

SOME FURTHER REMARKS ON THE SYSTEMATIC  
AFFINITIES OF THE PHORIDÆ, WITH DE-  
SCRIPTIONS OF TWO NEW NORTH  
AMERICAN SPECIES.\*

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In a recent paper published in the Transactions of the Entomological Society of London<sup>1</sup>, Mr. W. Wesché has dealt with this interesting question, and as his paper is in part a criticism of my last contribution along this line<sup>2</sup>, I think it desirable to add a few brief remarks.

Wesché has unfortunately completely misunderstood the position which I have taken in regard to the Phoridae and Hippoboscidae. In the paper above referred to (pp. 354 and 357) I

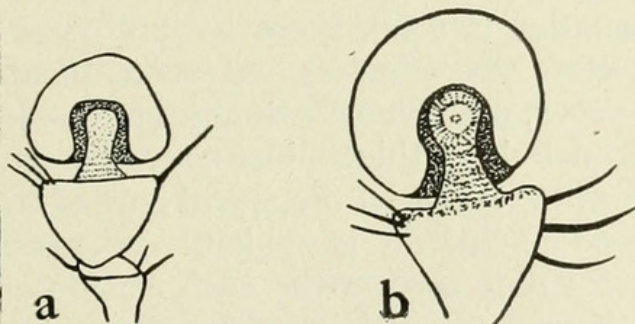


FIG. 1. a. antenna of *Borborus equinus* Fall.  
b. antenna of *Lonchoptera lutea* Panz.

have called attention to many striking *resemblances* between these two families, but it is expressly stated that "these resemblances are undoubtedly the result of parallel development." It was not my intention to imply that they indicate genetic relationship, for I most emphatically believe that they do not. The undoubted recent geological development of the Hippoboscidae and their evident adaptation to a peculiar habitat must preclude any idea that they are closely connected with the evolution of such comparatively generalized Diptera as Phoridae. As can be seen from my

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<sup>1</sup> For September 29, 1908, pp. 283-296, with plate VII.

<sup>2</sup> The Systematic Affinities of the Dipterous Family Phoridae, Biol. Bull., Vol. XII, No. 6, pp. 349-359 (May, 1907).



remarks on page 355 of the same article, this comparison was introduced simply to show what Wesché has perhaps more clearly stated when he says: "It will thus be seen that the Phorid venation is but of small assistance to the systematist, as in spite of its being so simple, striking and peculiar, it has led to very divergent opinions." This fully supports my contention that the superficial resemblance between the venation of Phoridæ, *Aspistes*, *Mycetophila*, *Scatopse*, *Olfersia*, *et al.*, is of very questionable value in tracing Phorid relationships.

Both of us seem to be in full accord in associating the Lonchopteridæ and Phoridæ, which is also the position taken by most recent dipterists. Beyond this, however, we appear to be almost completely at variance, as Wesché would assume that the Phoridæ show a closer, or at least a very close, affinity with the Dolichopodidæ.

There are indeed many resemblances between the two families, but there are also a number of wide differences which I consider quite fundamental.

As to the venation, I think there is little more to be said, for it seems quite certain that it offers but few available data. There is one point, however, on which I cannot agree with Wesché; that is in calling the nebulous thickening near the costa beyond the tip of the third vein a vestige of the apical part of the third (which he calls the second) vein. It is evidently of adventitious origin, for among Diptera it is always the case, so far as I know, that the costal vein when not encircling the entire wing, ends sharply where it meets the tip of one of the longitudinal veins, usually the third or fourth. That is to say, the point where the costa and the longitudinal vein meet may vary in different forms, but their junction always marks sharply the end of both. This makes it almost certain that this thickening in the Phoridæ is of secondary origin.

