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Scutellar bristles: four, of about equal length, the middle pair decussate.[1])

As long as the chaetotaxy of all the known genera is not worked out, it will be necessary to go into this detail, in describing a genus; later, it will be sufficient to indicate the differences. The application of chaetotaxy is not very difficult, as soon as its terminology is thoroughly mastered, and its more general use will afford, I think, an excellent index of the affinities of genera.

Heidelberg, Germany, May 20. 1890.

Synonymy of Antocha O. S. and Orimargula Mik

by *C. R. Osten Sacken.*

In my Studies on Tipulidae (Berl. Ent. Zeitsch. 1887, p. 187) I said:

„*Orimargula alpigena* Mik, Wien Ent. Z. 1883, p. 198, w. fig., from the austrian and bavarian Alps, is an *Antocha* with an open discal cell. The generic agreement is perfect. It seems to me that in Prof. Mik's figure the auxiliary vein is represented as too far remote from the first longitudinal. I remember seeing this species in Dr. Loew's collection many years ago; the specimens are in the Berlin Museum now, and are labelled: Kochel, Bavarian Alps, August 1867." —

Whereupon Prof. Mik answered (Wien. Ent. Zeit. 1888, p. 226):

„In Bezug darauf, ob meine Gattungen *Orimargula* und *Symplectomorpha* mit Recht eingezogen werden, behalte ich mir vor, an

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1) It was Dr. Schnabl in Warsaw who introduced the term decussate (Kreuzborsten) to describe the position of macrochaetae crossing each other, as they sometimes do, on the head, or the scutellum. The term, derived from the latin decem (X), is very happily chosen and has already been used in botany. Thus we now have, for the relative position of a pair of bristles, the following terms: erect, diverging, converging, decussate, proclinate (pointing forwards) and reclinate (pointing backwards).

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anderer Stelle bei Gelegenheit zu sprechen; nur möchte ich gegenüber der Aeusserung (p. 187): „It seems to me that etc.", was sich auf die von mir gegebene Flügelabbildung bezieht, erklären, dass die Abbildung richtig ist."

As Prof. Mik has not made good yet his promise of further explanations, and in presence of his very positive statement about the correctness of his figure of the wing, I felt bound, to prevent further misconceptions, to give the subject a renewed study and to publish the result. This result is founded upon the comparison of specimens, as well as of the descriptions.

The principal points of difference that may be urged against the identification of these two genera are found in the wings, whereas the bodies are remarkably alike in structure and coloring. The wording of Prof. Mik's diagnosis of *Orimargula* (Wiener Ent. Z. 1883, p. 198), as far as the body is concerned, corresponds nearly word for word with my description of *Antocha* (Monogr. N. A. Dipt. IV, p. 124). Thus Mik has: „Tibiarum apices calcaribus nullis, empodium perparvum, angustum"; and O. S.: „Tibiae without spurs, empodia indistinct"; Mik: „ungues ad basim furcati"; O. S.: „ungues with small teeth on the underside, at the basis"; Mik: „antennae 16 articulatae"; the same in O. S.; Mik: „forcipis maris articuli basales coniformes, ante apicem appendiculis binis altera unguiformi, altera lamelliformi"; compare with this statement the figure of the forceps of *Antocha*, given by O. S. l. c. Tab. III, f. 10, and the description: „the forceps of the male has, on the usual basal pieces, a double claw-shaped appendage, which consists of a horny and a soft part, closely joined". The ovipositor of both species, as I compare them, shows no difference. The mode of life is the same: both species occur in the vicinity of, and sometimes almost in contact with water.

In comparing my heliograph of the wing of *A. opalizans* (l. c. Tab. I, f. 11) and Prof. Mik's figure of the wing of *Orimargula* Mik, l. c., the resemblances become at once apparent: the acute angle at which the second vein issues from the first is the same in both (quite different in *Orimarga*!); in both, this origin is much nearer to the root of the wing than in the neighbouring genera; in both, the submarginal cell is considerably longer than the first posterior; in both the two last longitudinal veins are straight (and not undulating as in *Orimarga*). In the figures there is a difference in the distance of the great crossvein from the discal cell (which is open in *O. alpigena*); but this distance is not constant in the same species; in examining a considerable number of specimens of the

