

A Systematic Study on the Marine Bryozoans in Cheju-do

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제주도산 해산 태충류의 분류학적 연구

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적 요

제주도산 해산 태충류의 분류학적 연구를 위하여 1965년부터 1985년까지 제주도내의 13개 지역(제주항, 비양도, 과부탄, 가파도, 대포, 삼매봉, 범섬, 문섬, 숲섬, 서귀포, 위미리, 파랑도, 우도)에서 채집한 재료들을 동정 분류한 결과 52종을 얻었으며 이중 11종은 한국미기록종으로 나타났다. 그들은 다음과 같다. *Tubulipora pulchra*, *Ellisina canui*, *Labioporella sinuosa*, *Mucroporella mucroaviculata*, *Emballothea pacifica*, *Hippomenella spatulata*, *Micro-porella cribrosa*, *Smittina raigii*, *Smittoidea prolifica*, *Parasmittina triangularis* 그리고 *Escharoides excavata*.

따라서 지금까지 보고된 제주도산 해산태충류는 74종이 된다.

INTRODUCTION

This paper is the sixth paper in a series of the study on the classification and distribution of Korean bryozoans (Rho & Chung, 1975; Rho & Song, 1980; Rho & Kim, 1981; Rho & Seo, 1984; Rho & Seo, 1985).

Up to the present, 115 species were reported in bryozoan fauna of Korea. Of them 55 species were distributed in Cheju-do.

The present study was done for the systematic study of the bryozoans in Cheju-do.

MATERIALS AND METHODS

The materials identified were collected from 13 localities of Cheju-do (Chejuhang, Pi-

본 연구는 1984년도 문교부학술연구조성비에 의해 “한국산 동·식물의 종속지적 연구 I”이라는 제목하에 연구된 것의 일부임.

yangdo, Kwabut'an, Kapado, Taepo, Sammaebong, Pömdo, Mundo, Supto, Sögwipó, Wimi-ri, Socotra rock, Udo) from 1965 to 1985. (Diagram 1).

To identify the specimens, stereomicroscope was used. The observation of the zooecia in detail was done with scanning electron microscopy (SEM), using Model JSM35CF, at 25 KV accelerating voltages. For the photography of the colony, ASAHI PENTAX camera

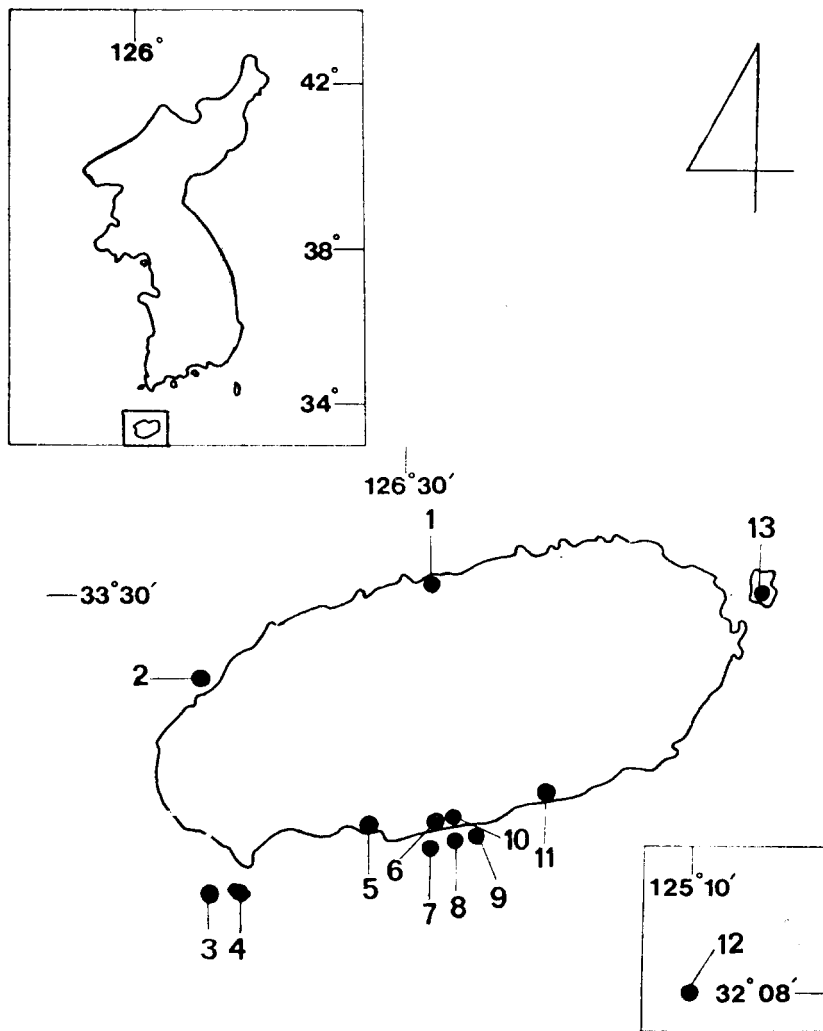


Diagram 1. A map showing the localities where the specimens identified were collected from 1965 to 1985.

- | | | |
|--------------------|-------------------|------------------------|
| 1. Chejuhang (濟州港) | 2. Piyangdo (飛揚島) | 3. Kwabutan (寡婦灘) |
| 4. Kapado (加波島) | 5. Taepo (大浦) | 6. Sammaebong (三梅峰) |
| 7. Pomdo (虎島) | 8. Mundo (蚊島) | 9. Supto (森島) |
| 10. Sogwipo (西歸浦) | 11. Wimi-ri (爲美里) | 12. Socotra rock (波浪島) |
| 13. Udo (牛島) | | |

(1 : 2.8) was used.

The authors prepared the descriptions and the plates about eleven unrecorded species from Korea and two species that Okada did not describe.

RESULTS

Systematic list of Species

Phylum Bryozoa Ehrenberg, 1831 태충동물 문

Class Stenolaemata Borg, 1926 협후 강

Order Cyclostomata Busk, 1852 원구 목

Division Tubuliporina Hagenow, 1851 관이끼벌레 군

Family Tubuliporidae Johnston, 1838 관이끼벌레 과

Genus *Tubulipora* Lamarck, 1816 관이끼벌레 속

1. *Tubulipora flabellaris* (Fabricius, 1780) 관부채이끼벌레

*2. *Tubulipora pulchra* MacGillivray, 1885 폴크라관이끼벌레 (신칭)

Division Rectangulata Waters, 1887 각이끼벌레 군

Family Lichenoporidae Smitt, 1866 접시이끼벌레 과

Genus *Lichenopora* DeFrance, 1823 접시이끼벌레 속

3. *Lichenopora novaezelandiae* (Busk, 1875) 노바접시이끼벌레

4. *Lichenopora radiata* (Audouin, 1826) 꽃접시이끼벌레

Class Gymnolaemata Allman, 1856 나후 강

Order Ctenostomata Busk, 1852 즐구 목

Division Paludicellea Allman, 1856 뿌리이끼벌레 군

Family Nolellidae Harmer, 1915 진흙이끼벌레 과

Genus *Nolella* Gosse, 1855 진흙이끼벌레 속

5. *Nolella papuensis* (Busk, 1886) 진흙이끼벌레

Division Vesicularina Johnston, 1847 주머니이끼벌레 군

Family Vesiculariidae Johnston, 1838 주머니이끼벌레 과

Genus *Amathia* Lamouroux, 1812 나선이끼벌레 속

6. *Amathia distans* Busk, 1886 나선주머니이끼벌레

Division Valkeriina Silén, 1942 포도이끼벌레 군

Family Mimosellidae Hincks, 1877 총상이끼벌레 과

Genus *Mimosella* Hincks, 1851 총상이끼벌레 속

7. *Mimosella verticillata* (Heller, 1867) 총상이끼벌레

Order Cheilostomata Busk, 1852 순구 목

Suborder Anasca Levinsen, 1909 무낭 아목

Division Inovicellata Jullien, 1888 육질이끼벌레 군

Family Aeteidae Smitt, 1867 자루이끼벌레 과

The asterisks (*) indicate the unrecorded species from Korea.

- Genus *Aetea* Lamouroux, 1812 자루이끼벌레 속
8. *Aetea anguina* (Linné, 1758) 자루이끼벌레
Division Malacostega Levinsen, 1909 연지붕이끼벌레 군
Family Membraniporidae Busk, 1854 막이끼벌레 과
Genus *Membranipora* Blainville, 1830 막이끼벌레 속
 9. *Membranipora tuberculata* (Bosc, 1802) 관막이끼벌레
Family Alderinidae Canu & Bassler, 1927 날개이끼벌레 과
Genus *Crassimarginatella* Canu, 1900 연후이끼벌레 속(신칭)
 10. *Crassimarginatella crassimarginata* (Hincks, 1880) 연후이끼벌레(신칭)
Family Hincksinidae Canu & Bassler, 1927 힌크스산이끼벌레 과
Genus *Antropora* Norman, 1903 굴이끼벌레 속
 11. *Antropora granulifera* (Hincks, 1880) 공굴이끼벌레
Genus *Ellisina* Norman, 1903 엘리시나이끼벌레 속(신칭)
 - *12. *Ellisina canui* (Sakakura, 1935) 카누이끼벌레(신칭)
Division Coilostega Levinsen, 1909 덮게이끼벌레 군
Family Steganoporellidae Smitt, 1873 단추이끼벌레 과
Genus *Steganoporella* Smitt, 1873 단추이끼벌레 속
 13. *Steganoporella magnilabris* (Busk, 1854) 큰단추이끼벌레
Genus *Labioporella* Harmer, 1926 입술이끼벌레 속(신칭)
 - *14. *Labioporella sinuosa* Osburn, 1940 굽은입술이끼벌레(신칭)
Division Cellularina Smitt, 1867 방이끼벌레 군
Family Scrupocellariidae Levinsen, 1909 가시이끼벌레 과
Genus *Tricellaria* Fleming, 1828 세방가시이끼벌레 속
 15. *Tricellaria occidentalis* (Trask, 1857) 세방가시이끼벌레
Genus *Amastigia* Busk, 1852 이은이끼벌레 속
 16. *Amastigia rudis* (Busk, 1852) 막대이은이끼벌레
Genus *Caberea* Lamouroux, 1816 카베레이이끼벌레 속
 17. *Caberea lata* Busk, 1852 라타이끼벌레
 18. *Caberea hataii* Okada, 1929 하테이끼벌레
 19. *Caberea boryi* (Audouin, 1826) 보라이끼벌레
Genus *Scrupocellaria* van Benenden, 1845 가시이끼벌레 속
 20. *Scrupocellaria diadema* Busk, 1852 가시이끼벌레
Family Bugulidae Gray, 1848 다발이끼벌레 과
Genus *Bugula* Oken, 1815 다발이끼벌레 속
 21. *Bugula dentata* (Lamouroux, 1816) 치상이끼벌레
 22. *Bugula subglobosa* Harmer, 1926 꽃다발이끼벌레
Family Beaniidae Canu & Bassler, 1927 콩이끼벌레 과
Genus *Beania* Johnston, 1840 콩이끼벌레 속
 23. *Beania hexaceras* (Ortmann, 1890) 육콩이끼벌레

