

A Taxonomic Study on the Order Gromiida (Protozoa: Sarcomastigophora: Rhizopoda) from Korea

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韓國產 有殼絲狀根足蟲目に 대한 分類學的 研究
(原生動物亞界: 肉質鞭毛蟲門: 根足蟲上綱)

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적 요

1989년 5월부터 10월까지 남한의 각종 담수역 9개 지점에서 채집된 유각사상 근족충류를 주사전자현미경으로 관찰하였다. 그 결과 3과 4속 4종의 유각사상 근족충이 동정되었으며 그 중에 3종 *Euglypha acanthophora*, *Tracheleuglypha dentata*, *Trinema enchelys*는 한국에서 처음으로 기록되는 종들이다.

Key words: taxonomy, Gromiida, Korea.

INTRODUCTION

The gromiids belonging to the Class Filosea are hyaline, enclosed by a test or rigid external membrane with distinct aperture for extrusion of filiform pseudopodia, often branching, sometimes anastomosing, and found in mosses, sphagnum and aquatic vegetation.

The systematic works of Gromiida have been accomplished actively since the early 19th century and about 40 species have been reported so far. With regard to the record of Gromiida from Korea, three species in two genera were reported in Han River, Ch'unch'ön and Ch'öngju area (Kim and Park, 1969; Cho, Cho and Yoon, 1978; Chung and Choi, 1989; 조 · 이, 1974). But, only *Euglypha scutigera* was recorded tax-

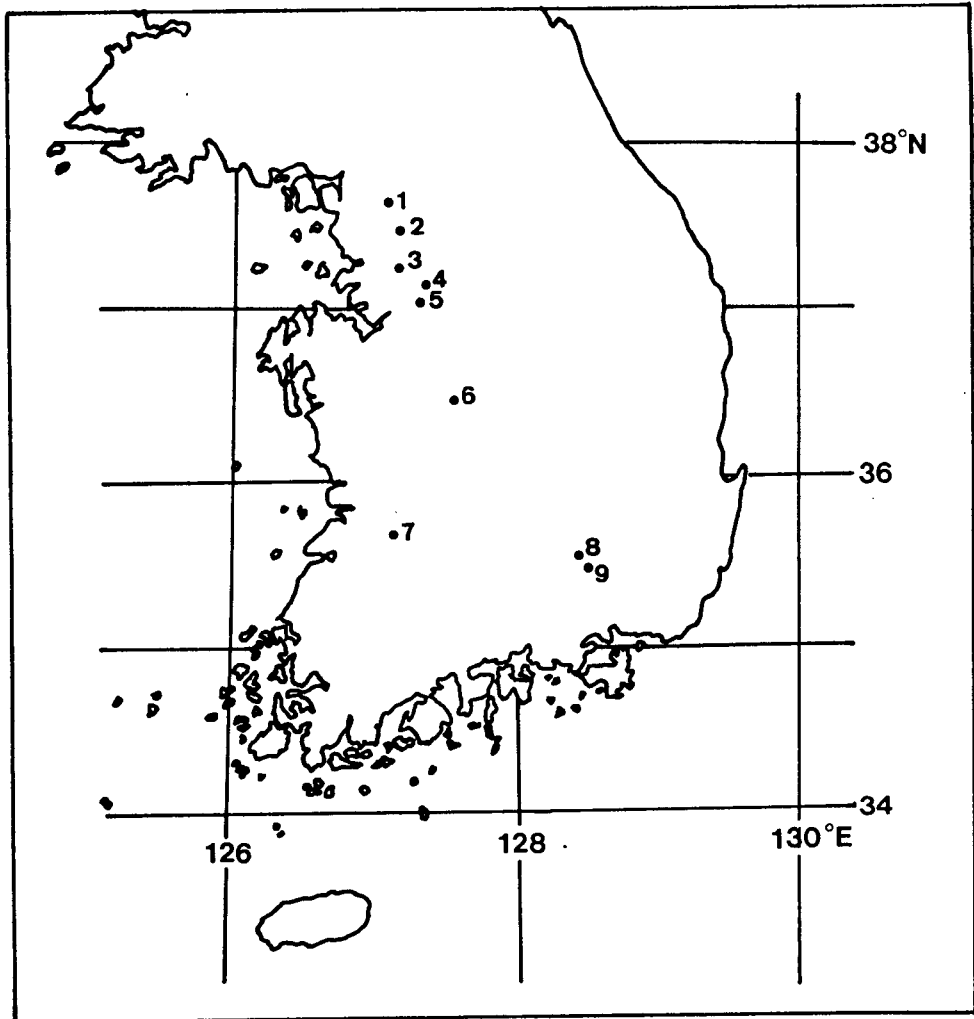


Fig. 1. A map showing the sampling sites. 1, Seoul (a pond in Kōnguk Univ.); 2, Kwach'ōn; 3, Wōnch'ōn; 4, Yongin; 5, Ansōng; 6, Ch'ōngju; 7, Chōnju; 8, Talsōng; 9, Ch'angnyōng.

onomically by Chung and Choi (1989), while the others ecologically.

