

A REVIEW OF THE TETTIGONIDAE OF NORTH
AMERICA NORTH OF MEXICO.

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The present paper has been planned to serve a double purpose. Its first object being to furnish a means of separating and determining the members of this family found in the United States and Canada, together with their varieties and the synonymy as far as it has been worked out. Secondly, to give sufficiently accurate and detailed descriptions in all cases, even where not necessary in the separation of our own forms, so that later workers in the group and those from other parts will be able to discriminate between our species and closely allied forms from other regions, or to recognize our forms when found in other countries.

This is all the more necessary from the fact that this group, which forms a very small part of the Jassid fauna in the United States, becomes the dominant one in tropical regions, especially of the Western Continent. Of the five hundred or more described species the great majority are found in the region between Mexico and Brazil. A number of these species, among which are some of our own forms, extend throughout the whole of this territory.

Taking into account these facts and the additional one that most of the work on the group so far has been done by European authors, whose material was mainly from tropical regions, and who paid little attention to the isolated descriptions of the American authors, it is little wonder that there is much of synonymy. At the same time American authors have paid little attention to the European work, and a goodly number of the later synonyms are from this side of the water. Mr. Walker, of course, con-

tributed to the confusion. There is much in synonymy yet to be worked out which can only be completed when the species of the different countries have been carefully collected and accurately determined as to specific and varietal limits.

The bibliography of our forms in this group has been so carefully and accurately worked out by Van Duzee in his Catalogue of the Jassoidea that it seemed unnecessary to repeat it here. Under each species is given the reference to the original description and the date, and reference to the descriptions of all synonyms and varieties. In addition to this, references are given to systematic works published since the Van Duzee Catalogue, and references that have been changed from that given in the catalogue, are included, when necessary to make them clear.

There are few characters that seem available for generic use, and consequently, the classification within certain parts of the group is very unsatisfactory. With a limited number of species, such as we possess, one may readily lay down characters that will separate them into well-defined genera, but with a large number the task becomes more difficult.

The author has followed Stal in generic disposition, the main objection to this system being that the genus *Tetti-gonia* is still burdened with an immense number of quite diverse species. Even in our fauna it contains quite widely separated forms. It will, however, be necessary to study carefully a representative series from tropical regions before any rational and permanent separation can be had. On the other hand, the group represented by *mollipes* is mainly temperate in distribution, we having seven species in our fauna, of which Fowler only records two for Mexico and Central America, and it has been thought best to separate it from *Diedrocephala*.

The adoption of a system of describing by means of varieties, in some cases, was but the choice of evils, it seeming to be almost impossible to define some of the variable forms in any other way. Having adopted that method, it seems preferable to designate them by names rather than

by symbols or letters, as is often done, especially as in the majority of cases these varieties have already received names.

In the prosecution of this work, I have had for study the collection of the Iowa State College and the Van Duzee collection, both very rich in material, through the kindness of Prof. H. E. Summers; the National Museum collection, through the kindness of Dr. L. O. Howard; the Ohio State University collection and the private collection of Prof. Herbert Osborn; a series of Florida forms from Prof. H. A. Gossard; and a fine series of Eastern forms from Mr. Otto Heidemann; the Colorado Agricultural College collection; some typical specimens of Woodworth's species, from the Illinois Laboratory, through Prof. Hart; and numerous smaller series sent in for determination. My own collection includes all but one of the forms enumerated in the paper, as well as a large number of species from Mexico, the West Indies and South America, some two hundred species in all.

This large amount of material has made it possible to more thoroughly investigate and define the ordinary variations of a species and to recognize some hitherto very puzzling forms as only extreme variations in a specific type. Some of these variations were found to run through a considerable number of species, distributed through several genera, often the same variation would be found to occur in a majority of the species of a given locality.

The most striking structural variation commonly met with was the broadening of the head and consequent relative shortening of the vertex noticed in the specimens from the Pacific Coast and Mexican points. This was particularly noticeable in the Western specimens of *T. hieroglyphica* var. *confluens* and in the Mexican specimens, *tripunctata* and *bifida*; specimens of *bifida* from the West Indies were intermediate in this character. Another common variation was the change in the ground color in pronotum and elytra from red to blue and even green, with all possible combinations and variations in these colors. The variations in *T. hieroglyphica* and *O. undata* are striking exam-

in hand, but his references of *ichthyocephala* Sign. to this form seems doubtful.