24. *Beania magellanica* (Busk, 1852) 마젤라니카콩이끼벌레
25. *Beania discodermiae* (Ortmann, 1890) 두껍질콩이끼벌레
Suborder Ascophora Levinsen, 1909 유낭 아목
Family Savignyeiellidae Levinsen, 1909 사비그니이끼벌레 과(신칭)
Genus *Halysisis* Norman, 1909 할이시시스이끼벌레 속(신칭)
26. *Halysisis ijimai* (Okada, 1921) 할이시시스이끼벌레(신칭)
Family Catenicellidae Busk, 1852 연쇄방이끼벌레 과
Genus *Vittaticella* Maplestome, 1900 미끈이이끼벌레 속
27. *Vittaticella elegans* (Busk, 1852) 미끈이이끼벌레
Family Petraliellidae Harmer, 1957 앞이끼벌레 과
Genus *Hippopetraliella* Stach, 1936 말앞이끼벌레 속
28. *Hippopetraliella magna* (D'Orbigny, 1852) 큰말앞이끼벌레
Genus *Mucropetraliella* Stach, 1936 앞이끼벌레 속(신칭)
- *29. *Mucropetraliella mucroaviculata* (Okada & Mawatari, 1938) 조두체이끼벌레(신칭)
Family Hippopodinidae Levinsen, 1909 말발이끼벌레 과(신칭)
Genus *Cheiloporina* Canu & Bassler, 1923 입술구멍이끼벌레 속(신칭)
30. *Cheiloporina haddoni* (Harmer, 1902) 하돈입술구멍이끼벌레(신칭)
Family Schizoporellidae Jullien, 1903 구멍이끼벌레 과
Genus *Schizoporella* Hincks, 1887 구멍이끼벌레 속
31. *Schizoporella nivea* Busk, 1884 구멍이끼벌레
Genus *Emballothea* Levinsen, 1909 못이끼벌레 속(신칭)
- *32. *Emballothea pacifica* Harmer, 1957 태양못이끼벌레(신칭)
Genus *Arthropoma* Levinsen, 1909 관절이끼벌레 속(신칭)
33. *Arthropoma ceciliae* (Audouin, 1826) 관절이끼벌레(신칭)
Genus *Calyptotheca* Harmer, 1957 은협이끼벌레 속
34. *Calyptotheca wasiensis* (Waters, 1909) 은협이끼벌레
Family Hippoporinidae Osburn, 1952 말구멍이끼벌레 과(신칭)
Genus *Hippomenella* Canu & Bassler, 1917 말달이끼벌레 속(신칭)
- *35. *Hippomenella spatulata* Harmer, 1957 스푼이끼벌레(신칭)
Family Microporellidae Hincks, 1880 소공이끼벌레 과
Genus *Microporella* Hincks, 1877 소공이끼벌레 속
- *36. *Microporella cribrata* Osburn, 1952 체이끼벌레(신칭)
Genus *Fenestrulina* Jullien, 1888 방사이끼벌레 속
37. *Fenestrulina mutabilis* (Hastings, 1932) 변이방사이끼벌레
Family Smittinidae Levinsen, 1909 입이끼벌레 과
Genus *Smittina* Norman, 1903 입이끼벌레 속
- *38. *Smittina raigii* (Audouin, 1826) 라이기입이끼벌레(신칭)
Genus *Smittoidea* Osburn, 1952 태양입이끼벌레 속
- *39. *Smittoidea prolifica* Osburn, 1952 입이끼벌레(신칭)

- Genus *Parasmittina* Osburn, 1952 측입이끼벌레 속
- *40. *Parasmittina triangularis* (Mawatari, 1952) 세모측입이끼벌레 (신칭)
Genus *Codonellina* Canu & Bassler, 1934 종이끼벌레 속
41. *Codonellina obtusata* (Ortmann, 1890) 무딘종이끼벌레
42. *Codonellina acuta* (Ortmann, 1890) 종이끼벌레
43. *Codonellina spatulata* (Okada & Mawatari, 1936) 스파툴라이끼벌레
Genus *Mucronella* Hincks, 1880 침이끼벌레 속
44. *Mucronella perforata* Okada & Mawatari, 1937 구멍침이끼벌레
Family Exochellidae Bassler, 1935 우뚝이끼벌레 과 (신칭)
Genus *Escharoides* Milne-Edwards, 1836 혀이끼벌레 속
45. *Escharoides sauroglossa* Levinsen, 1909 뱀혀이끼벌레
- *46. *Escharoides excavata* (MacGillivray, 1860) 난로이끼벌레 (신칭)
Family Adeonidae Jullien, 1903 사슴뿔이끼벌레 과
Genus *Adeona* Lamouroux, 1812 사슴뿔이끼벌레 속
47. *Adeona japonica* (Ortmann, 1890) 사슴뿔이끼벌레
Family Onchoporiidae Busk 산호부치이끼벌레 과
Genus *Onchoporella* Busk, 1884 산호부치이끼벌레 속
48. *Onchoporella selenoides* Ortmann, 1890 산호부치이끼벌레
Family Reteporidae Smitt, 1867 망이끼벌레 과
Genus *Iodictyum* Harmer, 1933 빨간망이끼벌레 속
49. *Iodictyum axillare* (Ortmann, 1890) 빨간망이끼벌레
Genus *Reteporellina* Harmer, 1933 망이끼벌레 속
50. *Reteporellina denticulata* (Busk, 1884) 등색망이끼벌레
Family Celleporidae Busk, 1852 가지이끼벌레 과
Genus *Celleporina* Gray, 1848 가지이끼벌레 속
51. *Celleporina porosissima* (Okada, 1923) 포로시시마이끼벌레
Family Margaretidae Harmer, 1957 마가레타이끼벌레 과 (신칭)
Genus *Margaretta* Gray, 1843 마가레타이끼벌레 속 (신칭)
52. *Margaretta cereoides* (Ellis & Solander, 1786) 왁스이끼벌레 (신칭)

The following is a list of bryozoans in Cheju-do based on the literature records.

1. *Crisia eburneodenticulata* Smitt, 1865 흰수염이끼벌레
2. *Vesicularia harmeri* Silén, 1942 주머니이끼벌레
3. *Amathia convoluta* Lamouroux, 1816 메꽃주머니이끼벌레
4. *Brettia mollis* Harmer, 1926 곤봉이끼벌레
5. *Cellaria punctata* (Busk, 1852) 마디이끼벌레
6. *Tricellaria dubia* Silén, 1941 털세방가시이끼벌레
7. *Scrupocellaria maderensis* Busk, 1860 모가시이끼벌레
8. *Canda clypeata* (Haswell, 1880) 방패이끼벌레
9. *Synnotum aegyptiacum* (Audouin, 1826) 염주이끼벌레

10. *Bugula californica* Robertson, 1905 캘리포니아이끼벌레
11. *Beania mirabilis* Johnston, 1840 줄콩이끼벌레
12. *Beania petiolata* Harmer, 1926 엽병이끼벌레
13. *Schizobrachiella subhexagona* (Ortmann, 1890) 육모이끼벌레
14. *Lepralia reticulata* Okada, 1929 비늘이끼벌레
15. *Dakaria bidentata* (Ortmann, 1890) 두이자주이끼벌레
16. *Fenestrulina malusii* (Audouin, 1826) 방사이끼벌레
17. *Watersipora subovoidea* (D'Orbigny, 1852) 자주이끼벌레
18. *Smittioidea pacifica* Soule & Soule, 1873 태양입이끼벌레
19. *Parasmittina areolata* (Canu & Bassler, 1927) 측입이끼벌레
20. *Codonellina montferrandii* (Audouin, 1826) 철빛중입이끼벌레
21. *Mucronella ellerii* MacGillivray, 1887 침이끼벌레
22. *Celleporina geminata* (Ortmann, 1890) 가지이끼벌레

Description of Species

1. *Tubulipora pulchra* MacGillivray, 1885 폴크라관이끼벌레
(Pl. 1, figs. 1-4, Pl. 2, fig. 1, 2)

Tubulipora pulchra MacGillivray, 1885, p. 95, pl. 2, fig. 1.

Tubulipora continua: Ortmann, 1890, p. 63, pl. 4, fig. 36; Rho & Kim, 1981, pp. 2, 4, pl. 1, fig. 2.

Tubulipora pulchra: Robertson, 1910, pp. 250, 251, p. 23, figs. 32-35; Sakakura, 1935b, p. 116; Okada & Mawatari, 1937, p. 445, pl. 11, fig. 9; 1938, p. 447; Mawatari, 1952, p. 262; Osburn, 1953, p. 653, pl. 68, figs. 2-4; Mawatari, 1955, p. 46; Mawatari & Mawatari, 1974, pp. 350, 351, pl. 28, fig. 2; Mawatari, 1981, p. 88, fig. 4.

Specimen examined: Põmdo, May, 21, 1982, J.I. Song.

Description: Colony discoidal, adhering to the seaweed. Zooecia arranged radially from primary circular disk with quadrangular teeth, tubular, erect slightly at the tip, marginal zooecia with lateral teeth. Dorsal side of the colony with attachment processes. Oecia spreading among zooecial rows, oeciopore compressed-shaped, opening below zooecium.

Distribution: Korea (South Sea); Japan (Onagawa Bay, Aomori, Kanagawa-ken, Kii Peninsula, Sagami Bay, Toyama Bay, Matsushima Bay, Amakusa, Akkeshi, Muroran, Shirikishinai, Hakodate, Otaru, Kaiyama); South California; San Diego; Australia.

2. *Crassimarginatella crassimarginata* (Hincks, 1880) 연후이끼벌레
(Pl. 2, figs. 1, 2)

Membranipora crassimarginata Hincks, 1880, p. 71, pl. 9, fig. 1.

Membranipora crassimarginata: Ortmann, 1890, p. 28, pl. 2, fig. 3; Okada, 1923, p. 222.

Crassimarginatella crassimarginata: Cook, 1968, p. 148; Mawatari & Mawatari, 1980, pp. 59, 60, fig. 15.

Specimen examined: Sõgwipõ, Oct., 19, 1973, B.J. Rho.

Description: Colony encrusting the other bryozoans. Zooecia and opesia oval. Spines paired,

situated at distal corners of zooecium. Avicularia with semielliptical mandible located at bifurcation of zooecial rows. Ovicell rather small, granular.