I must confess that I was mistaken in assuming that the articulation of the third antennal joint of the Phoridæ is so unique among Diptera. Wesché shows in this paper that the Dolichopodidæ have a somewhat similar arrangement, which he regards as a strong mark of affinity between them. I have therefore been led to examine the antennæ of a species of *Borborus* (*B. equinus* Fall.) and find, contrary to my expectations, that this species shows a closely similar method of attachment to that exhibited by the Phoridæ (Fig. 1), a fact which still further confirms my



opinion that the resemblances between these two families are not superficial. The second joint shows the same bulbous enlargement which appears to contain a type of spherical sense organ similar to that in the Phorid antenna.

I have also made preparations of several specimens of *Lonchoptera lutea* Panz. and find that this species is somewhat different from the figure given by Wesché for *L. flavicauda* Meig. Particularly in dorsal view the attachment is extremely like that of *Borborus* and much more like that of the Phoridae than the figure given in Wesché's paper. (Fig. 1.)<sup>3</sup> The antennæ therefore shows less similarity to those of at least some of the Dolichopodidae than to certain Borboridae.

Another point not touched upon by Wesché is the general form of the head, the relations of the antennæ, face and front. This character has already been pointed out by Mik in discussing the relationships of certain aberrant Phoridae; it is quite constant among Asilidae, Empididae and Dolichopodidae, the face is long, not regularly excavated for the antennæ nor sharply differentiated from the front as is the case in the Cyclorrapha, particularly the Myodaria.<sup>4</sup> The Phoridae are very different in this respect from these families with which Wesché would associate them, and while the character may at first sight appear to be vague, I think it is one which is clearly defined in the mind of anyone who has devoted much time the taxonomy of Diptera.

Perhaps the absence of a ptilinum is good evidence that the Phoridae are not descended from Muscid-like forms, but it can not be considered at all unlikely that such a character might be easily lost, especially in such minute forms where its mechanical use is probably not so great.<sup>5</sup>

I do not feel competent to express an opinion on Wesché's data concerning the mouthparts and genitalia, but am assured

<sup>3</sup> The preparations figured were made by soaking the insects for several hours in a 25% aqueous solution of Potassium hydroxide, rinsing in water and bleaching in strong Hydrogen peroxide until sufficiently transparent, after which they can be dehydrated and mounted in balsam. The evolution of oxygen bubbles caused by immersion in the peroxide serves a very useful purpose in gently distending the body, thus extruding very nicely the mouthparts, genitalia, etc.

<sup>4</sup> It must be admitted that some Leptidae, e. g. *Chrysopila*, depart widely from this and remind one strikingly of Phoridae in the form of the head.

<sup>5</sup> As to the assumption that the Phoridae are predaceous, I cannot believe that they are very generally so. Most of our species feed on decaying plant or animal matter as adults; even *Phora incisuralis* Lw., one of our species with unusually chitinated proboscis, feeds normally on decaying plant tissue, caterpillar excrement, and dead insect larvæ. Even so, I do not think that such a character is of much use in determining affinities between families.



from other characters that there are many, and at least fully as great, differences between these flies and the Dolichopodidæ as between them and the Borboridæ; nevertheless I feel, as when concluding my original paper, that my negative conclusions are more acceptable than any positive ones yet put forward in regard to their relationships.

***Aphiochæta smithii* sp. nov.**

Male. Length 1.2 mm. Black; legs brownish testaceous; knob of halteres whitish; palpi clear yellow. Head rather flat, the front subopaque or slightly pollinose; about one-fourth broader than high; median frontal groove and ocellar tubercle present. Anterior margin of front with only two distinct median proclinate bristles. Lateral bristles of lower row close to the lateral angle and very near to the anterior margin of the front; following row above straight, its bristles equidistant, but the lateral ones very close to the eye. Ocellar row as usual. Third antennal joint oval, slightly more elongate than usual, with a long, almost entirely bare arista. Proboscis retracted. Palpi of moderate size, with numerous, but rather small bristles; conspicuous by their contrasting clear yellow color. Mesonotum subshining, very much more distinctly punctate than usual, thinly hairy. One pair of dorsocentral bristles and only two marginal scutellar bristles; mesopleura bare. Abdomen opaque, the segments gradually decreasing in length, the second not elongated and without lateral tufts of bristles. Entire abdomen with very sparse, short, bristly hairs. Wings hyaline, the costal vein reaching distinctly beyond the middle of the wing; first vein ending very close to the third, its tip being fully twice as far from the humeral cross-vein as from the tip of the third; tip of second vein slightly but distinctly nearer to the tip of the third than to the first. Costal cilia quite long and closely placed. Fourth vein slightly and evenly curved; fifth sinuate, sixth more distinctly so; seventh distinct. Knob of halteres whitish. Legs slender, brownish testaceous, the four posterior coxæ and the hind femora more or less infuscated. Tibiæ destitute of distinct bristles or setulæ; the hind ones with a raised line on the upper side extending to the apical third where it divides to enclose a peculiar oval, flattened or concave area which extends to the tip of the tibiæ. Tarsi simple.

