

VENATIONAL CHARACTERS IN TYPHLOCYBINÆ WINGS.

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The occasion for discussing this problem of wing venation of a group of small Homoptera has been brought forward by the criticism of W. L. McAtee which appeared in the Journal of the New York Entomological Society, Vol. 34, p. 158.

In commenting upon the wing drawings of *Dikraneura* which accompanied a discussion and revision of the genus by E. D. Ball and the writer, he makes the following statement: "The figures illustrating venation in the paper referred to are carelessly drawn in a number of instances. In general the sectors are drawn as if visible to the base of tegmen, while a leading characteristic of the subfamily Eupteryginæ is that the sectors are usually not visible basally."

Early workers referred to this basal condition of the wings as a possible character and later workers have frequently followed them without detailed work or sufficient and proper technique in study. The present criticism we trust resulted from unsuccessful attempts to examine the wings at their bases, following which it was merely assumed that this was a leading characteristic of the subfamily. Furthermore it is quite apparent by examining drawings and noting statements made, that Mr. McAtee has overlooked the veins in the basal portion of the Typhlocybid wing.

The statement that the sectors usually "are not visible basally" will not hold for the genus *Dikraneura* nor for the subfamily Typhlocybinæ as a whole, when thorough and careful study is made. In the genus *Dikraneura* the sectors are visible to the base of the tegmen in most specimens of every species examined, some more plainly than others. But even the faintest may be observed rather easily by the use of a microscope condenser. Photographs are exact reproductions of these characters, and the accompanying photographs of mounted slides of *Dikraneura* elytra from which drawings were made are typical examples which show the basal veins distinctly.

Many of these mounted slides were placed on demonstration at the Entomological meetings held in connection with the meetings of the A. A. A. S. at Philadelphia in December 1926.

TECHNIQUE AND METHODS OF STUDY.

Probably the chief reason that the veins in the basal portion of the elytra are not always seen is due to the fact that they are usually mounted on a slide in balsam for examination and when thus treated the basal one-half or two-thirds of the wing will be cleared by this solution to such a degree that the veins are not plainly visible. Especially is this true since the veins in the basal portion of the elytra are usually narrower and less conspicuous than in the apical portion. On the other hand these structures are frequently examined without removing them from the insect. In this case the veins are not visible because they are not sufficiently prominent to use reflected light and the body is too thick to use transmitted light. For these reasons if the veins are to be seen as they really exist, it is necessary to mount the elytra in a film of air and seal the coverglass without using a clearing solution of any kind. They can be kept in this condition indefinitely for further examination. These slides are then placed under the microscope which is held in a horizontal position and by the use of a 90° prism on the ocular end of the microscope, and a projection lantern transmitting the light through the objective end, the wing greatly magnified, sharply focused and with the veins showing conspicuously, is thrown on a screen and traced. In order to be as sure as possible, of these structures, the slide is then studied under the microscope and every vein is verified. The lighting factor is very important where veins are rather faintly visible since a varied degree of transmitted and reflected light will greatly change the degree of visibility. Occasionally the light when placed at an angle so as to give the effect of a dark field illumination will aid greatly in making the veins conspicuous. The drawings are then inked. All the illustrations cited as carelessly drawn were made in the manner described above after thorough study and care, with the exception of three which were made from unique types where the wings could not be removed. One of these is in the private collection of W. L. McAtee at Washington. The writer is not certain of the correctness of these three illustrations. In all other

cases the drawings were made as cited above and although errors may have occurred, care was exercised in an attempt to portray the venation correctly.

DISCUSSION.

In further commenting upon the drawings of *Dikraneura* wings he states "no fewer than six different styles of fusion of

