

Notes on the Gregarines in Japan 11.

A New and Two Already-known Species of Gregarines from Japanese Coccinellidae.

By

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(Received 30 June, 1980)

A new species of gregarine and two already-known species of gregarines from Japanese Coccinellidae are described in this paper. Two species of gregarines have been reported until now from three species of Coccinellidae in Japan. One is *Gregarina katherina* Watson from *Coccinella bruckii* Muls (Recently the name of this host was changed from *C. bruckii* Muls to *C. septempunctata* L.) and from *Aiolocharia mirabilis* Motsulsky reported by H. Tsugawa in 1951. The other is *Gregarina chilocori* Obata from *Chilocorus rubidus* Hope reported by K. Obata in 1953. The description of these two species are rewritten according to the system which the author proposed in the previous paper. During the spring in 1980 a lot of *C. septempunctata* L. were collected at the campus of Yamaguchi University and they were heavily infected with *G. katherina*. Each stage of the life cycle of *G. katherina* Watson is shown in the photograph.

A new member of gregarine is found in the intestine of *Epilachna pustulosa* Kono. *E. pustulosa* is a comparatively large ladybird and lives on the plants genus *Cirsium*. Ten percents of *E. pustulosa* collected at Nopporo in Hokkaido during the summer of 1971 and five percents of *E. pustulosa* collected at Aratani in Yamaguchi City during the summer of 1979 were infected with this gregarine. *Epilachna vigintioctomaculata* Motshulsky which lives on *Solanum tuberosum* L. collected in Hokkaido during the summer of 1971 and 1979 were examined on the parasitism of gregarines but no parasite was observed at both times.

Gregarina katherina Watson 1915

1951 *Gregarina katherina* H. Hoshide 1951 : 101

1957 *Gregarina katherina* H. Hoshide 1957 : 71

Host : *Coccinella septempunctata* Linne Coleoptera, Coccinellidae

Habitat : Intestine

Locality : Obatake, Hikari (Yamaguchi Pref.)

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I. Sporadin

1. Association Biassociative.
 2. Measurements Maximum length of association 290 μ .

2—1. Size
 Average TL 121 LP 23 LD 98 WP 28 WD 48
 tl 129 1p 19 1d 110 wp 35 wd 42
 2—2. Ratio LP : TL = 1 : 5.3 WP : WD = 1 : 1.7
 1p : tl = 1 : 6.8 wp : wd = 1 : 1.2

3. Shape Ovoidal to ellipsoidal.

(Primitie)

4. Protomerite

4—1. Shape Almost hemispherical, widest at near base, rounded at apex, width nearly equal to height or $1\frac{1}{2}$ times as wide as high.

5. Deutomerite

5—1. Shape Cylindrical or elongate ovoidal, widest just above the posterior end where is broadly rounded, slightly narrowed through middle.

6. Septum

Conspicuous, constriction fairly deep.

7. Nucleus

7—1. Shape Spherical, 15—16 μ in diameter.

7—3. Nucleolus One, large.

(Satellite)

4'. Protomerite

4'—1. Shape Depressed, flattened top and bottom, 2 to 3 times as wide as high.

5'. Deutomerite

5'—1. Shape Elongate, widest at shoulder, well rounded at posterior extremity.

6'. Septum

Constriction here slight.

8. Endoplasm

8—1. Color Blackish in adults.

8—2. Granules Considerably scant but homogeneous in both protomerite and deutomerite.

9. Ectoplasm

At anterior region of protomerite thickened.

II. Cyst

1. Structure

Milky white, spherical, 80 μ in average diameter, covered with two membranes : outer and inner ones.

2. Dehiscence

By 1—4 sporeducts, each about 30 μ in length, spores extruded in chains.

III. Spore

1. Shape Barrel-shaped, truncated at both ends.
 2. Size 10 x 7 μ .

IV. Movement Not so active.

Taxonomic position :

The gregarine from *Coccinella septempunctata* L. collected at the campus of Yamaguchi University in 1980 is identified as *G. katherina* by their characters.

