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Second notice on the Apiocerina

by

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An article by D. W. Coquillett about the genus *Rhaphiomidas* O. S. (in the West-American Scientist, S. Francisco, Jan. 1891, p. 84—86) adds some new facts to our scanty knowledge of this remarkable genus, and induces me to return to the subject of the Apiocerina, already discussed by me in a previous article (Berl. Ent. Z. 1883. p. 287 1)).

In establishing the genus *Rhaphiomidas* (Western Diptera, p. 281 1877) I had a single defective female specimen only to compare Coquillett had several specimens of *R. episcopus* O. S. in both sexes, and a single male specimen of a second species which he calls *R. Acton.* It results from his data that *R. episcopus* has three ocelli and not only two, as I saw them in my damaged specimen. *R. Acton*

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1) Readers of this article are particularly requested to introduce into it, before its pensal, the correction published by me in the Berl. Ent. Zeitsch. 1886, p. 139.

At that time I had no chilian specimens for comparison and was misled by Brauer's statement about them, a statement which he had based upon Philippi's erroneous figure, without comparing specimens. In his: Characteristik der mit *Scenopinus* verwandten Dipteren-Familien etc., in the Vienna Denkschriften, Vol. XLIV, p. 107 (Separ. 51) he separates *Anypenus* from *Apiocera* thus:

The first and second veins, issuing from the discal cell, end before the apex of the wing. *Anypenus* Phil.

The first of these veins ends before, the second behind the apex of the wing. *Apiocera* Westw.

Such a distinction does not exist in nature, as I ascertained the first time I saw a chilian *Apiocera*; in both cases, it is only the first of the veins which ends before the apex.

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has the ocelli indistinct, their places being occupied „by sunken not shining spots".

As to the venation, I said in my description: „The small cross vein near the posterior margin is absent, although a rudiment of it in the shape of a minute stump of a vein, is perceptible in the usual place". This seems to have been an accidental aberration in the specimen which I had, because Coquillett says: „the marginal cross vein . . . . . is present in all of my examples."

The male forceps of both species is largely developed, one-fourth as long as the abdomen in *episcopus* and as much as two-fifth in *Acton*. The habits of *Rhaphiomidas* are peculiar. „*R. episcopus* occurs sparingly in Los Angeles county in mid-summer, hovering over flowers like a humming-bird".

In my article of 1883 (p. 293) I said that „it would seem that *Rhaphiomidas* in an Asilid of a peculiar type having, like *Apiocera*, a Midaid-like venation, but antennae of a different structure and a much longer proboscis". Since then, during a flying visit in the U. S. (1885) I had the opportunity to corroborate this opinion by examining the type of my description again (in the Mus. Comp. Zool. Cambridge Mass.); and Coquillett's discovery of the male proves that it has a forceps, which, although not described in detail, is said to be largely developed. even more than in *Apiocera*.

All the characters which I have enumerated in my previous paper (p. 292) as distinguishing *Apiocera* from the Midaidae, are also found in *Rhaphiomidas*: the presence of ocelli, of macrochaetae

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Two other corrections to my paper of 1883 may find their place here.

On p. 293, lines 19 and 20 from the bottom an obvious slip of the pen has occurred: read Asilidae for Midaidae and vice-versâ.

On p. 289 I founded my account of the chaetotaxy of *Apiocera* principally on Australian specimens: my american material, from California, was scanty and of chilian specimen I had none. Having examined such specimens since I found that the arrangement of their macrochaetae is still nearer to the Asilina than that of the australian species. For instance, the humeral bristles of the australian Apiocerae which I described as „hardly deserving the name of macrochaetae" (l. c. p. 289), are much more distinct in the chilian specimens; their praesutural bristles are as large as in some Asilidae. In *A. brevicornis* Phil. I count four scutellar bristles. — It may therefore be stated in general that the relationship of the american Apiocerae to the section Asilina is even more evident than that of the australian species.

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on head and thorax; the structure of the scutellum, of the male forceps, of the legs and antennae; and also the comparative shortness of the discal cell. About the palpi of *Rhaphiocera* I have not been able to say anything in my description, nor is there anything in Coquillett's paper.

The only character in which both *Apiocera* and *Rhaphiomidas* differ from the Asilidae and resemble the Midaidae lies in the venation.

I said (l. c. p. 291) „the only link, as yet missing, in order to complete the transition from the venation of certain forms of *Erax* to *Apiocera*, consists in the position of the first vein issuing from the discal cell. We have no Asilid yet in which this vein ends before the apex of the wing, and no *Apiocera* in which it ends behind it. And this is the only point in which *Apiocera* is like the Midaidae."

The venation of *Rhaphiomidas*, far from bridging over this gap, widens it by approaching still nearer to the Midaidae. In the Asilidae (*Erax* etc.) the first vein, issuing from the discal cell ends in the margin beyond the apex of the wing; in *Apiocera* it ends before it; in *Rhaphiomidas* not only the first, but also the second vein issuing from the discal cell end before the apex. For this reason in the Asilidae there is only one cell between the second submarginal cell and the posterior margin; in *Apiocera* there are two, in *Rhaphiomidas* three. The venation of *Rhaphiomidas*, as I described it in the „Western Diptera" is not unlike that of the Midaid *Diochlistus mitis*, figured by Gerstaecker in his Monograph, Tab. I, fig. 1. I have indicated the differences, the principal of them being the much shorter discal cell which is charasteristic of an Asilid and also belongs to *Apiocera*. The three genera of the Midaidae which, like *Rhaphiomidas*, have three cells between the second marginal cell and the posterior margin (*Diochlistus*, *Mitrodetus* and *Triclonus*) occur in Australia and Chili; all the other Midaidae have, like *Apiocera*, only two such cells (comp. Gerstäcker, Stett. Ent. Zeit. 1868, p. 8).

