



Title	Studies on Gregarines from Japan : II. Cephaloidophora anisogammari n. sp. and Cephaloidophora elongata n. sp. from Amphipoda (With 2 Text-figures, 2 Tables and 1 Plate)
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**Studies on Gregarines from Japan**  
**II. *Cephaloidophora anisogammari* n. sp. and *Cephaloido-***  
***phora elongata* n. sp. from Amphipoda<sup>1)</sup>**

By

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(With 2 Text-figures, 2 Tables and 1 Plate)

Much investigation has done in the field of gregarines. Various workers have reported using their own patterns since there isn't yet any standardized pattern for describing the diagnosis of the animal. It is, I believe, necessary to unify and simplify the description. As the first step, in this paper, I shall make some simplifications and standardizations by introducing a numbering system placing a numeral before each character. Of course a more sophisticated system should be established in the near future.

In this paper I wish to report two new species belonging to the family Cephaloidophoridae which are parasitic in the intestine of the marine amphipodes. These observations were made in 1968 and 1970.

I am deeply grateful to Prof. M. Yamada under whose direction this work has been carried out and also to Dr. Sh. F. Sakagami for his valuable suggestions and criticisms. I also thanks Prof. D. McCoy, Sophia University Science English Center, for his needful suggestion.

**Materials and Methods**

The host amphipodes used in this study were collected from the seaside districts of Hokkaido. Almost all the amphipodes examined in my investigation were infected with gregarines.

One host, *Anisogammarus pugetensis*, was caught at Ishikari beach in December 1970. It is a common seaflea whose habitat is under sea weeds or rubbish washed upon the shore.

The other host, *Hyale schmidtii*, is a dark brown sandhopper with white spots on the body surface. It was found among calcareous algae on a reef at Aikappu Point in Akkeshi.

These parasites were studied as fresh specimens and also in fixed preparations, as has been done in a previous paper (K. Hoshide, 1968). The smear preparations were fixed in Bouin's fluid and stained by Delafield's haematoxylin. Lugol's solution was often used for the detection of iodophilous granules in the cytoplasm and nucleus.

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***Cephaloidophora elongata* n. sp.**

(Fig. 1, Pl. 1-4)

Host: *Hyale schmidti* (Heller)  
 Habitat: Intestine  
 Locality: Akkeshi, Aikappu Point  
 Time: June 1968  
 Ratio of infection: 60%

Diagnosis

I. Sporadin

1. Association . . . . . Biassociation, Longest specimen 378 $\mu$
  2. Measurements
    - 2-1. Size (unit  $\mu$ )
 

Maximum	TL 202, WD 25
Average	TL 155, LP 10, LD 145, WP 14 WD 19; tl 164, lp 6, ld 158, wp 14, wd 19
Nucleus	14 $\times$ 10
    - 2-2. Ratio
 

LP:TL=1:16.3, WP:WD=1:1.4; lp :tl =1:27.9, wp : wd=1:1.4
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  3. Epimerite . . . . . Rudimental
  4. Protomerite
    - 4-1. Shape . . . . . Hemispherical, well rounded at top
    - 4-2. Structure . . . . . Lens-shaped transparent structure at anterior half of protomerite
  5. Deutomerite
    - 5-1. Shape . . . . . Elongate cylindrical, almost the same width from anterior to posterior part, widest portion unfixed
  6. Septum . . . . . Distinct, transparent Constriction shallow but clear
  7. Nucleus
    - 7-1. Shape . . . . . Ellipsoidal, sometimes spherical
    - 7-2. Position . . . . . At anterior half of deutomerite, visible in living
  8. Endoplasm
    - 8-1. Color . . . . . Brown
    - 8-2. Granules . . . . . Fairly dense, fine homogeneous granules
- (Satellite)
- 4'. Protomerite
    - 4'-1. Shape . . . . . Somewhat suppressed, disc-shape
    - 4'-2. Structure . . . . . Anterior part projects into concave posterior end of primate
  - 5'. Deutomerite . . . . . Same as that of primate