Three species of gregrines, *G. katherina*, *G. coccinellae* and *G. ruszkowskii*, have been recorded from *C. septempunctata* in the world. Foerster reported *G. katherina* in Germany and Tsugawa reported the same species in Japan. Lipa reported *G. coccinellae* and *G. ruszkowskii* in Poland. Lipa indicates the diognostic difference between *G. katherina* and these two species. The Endoplasm of *G. coccinellae* and *G. ruszkowskii* is granular and dark but that of *G. katherina* is translucent. *G. coccinellae* and *G. ruszkowskii* have three nucleolus but *G. katherina* has only one. *G. ruszkowskii* forms multiple associations but *G. katherina* does not.

Gregarina chilocori Obata 1953

1953 *Gregarina chilocori*

Obata 1953 : 5

Host : *Chilocorus rubidus* Hope

Coleoptera, Coccinellidae

Habitat : Intestine

Locality : Hiroshima (Hiroshima Pref.)

I. Sporadin

1. Association Biassociative.

2. Measurements

2—1. Size

Average

TL 51 LP 11 LD 40 WP 17 WD 28

tl 54 lp 10 ld 44 wp 18 wd 24

2—2. Ratio

LP : TL = 1 : 4.6 WP : WD = 1 : 1.6

lp : tl = 1 : 5.4 wp : wd = 1 : 1.3

3. Shape

Short cylindrical somewhat ovoidal.

(Primitive)

4. Protomerite

4—1. Shape

Ellipsoidal, one-half or twice as wide as high.

5. Deutomerite

5—1. Shape

Cylindro-ovoidal, dilated in posterior half, widest at one-fourth from posterior end, terminating in well rounded

5. Deutomerite
 5—1. Shape Anterior end at the septum swells, thence width decreases rapidly and constricts at anterior one third of deutomerite. It widens gradually again to the widest part which is a little above the posterior end. Almost flat or broadly rounded at the posterior extremity.
6. Septum Conspicuous, slight or no constriction.
7. Nucleus
 7—1. Shape Spherical.
 7—2. Position Not fixed, but generally anterior part or middle part of deutomerite.
 7—3. Nucleolus One.
 (Satellite)
- 4'. Protomerite
 4'—1. Shape Almost the same as that of primite
- 5'. Deutomerite
 5'—1. Shape Elongate cylindrical, near the both ends, anterior and posterior, swell as that of primite slightly, bluntly pointed or paraboloidal at the posterior end.
- 6', 7'. Septum, Nucleus Almost the same to that of primite.
8. Endoplasm
 8—1. Color Dark or yellowish brown.
 Color different at each part of body depending on the thickness of endoplasm, so yellowish brown at the constricted part of deutomerite.
9. Ectoplasm Thin almost of uniform thickness throughout the body.
- II, III. Cyst, Spore Not observed.
- IV. Movement Fairly active.
- V. Cephalin
 1. Shape Ovoidal to short cylindrical.
 3. Epimerite Simple small knob.

Remarks :

Among the members of genus *Gregarina*, which are recorded from Coccinellidae, this species bears some resemblance to *Gregarina straeleni* Theodorides and Jolibet 1959, *G. katherina* Watson 1916, *G. barbarara* Watson 1916 in some features, body size and ratio of body. This species differs from them in the shape of sporadin that is dumb-bell shaped, in outline. It swells at the anterior and posterior region and constricts at about middle.

Therefore I assume the gregarine is new species of genus *Gregarina* and proposed the name *Gregarina epilachnae* n. sp..

Table. 1. *Gregarina epilachnae* n. sp.
Measurements and Ratio of Sporadins (unit μ)

Total length of Association	325	318	315	314	327	278
Primitive						
TL	150	140	145	143	145	120
LP	38	35	32	30	30	25
LD	112	105	113	113	115	95
WP	55	52	50	48	53	50
WD	45	51	42	45	48	47
Ratio						
LP : TL	1 : 3.9	1 : 4.0	1 : 4.4	1 : 4.8	1 : 4.8	1 : 4.8
WP : WD	1 : 0.8	1 : 1.0	1 : 0.8	1 : 0.9	1 : 0.9	1 : 0.9
Satellite						
tl	175	178	170	171	182	158
lp	28	25	28	25	22	25
ld	147	153	142	146	160	133
wp	45	48	40	40	45	39
wd	45	45	37	38	42	38
Ratio						
lp : tl	1 : 6.3	1 : 7.1	1 : 6.0	1 : 6.8	1 : 8.2	1 : 6.3
wp : wd	1 : 1.0	1 : 0.9	1 : 0.9	1 : 1.0	1 : 0.9	1 : 1.0

References

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Explanation of Fig.