Remark: Mawatari (1980) described that their specimen had no spines, but presented a figure of zooecium with a pair of spines. We could find a pair of spines in specimen of Sögwipó.

Distribution: Korea (South Sea, Strait of Korea); Japan (Sagami Bay, Kanagawa-ken, Shizuoka-ken, Nagasaki-ken); China Sea; Madeira I.; Tropical west Africa; Mediterranean Sea; Porto Rico.

3. *Ellisina canui* (Sakakura, 1935) 카누이끼벌레

(Pl. 4, Figs. 1, 2)

Amphiblestrum canui Sakakura, 1935a, p. 9, pl. 1, Fig. 9, text-fig. 1.

Amphiblestrum canui: Sakakura, 1935b, pp. 107, 108, pl. 2, fig. 7.

Ellisina canui: Silén, 1941, pp. 37-39, figs. 43-46; Mawatari, 1952, pp. 263, 270, 271, fig. 5.

Specimen examined: Sögwipó, July, 13, 1979, H.K. Kim.

Description: Colony encrusting the other bryozoans. Zooecia arranged radially from ancestrula. Opesia narrower distally, serrated at periphery, Cryptocyst also broader proximally. Two vestigial spines located at distal half of zooecium. Avicularium situated on each lateral corner of distal end of zooecium, mandible pointed forwards obliquely. Ovicell rather small, globular, granular.

Remark: Avicularia of our specimen having length of about 1/5 of an zooecium length were smaller than Silén's ones

Distribution: Korea (South Sea); Japan (Toyama Bay, Bōsō Peninsula, Kii Peninsula, Tokyo Bay, Sagami Sea).

4. *Labioporella sinuosa* Osburn, 1940 굽은입술이끼벌레

(Pl. 5, figs. 1, 2)

Labioporella sinuosa Osburn, 1940, p. 377, pl. 5, figs. 40, 41.

Labioporella sinuosa: Osburn, 1950, pp. 109, 110, pl. 11, fig. 12; Soule & Duff, 1957, p. 98; Soule, 1959, pp. 31, 32; Banta, 1980, pp. 361, 373, fig. 24. 30.

Specimen examined: Sögwipó, Dec., 25, 1971, B.J. Rho.

Description: Colony encrusting loosely on the seaweed. Zooecia arranged regularly, rectangular with sinuate lateral walls. Operculum longer than wide, with brown sclerite. Cryptocyst perforated, giving rise to a median process extending distally.

Distribution: Korea (South Sea); from Gulf of California to Ecuador; Puerto Rico; Virgin Is.

5. *Mucropetraliella mucroaviculata* (Okada & Mawatari, 1938) 조두체이끼벌레

(Pl. 5, figs. 3, 4, Pl. 6, figs. 1, 2)

Petraliella armata var. *mucroaviculata* Okada & Mawatari, 1938, pp. 454, 455, pl. 24, figs. 4, 5, text-fig. 2.

Petraliella armata var. *mucroaviculata*: Ma watari, 1952, p. 264.

Specimen examined: Sögwipó, May, 22, 1982, J.I. Song.

Description: Colony attaching to the ascidians by radicles. Frontal surface perforated, orifice semicircular, bearing 2-5 spines distally, lateral cardelles and lyrula on the proximal border. Sometimes zooecium had one avicularium with small and round mandible beside orifice. Avicularian mucro below orifice bifurcated, having avicularium with lip-like mandible on one side. One or two small avicularia, scattered on the mucro.

Remark: According to original description of Okada & Mawatari (1938), orifice bearing five spines and two avicularium laterally, mucro having 2-4 small avicularia. It is noticeable that specimen of Sögwipó differs from their one in number of avicularia and spines.

Distribution: Korea (South Sea); Japan (Wakayama-ken).

6. *Emballothea pacifica* Harmer, 1957 태양꽃이끼벌레

(Pl. 7, figs. 1, 2)

Emballothea pacifica Harmer, 1957, pp. 1088, 1089, pl. 67, figs. 3-5.

Specimen examined: Sögwipó, July, 13, 1979, H.K. Kim.

Description: Colony encrusting the sponges. Zooecia irregular in arrangement and shape, but separated in distinct septal lines. Frontal surface perforated. Orifice wider than long, with median process forming sinus on each side. One avicularium long, spoon-shaped, narrow at the middle.

Distribution: Korea (South Sea); Makasar Strait.

7. *Arthropoma ceciliae* (Audouin, 1826) 관절이끼벌레

(pl. 8, figs. 1, 2)

Flustra ceciliae Audouin, 1826, p. 239.

Schizoporella ceciliae: Busk, 1884, p. 166; Robertson, 1908, p. 288, pl. 19, fig. 42; Okada, 1923, p. 229; Okada & Mawatari, 1935, pp. 138, 139.

Schizoporella caeciliae: Ortmann, 1890, p. 51, pl. 4, fig. 4.

Arthropoma ceciliae: Canu & Bassler, 1929, pp. 296, 297, pl. 32, fig. 1; Sakakura, 1935b, p. 112; Okada & Mawatari, 1936, p. 62; 1938, p. 455; Mawatari, 1952, p. 264; Osburn, 1952, pp. 333, 334, pl. 38, figs. 1-3; Soule & Duff, 1957, pp. 108, 109; Harmer, 1957, pp. 1001-1003, pl. 72, fig. 23, text-fig. 18; Lagaaij, 1963, pp. 186, 187, pl. 4, fig. 6; Soule & Soule, Pinter, 1975, p. 599, fig. 68; Hayward & Ryland, 1979, pp. 190, 191, fig. 79.

Specimen examined: Sögwipó, July, 13, 1971, H.K. Kim.

Description: Colony encrusting the seaweed. Zooecia arranged radially, rather large, hexagonal, separated in distinct septal lines. Frontal surface perforated by numerous pores, median suboral area commonly imperforate. Orifice semicircular, with narrow and long sinus. Sometimes a low umbo proximal to the sinus. Ovicell large, prominent, globular.

Distribution: Korea (South Sea, Strait of Korea); Japan (Izu Peninsula, Kanagawa-ken,

Kagoshima Bay, Takanoshima, Chiba-ken, Kushimoto, Sagami Bay, Okinose, Yamaguchi, Kii Peninsula, Toyama Bay); Queen Charlotte Is.: California; Galapagos; Philippines; China Sea; Australia; New Guinea; Sumbawa; Port Philip Bay; Gulf of Mexico; Costa Rica; Brazil; England; Mediterranean Sea; Zanzibar Channel; Gulf of Candiz; Cape Blanc; Cape Verde; La Jolla.

8. *Hippomenella spatulata* Harmer, 1957 스푼이끼벌레

(Pl.9, figs. 1-3)

Hippomenella spatulata Harmer, 1957, pp.1095, 1096, pl. 72, figs. 27, 31.

Specimen examined: Sögwipó, Dec., 25, 1981, B.J. Rho.

Description: Colony encrusting the other bryozoans. Zooecia rectangular, convex, separated in distinct septal lines. Frontal surface perforated, median suboral area imperforate. Orifice semicircular, with condyles on both sides proximally limiting wide and shallow sinus. Peristome low, with six spine-bases. Avicularium round and small, a pair on each side of orifice distally, one or two frontally. Sometimes one of lateral oral avicularia large, spoon-shaped, extending distally. Ovicell large, globular, perforated at the frontal surface.

Distribution: Korea (South Sea); Queensland; Torres Strait; Royalty Is.

9. *Microporella cribrosa* Osburn, 1952 채이끼벌레

(Pl. 10, figs. 1, 2)

Microporella cribrosa Osburn, 1952, pp.380, 381, pl.44, fig.3.

Microporella californica: Robertson, 1908, pp. 281, 282, pl.18, figs. 32~34.

Microporella cribrosa: Soule, 1961, pp.27, 28; Pinter, 1969, p.209; Soule, Soule & Pinter, 1975, p.598, fig. 60, A,B; Banta, 1980, p.386, fig. 24. 76.

Specimen examined: Sögwipó, July, 1979, H.K. Kim.

Description: Colony encrusting the seaweed. Zooecia round hexagonal, perforated by large pores. Orifice semicircular, with five spines distally, two spines in fertile zooecia. Ascopore located on midline between orifice and umbo, protected by perforated "sieve-plate". Avicularia single or paired, flanking ascopore, with long triangular mandible. Ovicell large, globose, capped by a distinct umbo, ribbed about the base.

Distribution: Korea (South Sea); California.

10. *Smittina raigii* (Audouin, 1826) 라이기암이끼벌레

(Pl.10, figs. 3, 4)

Cellepora raigii Audouin, 1826, p.65.

Smittina raigii: Harmer, 1957, pp. 938-940, pl. 65, figs. 1-3.

Specimen examined: Kwabut'an (Water Depth 3m), June, 18, 1985, H.S. Choi.

Description: Colony encrusting the other bryozoans. Frontal surface with areolae. Orifice with four spines, Peristome raised, forming narrow sinus, serrated at periphery. Two kinds of avicularia, large one with triangular mandible directed proximally and smaller one with narrow round mandible located at lateral side below orifice. Ovicell small, globose, with minute pores, small triangular avicularium located at it's base.

Distribution: Korea (South Sea); Japan; Makasar Strait; Celebes; Halmahera I; Sumbawa; Aru Is.

11. *Smittoidea prolifica* Osburn, 1952 입이끼벌레

(Pl. 11, figs. 1, 2)

Smittoidea prolifica Osburn, 1952, pp. 408, 409, pl. 48, figs. 7, 8.

Smittina reticulata: Robertson, 1908, p. 306, pl. 23, figs. 75, 76; Okada & Mawatari, 1936, pp. 64, 65.

Smittoidea prolifica: Soule, 1961, pp. 33, 34; Soule & Soule, 1964, pp. 24-26; Soule, Soule & Pinter, 1975, p. 601, fig. 76; Banta, 1980, p. 388.

Specimen examined: Socotra rock, Apr., 7, 1984, J.Y. Cho.

Description: Colony encrusting the other bryozoans. Zooecia arranged radially, irregular hexagonal. Areolae of frontal surface separated by costae. Orifice semicircular, with three spines, a lyrula on the proximal border and lateral cardelles. Peristome forming a sinus which surrounds a small median avicularium. Ovicell rather large, prominent, perforated by numerous pores at the surface.

Distribution: Korea (South Sea); Japan (Mutsu Bay, Izu Peninsula); California.

12. *Parasmittina triangularis* (Mawatari, 1952) 세모측입이끼벌레

(Pl. 12, figs. 1-3)

Smittina triangularis Mawatari, 1952, pp. 265, 282, 283, fig. 16.

