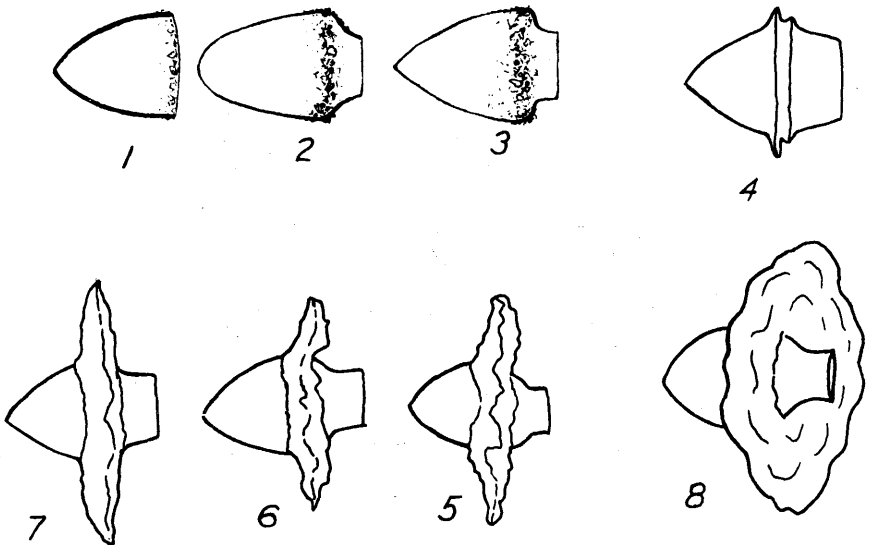


## A UNIQUE VARIANT OF CHRYSOCOCCUS ASPER LACKEY

JAMES B. LACKEY,

Senior Biologist, U. S. Public Health Service,  
Cincinnati, Ohio

In January, 1941, several one liter samples of water were collected by the courtesy of Mr. Claudeous J. D. Brown, of the Michigan Institute for Fisheries Research, at various depths under the ice in Third Sister Lake. In April a second set of samples was collected. Both sets of samples were preserved with formalin and stored in the dark until sedimentation of all organisms and debris was complete. The contained microorganisms were then identified and counted. The first set contained 32 identifiable species of Algae and Protozoa; the second set 34; and the total in both sets was 47. Chrysophyceae accounted for 8 species in the first set, 3 in the second.



FIGS. 1-8. Variations in *Chrysococcus asper*. (1) Rough shoulder and neck, pointed shell; (2) Rough shoulder and neck, rounded shell; (3) No neck or shoulder, slightly roughened, pointed shell; (4) Form occasionally seen in rivers, with roughened area forming two small ridges; (5-8) Third Sister Lake variant showing wide flaring collar of the shoulder region.

Most of these were species of *Chrysococcus* which occurred from the surface to a depth of 50 feet. Among these was a type with a wide flaring collar encircling the shell a short distance behind its anterior opening. At first it was thought to represent a new species but careful observation of a large number showed it to be a variety of *C. asper*.

The genus *Chrysococcus* was founded by Klebs (1) with the type species *C. rufescens*. Pascher (2) added the species *punctiformis*, *Klebsianus*, *dokidophorus* and *ornatus*. Nauman (3) added the species *porifer* and *cordiformis* in 1921, and in 1938 and '39 the writer (4, 5) added seven species. These 14 species appear to comprise the genus as far as known. In all situations examined *rufescens*, *ovalis*, *cylindrica*, *asper* and *major* have been the most abundant. The writer

has never seen *Klebsianus*, *dokidophorus*, *ornatus*, *porifer* and *cordiformis*. The species are rather clearly separated, although *rufescens* and *porifer* are close to each other, while *major* differs from *rufescens* principally in size and the lack of a posterior internal tubercle on the shell.

Usually the species do not exhibit a wide range of variation. *C. cylindrica* in the Licking River of Kentucky has shown rather divergent shell types, but all are clearly referable to the one species. *C. asper* has been perhaps the most variable. Its shell (Figures 1, 2, 3) may be pointed or rounded posteriorly, and there may be a constricted neck-like region, or the anterior end may be abruptly truncate. There is a tendency for one of these types to markedly predominate at any station where the species occurs in abundance.

Occasionally a form as shown in Figure 4 has been found. These have had the scabrous shell, but the roughening has extended to the formation of one or two small ridges encircling the shell in the shoulder region, ragged and uneven. Among the specimens from Third Sister Lake this region in many instances has become wide and flaring, forming a pronounced collar (Figures 5-8 incl.) so that single individuals might easily be mistaken for new species. There is a gradual transition, however, and it is apparent from studying a large number of individuals that all graduations exist between the typical *C. asper* types and the forms having the extreme collar. None-the-less no specimens were found in the April catches which were typical *C. asper* as in Figures 1 to 4; *C. rufescens* was abundant and *C. spiralis* occurred sparingly, but all others had wide collars as in Figures 5 to 8. If the intermediate forms in the January samples had been missed, there would have been a strong tendency to call the April forms of *C. asper* a new species.

These variants are an excellent example of variation in a given direction. *Chrysococcus* is apparently much more common to streams than to lakes, and this unusual type has not been encountered in streams. Third Sister Lake is deep, and the organism is photosynthetic; but to imagine the collar a flotation mechanism is futile, in view of its apparent added weight. We are thus left with another example of the query as to the cause of variations and with a renewed caution against species creation without examining large numbers of the questionable new forms.

#### REFERENCES

- (1) Klebs, G. 1892. Flagellatenstudien. Zeitschr. f. Wissenschaft Zoologie, 55: 353-445. 1892.
  - (2) Pascher, A., and E. Lemmermann. 1913. Die Susswasser-Flora Deutschlands, Osterreichs and der Schweiz. H. 2. Flagellatae 2. Gustav Fischer, Jana.
  - (3) Naumann, Einar. 1921. Notizen sur Systematik der Susswasser-algen. Arkiv. f. Botanik 16 (2): 1-19.
  - (4) Lackey, James B. 1938. Scioto River Forms of Chrysococcus. Am. Mid. Natur. 20 (3): 619-623.
  - (5) ———. 1939. Notes on Plankton Flagellates from the Scioto River. Lloydia, 2: 128-143.
-