

# REDESCRIPTION OF THE THECAL TABULATION OF *SCRIPPSIELLA GREGARIA* (LOMBARD AND CAPON) COMB. NOV. (PYRRHOPHYTA) WITH LIGHT AND SCANNING ELECTRON MICROSCOPY

Alfred R. Loeblich, III, James L. Sherley, and Robert J. Schmidt

*Abstract.*—*Peridinium gregarium* is transferred to *Scrippsiella* and the thecal tabulation is revised. Variations in this plate tabulation occur. The thecal formula most common is p.p., p.r., 4', 3a, 6'', 6c, 5s, 5''', 2''''.

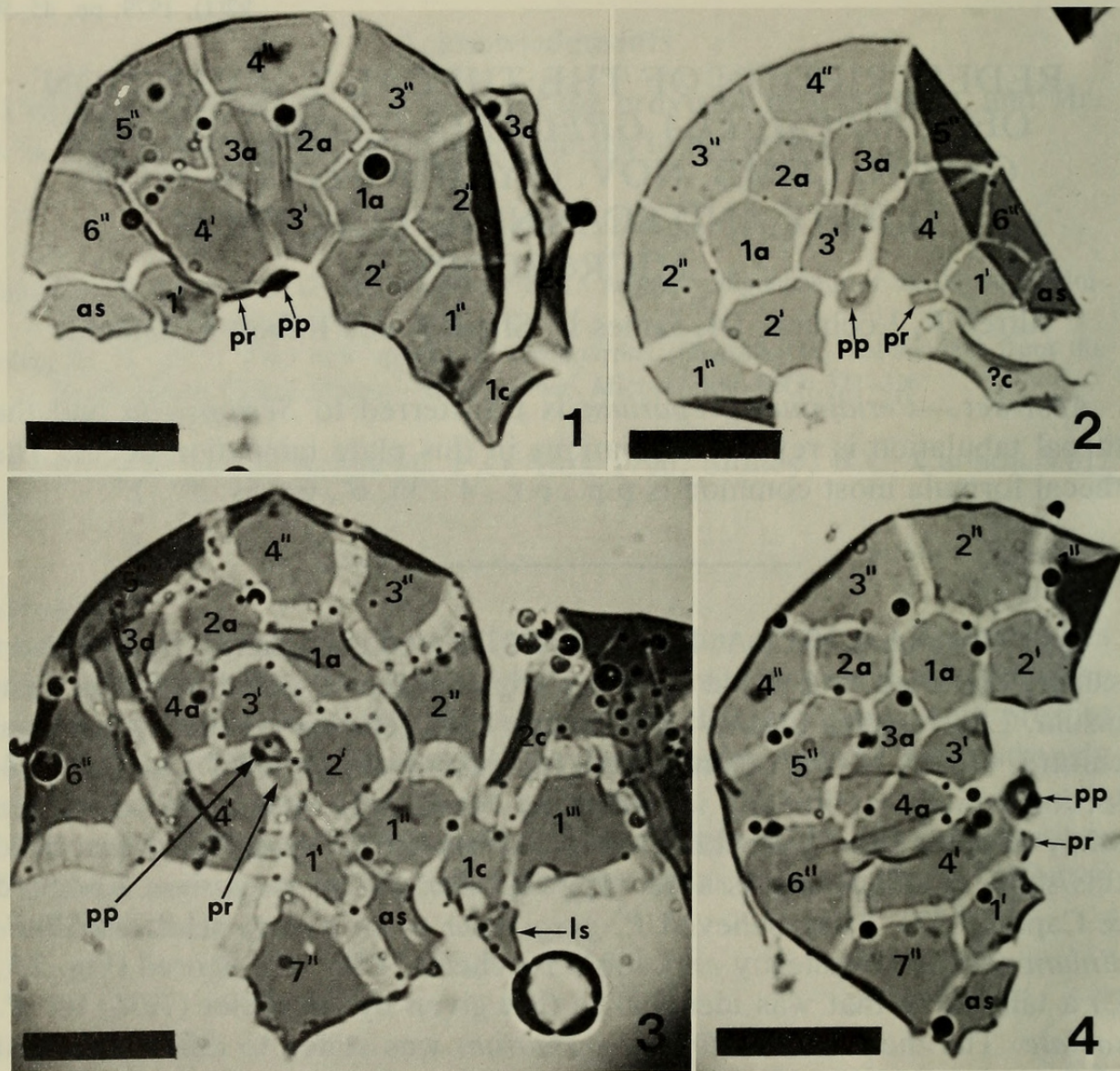
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On 1 November 1967, A. Loeblich, III isolated a single cell from a water sample collected by Eugene Lombard from a tidepool in Palos Verdes Peninsula, Los Angeles County, California. This isolation resulted in a clonal culture, UTEX 1948. A clone of the organism from the 1967 Lombard collection which was initially identified as *Peridinium sociale* was used in a study of lipids (Lee & Loeblich, 1971). Lombard & Capon (1971) described this same dinoflagellate as a new species, *Peridinium gregarium* Lombard & Capon, 1971. They believed *P. gregarium* to be closely related to *Peridinium sociale* (Henneguy ex Labbé) Biecheler, 1935, and figured (Fig. 2A, C) a tabulation that was identical to that given by Biecheler (1935) for *P. sociale*. The theca of *Peridinium gregarium* was stated to differ from that of *P. sociale* in 1) lacking an apical projection, 2) possessing an "antapical pore" (actually figured on a sulcal plate and not on an antapical plate), 3) having striated rather than reticulate ornamentations and 4) having different thecal plate shapes.

