

# THE GEOLOGICAL

—AND—

# NATURAL HISTORY

SURVEY OF MINNESOTA,

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## VIII.

PAPERS ON THE CRUSTACEA OF THE FRESH WATERS  
OF MINNESOTA.

BY C. L. HERRICK.

- I. *Cyclopidae of Minnesota with notes on other Copepoda.*
- II. *Notes on some Minnesota Cladocera.*
- III. *On Notodromas and Canbarus.*

I have collected from various sources what I could of the extensive bibliography of this, the sole species of the genus. One of the most characteristic and pleasing figures given is that of Weismann in his article on the "Schmuckfarben der Daphnoiden," though we believe that author in the wrong in the deductions made. Our specimens rarely approach the brilliancy of the plate, and there seems to be a more legitimate way of explaining these secondary colors than by sexual selection. This species is never abundant, nor is it very rare; found in Lake Minnetonka, and the larger lakes with their outlets.

### III On *Notadromas* and *Cambarus*.

## CYPRIDÆ.

This group is one of the most difficult and perhaps least studied. A number of species some of which, perhaps most, are new, occur in Minnesota, and among them is a *Cypris* which exceeds any described form in size. I only mention one genus which is cosmopolitan.

### NOTADROMAS, Lilljeborg.

Carapace differing in male and female; eyes two; antennæ similar to those of *Cypris*, the superior having seven and the inferior six joints; setæ of inferior antennæ reaching beyond the apex of the terminal claws; second pair of jaws without a branched appendage, in the male pediform; abdominal rami rather long.

### NOTADROMAS MONACHUS, Müller.

#### *Bibliography.*

*Cypris monacha*, Muller, Latreille, Bosc, Demorest, Baird. Edwards.

*Monoculus monachus*, Gmelin, Manuel. Fabricius, Rees, Jurine.

*Notodromas monachus*, Lilljeborg, De Crust. ex ord. trib.

Brady, British Ostracoda.

Females of this widely distributed species were collected near Minneapolis, presenting in as far as could be seen no material points of distinction from English types.

## DECAPODA.

But two species of *Cambarus*, *C. virilis*. Hagen, and *C. signifer*, occur in Hennepin county, except, perhaps, in the Mississippi. The following localities for the former species are known in the State: Mississippi river, Minnehaha creek, Bassett's creek, Cedar lake, Lake Minnetonka, Lake Independence, Lake Superior.

It is possible to recognize three age-forms in the males of this species.

A. The immature male (II Form, Hagen). Reaching two to three inches in length, this stage has the chelæ proportionally smaller, and the spinous armature less developed; the first abdominal foot is simply bifid at the end.

B. (Form I of Hagen,) usually over two and one-half inches long; chelæ larger; branches of abdominal foot distinct; inner branch grooved but lance-linear.

C. Very large (four inches); inner branch of abdominal foot spatulate at end; the two rows of tubercles on the inner margin of the "hand" with six or seven in a row instead of five.

Male of Form II, A stage,  $2\frac{1}{2}$  in. long, Chela. 7 in., thumb .49 in.

" " I, B stage,  $2\frac{1}{2}$  in. long, " 1 in., " .6 in.

" " I, C stage, 4 in. long, " 1.8 in., " 1.1 in.

" " II, A stage, 3 in. long, " 1.2 in., " .75 in.

It will be seen from the above that size does not govern the transition from the first to the second form entirely. This differs either in different localities or at different seasons of the year. A large gathering from Cedar lake showed no specimens of the form I, while a similar gathering at Lake Independence contained but one of the form II. A male from Minnehaha creek had rudiments of a third tooth on the carpus of the left claw, thus indicating an approach to Hagen's Var. A.

## CAMBARUS SIGNIFER sp. nov.

(FIG. 7.)

A slender, graceful species of rather marked colors, belonging to the section having a hook on the third pair of legs but not on the fourth. The rostrum is not carinated nor toothed at the apex; acumen moderate, lateral borders curved, moderately excavated. Cephalothorax arched and not depressed above, densely punctate; areola linear; chelae slender, straight; thumb deeply excavated on the inner margin for the proximal one-third; opposite finger with an impressed groove on the inner but not on the outer margin.

*Male, I Form.* Color reddish-(crimson) brown, not obviously figured; tail lighter; fin chestnut, marked with gray; chelæ bright crimson below there are green markings on the body and legs, and some yellow below.

The hands are rather narrow and straight, while the "thumb" is deeply excavated for one-third its length, and the notch thus formed is armed with three or four teeth; the finger opposite has a tooth half way from the apex, and others near the base; the angle at base of thumb is densely hairy. The penultimate and previous joint of second foot bears a very dense and thick tuft of hairs on the inner margin which is particularly noticeable in living specimens. The antennæ are short about as long as the thorax when reflexed.

The first pair of abdominal feet resemble those of *C. virilis* somewhat, but are stouter and less divided. They are more strongly curved than in *C. propinquus*.

The laminae of antennæ are much as in *C. troglodytes* but wider at the base.

The second form has the two branches of the abdominal foot united almost to the end. The young males have the chelæ greenish-blue and mottled, while the coloration of the body is like the females.

The females have shorter chelæ, and broader abdomen marked with chestnut bars on each segment above.

A male 3.3 in. long was still in form II, while another 3.2 in. long was in the form I. Found by hundreds in a shallow pool known as Grass Lake, in Richfield, Hen. Co.

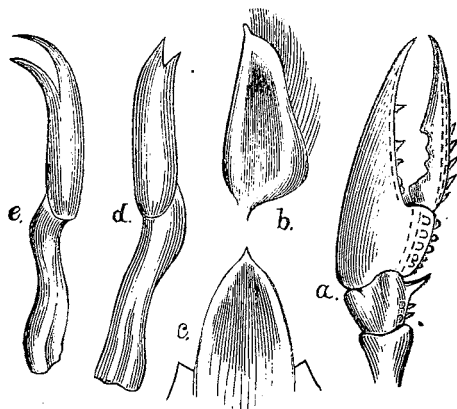


Fig. 7.

*Cambarus signifer.*

a chela. b lamina of antenna. c rostrum. d abdominal foot of form II. e abdominal foot of form I.