Specimen examined: Piyangdo, June, 20, 1985, J.E. Seo.

Description: Colony encrusting the sponges. Zooecia pentagonal, separated in distinct septal lines. Frontal surface granular, perforated by areolae. Orifice circular with a median denticle and two lateral condyles. Sinus formed by peristome, narrow and long. Avicularia were of four types. One large elongate type with peculiar elongate mandible and one or two smaller type with elongate triangular mandible situated lateral to the orifice. One or two small triangular avicularia situated near the orifice. Sometimes a large triangular avicularium located latero-proximal to the orifice. Ovicell small, perforated at the frontal surface.

Remark: Numbers of avicularia in our specimen were lesser than ones of Mawatari (1952).

Distribution: Korea (South Sea); Japan (Kii Peninsula).

13. *Escharoides excavata* (MacGillivray 1860) 난로이끼벌레

(Pl. 13, figs. 1-3).

Lepralia excavata MacGillivray, 1860, p. 166, pl. 2, fig. 4.

Escharoides excavata: Powell, 1967, pp. 231-234, text-fig. 11.

Escharoides praestans: Osburn, 1952, pp. 372, 373, pl. 43, fig. 12.

Specimen examined: Sögwipó, July, 12, 1979, H.K. Kim.

Description: Colony encrusting the rock. Areolae of frontal surface separated by costae. Orifice with four spines. Peristome elevated on the proximal border. A denticle situated

within proximal lip of peristome. A avicularium situated proximally below orifice directed laterally, variable in size and form but spatulate in most case. Ovicell subimmersed, costate like the frontal with a central umbonate process.

Distribution: Korea (South Sea); Californica; Galapagos; Australia; New Zealand; Albe-marle Strait.

ABSTRACT

For the systematic study of the bryozoans in Cheju-do, the present study was done with the materials collected from 13 localities of Cheju-do during the period from 1965 to 1985. As a result, 52 species were reported, bringing total number of species known from Cheju-do to 74. Of them eleven species were new to Korean fauna. They were as follows: *Tubulipora pulchra*, *Ellisina canui*, *Labioporella sinuosa*, *Mucropetraliella mucroaviculata*, *Emballothea pacifica*, *Hippomenella spatulata*, *Microprella cribrosa*, *Smittina raigii*, *Smittoidea prolifica*, *Parasmittina triangularis* and *Escharoides excavata*.

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EXPLANATION OF PLATES 1-13

PLATE 1

Figs. 1-4. *Tubulipora pulchra* MacGillivray, 1885

Fig. 1. Colony adheres to the seaweed.

Fig. 2. Dorsal view showing the attachment processes (P).

Fig. 3. Primary circular disk surrounded by small quadrangular teeth.

Fig. 4. Colony fan-shaped, consisting of radiating zooecial rows. Ovicells (OV) spreading among zooecial rows. Note the ooeciopore (O).

PLATE 2

Figs. 1, 2. *Tubulipora pulchra* MacGillivray, 1885

Fig. 1. Zooecia arranged radially from the ancestrula.

Fig. 2. Ovicell (OV) and ooeciopore (O) in detail.

PLATE 3

Figs. 1, 2. *Crassimarginatella crassimarginata* (Hincks, 1880)

Fig. 1. Arrangement of zooecia with ovicell (OV) and spines (S).

Fig. 2. Avicularium (AV) is located at the bifurcation of zooecia with semielliptical mandible (M).

PLATE 4

Figs. 1, 2. *Ellisina canui* (Sakakura, 1935)

Fig. 1. Arrangement of zooecia. Note the vestigial spines (S).

Fig. 2. Zooecium with ovicell (OV). Avicularium (AV) with narrow triangular mandible (M) is situated on the distal corner of the zooecium. Cryptocyst (CR) below the frontal membrane is broad proximally.

PLATE 5

Figs. 1, 2. *Labioporella sinuosa* Osburn, 1940

Fig. 1. Colony encrusting the seaweed loosely.

Fig. 2. Arrangement of zooecia with sinuate lateral walls (arrow). Cryptocyst give rise to a median process (mP) extending distally. Operculum with brown sclerite (Sc).

Figs. 3, 4. *Mucropetraliella mucroaviculata* (Okada & Mawatari, 1938)

Fig. 3. Colony attaching to the ascidians by numerous radicles.

Fig. 4. Arrangement of zooecia. Zooecium with spines (S) and avicularian mucro (Mc), having avicularium (MA). Small avicularia (AV) are scattered on the mucro (Mc) and situated at the side of orifice.

PLATE 6

Figs. 1, 2. *Mucropetraliella mucroaviculata* (Okada & Mawatari, 1938)

Fig. 1. Orifice bears four spines (S). Mucro avicularium (MA) is situated on one side of the mucro bifurcated.

Fig. 2. Orifice with wide lyrula (LY) and mucro (Mc) with small avicularium (AV).

PLATE 7

Figs. 1, 2. *Emballothecha pacifica* Harmer, 1957

Fig. 1. Arrangement of zooecia with avicularium (AV).

Fig. 2. Long and spoon-shaped avicularium in detail.

Note the median process (mP) forming the sinus of the orifice.

PLATE 8

Figs. 1, 2. *Arthropoma cecilii* (Audouin, 1826)

Fig. 1. Arrangement of zooecia with ovicell (OV). Frontal surface with small umbo (U).

Fig. 2. Ovicell and orifice (OR) with slit-like sinus in detail.

PLATE 9

Figs. 1-3. *Hippomenella spatulata* Harmer, 1957

Fig. 1. Colony encrusting the other bryozoans.

Fig. 2. Arrangement of zooecia with ovicell (OV).

Fig. 3. Orifice with shallow sinus is covered with operculum (OP) and peristome bears six spine-bases (S). Round avicularium (rAV) is situated on both side of the orifice and frontal surface below the orifice. Sometimes one of the lateral oral avicularia is the spatulate avicularium (sAV).

PLATE 10

Figs. 1, 2. *Microporella cribrifera* Osburn, 1952

Fig. 1. Colony encrusting the seaweed.

Fig. 2. Arrangement of zooecia with ovicell (OV), avicularium (AV) and spine (S). Note the cribriform plate (↑) covering the ascopore.

Figs. 3, 4. *Smittina raigii* (Audouin, 1826)

Fig. 3. Colony encrusting the other bryozoans.

Fig. 4. Arrangement of zooecia. Zooecium has ovicell (OV) and four spines (S). Avicularium is the narrow avicularium (nAV) or the triangular avicularium (tAV). Avicularium of ovicell (oAV) is a small and acute type.

PLATE 11

Figs. 1, 2. *Smittioidea prolifica* Osburn, 1952

Fig. 1. Arrangement of zooecia with ovicell (OV). Orifice (OR) is straighter on the proximal border.

Fig. 2. Orifice with lyrula (LY). Peristome has three spines (S) and forms a sinus enclosing the suboral avicularium (AV).

PLATE 12

Figs. 1-3. *Parasmittina triangularis* (Mawatari, 1952)

Fig. 1. Colony encrusting the sponge.

Fig. 2. Arrangement of zooecia with ovicell (OV). Zooecium has large elongate avicularium (↖) and small elongate avicularium (↗).

Fig. 3. Zooecium with large triangular avicularium (↕) and small triangular avicularium (↙).

PLATE 13

Figs. 1-3. *Escharoides excavata* (MacGillivray, 1860)

Fig. 1. Colony encrusting the rock.

Fig. 2. Arrangement of zooecia with ovicell (OV).

Fig. 3. Zooecium with spines (S) and avicularium (AV). Open mandible (M) is well to be seen. Note the denticle (↖).