Described from two specimens reared June 21 by Professor John B. Smith from an agaric mushroom collected at Stelton, N. J., which were sent to me by Dr. E. P. Felt for determination.



The species is very distinct from any known to me, the bare hind tibiae, with the peculiar flattened pit-like structure at the tip serving at once to distinguish it from any other so far described.

***Puliciphora sylvatica* sp. nov.**

Male. Length 1 mm. Black, with long piceous legs and very large quite strongly infuscated wings. Head rather small and considerably flattened. Four anterior frontal bristles proclinate, slender, but unusually long. Lower lateral angles of front with a pair of reclinate bristles as usual. Row above rather strongly curved downward medially. Ocellar row long, but rather slender. Ocellar tubercle present, but no median frontal groove. Eyes faintly pubescent; postocular cilia delicate; cheeks with a small patch of rather small macrochaetae. Proboscis small, retracted; palpi very much enlarged and flattened; leaf-like, nearly as long as the head height and as broad as the eye, strongly bristly along the inferior edge near and at the apex. Antennae of moderate size, oval with a pubescent arista. Mesonotum subshining, with one pair of dorsocentral macrochaetae and four strong scutellar bristles. Abdomen smooth, faintly shining along the sutures, with a few sparse bristly hairs scattered over its surface. Second segment elongated, but scarcely longer than the third; following growing shorter. Hypopygium not prominent, the superior lamella more strongly hairy than usual. Legs long and slender, quite thickly clothed with short, velvety pubescence, but without any external macrochaetae or bristles. Tibial spurs obsolete on all the legs. Wings very large, strongly infuscated, especially in front and along the veins. Costal vein extending to or a little beyond the middle of the wing; its cilia very short and delicate, almost obsolete. Mediastinal vein present, very distinct. Tip of first vein slightly but very appreciably closer to the humeral cross-vein than to the tip of the third. Third vein simple, not furcate or swollen at the tip and connecting closely with the tip of the costal vein; fourth vein almost straight; fifth and sixth slightly sinuate; seventh vein nearly straight, very distinct and close to the margin. Halteres pure black.

Described from a single male specimen taken from sweepings collected along a mountain stream near the base of Mount Constitution (Humid transition area), Orcas Island, San Juan Co., Washington, during July, 1908.



No doubt the female is wingless like those of other species of the genus, and as the male is unusually large, it must be a very striking form.

This is a very extraordinary species, and I cannot be positive that it is correctly placed in the present genus. It is apparently closely related to some East Indian species of *Puliciphora* (*P. pulex* Dahl and *P. lucifera* Dahl), but unfortunately these are imperfectly known. The enlarged palpi are unique in the genus so far as I know, although similarly swollen palpi are of occasional occurrence in *Phora* and *Aphiochæta*. The venation and frontal chætotaxy, however, exclude it from either of these genera and from *Hypocera* as well. It is undoubtedly a very interesting addition to our fauna.



Brues, Charles T. 1910. "Some further remarks on the systematic affinities of the Phoridae, with descriptions of two new North American species." *Bulletin of the Wisconsin Natural History Society* 7, 103–108.

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