한국동물분류학회지 제11권 제2호
The Korean Journal of Systematic Zoology
Vol. 11, No. 2: 147-158 (June 1995)

A Systematic Study on the Marine Sponges in Korea 12. Tetractinomorpha (Porifera: Demospongiae)

Chung-Ja Sim and Young-A Kim
(Department of Biology, Han Nam University, Daejeon 300-791, Republic of Korea)

ABSTRACT

The identified marine Tetractinomorpha consist of 6 species in 5 genera, 5 families and 3 orders. Of those two species, *Poecillastra wondoensis* and *Jaspis wondoensis,* are new to science and are described with detailed illustrations. Four species, *Craniella ellipsoida, Discodermia tuberosa, Discodermia panoplia,* and *Stelletta validissima orthotriaena,* are new to Korea and are remarked with illustrations.

Key words: systematics, marine sponges, Tetractinomorpha (Demospongiae), Korea

INTRODUCTION

Tetractinomorpha were studied in coastal localities of the South Korea including many islands untill 1994. Ninety six species of marine Tetractinomorpha sponges have been reported from Korean waters (Sim, 1981, 1982, 1990; Sim, Kim and Byeon 1990; Sim and Byeon 1991; Sim, Kim and Kim 1992; Sim and Kim 1994).

For the present study, materials were collected from 4 localities; Cheju Island, Komundo Island, Chongsan Island and Kunduk of East Sea from 1992 to 1994. For their identification, surface and spicules were observed under light microscope, dissecting microscope and SEM (Scanning Electron Microscope). Six species in 5 genera and 5 families were identified. Of which, two species were recognized as new to science and four as new to Korea.

The present study was supported by the Basic Science Research Institute program, Ministry of Education, BSRI-94-4428.

SYSTEMATIC ACCOUNT

Phylum Porifera Grant, 1836 해면동물문
Class Demospongiae Sollas, 1885 보통해면강
Subclass Tetractinomorpha Levi, 1956 사축해면아강
Order Astrophorida Levi, 1973 아스트로포리다목
Family Stellettidae Carter, 1875 별해면과
Genus *Stelletta* Schmidt, 1862 별해면속

1. *Stelletta validissima orthotriaena* Koltun, 1966 오르소많은별해면(신칭) **(Fig. 1).**

Stelletta validissima orthotriaena Koltun, 1966, p. 70, Fig. 20, Plate VII-1-2.

Material examined. Kunduk (fish net), 6 June 1993.

Remarks. This sponge is globular, massive, size up to 70 × 60 × 35 mm. Texure is very hard. Color in spirits is light gray. The surface is smooth and covered with algae.

Spicules. Megascleres

(1) Oxeas ..... 7600 × 40-75 μm
(2) Orthotriaenes ..... 6120 × 110 μm
(3) Plagiotriaenes ..... 90-3000 × 30-50 μm
(4) Anatriaenes ..... 3800-4870 × 20-48 μm

Microscleres

(5) Large oxyasters ..... 30-45 μm
(6) Small oxyasters ..... 10-25 μm
(7) Tylasters ..... 5-7 μm

Distrbution. Korea (Kunduk), USSR (North and far eastern sea) and Sea of Japan (off Hokkaido).

Family Pachastrellidae Cater, 1875 사루해면과
Genus *Poecillastra* Sollas, 1888 다성해면속

2. *Poecillastra wondoensis*, n. sp. 원도다성해면(신칭) **(Fig. 2).**

Material examined. Holotype: Por. 18 (Han Nam Univ. NHM), Komundo (Wondo), on the sponge, SCUBA, 15-25 m deep, Nov. 1994.

Description. Thickly encrusting sponge covered on all upper part of sponge *Jaspis wondoensis*. Size up to 80 × 60 × 10 mm, Surface rough, slightly hispid owing to projecting long oxeas. Texture hard and slightly compressible. Colour in life bright yellow but surface grey because of mud. Ectosome: At dermal portion, large oxea and calthrops arranged irregularly at one plane. Among them, several size of microxea and metasters scattered. Choanosome: Large thick oxea arranged longitudinally mixed with calthrops tightly also, mixed with microscleres.