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european *A. opalizans* I find that in most of them that distance is the same as in Mik's figure of *Orimargula*; my heliograph, taken from an american specimen, happens to have it shorter. A more striking difference between the two figures consists in the course of the auxiliary and first longitudinal veins. — In Mik's figure the two veins are separated by a distinct interval and connected by a distinct crossvein; the first longitudinal, within the stigma, forms a sinuosity enclosing a small cell. It is barely possible that by dint of maceration of the wing in some chemicals, and its strong compression afterwards between glassplates, Prof. Mik may have produced such an appearance; in such a case he should have mentioned it. The dry specimens of the two species which I am able to compare show nothing of the kind; they show the auxiliary vein, closely approximate to the first vein, and gradually coalescing with it; both form a slight thickening of the costa just above the stigma. In fresh specimens of *Antocha* which I examined recently the course of the two veins is more distinctly visible, exactly as it is described and figured by me when compressed between glassplates (l. c. p. 125, footnote). In other words the characteristic course of these veins in both species consists in their great approximation, convergency and final coalescence; white the majority of the other Limnobina have these veins more parallel, and more or less distinctly incurved at the end towards the costa. The only analogous form of coalescence of the first vein and the costa I found in *Toxorrhina* (as I mentioned l. c. p. 126 at the top). The little sinuosity of the first vein within the stigma, as represented in Mik's figure, exists in *Antocha* also, but it is much paler, more straigth and less distinct than represented. I take it for a mere chitinized fold of the wing-substance rather than for a prolongation of the first vein.

The anal angle of the wing of *O. alpigena* is represented by Mik as less square-cut than that of *A. opalizans*. This is correct; the difference really exists between the two species, although in a very slight degree.

The most striking character of the wings, common to both species, is their apparent glabrousness and opalescence. While, in most Tipulidae, a good lens shows the microscopic pubescence, these two species require, for the same purpose, a compound microscope. I have stated in Mon. IV, p. 125 that it requires a magnifying power of 150 to discover the pubescence on the wings of *A. opalizans*. I renewed the experiment recently, and compared the pubescence of the same species, with that of the wings of *Thaumastoptera*. The latter pubescence belongs to the most delicate,

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and is hardly perceptible under a strong lens. Under a power of 150 the wing of *A. opalizans* appeared very densely and minutely dotted; the hairs originating from these dots were imperceptible and could be discerned in certain places only, where a fold allowed a side-view. Under the same power, and under much lower powers, the wings of *Thaumastoptera* showed the hairs most distinctly, issuing from dots much more sparsely scattered than those in *Antocha*. The same experiment was tried with a wing of *Dicranoptycha*, also remarkable for its fine pubescence (l. c. p. 117), with the same result: this pubescence proved to be much coarser than that of *Antocha*. On the contrary, the wing of *Orimargula* subjected to the same test and placed under the microscope alongside of the wing of *Antocha*, showed exactly the same minuteness of pubescence, to which the peculiar opalescence which distinguishes both species is probably due. This fact I think clinches the argument of the generic identity of *Antocha opalizans* and *Orimargula alpigena*.

The general result of this examination may be formulated thus: besides a general agreement of characters, as befits two species of the same genus, these species have two particular characters in common, which bind them still closer and distinguish them from the majority of Limnobina: first, the unusual, but only apparent, glabrousness of the wings, produced by the extreme minuteness and density of the microscopic pubescence, and second, the convergence of the auxiliary and the first longitudinal veins. That in *A. opalizans* the discal cell is closed and in *alpigena* open, does not constitute a generic difference; in several genera among the Limnobina both forms occur in different species (*Dicranomyia*, *Elliptera* etc.). I will notice in this connection that in constructing his dichotomic table of the Limnobina anomala (l. c. p. 199) Prof. Mik has overlooked the fact that *Elliptera clausa* O. S. from California has a closed discal cell and not an open one, like the european *Elliptera omissa*. This table, as much as mine in Monogr. etc. IV, p. 46 require amending in regard to the genera *Antocha* and *Elliptera* in both of which the discal cell is sometimes open.

Antocha, from the peculiarity of its characters, seems to be, like most of the Limnobina anomala, a survival of an earlier fauna. Such genera are for the most part not rich in species, and often monotypical. The discovery of a second species of *Antocha* is therefore an interesting fact, more interesting than the hasty creation of a dubious new genus.

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