

**Notes on a New Species of *Gymnoplea* from  
Richmond, Natal, South Africa; *Adiaptomus*  
*natalensis* (gen. et sp. nov.).**

By  
**Arnold W. Cooper, F.R.M.S., etc.**

With Plate XII.

THE following notes on a new species of *Gymnoplea* found by Mr. J. Y. Gibson and myself near Richmond in November, 1905, may be of interest. During the latter part of 1905 we had been making periodical visits to several pools in a marsh with the view of ascertaining what varieties of aquatic life occur during the cycle of the year. During the months of August, September, and October *Diaptomus orientalis* was plentiful; the new species now being described first appeared in November. I have no reason to think it had been overlooked earlier because of its larger size and distinctive features. It is, however, rather local, not being found in all the pools examined, although its range has extended since first being observed. This species and *D. orientalis* are the only two *Gymnoplea* which have been seen in this locality during our visits, which have been made fortnightly. A marked peculiarity of the new species is that both antennæ in the female and the left antenna in the male have twenty-six joints; I have not seen any *Gymnoplea* described with more than twenty-five. There are other differences from *Diaptomus* and *Paradiaptomus*, which will be seen from the following description.

I have not seen any note mentioning the extreme elasticity of the spermatophores which the following incident exemplifies. Having mounted a specimen in damar after the usual fixation in perchloride of mercury and acetic acid, passing through absolute alcohol after staining, and clearing in oil of cloves, a slight accident happened to the mount. In trying to re-arrange the specimen with a fine needle, one of the spermatophores attached to the vulva became detached and stretched to nearly twice its normal length, the two ends being connected by a thread-like portion only; in less than an hour afterwards it had assumed nearly its former shape and proportions.

Description:

BODY.

Total length of female 1.8-1.9 mm. Male somewhat smaller.

Male.—Thoracic segments five, the anterior segment being partially fused with the head, the last thoracic segment being rounded along the posterior edge. Abdomen five segments. Furca symmetrical, each fork with five plumous bristles (fig. 2). Genital aperture at the anterior end of the second abdominal segment. No median dorsal spine.

Female similar to the male, except that the last thoracic segment is drawn out into a right and left backwardly directed flange (fig. 3). Abdomen consists of two segments, the vulva being in the middle of the first. Furca symmetrical, each fork bearing five short swollen plumous setæ. No median dorsal spine.

CEPHALIC APPENDAGES.

Antennæ 1, Male.—The right antenna consists of twenty-three joints (fig. 4), the terminal prehensile portion having four joints, the first of these (twentieth joint) with well-developed terminal hinges; joints fifteenth to nineteenth greatly swollen; a hyaline membrane extends along the inner side of the eighteenth, nineteenth, and twentieth joints.

Female.—Right and left antennæ symmetrical, similar to the left antenna of the male, with twenty-six joints (fig. 5).

Antennæ 2.—Similar in male and female. Basipodites two joints. Endopodite two joints, the first being slightly longer than the terminal joint, provided with two clumps of five non-plumous bristles. Exopodite with seven joints, the second and last being the longest; provided with three terminal bristles and nine non-plumous lateral setæ (fig. 6).

Mandibles.—Similar in male and female, the biting blade being provided with one large anterior tooth and a posterior serration of seven teeth, of which the anterior one is the largest. Basipodite two-jointed, provided with three setæ on the inner edge. Exopodite not distinctly jointed off from the Basipodite; provided with seven large bristles. Endopodite bi-lobed, the terminal lobe provided with seven bristles, the lower lobe with four (fig. 7).

Maxilla 1.—Basipodite not obviously divided into two joints; provided on the inner edge with a clump of nine strong bristles; on the outer side are two lobes, each provided with about four bristles. Exopodite and Endopodite not distinctly jointed off from Basipodite; Exopodite provided with a clump of nine bristles; Endopodite considerably lobed, each lobe provided with four or more bristles (fig. 8) (these bristles are finely plumous; a good light and definition are necessary to observe this).

Maxilla 2.—Basipodite provided with six lobes on the inner edge, each with a pair of finely plumous bristles. Endopodite, constituting the remaining portion of the appendage, is not obviously jointed off from the Basipodite; it carries five long, finely plumous bristles (fig. 9).

Maxilliped.—Basipodite consists of two long joints, the basal proximal joint provided with a prominent keel anteriorly directed. Endopodite three-jointed; these joints are provided with small lobes which carry very finely plumous bristles (fig. 10).



## THORACIC APPENDAGES.

First pair.—First thoracic appendages: Basipodite two-jointed; Exopodite three-jointed; first and third joints provided on the outer edge each with a short seta bearing four or five short spines; no seta present on the second joint; the inner edge of the third joint is provided with six plumous bristles; the terminal two serrated on the outer edge. Endopodite two-jointed; setae absent on the outer edge; the inner edge bears seven long plumous bristles (fig. 11).