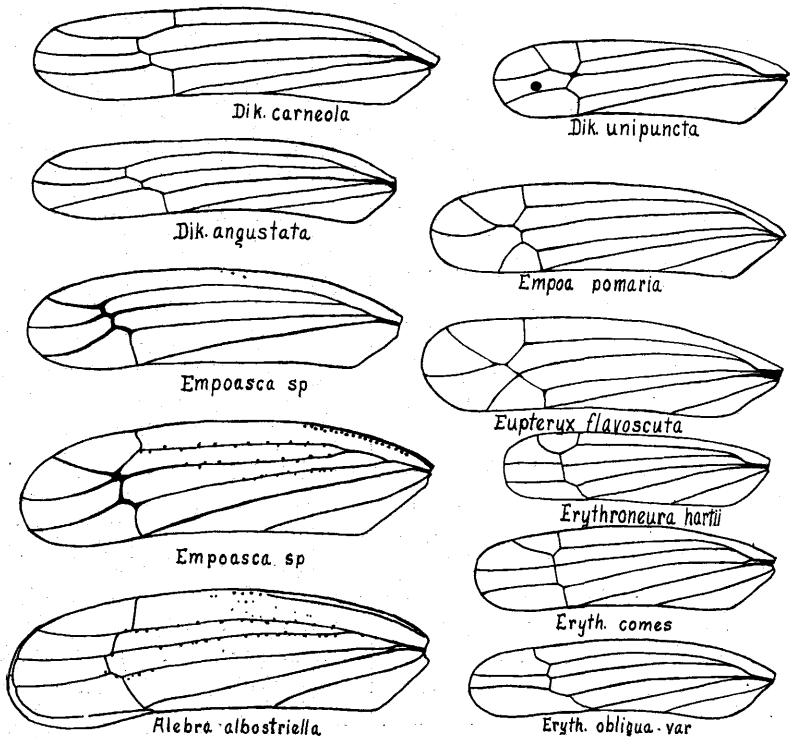


FIG. 1. Venation in Typhlocybinæ.

these veins basally are shown; a state of affairs which if actually exhibited by the specimens would compel their distribution to widely separated taxonomic groups." These groups are not named and we are left in doubt as to their identity.

This criticism is especially interesting since on the same page of his paper and in referring to a variable character in the apical portion of the wing, used for a generic separation, he states that it is "too variable to serve as the basis for such a

trenchant character." When these variations are pointed out by another worker however no consideration is given to them, the variation would be absurd and the specimens would be placed in widely separated taxonomic groups.

The point in question here is very similar to that at the apex of the wing, a question of the distance of the point of fusion of veins from the base of the wing, and which veins unite farthest from the base. This is apparently quite variable or seems to be as one studies it in a series of specimens. When species and genera are considered the variation is even greater.

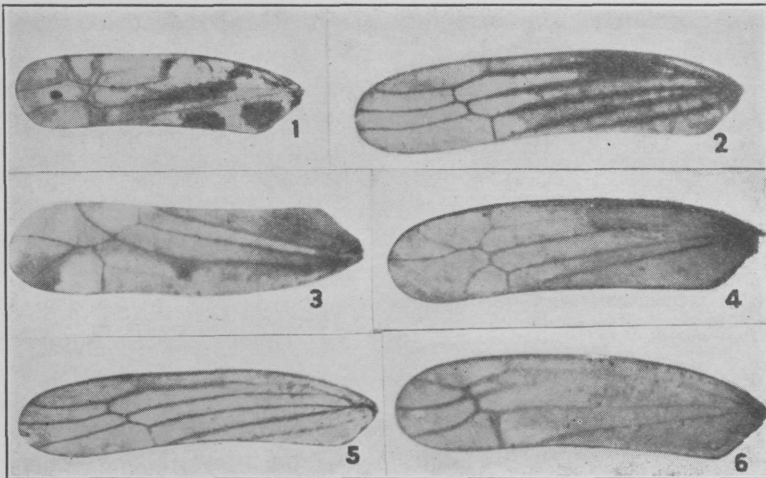


FIG. 2. Venation as shown by photographs.

Regardless of what the original condition may have been, we must study the present fusion of veins as we find it and must not assume that certain types of fusion would widely separate certain species unless we can prove it.

The great majority of Typhlocybid wings display the type of venation at the base as seen in *D. carneola* and *D. angustata* where "R" and "M" unite at the base before their fusion with "Cu" or the apparently united veins "Cu" and "1st A". This apparently is the rule, but there are exceptions. In some cases "Cu" will bend very sharply toward "1st A" and either unite with it or run parallel and proximal to it. Occasionally it bends sharply back and unites with "R" and "M" which are fused beyond this point. In some cases "R," "M," "Cu"

and "1st A" all seem to unite or fuse at about the same distance from the base, or if not fused, run parallel and so close to each other that the microscope does not designate them as separate veins. Perhaps the most interesting or peculiar condition is a fusion spur that occasionally unites "1st A" and the main trunk of "R" and "M" just beyond or at the point of fusion with "Cu." This is confusing in many instances if one attempts to trace the fusion point of "Cu."

In the case of *D. unipuncta* "R" does not fuse with "Sc" but runs very close to it and fuses in the usual manner with "M." In the drawing previously published by the writer the fusion portion at the base was omitted and the drawing was misleading. The second anal vein is frequently absent in the wing.

In certain species of *Alebra*, *Empoasca*, *Empoa* and *Erythroneura* "R" and "M" are frequently shown only faintly on the disc of the elytron and these faint veins are closely bordered by a row of pits or tubercles. The fusion of these veins basally is usually plainly visible or conspicuous. By properly focusing and adjusting mounted wings these veins can be traced in practically every case from the apical portion of the wing where they are most prominent to their points of fusion at the base.

In view of these facts it would seem that the criticism was unjust and furthermore it would seem absurd to state that a drawing was "carelessly made" if one had never seen the structure which another was attempting to illustrate and knew nothing of the care exercised and the methods and technique employed in an attempt to describe and portray the structures present.