HOMALODISCA LITURATA N. SP. Plate II, Fig. 2.

Smaller, narrower than *triquetra* with a longer head. Straw yellow, five irregular brown lines on the head. Length, 11mm; width, 2.25mm.

Vertex one-fifth longer than its basal width, half longer than the pronotum, disc flat, very deeply grooved in the middle. Front very long and narrow, disc flat and in same plane as the clypeus. Pronotum short, disc flat, posterior margin more strongly curved than the anterior one. Elytra very narrow, nervures distinct, a single cross nervure between the sectors situated at over one-third the distance from the fork of the first sector to the base.

Color; vertex pale yellow with five brown lines as follows: a narrow median one expanded on the apex, an interrupted line on either side the middle, arising considerably back of the apex and usually somewhat reticulate anteriorly, a pair of heavier stripes arising either side the apex and running back to the ocelli, their basal portions forming part of the loop that runs from the ocelli around to the eye, the striations of the reflexed part of the front brown. Pronotum yellow, irregularly punctured with brown; usually four distinct dark spots on the anterior submargin. Scutellum yellow with large brown spots sometimes arranged in the form of an H. Elytra hyaline, the nervures red, an irregular opaque red patch on the costal half back of the middle, terminating just before the apical cells and omitting an oval hyaline spot in the anterior end of the anteapical cells. Face and legs yellow, a spot on apex of front and anterior tibiae, fuscous. Abdomen black above, the terminal segment yellow, the lateral margins broadly white, at the base, narrowing apically, the spiracles dark. Below pale, sometimes a median line and the margins of the female segment black.

Genitalia; female segment half longer than the penultimate, the lateral margins parallel, the posterior margin in two slightly rounding divergent lobes, the notch between them narrow and less than half the depth of that in *triquetra*.

Specimens are at hand from Phoenix, Ariz; Yuma, California, and Comondu Lower, Calif, Mexico. The larger head and much narrower form together with the lineate arrangement of the markings will readily separate this form from *triquetra*.

HOMALODISCA INSOLITA WALK. Plate II, Fig. 3.

Preconia insolita, Walk. Homop. Suppl., p. 227, 1858.
Phera insolita, Fowl. Bio. Homop. II., p. 222, pl. xiv, fig. 2, 1899.

Resembling *triquetra*, but smaller and with a smaller head. Dark testaceous, with the anterior half of pronotum and vertex irrorate with yellow. Male sometimes almost black. Length, 10.5 mm.; width, 2.25 mm.

Vertex, no longer than the pronotum, very flat, but little inclined, margins acute, nearly right angled before. Front, convex, disc flat above. Face, as seen from side, much deeper than in *triquetra*, the outline sinuate. Elytra, rather broad, coriaceous; venation, regular, not prominent, the claval veins united for a short distance, the cross-nervure at about the middle of the first sector.

Color: dark reddish brown; a slightly olive tinge in the female. Vertex and anterior half of pronotum irrorate with pale yellow, sometimes a light median line in the furrow. Male very much darker, almost piceus on pronotum and elytra. Front and below, orange yellow; an ivory band arises on either side the apex of the vertex, below which it is indistinct, running back below the eyes, widening on the thorax and narrowing again on the margin of the abdomen. This stripe is narrowly margined with black, above and below, on the thorax. Fore tibiae, dark fuscous.

Genitalia: Female segment twice longer than penultimate, the posterior margin triangularly emarginate. The emargination rounds off into a narrow median slit, which extends two-thirds of the distance to the base. Male plates about as long as the ultimate segments, equilaterally triangular, rather stout.

Specimens are at hand from Texas and Arizona, and it is reported from several points in Mexico in the Biologia.

The evenly coriaceous elytra readily separates this from either of the other species. Neither Walker nor Fowler describe the genitalia, which is quite distinct, but there seems little doubt but that this is the form Walker described.

GENUS TETTIGONIA GEOFF.

Head, bluntly conical, but slightly sloping, eyes rarely prominent; ledges over antennal sockets, as seen from above, fused with the vertex margin at apex, not prominent. Front, convex, but not gibbous; vertex convex, confused with the rounding front. Pronotum, rather long, broadest at the lateral angles, the lateral and humeral margins nearly equal in length; posterior margin straight or roundly emarginate. Elytra, covering the abdominal tergum; venation, simple non-reticulate, often obscured by the color markings. Anterior tibiae simple.

This genus is world-wide in distribution, and contains a very large number of species of many different forms. Our