Spicules. Megascleres

(1) Large oxe ..... 1320-1820 × 30-80 μm
(2) Slender oxea ..... 1800-3500 × 3-10 μm
(3) Style ..... 730-1120 × 38-75 μm
(4) Calthrops ..... 110-500 × 10-50 μm

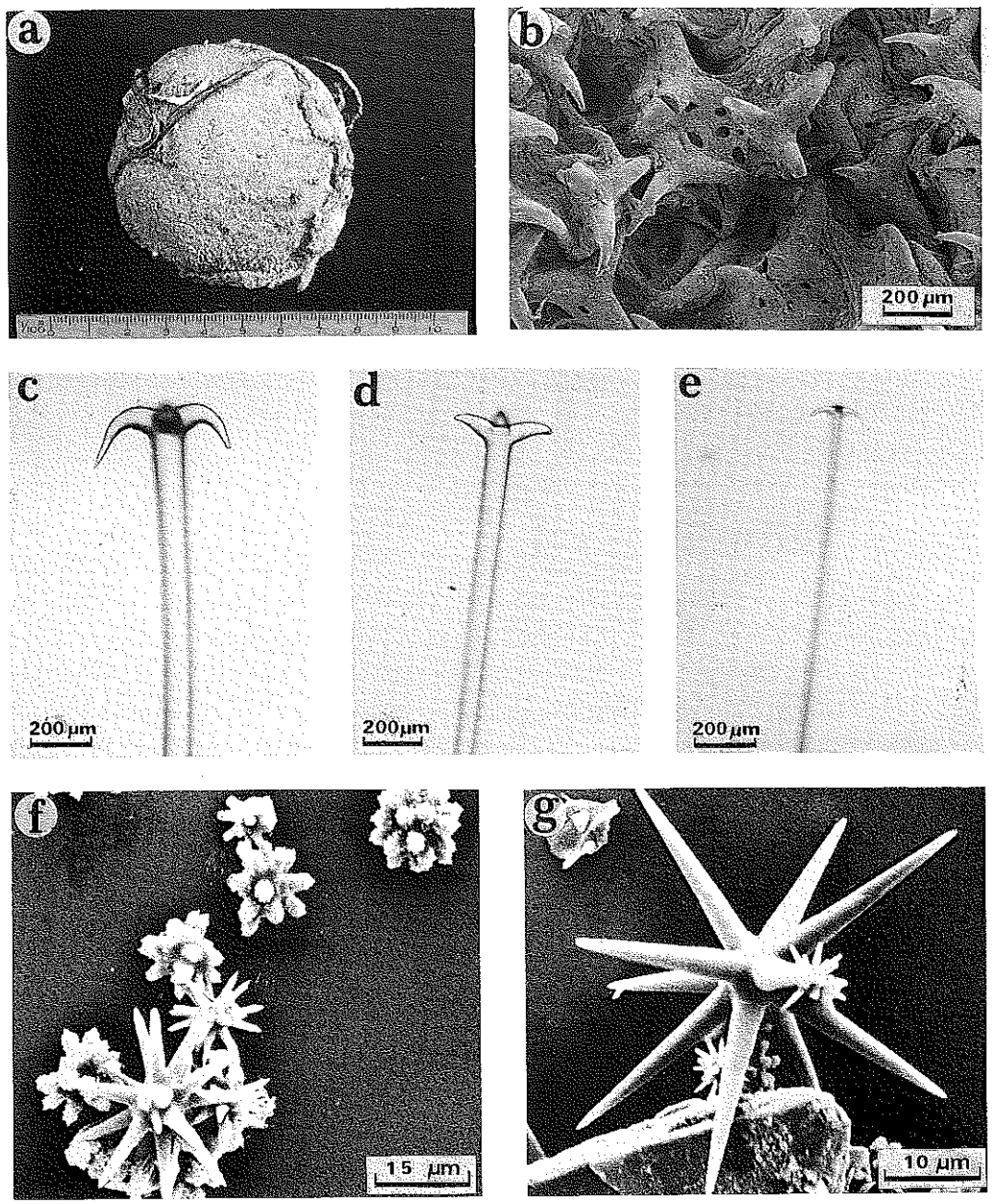

Fig. 1. *Stelletta validissima orthotriaena* Koltun: a, entire animal; b, surface of specimen; c-e, megascleres: c, orthotriaene; d, plagiotriaene; e, anatriaene; f-g, microscleres: f, tyloaster; g, oxyaster.