We examined the theca of isolate UTEX 1948 of *P. gregarium* using light and scanning electron microscopy. Our findings presented below differ significantly from the light microscopic observations of Lombard & Capon (1971), and have led to the transfer of this species to *Scrippsiella*.

## Material and Methods

Isolate UTEX 1948 was grown in medium GPM (Loeblich, 1975) at 30 C over 500 ft-c continuous cool white fluorescent light. Cells were fixed for scanning electron microscopy as previously described (Loeblich & Sherley, 1979). The theca was stained and examined using the light microscope as previously described (Schmidt et al., 1978). Exponentially growing cells were measured at 400 $\times$  after fixing with Lugol's (I, KI) solution.



Figs. 1-4. *Scrippsiella gregaria*. 1, Epithecae with 3a and 6'' plates viewed from exterior; 2, Same, viewed from interior; 3 and 4, Epithecae with 4a and 7' viewed from exterior; note wide sutures in Fig. 3. Scale bars = 10  $\mu$ m.

## Results

DIVISION PYRRHOPHYTA PASCHER, 1914

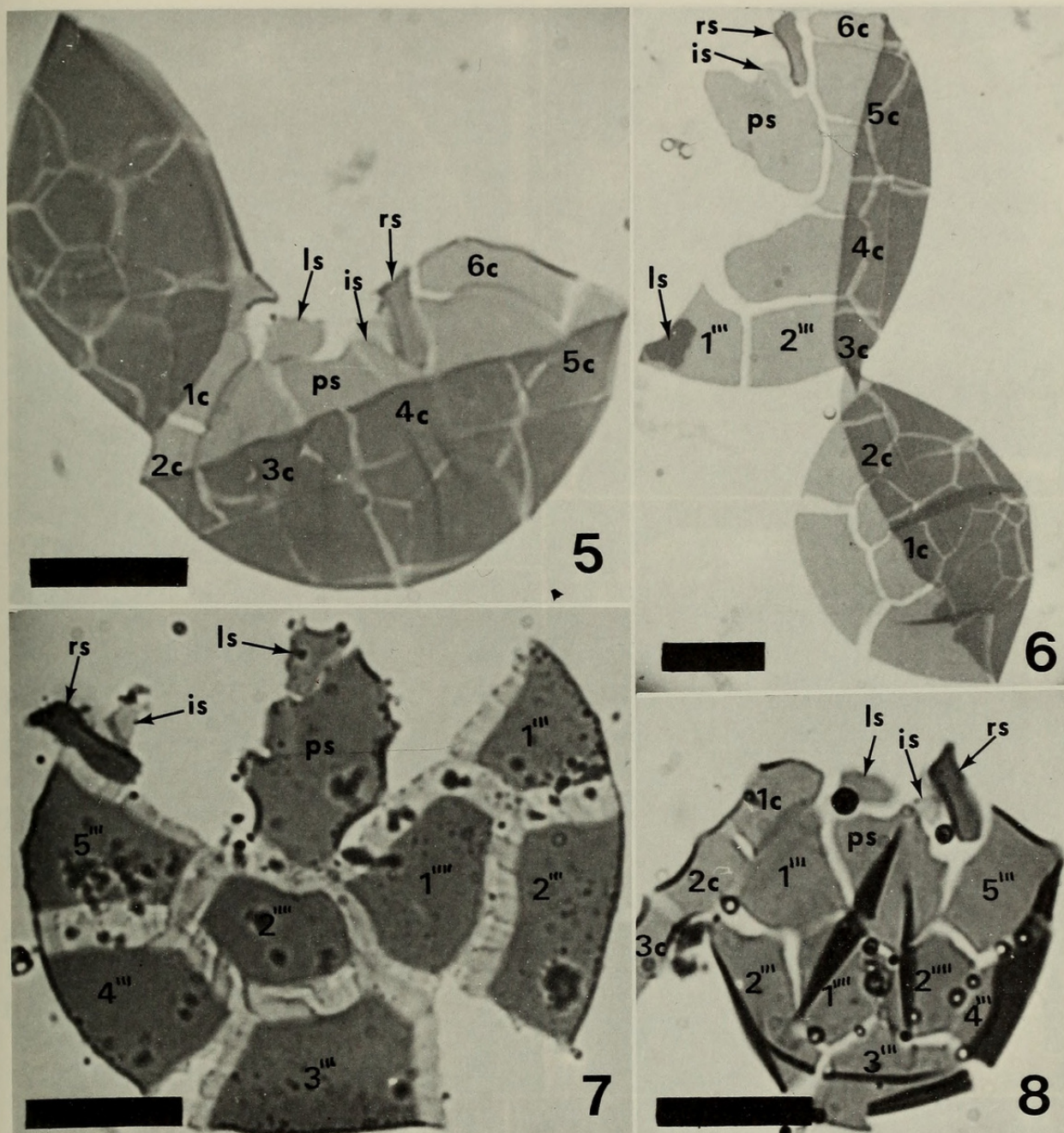
ORDER PERIDINIALES HAECKEL, 1894

FAMILY PERIDINIACEAE EHRENBURG, 1832

*Scrippsiella gregaria* (LOMBARD & CAPON) COMB. NOV.

Basionym: *Peridinium gregarium* Lombard & Capon, 1971:187, text-figs. 1A-B, 2A-C.

The most common thecal plate arrangement is: a pore plate, a preapical plate, 4 apical plates, 3 intercalary plates, 6 precingular plates, 6 cingular plates, 5 sulcal plates, 5 postcingular plates and 2 antapical plates (Figs. 1, 2). Four variations have been found in this tabulation: 1) 5-6 apicals, 2) 4-