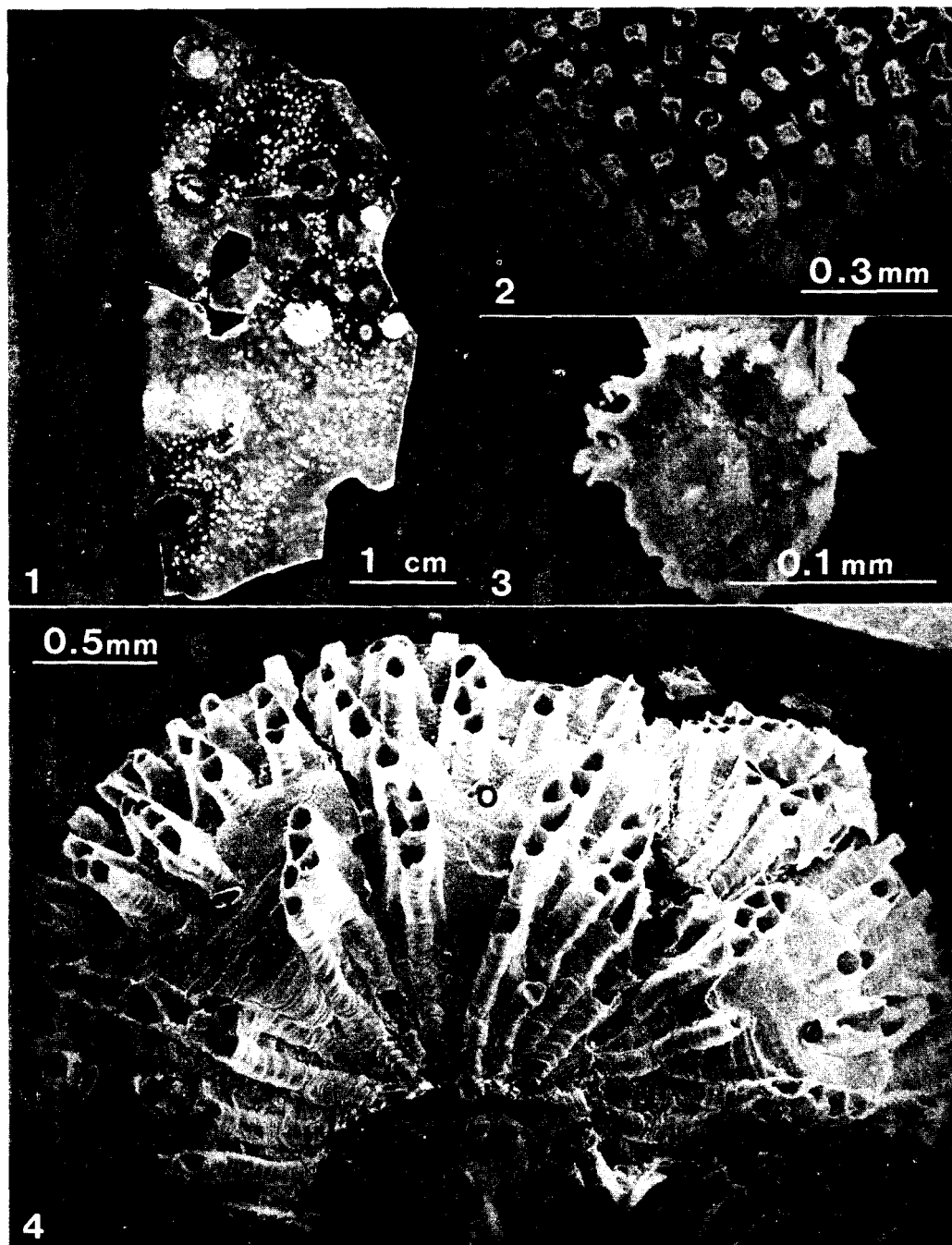


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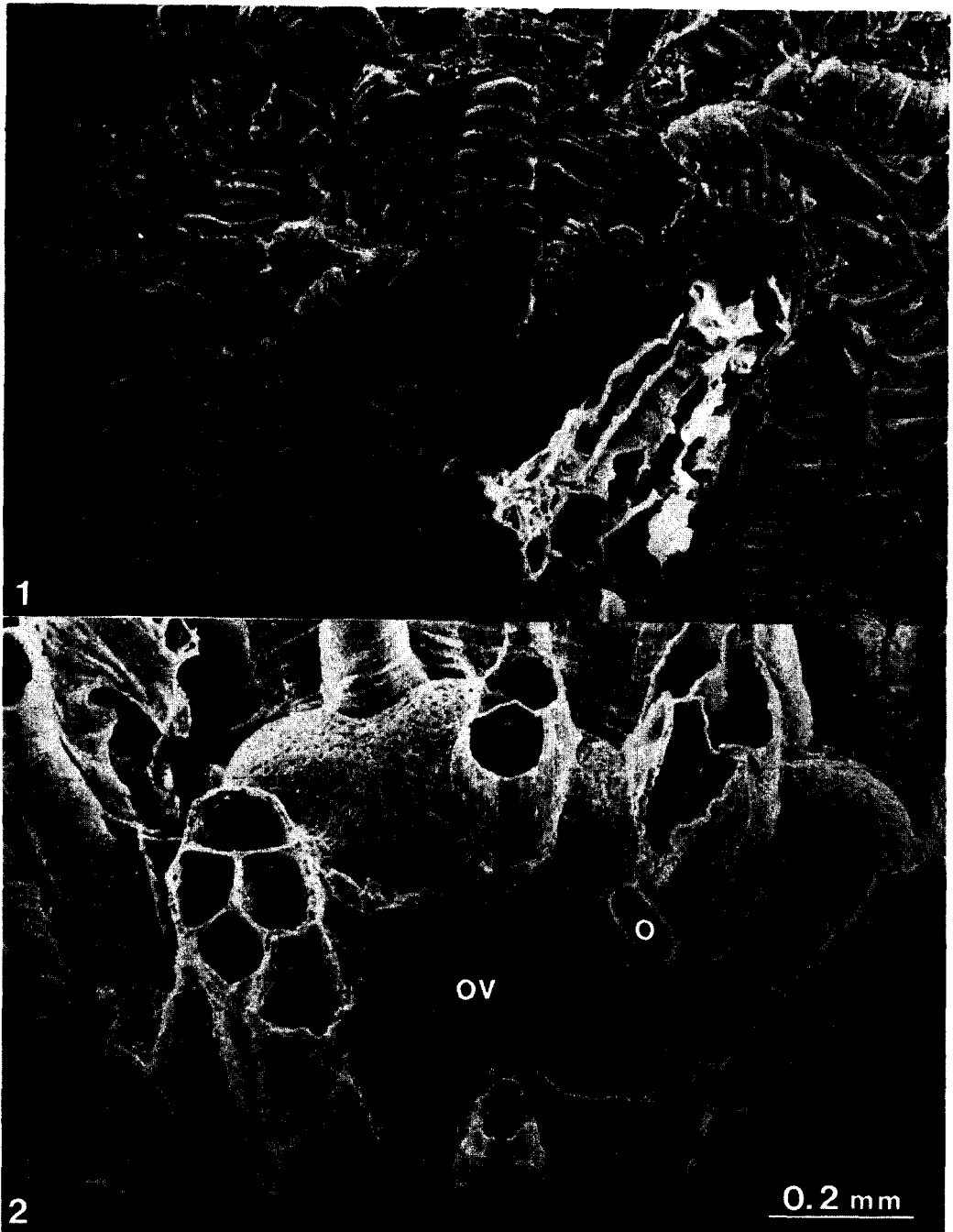




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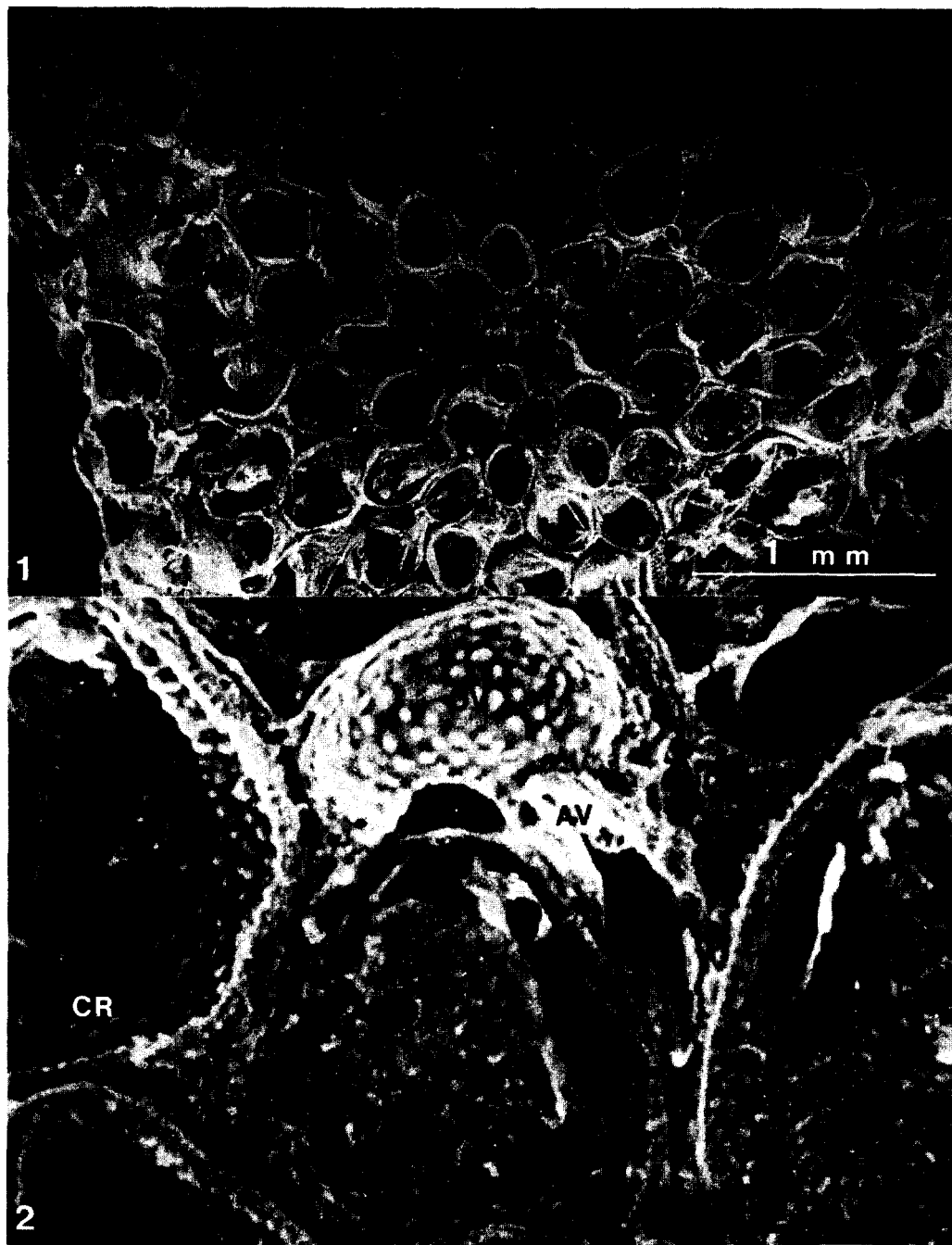