(5) Protriaenes ..... 2500 μm (clad 80 μm)

Microscleres

(6) Microxea ..... 150-250 × 5-10 μm
(7) Small microxea ..... 48-80 × 2.5 μm
(8) Metaster ..... 15-20 μm
(9) Spiraste ..... 15 μm

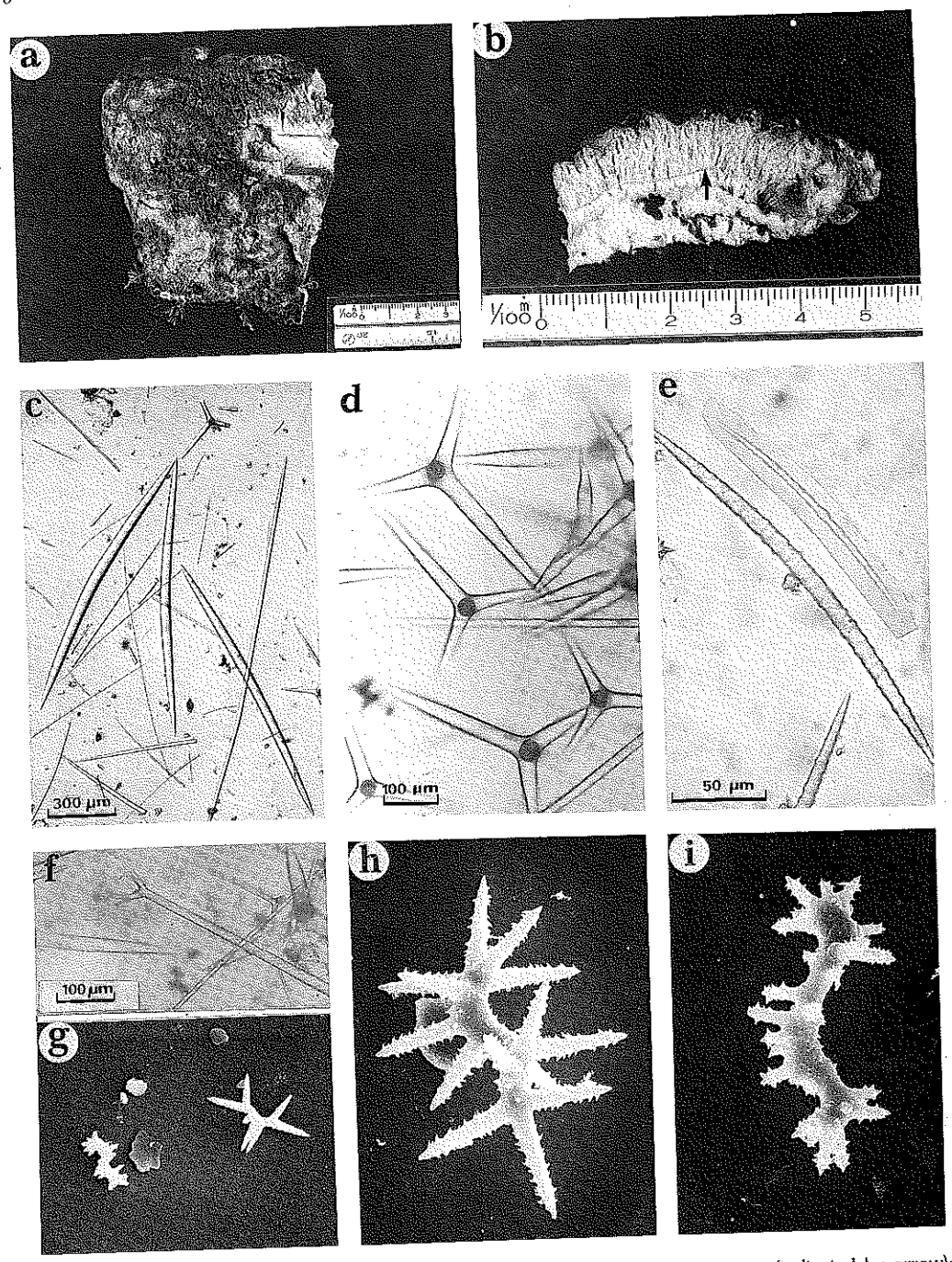

Fig. 2. *Poecillastra wondoensis*, n. sp.: a, entire animal; b, side view of specimen (indicated by arrow); c, megascleres: large oxea; slender oxea; d, megascleres: calthrops; e, microscleres: microxea; f, megascleres: protriaene; g, microscleres (SEM); h, microscleres: metaster (SEM); i, spiraster (SEM); j-k, surface of animal (SEM, × 40, ×100)