Fig. 1.

- A. *Gregarina chilochohi* Obata : A mature association. After K. Obata 1953 Fig. 8.
B, C, D, E. *Gregarina katherina*. Watson
B. A mature association. After H. Tsugawa 1951 Fig. 12.
C. Another mature association.
D. Cyst.
E. A mature cyst dehisces spores.
F, G, H, I, J. *Gregarina epilachnae* n. sp.
F, G, H. Cephalin.
I, J. A mature association.

Fig. 2, Fig. 3. *Gregarina katherina* Watson

Fig. 2.

- A, B, C, D, E. A mature association.
F, G. A mature association rotates before the cyst formation.
H. A multiple association, one primite with two satellite.
I. Another type of multiple association, three sporadin associate lineally.

Fig. 3.

- A, B, C A mature cyst.
D, E, F, G, H, I. Dehiscenced spores.

Fig. 4. Fig. 5. *Gregarina epilachnae* n. sp.

- Fig. 4. A, B, C, D. Fig. 5. A. A mature association.
B, C, D. Cephalin.

Fig. 1

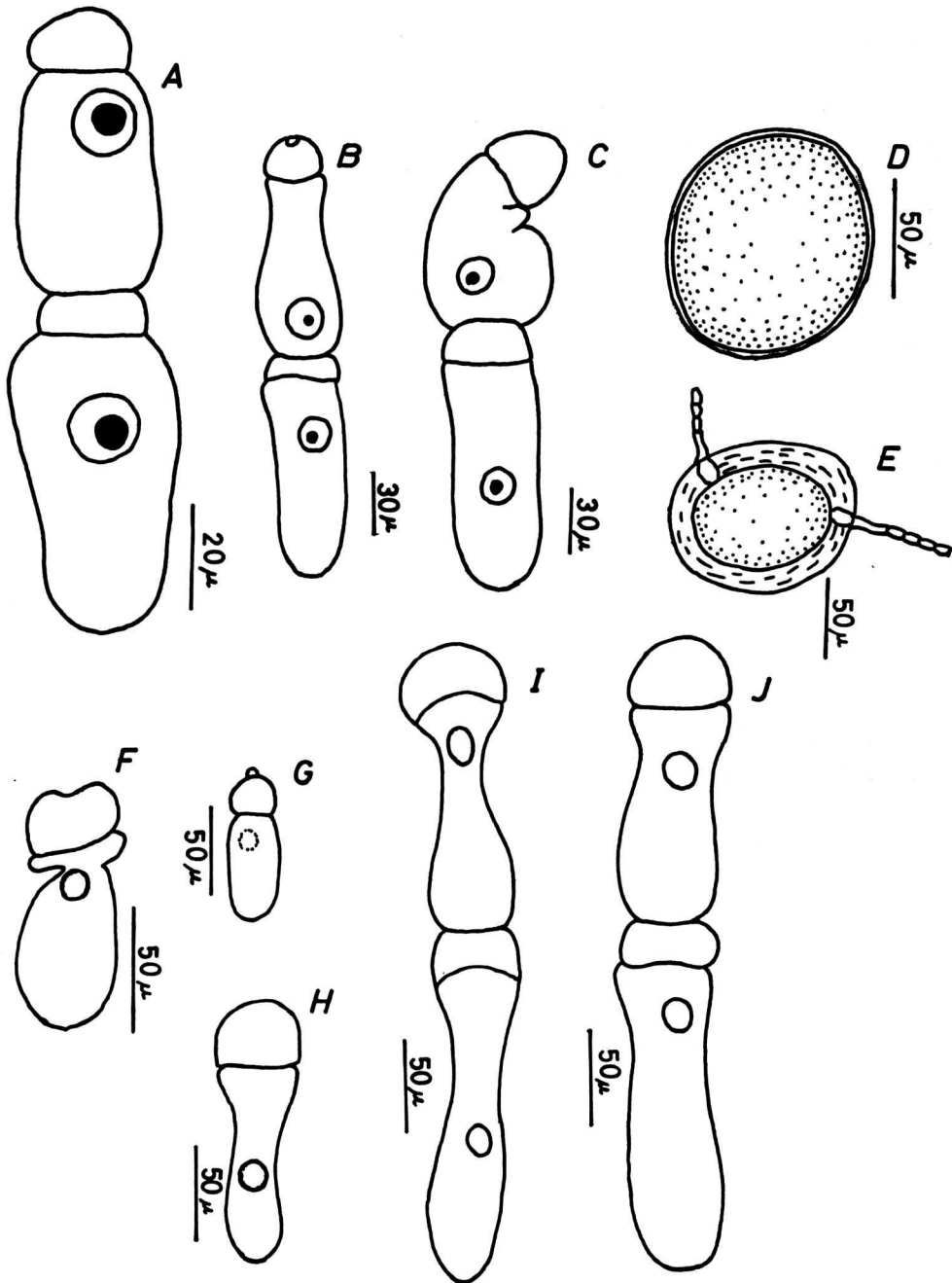


Fig. 2

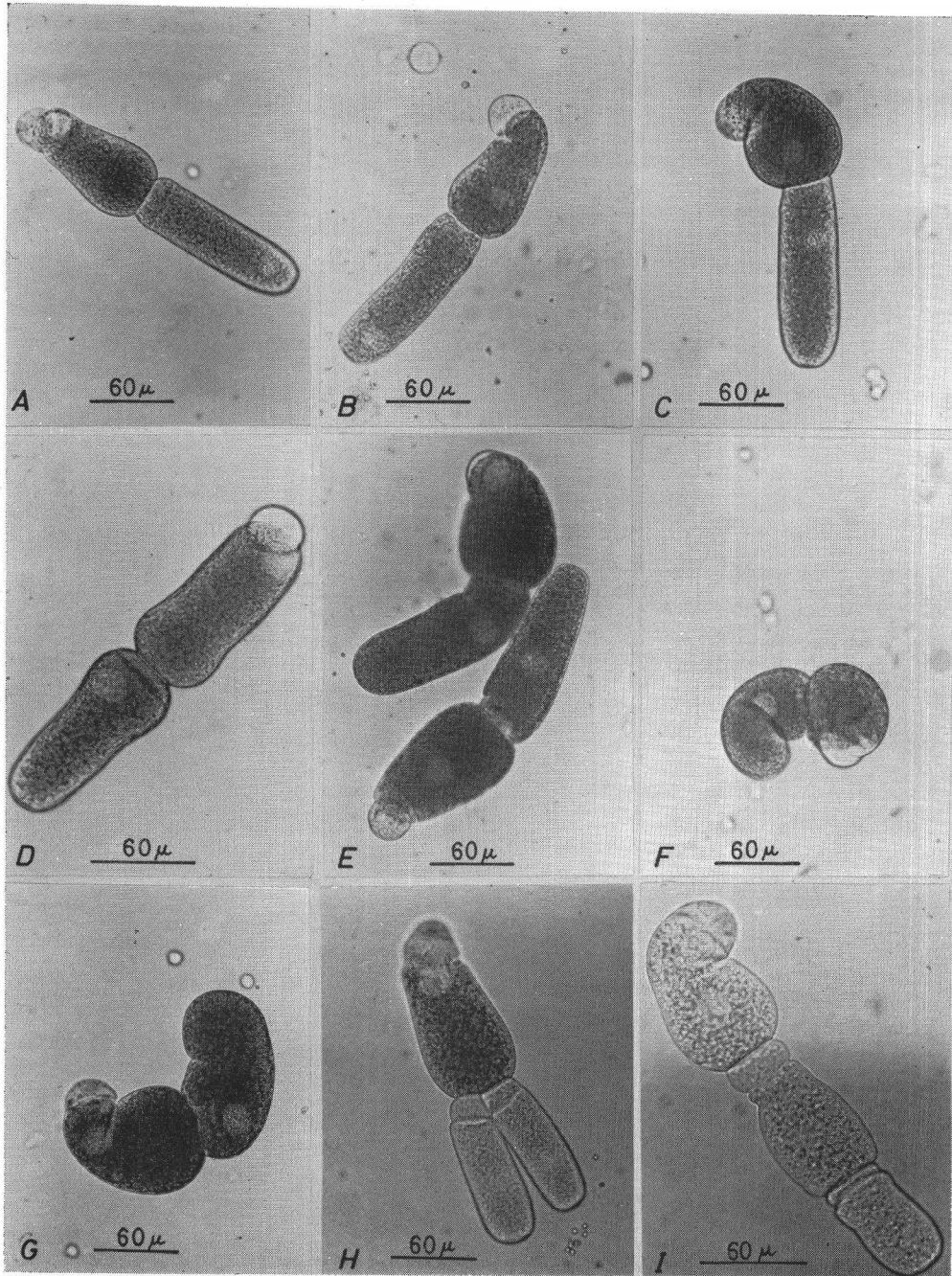


Fig. 3

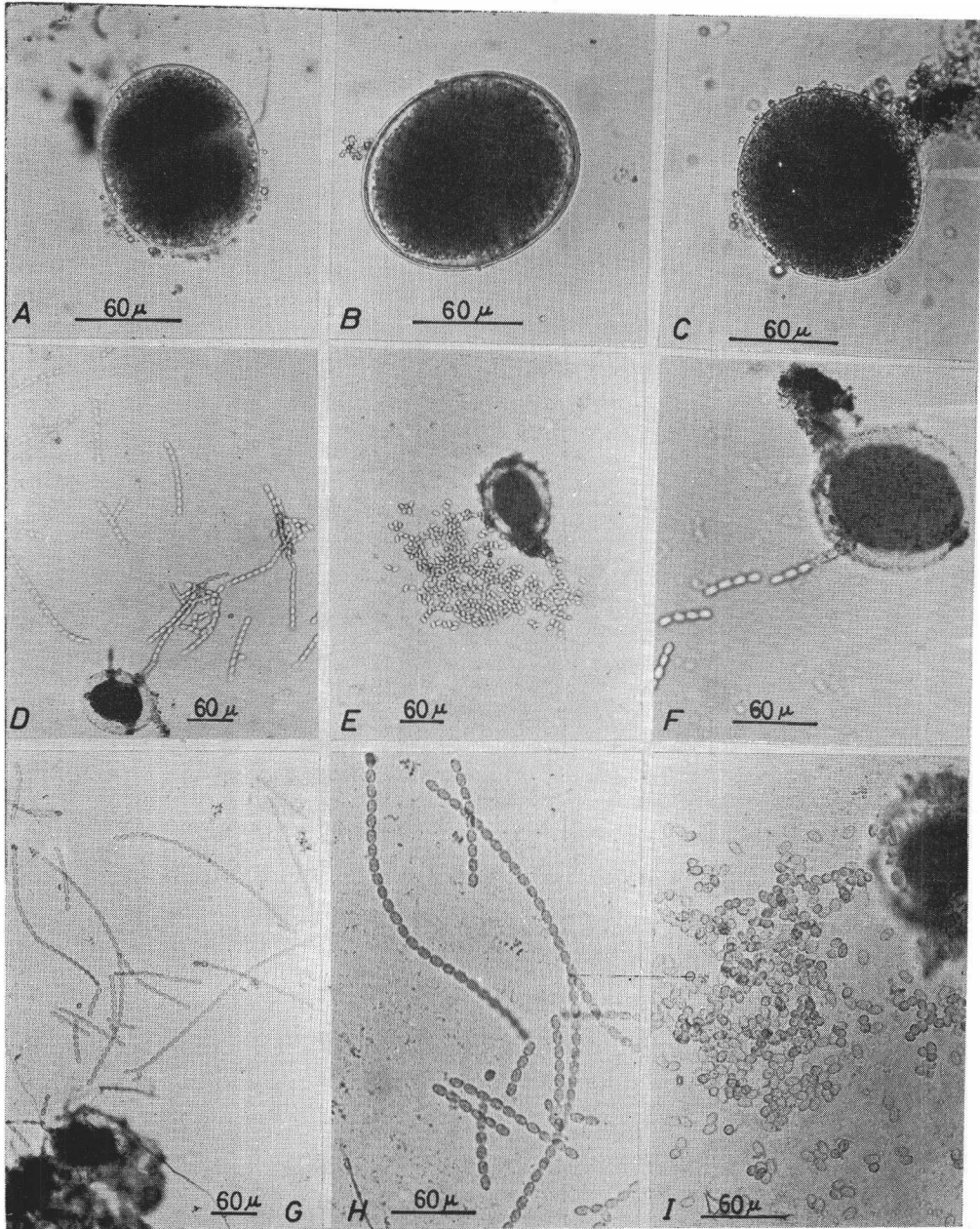


Fig. 4

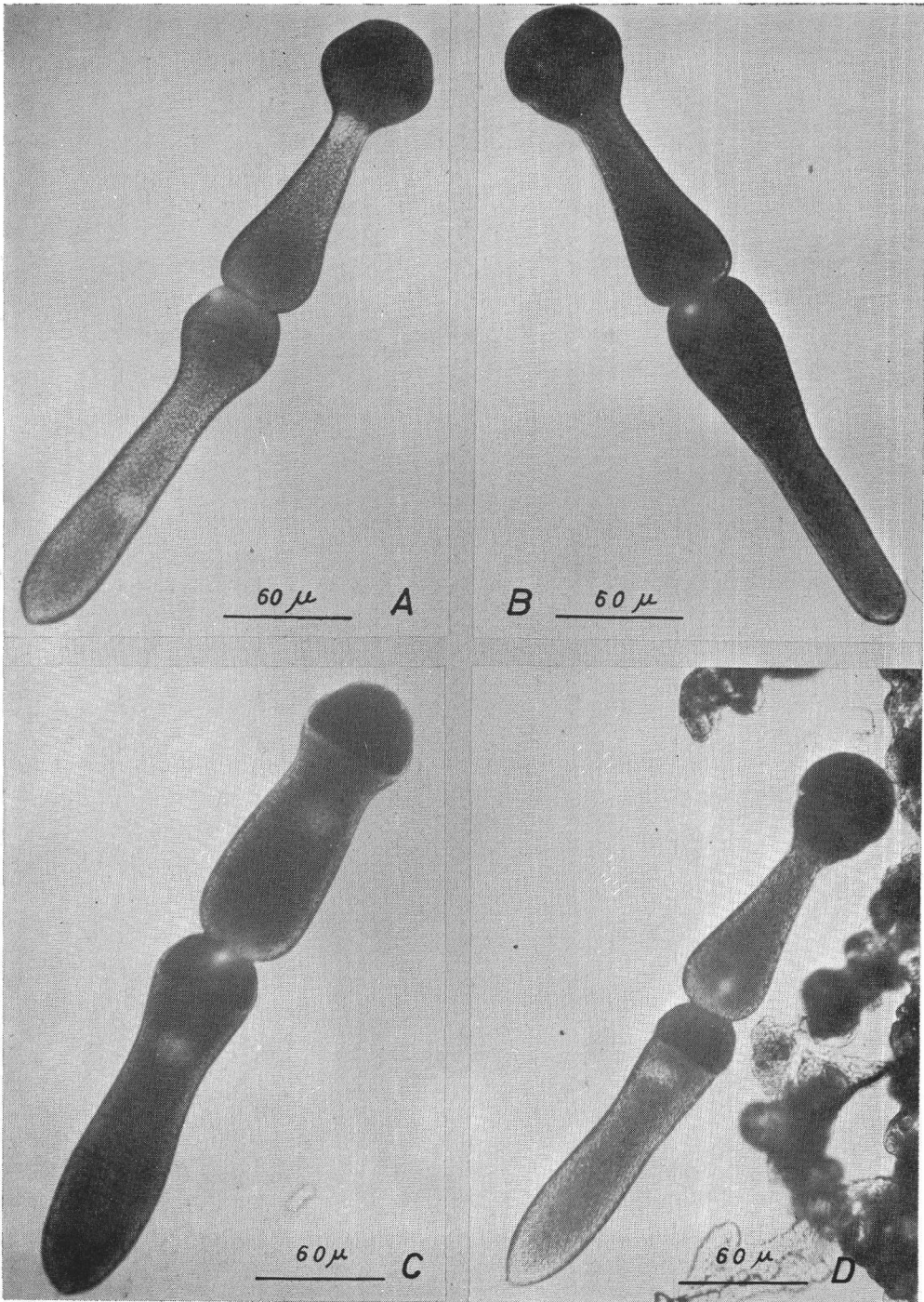


Fig. 5