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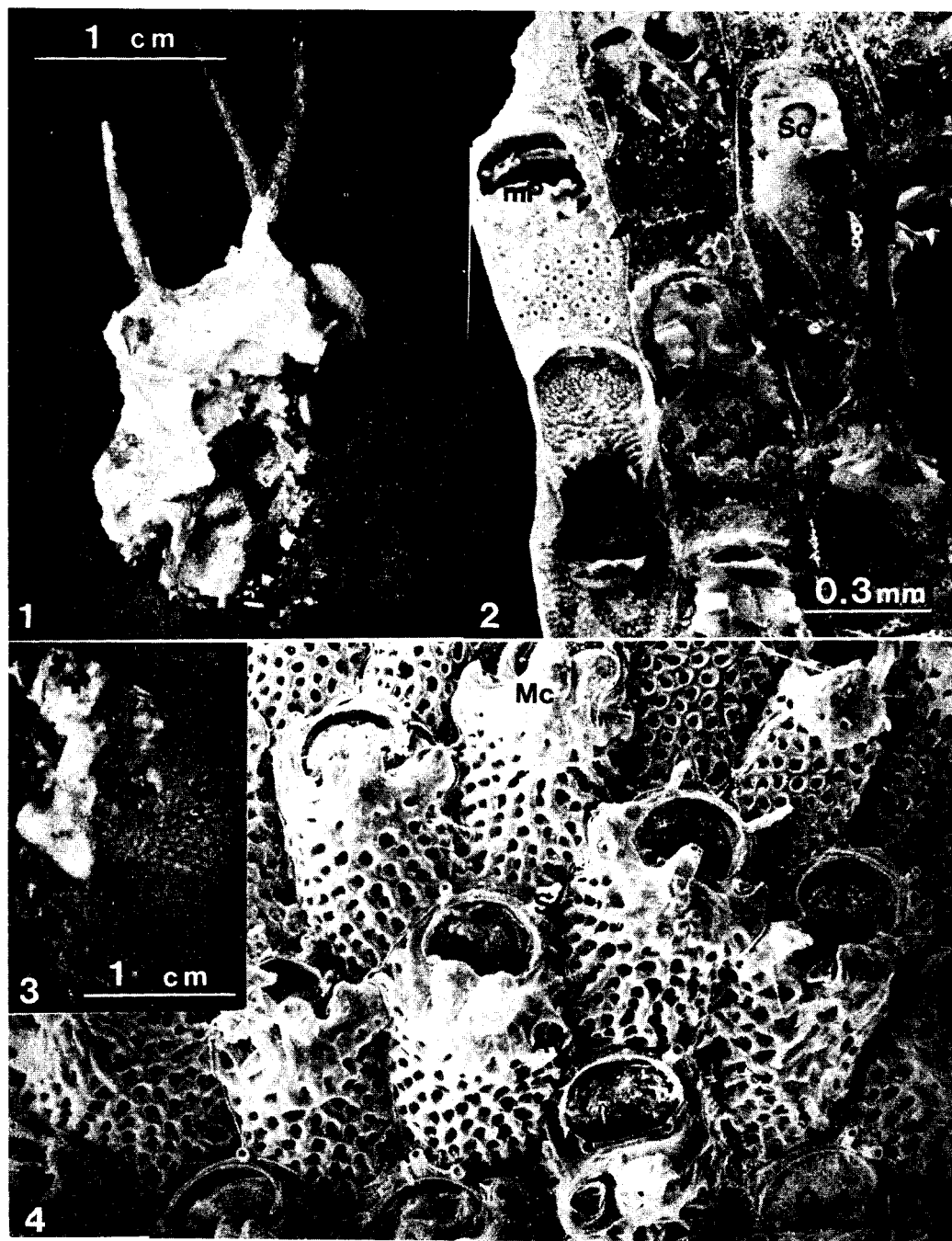
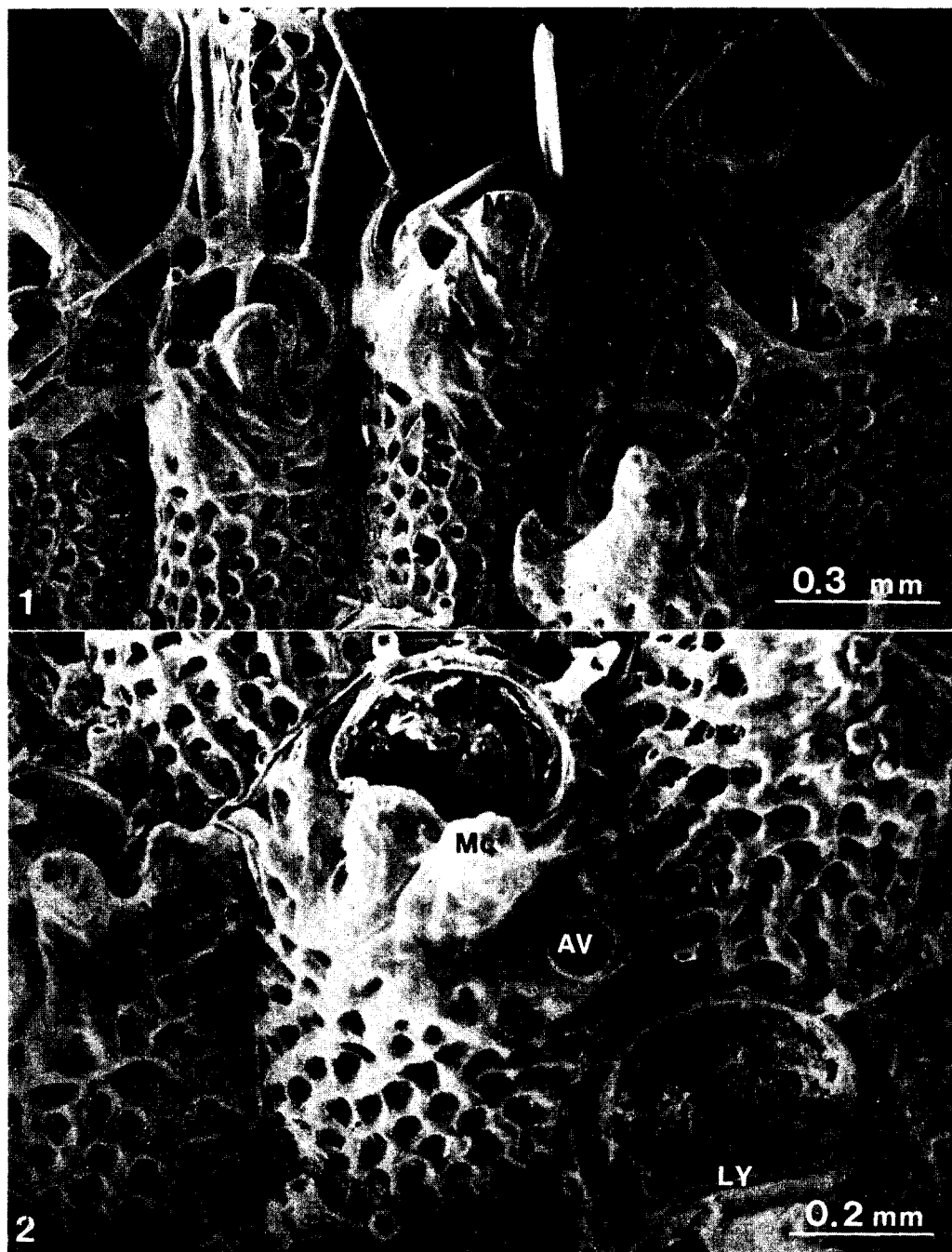


PLATE 5



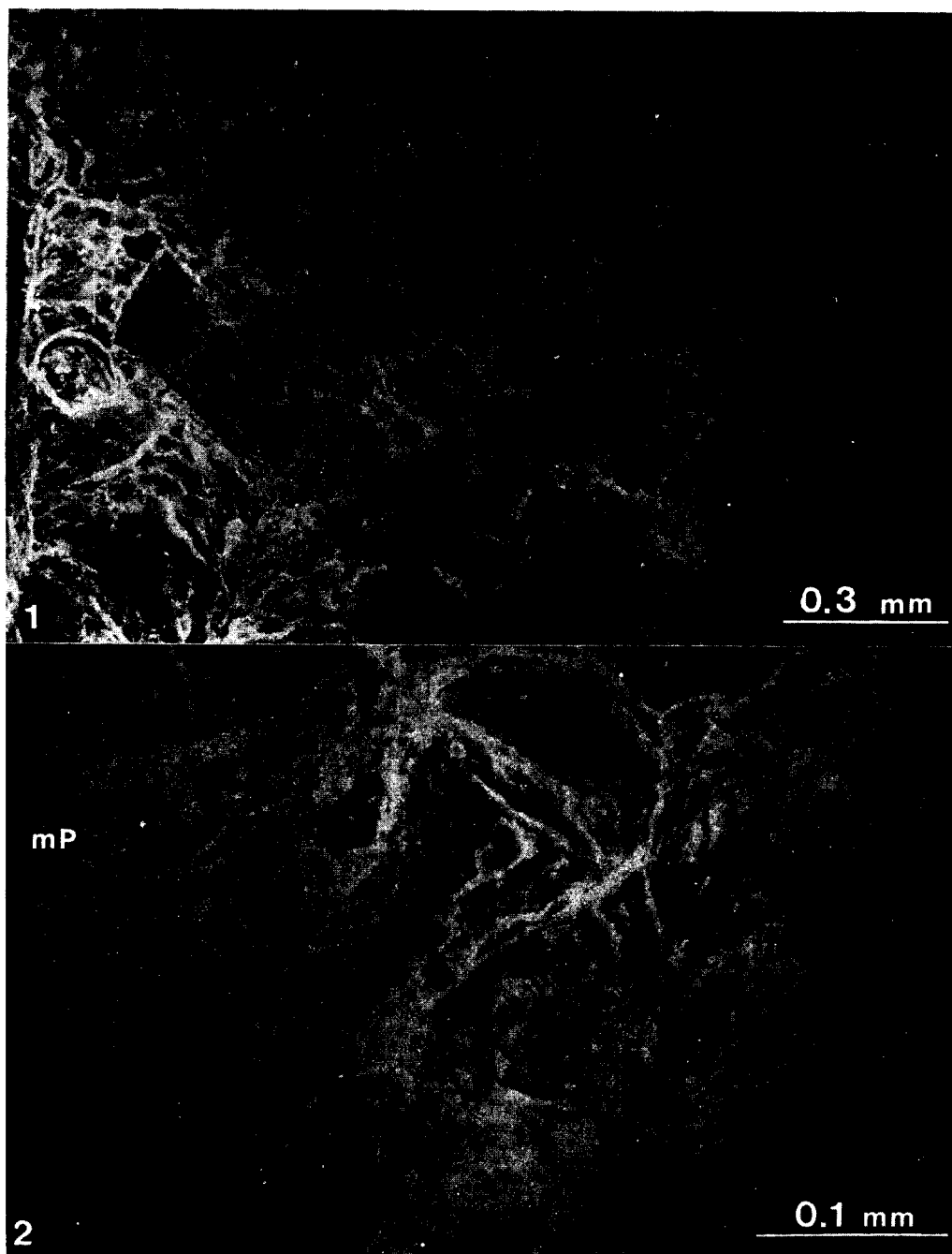
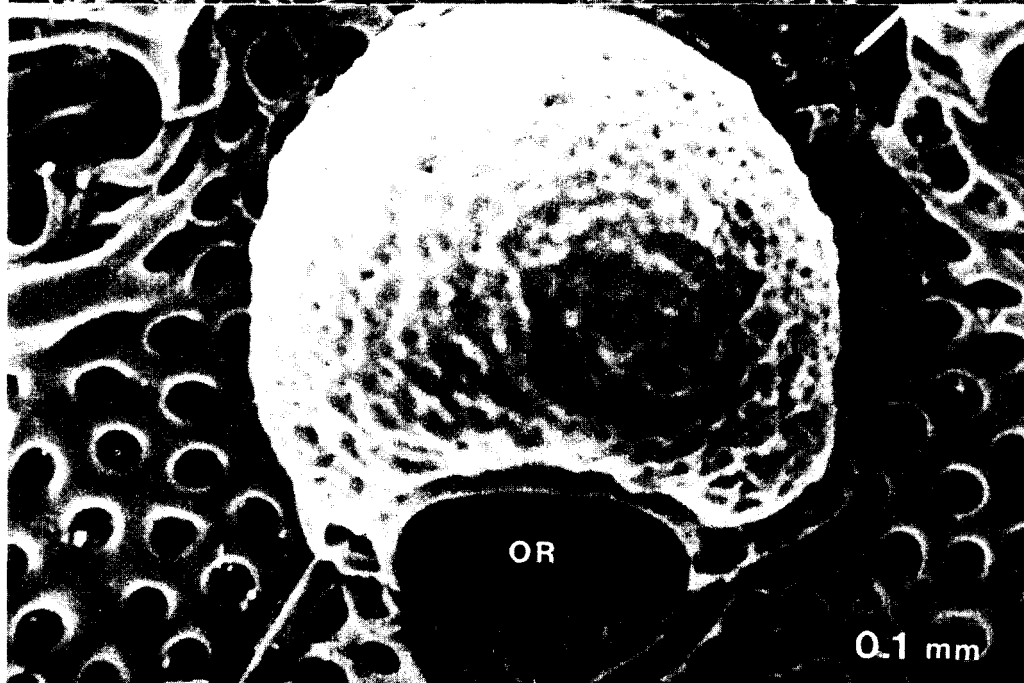
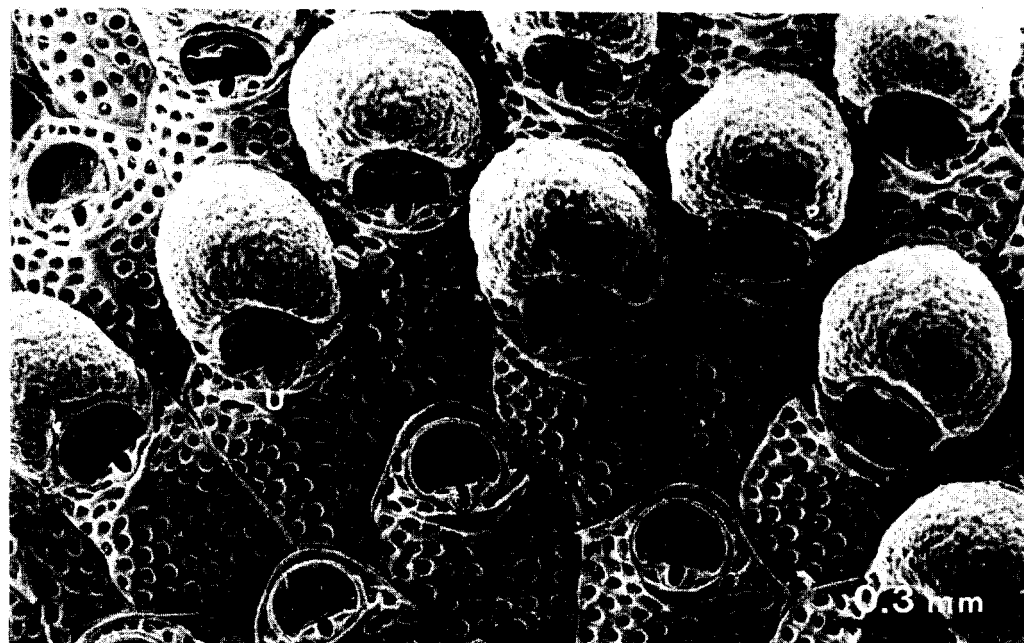


