

PAPER NO. 4. SIX SPECIES OF DELTOCEPHALUS WITH  
NOTES AND PHOTOMICROGRAPHS.

In certain groups of the genus *Deltocephalus* are to be found many species with beautiful, even bizarre, color patterns and markings. It is an interesting fact, however, that two or more allied species which are very distinct structurally resemble each other so closely in color pattern, that a word description on a color basis is not sufficient to distinguish them readily. For this reason the accompanying Plate No. II is included to show the resemblances and differences in species which are very distinct structurally. In Figs. 1 and 2, are represented two very distinct species of the *D. reflexus* group (*D. areolatus* Ball and *D. pictus* Osborn). Structurally these two species are closely related, both having the reflexed costal veinlets, and more or less flaring elytra, but in color patterns they are very distinct. *Deltocephalus configuratus* Uhler (Fig. 3) represents a form intermediate between the *reflexus* group and the *sayi-misellus* group. This species is very abundant in many situations throughout Pennsylvania, and, in fact, extends its range widely through the northern and middle states.

In Figs. 4 and 7 (*D. sayi* Fitch and *D. misellus* Ball) are shown two species which have very similar color patterns, and are easily and often confused in collections, as is evident after examining a large number of collections in various parts of the country. As a rule, *sayi* has the banded appearance on the elytra, as shown by the illustration, but sometimes this superficial character is very faint or wanting; and not infrequently *sayi*, which is normally somewhat larger than *misellus*, is found somewhat depauperated to the size of *misellus*. The species are readily separated by the concave hind margin on the last ventral segment of the female of *sayi*, and the roundly produced hind margin of the segment in *misellus*.

*Deltocephalus interruptus* DeLong and *D. weedi* Van Duzee, Figs. 5 and 6, are very similar in color pattern, and this fact has misled students of the group for a number of years, as both are abundant species, and *interruptus* was not described as distinct until 1916. It is rather more robust than *weedi*, and the genital characters are very distinct. In *interruptus* the female ultimate segment has additional membranous plates at the lateral margins, but in *weedi* the segment is simple.

Perhaps two of the most confusing forms of our species of this genus are *D. compactus* O. & B. and *D. obtectus* O. & B. (Figs. 8 and 9). The length of the wings will help usually in distinguishing

them at a glance, and the genital characters are certain means of identification, although the color patterns are very similar and confusing. The finer reticulation of the clavus, and the usually darker band across the vertex in *compactus* are sometimes distinguishing marks. As a rule the elytra in *D. compactus* scarcely reach the tip of the body, while in *D. obtectus* they generally much exceed the body in length.

It will be noted in glancing over the plate that the arrangement of the figures illustrates a gradual variation in shape and form of head, advancing from a very produced type in Fig. 1 to the distinctly rounded head type in Figs. 8 and 9.

These photomicrographs were taken by the authors with the aid of an ordinary vertical Bausch & Lomb camera stand and a 32 millimeter focus Micro-Tessar lens. Illumination was secured by two ordinary microscope electric lamps with an exposure of approximately 2½ to 3 minutes, depending on the color of the subject, with the lens stopped down to F. 22. The prints were then retouched with the aid of dilute India ink and pencil, thus bringing out the very characteristic appearance of these tiny insects as they appear under a binocular microscope.