The present study was done on the materials collected from 9 sites (Fig. 1) during the period from May to October 1989.

MATERIALS AND METHODS

Samples were collected from the freshwater habitats such as lakes and ponds in South Korea, during the period from May to October 1989. Specimens were selected by searching through small isolates of material in a petri dish, extracted using a micromanipulator, and then individual shells were manipulated onto the previously prepared cover slip which was glued with double stick tape on one side of a cover slip. When about twenty specimens were positioned on each cover slip, it was glued with double stick tape onto

a standard aluminum stub and allowed it to dry.

Prepared stubs were coated evenly with gold, and examined in a SEM operation at 10kV. The results were recorded on Polaroid 52 film.

The classification system in the present study was based on Levine *et al.* (1980) and Ogden & Hedley (1980). Korean name was based on Kang *et al.* (1971) and Kim *et al.* (1988).

SYSTEMATIC ACCOUNT

As a result of this study, four species of four genera in three families, were identified, of which three species are newly recorded from Korea and fully redescribed with photographs. They are preceded by an asterisk(*).

Class Filosea Leidy, 1879 사상근족충 강
 Order Gromiida Claparede and Lachmann, 1859 유각사상근족충 목
 Family Gromiidae Reuss, 1862. 유각사상근족충 과
 Genus *Pseudodifflugia* Schlumberger, 1845 난장이꽃병벌레 과 (신칭)

1. *Pseudodifflugia gracilis* Schlumberger, 1845 깍정이벌레 (신칭) (Pl.1, Figs.A-C)

Pseudodifflugia gracilis Schlumberger, 1845 (p. 254, iii) [cited from Leidy, 1879 (p. 198, pl.XXXIII, figs.18-28)].

Pseudodifflugia gracilis: Cash *et al.*, 1915 (p. 114, pl.L, figs.6-9, and pl.LI, figs.10-11); Kudo, 1954 (p. 487, figs.205); Jahn *et al.*, 1979 (p. 128, fig.216A); Ogden & Hedley, 1980 (p. 174, pl.76).

Material examined: 4 inds., St. 4, Oct. 18, 1989; 2 inds., St. 5, Oct. 18, 1989; 2 inds., St. 6, Aug. 17, 1989; 5 inds., St. 9, Aug. 2, 1989; 11 inds., St. 9, Oct. 11, 1989.

Description: Shell yellow or brown in color, hemispherical in lateral view (pl. 1, fig. A) and circular in broad view (pl. 1, fig. B), not compressed, surface covered with small sand and grains. Aperture large, circular, terminal, bordered by an arrangement of small particles.

Dimensions: Length of shell 30-44 μ m; breadth of shell 41-44 μ m; diameter of aperture 24-33 μ m.

Distribution: Europe, Africa, North America, Korea.

Remarks: What this genus have agglutinate shells can be distinguished from other genera contained in Filosea. In this study, the size of this species is found not in a wide range of forms which were described by Penard (1902), and the extraneous particles, respectively, are composed of small grains.

Family Euglyphidae Wallich, 1864 붕어벌레 과
 Genus *Euglypha* Dujardin, 1840 붕어벌레 속

2. **Euglypha acanthophora* (Ehrenberg, 1841) 가시붕어벌레 (신칭) (Pl.1, Figs.D, Pl.2, Figs.A-C)

Difflugia acanthophora Ehrenberg, 1841 (p. 413, taf.iv, fig.36) [cited from Leidy, 1879 (p. 207, pl.XXXV, figs.1-18)].

Euglypha alveolata: Leidy, 1879 (p. 207, pl.XXXV, figs.1-18); Hall, 1961 (p.9, Fig.E); Jahn *et al.*, 1979 (p. 130, fig.220A).