PLATE 7



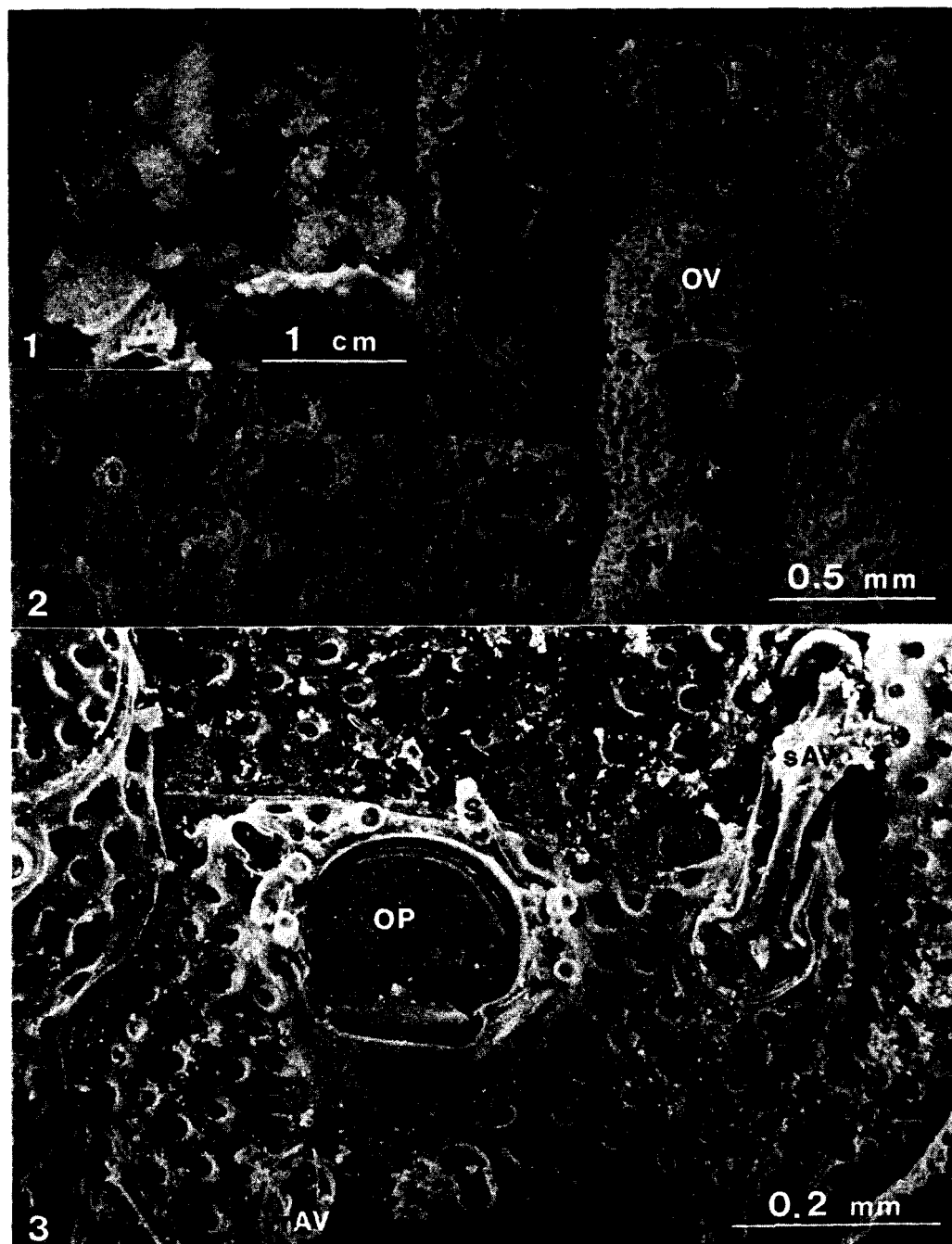


PLATE 9

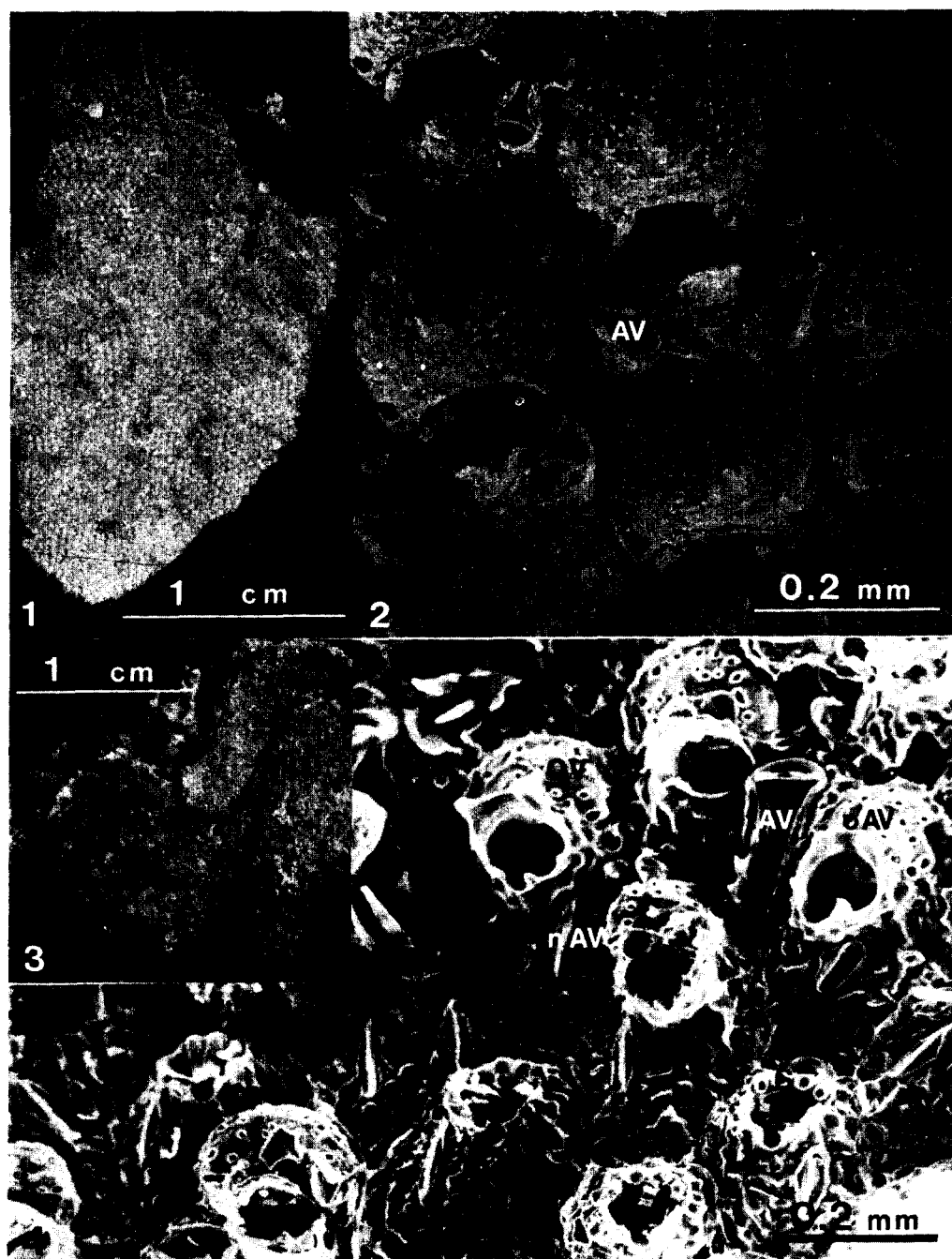


PLATE 10