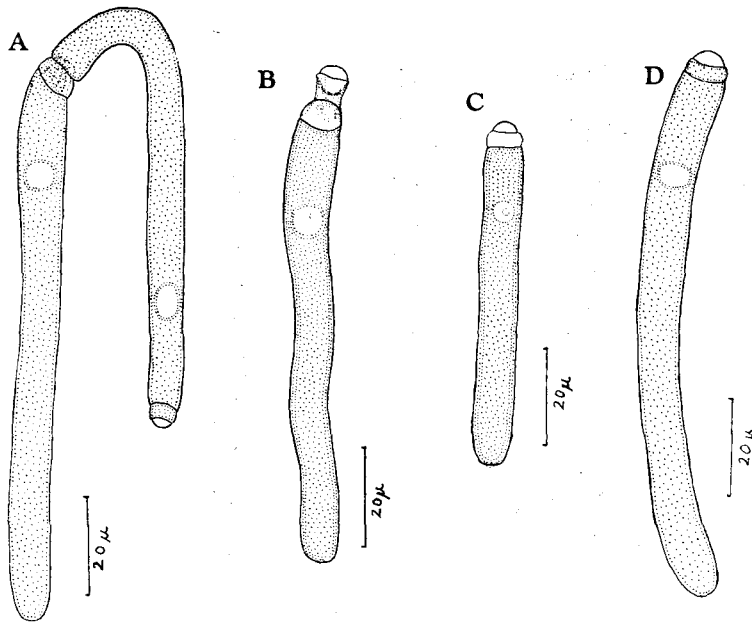


Fig. 1. *Cephaloidophora elongata* n. sp. A. Large adult association. B. Trophozoite. C. Small trophozoite. D. Large trophozoite.

Table 1.

Species	<i>Cephaloidophora elongata</i> n. sp.	<i>C. carpilodei</i>	<i>C. guinotae</i>
Diagnosis number			
I. 1. Association (Primate)	Max. length 378 $\mu$	Max. length 300 $\mu$	—
I. 2-1. Measurements Size	Max. TL 202 $\mu$ TL < tl	Max. TL 135 $\mu$ TL > tl	Max. TL 200 $\mu$ TL > tl
I. 2-2. Measurements Ratio			
PL: TL PW: DW	1: 16.3 1: 1.4	1: 5.5 1: 1.0	—



8. Endoplasm  
 8-1. Color .....Light yellow  
 8-2. Granules.....Relatively coarse  
       Granules of protomerite more coarse than that of deutomerite
- (Satellite)
- 4'. Protomerite  
 4'-1. Shape.....Disc-shaped, middle portion of protomerite widest  
 4'-2. Structures....Lens-shaped structure, comparable to that of  
       primate, protrudes into posterior end of primate  
       Size of lens-shaped part smaller than that of primate,  
        $3\mu$  in width,  $1.5\mu$  in thickness
- 5'. Deutomerite.....Same as that of primate
- 6'. Deptum.....Distinct, transparent  
       Constriction shallower than that of primate

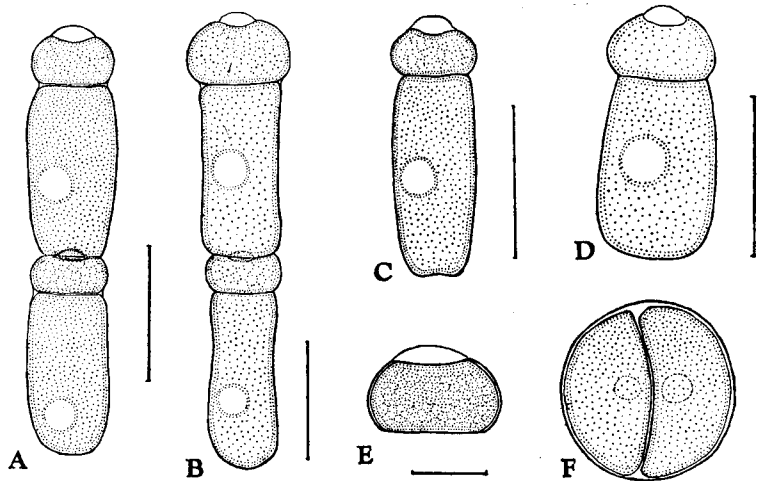


Fig. 2. *Cephaloidophora anisogammari* n. sp. A. Adult association. B. Another adult association. C. Trophozoite. D. Another trophozoite. E. Protomerite of primate. F. Cyst. A, B, F. A bar indicates  $20\mu$ . C, D, E. A bar indicates  $10\mu$ .

## II. Cyst

1. Shape and size.....Spherical, diameter  $35\mu$
2. Color.....Light yellow
3. Structure.....Covered with thin transparent wall  
       Two gametocytes contact side by side in cyst, one of  
       them swells and the other caves in

## III. Spore.....Not observed

## IV. Movement.....Smooth gliding movement

## Remarks:

This species is similar in the body shape and ratio to *Cephaloidophora setoutiensis* H. Hoshide 1958 and *C. setoutiensis minor* K. Hoshide 1969, but it them in the points shown in Table 2.

Table 2.