Euglypha acanthophora: Cash *et al.*, 1915 (p. 8, pl.XXXIII, figs.3-5, and pl.XXXV, fig.2); Kudo, 1954 (p. 487, fig.74); Hedley, Ogden & Krafft, 1974 (pl.1, figs.A-E); Ogden & Hedley, 1980 (p. 176, pl.77).

Material examined: 7 inds., St. 4, Oct. 18, 1989; 2 inds., St. 5, Oct. 18, 1989; 2 inds., St. 6, May

31, 1989; 1 ind., St. 6, Aug. 17, 1989; 4 inds., St. 7, Sep. 20, 1989; 6 inds., St. 9, Aug. 2, 1989; 13 inds., St. 9 Oct. 11, 1989.

Description: Shell hyaline, oviform or slightly elongated towards aperture, not compressed, circular in transverse section, composed of about two hundred oval, shell-plates and up to eight elongated shell-plates, formed of siliceous plates arranged in alteration longitudinal rows regularly imbricated, projected from aboral region of shell (pl.1, fig.D and pl.2, fib.B), surface smooth. Aperture terminal, circular, bordered by one or two rows of serrated scale, ten to thirteen in each row (pl.2, fig.A).

Dimensions: Length of shell 44-59 μ m; width of shell 22-30 μ m; diameter of aperture 13-17 μ m.

Distribution: Cosmopolitan

Remarks: This species is similar to *E. scutigera* (Chung & Choi, 1989) and *E. tuberculata* (Ogden & Hedley, 1980), but it can be distinguished from them by the number of apertural-plates and the character of eight elongated shell-plates (pl.2, fig.A and C).

Genus *Tracheleuglypha* Deflandre, 1928 목도리붕어벌레 속(신칭)

3. **Tracheleuglypha dentata* (Moniez, 1888) 덧니붕어벌레(신칭) (Pl.2, Fig.D, Pl.3, Fig.A)

Euglypha dentata Moniez, 1888 (p. 86) [cited from Cash *et al.*, 1915 (p. 64, pl.XLIII, figs.14 and 15; and p.65, figs.136-138)].

Sphenoderia lenta: Leidy, 1879 (p. 229, pl.xxxiv, f.40).

Sphenoderia dentata: Cash *et al.*, 1915 (p. 64, pl.XLIII, figs.14, 15, p.65, figs.136-138).

Tracheleuglypha dentata: Ogden & Hedley, 1980 (p. 202, pl.90).

Material examined: 4 inds., St. 2, Aug. 4, 1989; 1 ind., St. 5, Oct. 18, 1989; 1 ind., St. 6, May 31, 1989; 1 ind., St. 7, Sep. 20, 1989; 1 ind., St. 8, Aug. 2, 1989; 11 inds., St. 9, Aug. 2, 1989; 2 inds., St. 9, Oct. 11, 1989.

Description: Shell ovoid, hyaline, not compressed, composed of approximately one hundred, circular or oval siliceous shell-plates regularly imbricated arranged in alternating diagonal rows (pl.2, fig.D). Aperture circular, terminal, bordered by a dentate collar of organic material (pl.3, fig.A), in some cases, the organic collar not completely preserved and tooth-like projection absent.

Dimensions: Length of shell 33-44 μ m; width of shell 15-19 μ m; diameter of aperture 7-11 μ m.

Distribution: Cosmopolitan

Remarks: The test resembles that of *Euglypha acanthophora*, but is easily distinguished by the aperture bordered by a collar of organic material. Cash *et al.* (1915) described variations in the shell-plates from circular to oval, but in this study, observed only circular.

Family Trinematiidae 상어벌레 과(신칭)

Genus *Trinema* Dujardin, 1841 상어벌레 속(신칭)

4. **Trinema enchelys* (Ehrenberg, 1838) 큰상어벌레(신칭) (Pl.3, Figs.B-D)

Diffflugia enchelys Ehrenberg, 1838 (p. 132, taf.ix, fig.iv) [cited from Leidy, 1879 (p. 226, pl.XXXIX)].

Trinema enchelys: Leidy, 1879 (p. 226, pl.XXXIX); Cash *et al.*, 1915 (p. 86, pl.XLVII, figs.1-10; pl.XLVIII, figs.1-3; p.90, fig.152); Kudo, 1954 (p. 489, fig.207a); Hall, 1961 (p. 249, fig.5, 34A, B); Lousier, 1976 (p. 196); Jahn *et al.*, 1979 (p. 130, fig.220B); Ogden & Hedley, 1980 (p. 204, pl.91).