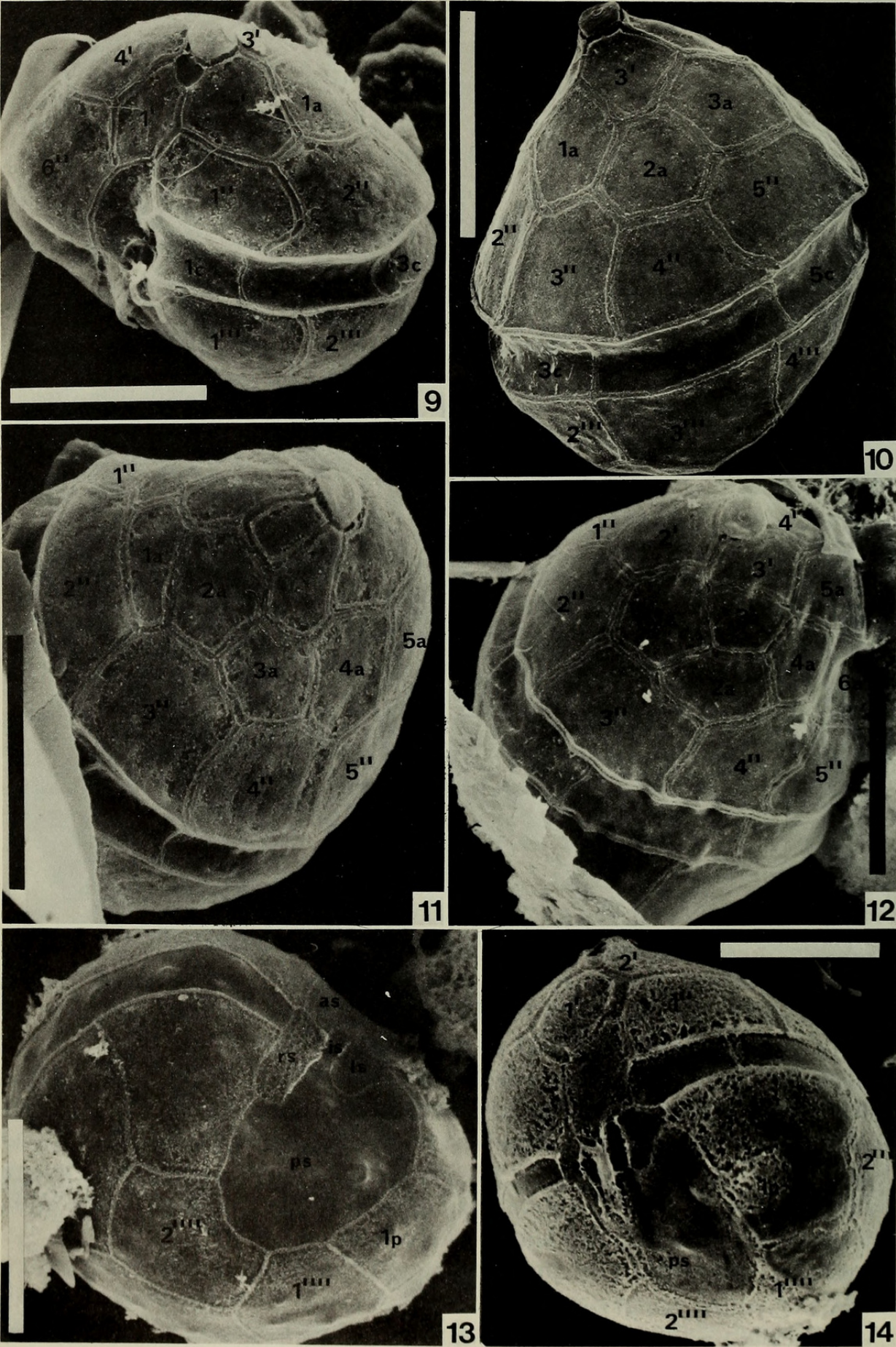


Figs. 5–8. *Scrippsiella gregaria*. 5 and 6, Cingular and sulcal plates indicated; 7 and 8, Sulcal and hypothecal plates labelled; note wide sutures in Fig. 7. Scale bars = 10  $\mu\text{m}$ .

6 intercalary plates (Figs. 3, 4), 3) 7 precingular plates, and 4) occasionally, a posterior intercalary plate present on the left side of the cell (Figs. 5, 6). Faint indications of vertical striations were noted on the dorsal epithecal plates (Fig. 3). Measurements of 30 cells of *S. gregaria* gave a mean length of 28.3  $\mu\text{m}$  (range: 24.5–33.1  $\mu\text{m}$ ) and a mean width of 26.1  $\mu\text{m}$  (range: 22.0–31.8  $\mu\text{m}$ ). The ratio of mean length to mean width is 1.08.

#### Discussion

Comparison of the line drawing of Lombard & Capon (1971) to our micrographs suggests that the tabulation for *S. gregaria* given by Lombard &



Capon is in error. Specifically, in reference to their Fig. 1, only a small part of plate 6'' is shown in ventral view and none of it in dorsal view. Their illustration of plate 6'' is more consistent with it being part of their 3a plate. This reinterpretation decreases the number of precingulars to six which is the common number present in this series.

In reference to their Fig. 1 the following comments are offered: 1) The plate 1' ends at the anterior margin of the cingulum on the left side of the cell, while all cells of this species we have observed have the anterior sulcal extending into the epitheca where it meets the posterior margin of plate 1'. 