Diagnosis	Species <i>Cephaloidophora anisogammari</i> n. sp.	<i>C. setoutiensis</i>	<i>C. setoutiensis minor</i>
(Primitive) I. 4-2. Protomerite Structure	Lens-shaped area measure 5×3μ	Lens-shaped area measures 12×7-5μ	Lens-shaped area measures 8×3μ
I. 5. Deutomerite	Cylindrical anterior 1/5 portion widest	Ovoid widest portion not definite	Ellipsoidal to cylindrical middle portion widest
I. 6. Septum	Constriction Fairly deep	Constriction slight	Constriction slight
I. 8-1. Endoplasm Color	Light yellow	Brown	Brown
(Satellite) I. 5'. Deutomerite	Cylindrical	Ovoid	Ellipsoidal to cylindrical

## References

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**Explanation of Plate VIII**

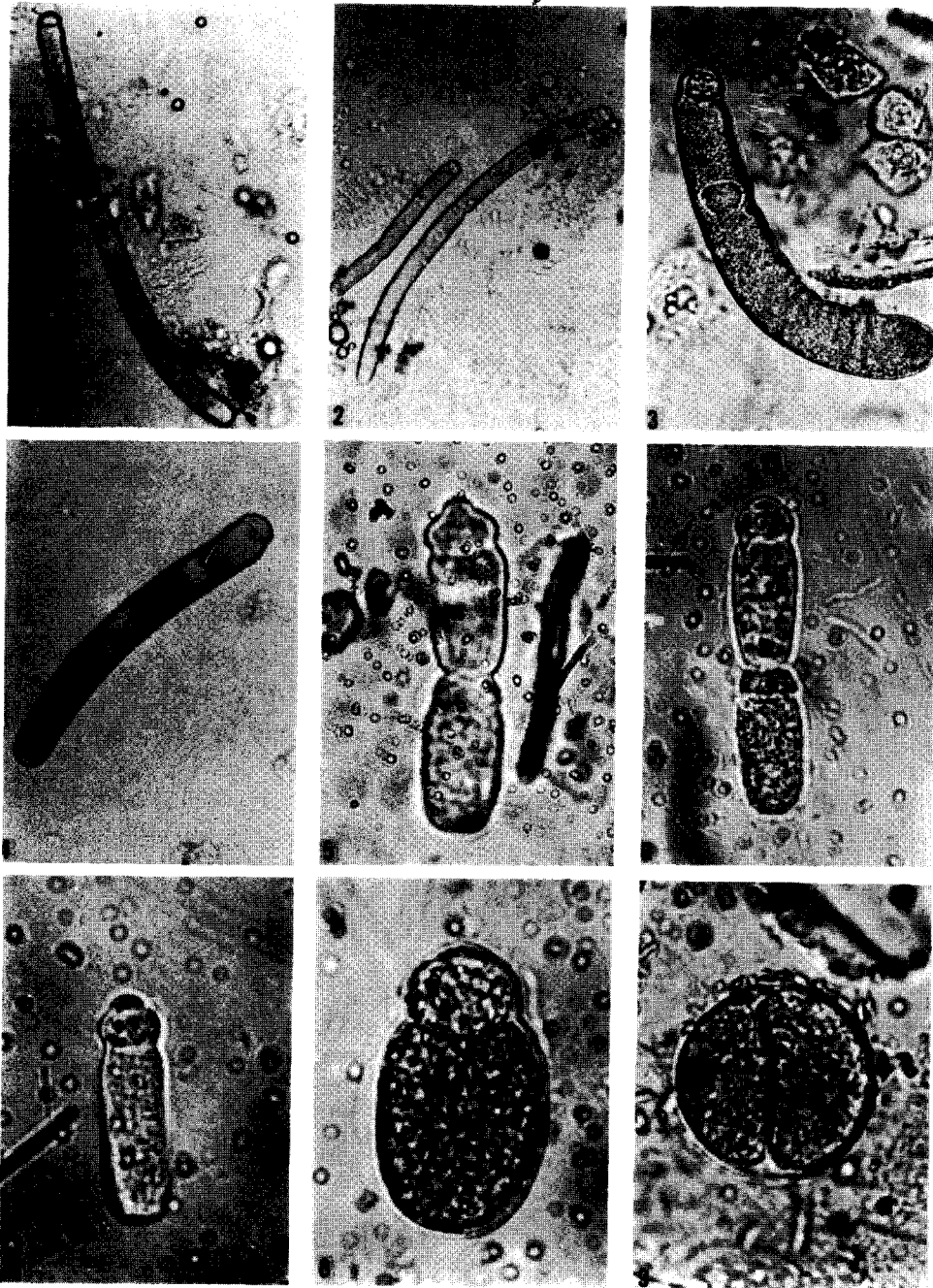
Fig. 1-4: *Cephaloidophora elongata* n. sp.

1. Associated sporadins.  $\times 140$ .
2. Another associated sporadins and trophozoite.  $\times 170$ .
3. Large trophozoite.  $\times 265$ .
4. Another trophozoite.  $\times 265$ .

Fig. 5-9: *Cephaloidophora anisogammari* n. sp.

5. Associated sporadins.  $\times 385$ .
6. Another associated sporadins.  $\times 385$ .
7. Trophozoite.  $\times 640$ .
8. Another trophozoite.  $\times 720$ .
9. Cyst.  $\times 720$ .





*K. Hoshide: Studies on Gregarines from Japan II*