Material examined: 1 ind., St. 1, Aug. 4, 1989; 7 inds., St. 4, Oct. 18, 1989; 1 ind., St. 5, Oct. 18, 1989; 2 inds., St. 7, Sep. 20, 1989; 18 inds., St. 9, Aug. 2, 1989; 24 inds., St. 9, Oct. 11, 1989.

Description: Shell hyaline, ovoid, compressed anteriorly, composed of approximately fifty, large, circular, siliceous, incompletely overlapping shell-plates and unknown number of smaller, oval, shell-plates (pl.3, fig.B). Aperture circular, subterminal, bolique and invaginated, bordered by an inner circle of about forty denticulate apertural-plates and two or three rows of small, oval, shell-plates (pl.3, fig.D).

Dimensions: Length of shell 34-54 μ m; width of shell 18-22 μ m; diameter of aperture 6-12 μ m.

Distribution: Cosmopolitan

Remarks: Because this species very similar to *T. lineare* (Hedley & Ogden, 1974), many records given in the synonymy under *T. enchelys* pertain to *T. lineare*, until Penard (1890) first clearly defined the two species. This species can be distinguished from *T. lineare* by the large size and the incompletely overlapping shell-plates (pl.3, fig.C).

ABSTRACT

The gromiids (Protozoa: Sarcomastigophora: Rhizopoda) collected at 9 different sites in Korea, during the period from May to October 1989 were examined, and four species were identified with the scanning electron microscope (SEM). Three species: *Euglypha acanthophora*, *Tracheleuglypha dentata* and *Trinema enchelys* turned out to be new to the Korean fauna.

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EXPLANATION OF PLATES

PLATE 1

- Figs. A-C.** *Pseudodiffugia gracilis* Schlumberger. A, Lateral view; B, Apertural view; C, latero-apertural view.
Fig. D. *Euglypha acanthophora* (Ehrenberg). D, Lateral view illustrating eight elongated shell plates.

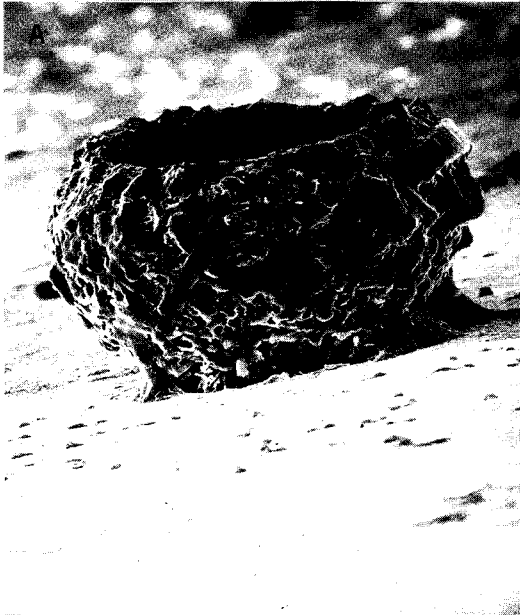
PLATE 2

- Figs. A-C.** *Eucllypha acanthophora* (Ehrenberg). A, View of aperture; B, Lateral view illustrating three elongated shell plates; C, preparation of shell plates to illustrate an elongated shell plates.
Fig. D. *Tracheleuglypha dentata* (Moniez). D, Lateral view.

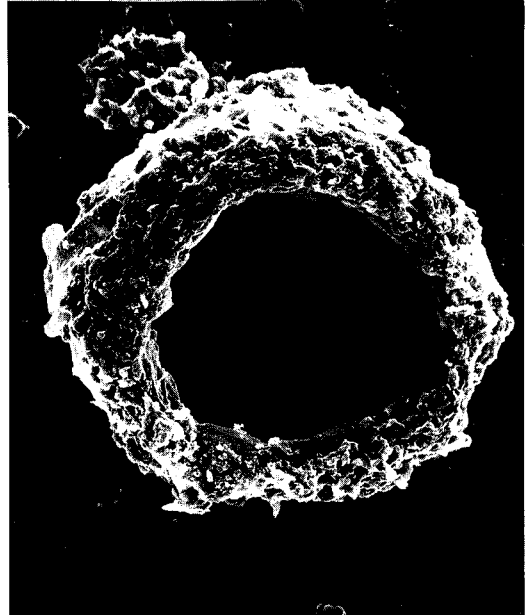
PLATE 3

- Fig. A.** *Tracheleuglypha dentata* (Moniez). A, View of aperture.
Figs. B-D. *Trinema enchelys* (Ehrenberg). B, Apertural view; C, Latero-apertural view; D, View of aperture.