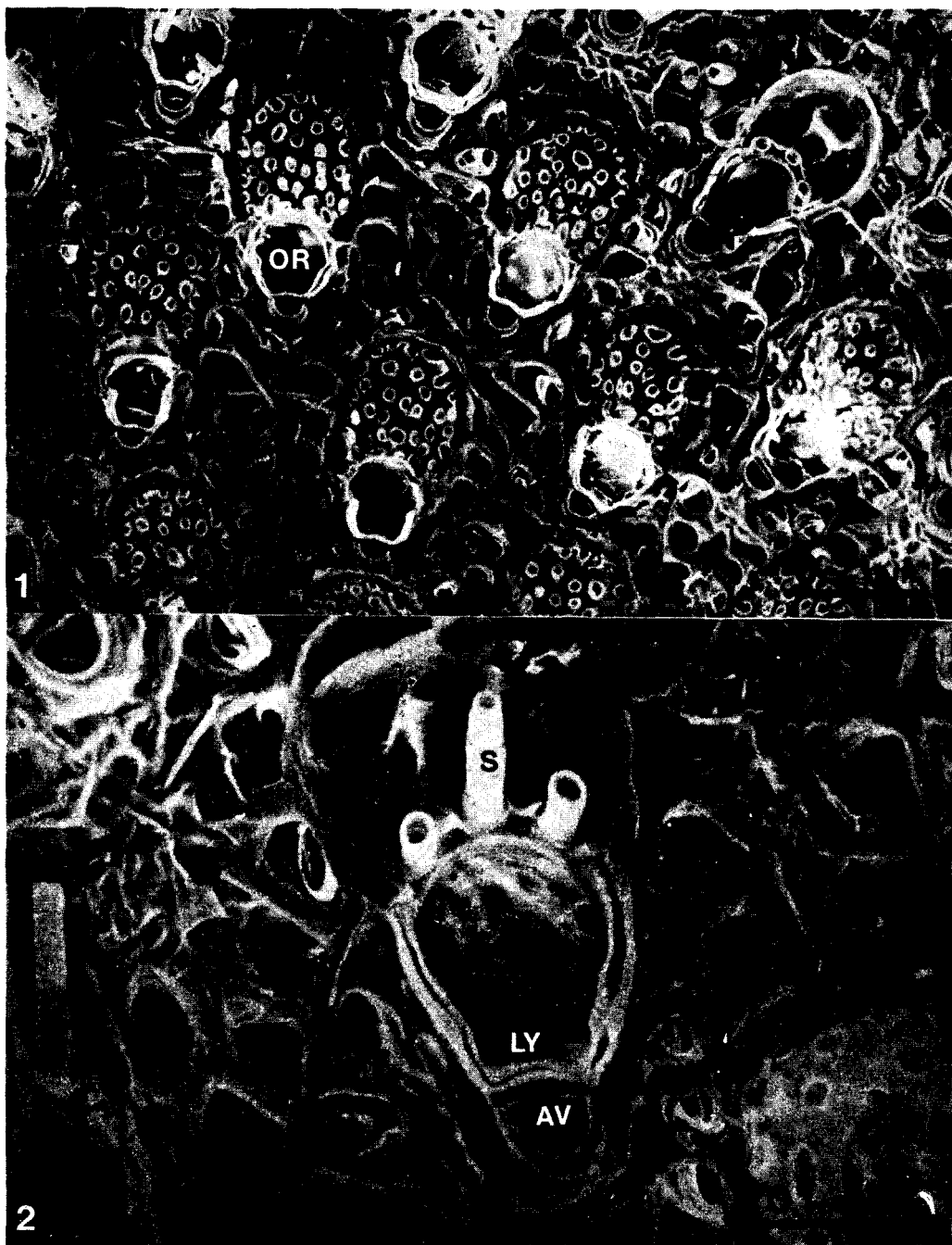


PLATE 11

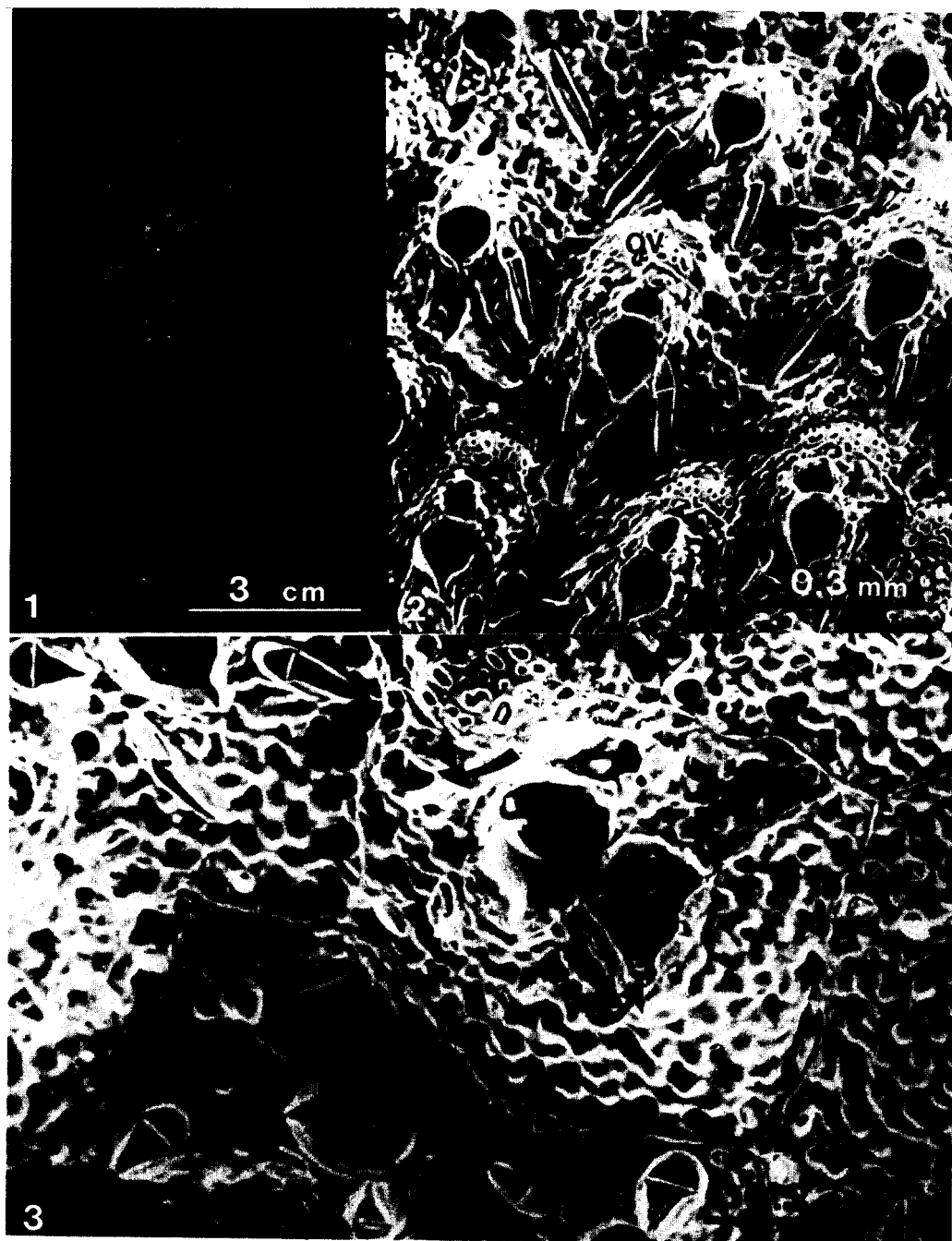


PLATE 12

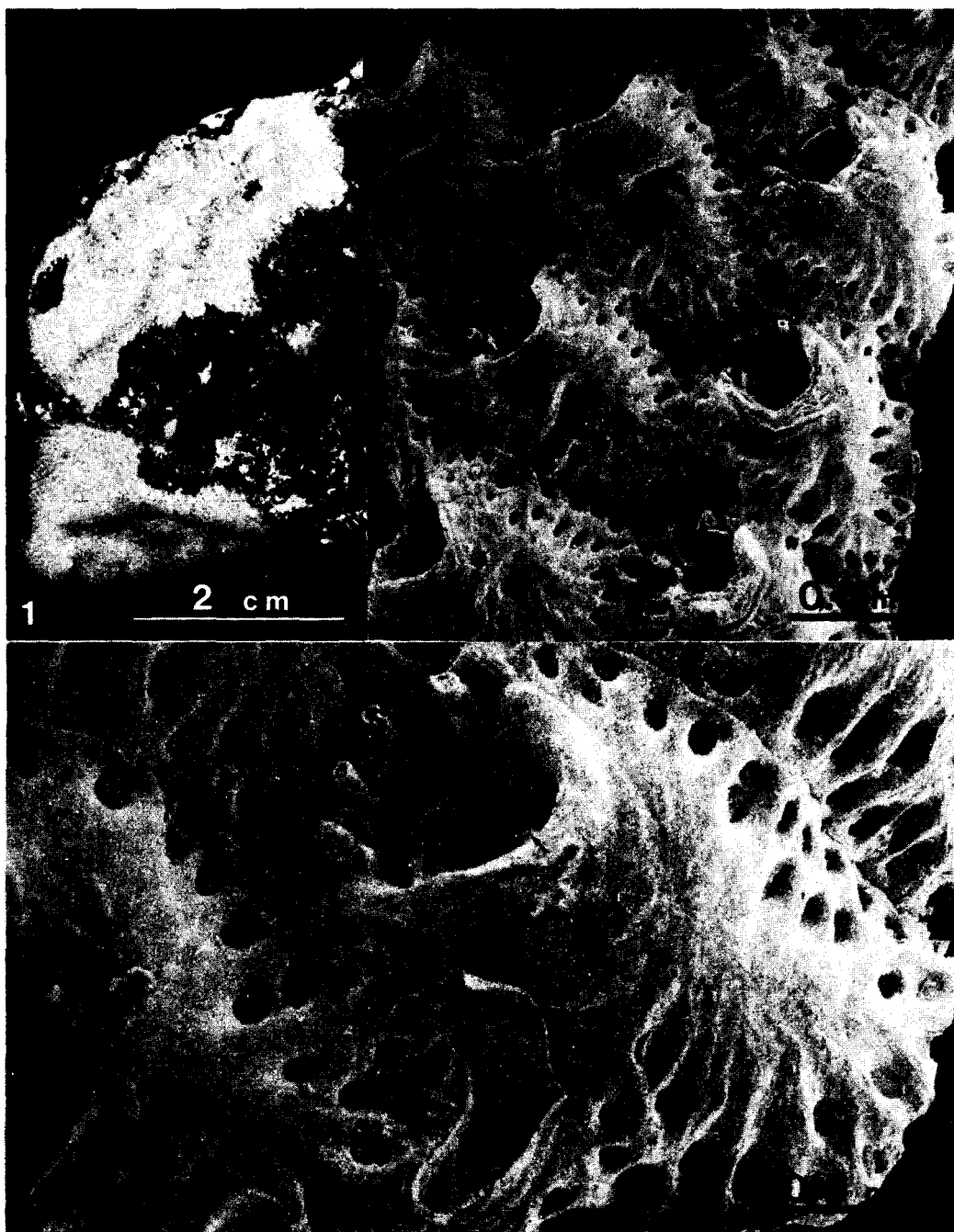


PLATE 13