Second, third, and fourth pair.—Basipodite two joints; Exopodite three joints, each bearing on the outer edge a swollen seta with spines; on the inner edge seven plumous bristles and a terminal serrated seta. Endopodite three joints, bearing along the outer edge and terminally ten plumous bristles (fig. 12).

Fifth pair.—Male asymmetrical, the right appendage being the larger, consisting of (1) Basipodite with two joints, (2) Exopodite, two-jointed; the second joint with a small spine on the outer edge, and long terminal curved claw without serrations. Endopodite three-jointed without bristles. Left: Exopodite not obviously jointed off from Basipodite, bearing on the inner edge two smooth pads or cushions; no "appendage" present on the outer edge; two claws, the outer being the larger. No endopodite has been observed (fig. 13).

Female.—Right and left symmetrical. Basipodite two-jointed, Exopodite two-jointed, the second joint bearing a prominent claw serrated on the inner edge; the place of the third joint is occupied by a prominent spine (*s.*), two accessory spines (*a. s.*) on the posterior surface. Endopodite one joint, with two terminal stout spines (fig. 14).

## SYSTEMATIC POSITION.

The characters in which the present species agrees with *Diaptomus* are numerous, and it is scarcely necessary to enumerate them; the characters in which it differs are:

- (1) Abdomen of female two-jointed instead of three.
- (2) Antenna 1, male, left, twenty-six joints; female, both twenty-six instead of twenty-five.
- (3) Mandible: Exopodite consists of one joint instead of five.
- (4) Maxilla 2: Basipodite not obviously jointed, as in *Diaptomus*; proximal and distal setae equal in length instead of unequal.
- (5) Thoracic 5, male, right, endopodite consists of three joints instead of one. Left, exopodite one-jointed, two cushions with smooth surfaces, and no "appendage." (In *Diaptomus*, exopodite two joints, the two cushions having a fringe of fine spines, and an "appendage" is present.) Endopodite not found, but described in *Diaptomus*. Female, third joint of exopodite absent, being replaced by a spine (*s.*) (a small third joint present in *Diaptomus*).

This species agrees with *Paradiaptomus* in:

- (1) Abdomen of female two-jointed.
- (2) Maxilliped: Endopodite three-jointed instead of five, as in *Diaptomus*.
- (3) Thoracic five, male, left, "no appendage" on the outer side of end joint of exopodite, present in *Diaptomus*.

## CHARACTER PECULIAR TO PRESENT SPECIES.

Antenna 1: Left of male, and right and left of female, twenty-six joints. This very peculiar character appears to be due to the division of the second joint. In the great majority of the *Gymnoplea* this second joint is longer than the third, fourth, etc., while in the new species the difference in size is not observable, and the position of the spine (*s.*), fig. 5, at the proximal end instead of in the middle of the third joint, favours this view—that the additional joint is obtained by the division of the second joint of a typical antenna. The hypothesis is supported both by the size of the second joint and the position of the spine in *Diaptomus orientalis* (see fig. 5*a*, *s.*<sub>2</sub>).

It appears impossible, with these differences, to place this

species with *Diaptomus* or *Paradiaptomus*, and accordingly a new genus (*Adiaptomus*) has been made for its reception.

The descriptions of *Diaptomus* and *Paradiaptomus* have been taken from the *Das Tierreich*, Copepoda, *Gymnoplea*, by W. Giesbrecht and D. Schmeil.

I am also indebted to Dr. Ernest Warren (Director of the Museum) for much valuable assistance with regard to this paper.

#### EXPLANATION OF PLATE XII,

Illustrating Mr. Arnold W. Cooper's "Notes on a New Species of *Gymnoplea* from Richmond, Natal, South Africa; *Adiaptomus natalensis* (gen. et sp. nov.)."

FIG. 1.—× 30. Side view of female of *Adiaptomus natalensis*.

FIG. 2.—× 40. Abdomen, male, side view; note the rounded posterior edge of the last thoracic segment.

FIG. 3.—× 40. Abdomen, female, ventral view; note the backwardly directed flange of last thoracic segment.

FIG. 4.—× 40. Antenna 1, male. Right, twenty-three joints; twentieth joint double-hinged, fifteenth to nineteenth swollen. Left, twenty-six joints like Fig. 4.

FIG. 5.—× 40. Antenna 1, female; twenty-six joints, the additional joint apparently due to the division of the second joint of typical limb. The spine ( $s_2$ ), which is usually in the middle of the second joint, is found at the proximal end of the third joint.

FIG. 5 a.—× 40. Proximal joints of antenna 1, female of *Diaptomus orientalis*, to show position of spine  $s_2$  on second joint, and to compare with the position of spine  $s_2$  in Fig. 5.

FIG. 6.—× 80. Antenna 2, male.

FIG. 6 a.—Face view of terminal joint of endopodite.

FIG. 7.—× 80. Mandible, right; exopodite, one joint, not separable from basipodite.