The strengthening of the hind margin of the wing by veins parallel to it implies among Diptera the power of regulating the flight, of hovering or poising. We have instances in the Syrphidae, Bombylidae etc., diptera of a very light build. That heavier forms, like the Midaidae and the Apiocerina, are provided with a stronger armature of parallel veins seems natural. We have a similar case in the Cyrtidae *Eulonchus* and *Lasia*, whose venation reminds of the Midaidae, although the homologies of the veins are different.

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I have seen *Eulonchus* hovering over the flowers in California, just as Coquillett saw *Rhaphiomidas*.

With all that I must confess that the great resemblance of complicated venations in two different families, like those of the Midaidae and Apiocerina is a rather startling fact. Further discoveries of new forms in Western America and Australia may perhaps explain its significance.

The larger development of the lips and the tendency of the proboscis to elongation in the group of the Apiocerina may be explained by the fact that they suck flowers (as appears at least from Mr. Coquillett's observation), while the other Asilidae suck insects, whose more or less tough chitinous covering must be pierced by the proboscis. The change in the nature of the food has nothing to astonish us when we call to mind the Tabanidae, Empidae and other families containing blood-sucking, predaceous and flower-sucking species at the same time.

Compare for instance in Westw. Introd. II, 541 the statements about *Pangonia rostrata* and *longirostris*, and in Philippi, Verh. Z. B. Ges. 1865, p. 707 about the chilian common „Potoquin", the *Pangonia lata* Guér. Should therefore *Rhaphiomidas* prove to feed on the sap of flowers, it would explain the change of structure of its proboscis, without preventing it from counting among the Asilidae.

In my former paper (p. 293) I expressed some reluctance against introducing a separate section of the Asilidae for *Apiocera* alone; but since the discovery of a second, still more aberrant generic type of the same group has become an undoubted fact, I do not hesitate to form the section Apiocerina, which I consider as Asilidae, adapted to peculiar conditions of life, and holding the same borderland position as the Ptychopterina among the Tipulidae. Not having any specimens of *Rhaphiomidas* before me at present I must content myself with data borrowed from my own description and give a definition which is merely provisional and tentative:

Section IV. *Apiocerina.*

The tip of the first, and sometimes also of the second vein issuing from the discal cell end before the apex of the wing (and not after as in the other sections of the Asilidae). Large development of the lips, and a tendency towards a gradual elongation of the proboscis: it is quite short in the chilian *Apiocera brevicornis* Phil., longer in some australian species, and reaches excessive proportions in *Rhaphiomidas*. Absence on the metapleura of the tuft or fan-like row of bristles, occurring in the other Asilidae (in *Rhaphio-*

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midas the metapleura is strongly bulging, conical; this is the „conical body" the homology of which I did not attempt to explain in the Western Diptera, p. 282). The characters of the body, the genitals and the chaetotaxy of the Apiocerina do not differ in the essentials from those of the Asilidae, and expecially of the Section Asilina.

As Mr. Williston has omitted the *Apiocerina* from his recently published „List of South-Amer. Asilidae" (Trans. Am. Ent. Soc. 1891), I conclude that he still holds the opinion about their position, which he expressed in his paper: *Hilarimorpha* and *Apiocera* in Psyche, Vol. V, p. 100, 1888. To the first part of this paper, about *Hilarimorpha*, I have replied elsewhere (Berl. Ent. Z. 1890, p. 303). In the second part Mr. Williston quotes what he calls my „elaborate" article about *Apiocera*, but he does not seem to have paid much attention to my arguments, including the very cogent ones, borrowed from chaetotactic characters, about the affinity between *Apiocera* and the Asilidae, and their dissimilarity from the Midaidae. His article concludes with the words that the Apioceridae are „most nearly related geologically to the Nemestrinidae and Midaidae, next to the Asilidae and less intimately to the Therevidae". This is certainly a non-committal way of solving the question, and the allusion to the Therevidae especially tends to conciliate the most diverging opinions. An interesting fact, mentioned in this paper, is that in one of the australian species, both male and female, in Mr. Williston's possession, there is no indication whatever of the anterior branch to the third longitudinal vein.

It remains for me to answer an objection of Mik (Wien. Ent. Z. 1888, p. 181—182) against the location of *Apiocera* among the Asilidae. He notices the enlarged facets in the middle of the flattened eyes of the Asilidae and does not find them in *Apiocera*. This structure of the eyes of the Asilidae is nothing new to those who paid any attention to this family, and has been used ad nauseam by Walker in his bad descriptions (compare all the descriptions of Dasypogons in Walker's List, Vol. II, especially those on p. 346—356). It is most developed in the Dasypogons and is almost imperceptible in most species of the genus *Asilus* in Schiner's sense as well as in *Apiocera*, although in a slight degree it exists n both. It has no value as a criterion at all. It must represent some adaptation for predaceous purposes, because it is very distinct in some Dolichopodidae.

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1) About this part of the thorax compare my Essay on Chaetotaxy, in the Trans. Ent. Soc. London, 1884, p. 504.

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