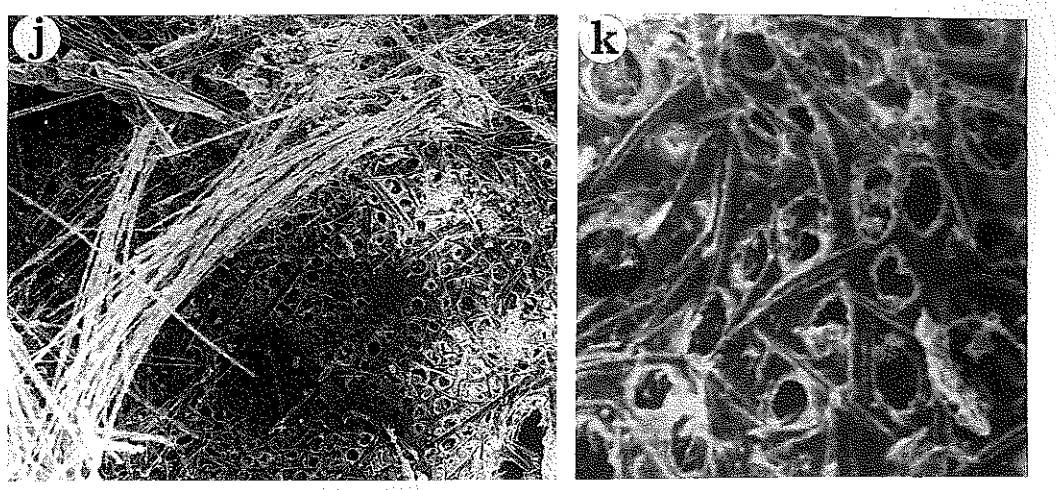

Fig. 2. continued.

Remarks. This sample was identified as a symbiotic mixture of two different sponges. Both sponges were attached tightly each other like one sponge. Cross section of the sample shows two layers of morphologically distinct sponges. The thin and dirty yellow outer layer was identified as *Poecillastra wondoensis*, n. sp. The light grey inner layer was identified as *Jaspis wondoensis*, n. sp. They are not easily detached from each other. Thirty samples of the collected specimens were all symbiosis encrusting on *Jaspis wondoensis*. The present species is similar to *P. tenuilaminaris* (Sollas, 1888) in its spicules but it has long hair like oxea and quite different metaster. New species has protriaene but very rare. They also form a single sponge not a symbiotic mixture.

Etymology. This species is named for Wondo where the holotype was collected.

Family Jaspidae De Laubenfels, 1936 벽옥해면과

Genus *Jaspis* Gray, 1867 벽옥해면속

3. *Jaspis wondoensis*, n. sp. 원도벽옥해면(신칭) **(Fig. 3).**

Material examined. Holotype: Por. 19 (Han Nam Univ. NHM), Komundo (Wondo), on the rock, SCUBA, 15-25 m deep, 1 Nov. 1994.

Description. Large mass varying in size up to 80 × 60 × 20 mm; Surface all covered with *Poecillastra wondoensis*. They are not clean because very difficult to separate each other. Texture hard and tough. Colour when alive beige. Ectosome with thin membrane mixed small aster. Large thick oxea protruding from choanosome. The arrangement of spicule is longitudinal with thick oxeas and styles. Choanosome, large oxeas and styles arranged irregularly.

Spicules.

Megascleres

(1) Large oxea ····· 1100-1530 × 45-90 μm

(2) Style ····· 1000-1150 × 100 μm

Microscleres

(3) Oxyaster ····· 17.5-45 μm

(4) Spheraster ····· 5-25 μm

Remarks. The present species is different from *Jaspis novaezealandiae* (Dendy, 1924) in the spicules.