2) On the dorsal side they figure three intercalary plates and show plate 3a as an isolated intercalary. A similar arrangement occurs in *P. sociale* according to Biecheler (1935). We have always found the intercalary plates to be in contact with each other and situated in such a position that there is never any contact of plate 3' and 4''. Contact of these two plates was the basis for the section *Sociale* Biecheler, 1935, and Biecheler's separation of *P. sociale* from other *Peridinium* species. 3) Our observations are in agreement with respect to the number of postcingular and antapical plates, but we have occasionally found a posterior intercalary on the left side of the hypotheca. This intercalary may be the same plate that Lombard & Capon illustrate as the 3''' in their Fig. 1A. 4) We find the sulcus made of five plates with the posterior sulcal plate the largest and the anterior sulcal extending into the epitheca. No pore was found in the sulcal region as illustrated by Lombard & Capon (their Fig. 1A, 2C).

Because of the presence of a pore plate, preapical plate, six cingular plates and the marine habitation of *S. gregaria*, this species is removed from *Peridinium* and placed in *Scrippsiella* which is characterized by these features.

### Acknowledgments

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Figs. 9-14. *Scrippsiella gregaria*. All at 10 kV except Fig. 2 at 30 kV. Scale bars = 10  $\mu$ m. 9, Left ventral view; 10, Dorsal view; 11, Left-dorsal view of cell with 6 apical and 5 intercalary plates; 12, Dorsal view of cell with 6 intercalary plates; 13, Cells with posterior intercalary in posterior view; 14, Same, ventral view.

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