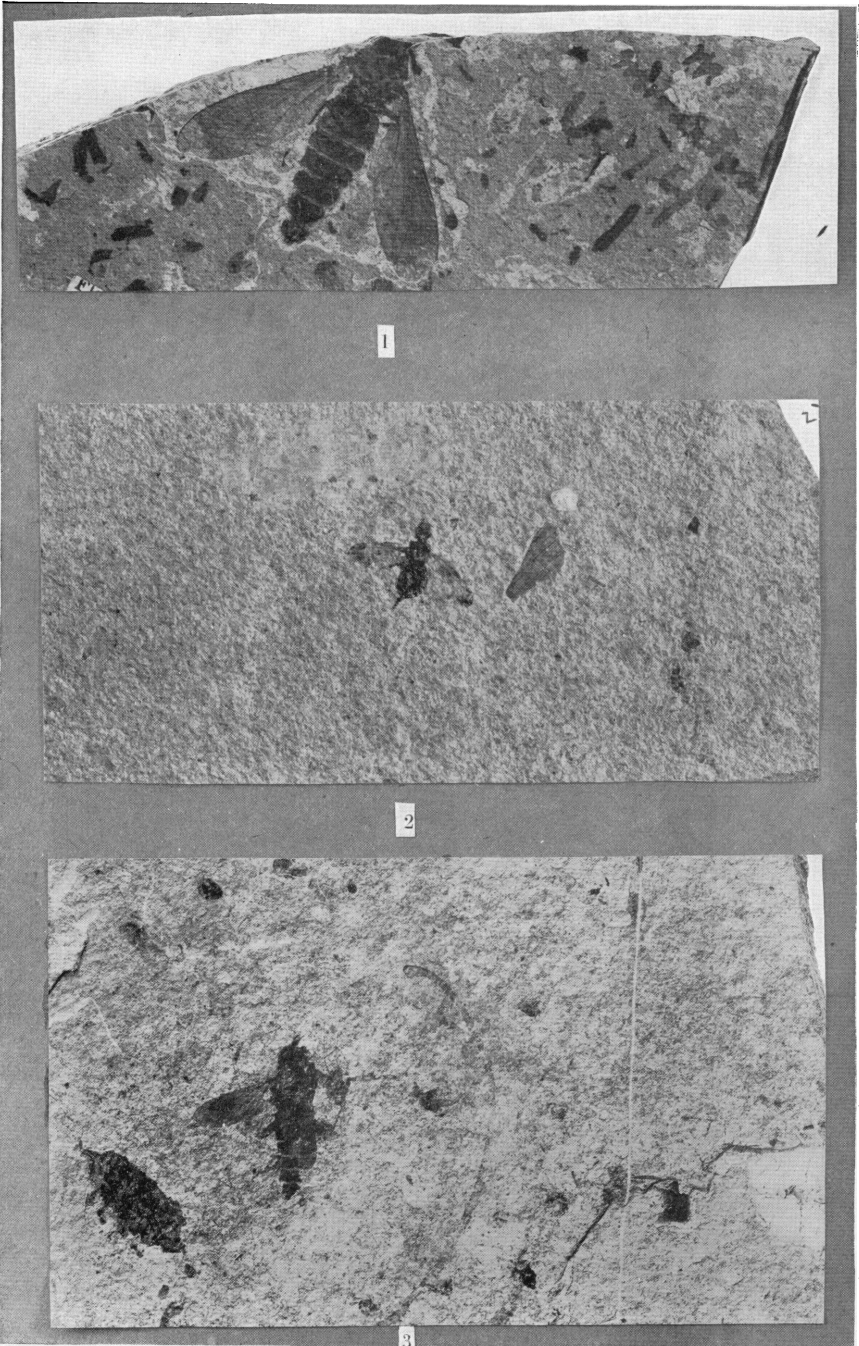
♀. Length 5 mm.; wing $4\frac{3}{4}$ mm.; proportions ordinary, the abdomen oval; ovipositor protruding somewhat over 1 mm. (not counted in measuring length); head and thorax dull dark reddish-brown; abdomen shining, a little redder; legs dark; wings hyaline with large fuscous clouds, veins fuscous. The wing markings

are as follows: apex broadly fuscous, the dark cloud extending a short distance along costa; apical margins of first basal and discal cells broadly clouded (as in living species); middle of costa broadly clouded, the dark color ending about at the end of first vein; this costal extends broadly downwards and obliquely basad. In the living *Tetanocera clara* the same markings may be seen, in modified form; thus in the *Tetanocera* the costal portion of the apical cloud has become more prominent, and separated from the apical portion; while the mid-costal cloud, so large in the fossil, has become reduced to a small spot.

The costa bears minute black bristles; the first vein is bare. The end of the first vein is more apicad than usual; thus it is about 2720 μ from the base of the wing, but only 1700 μ from the end of the second vein. The end of the second vein is straight — not at all turned upwards. The anal cell is quite normal, its apical side truncate, bulging. The first basal cell extends 1140 μ beyond the second.

Hab.— Florissant, in the Miocene shales, Station 13 (*W. P. Cockerell*, 1907). From the heavily spotted wings, this looks like an Ortalid.

The types of all the above species are in the American Museum of Natural History.



FOSSIL INSECTS, FLORISSANT, COL.

1. *Megacosmus mirandus*, sp. nov.
2. *Sciomyza florissantensis*, sp. nov.
3. *Psilocephala scudderi*, sp. nov.