FIG. 8.—× 80. Maxilla 1, left; note the two outer lobes as in *Diaptomus*.

FIG. 9.—× 80. Maxilla 2, left; endopodite not obviously jointed off from basipodite.

FIG. 10.—× 90. Maxilliped, left; endopodite three-jointed.

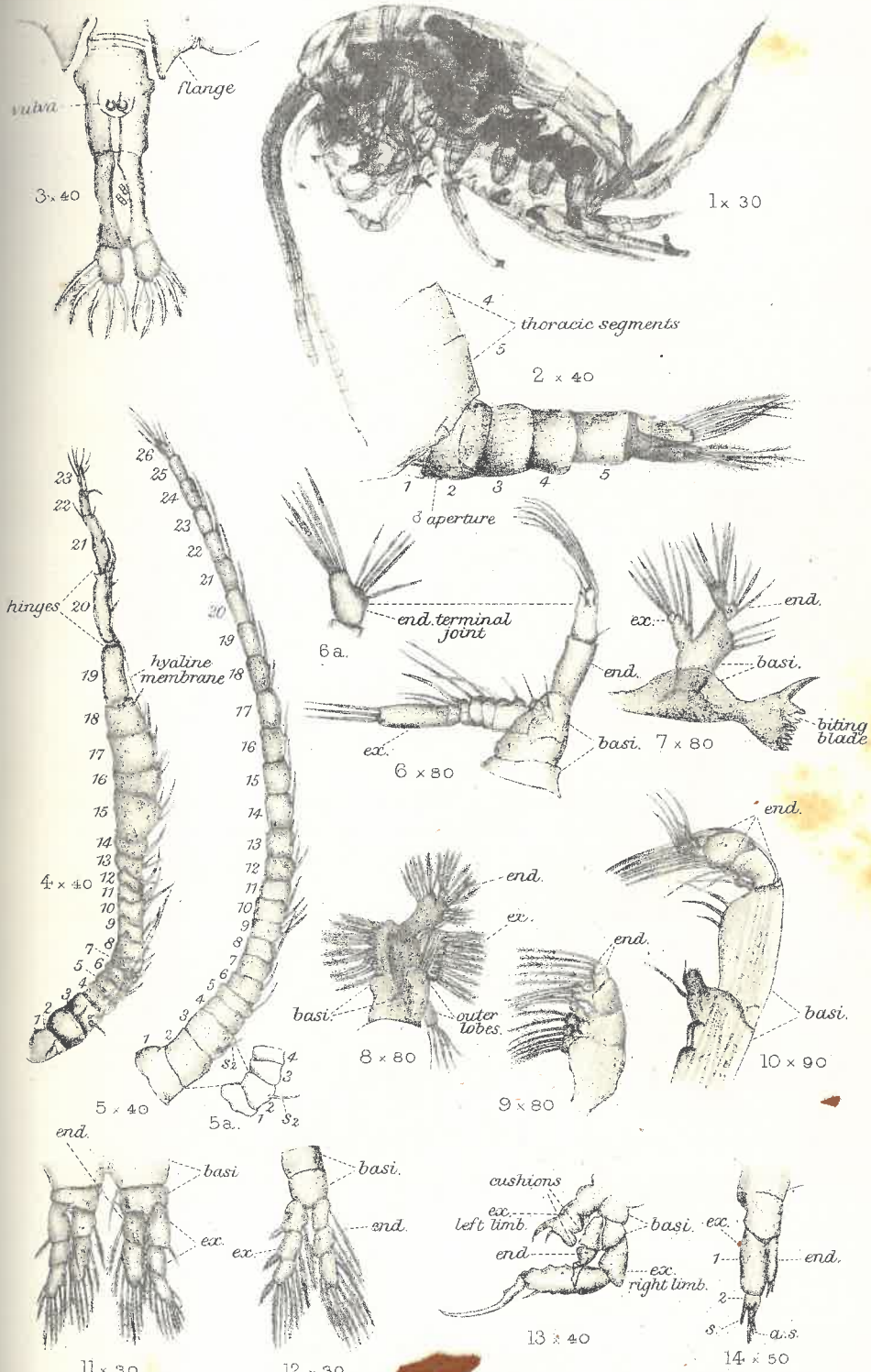
FIG. 11.—× 30. Thoracic leg 1; second joint of exopodite without spine on outer edge.

FIG. 12.—× 30. Thoracic leg, second to fourth, inclusive.

FIG. 13.—× 40. Thoracic leg 5, male; right, three-jointed endopodite; left, one-jointed exopodite, two cushions, no "appendage," no endopodite found.

FIG. 14.—× 50. Thoracic leg 5, female; right and left symmetrical; third joint of exopodite absent and replaced by a spine ( $s$ ); two accessory spines on posterior surface of second joint ( $a. s.$ ).





Cooper, del.

Huth, Lith. London.