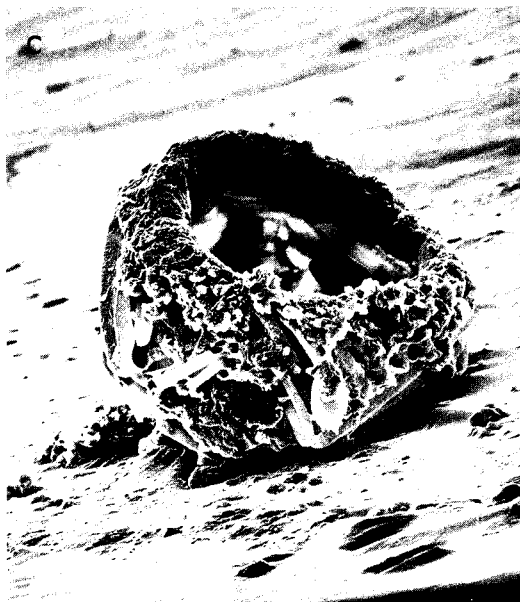
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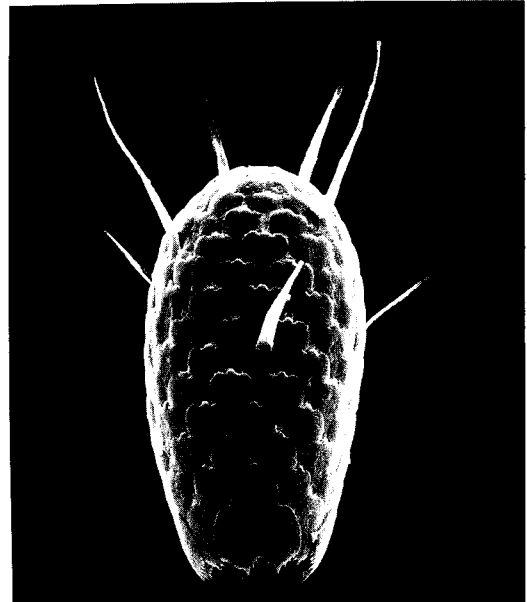
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PLATE 2

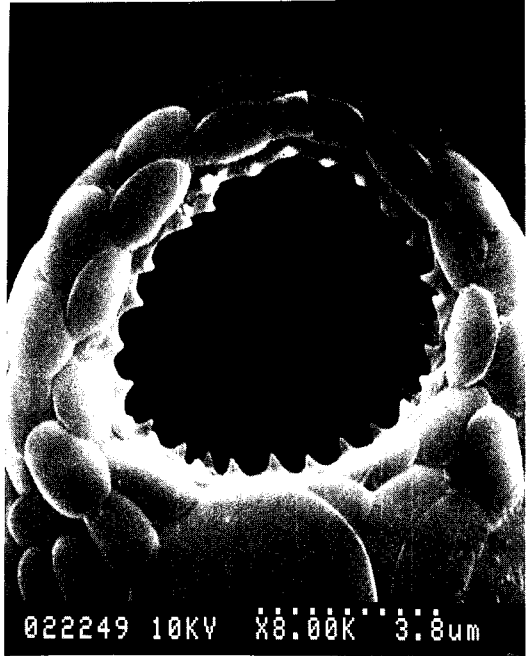
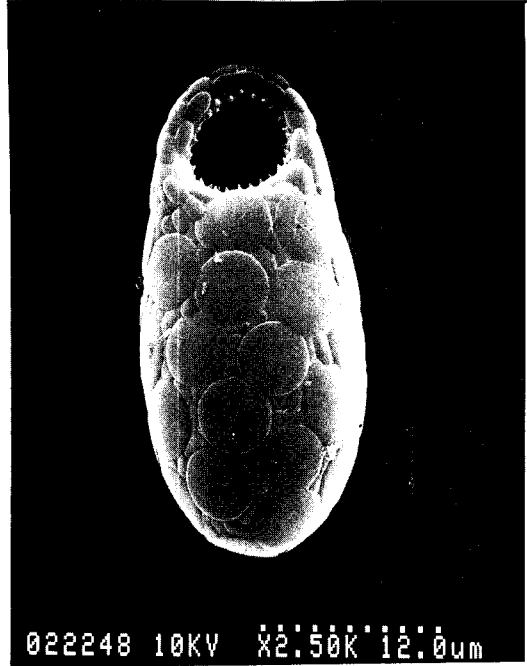


PLATE 3