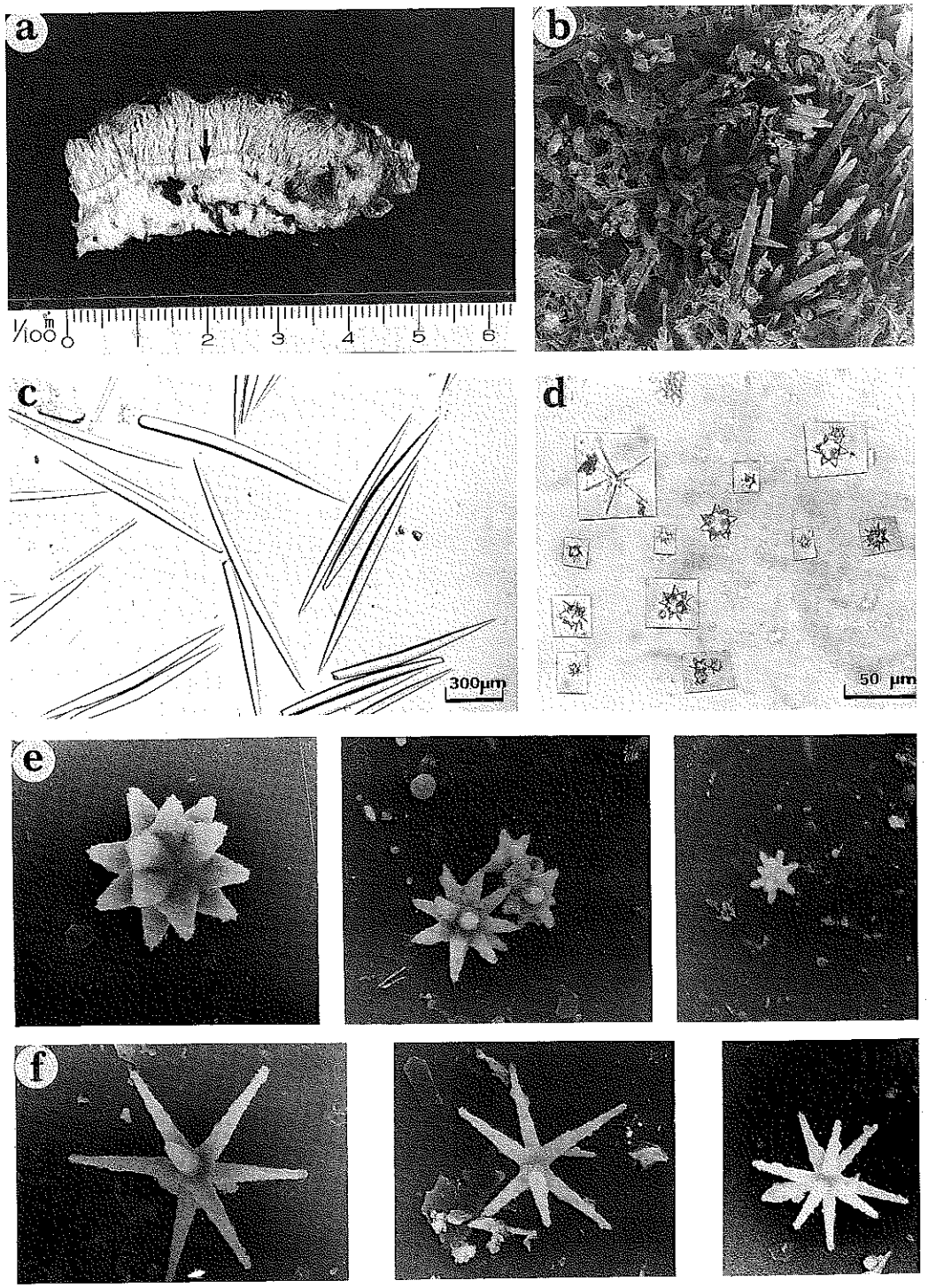

Fig. 3. *Jaspis wondoensis*, n. sp.: a, side view of specimen (indicated by arrow); b, surface of animal; c, megascleres: oxea, style; d, microscleres; e, microscleres (SEM, × 1000); spheraster; f, microscleres (SEM, × 1000): oxyaster; g, section of peripheral skeleton.

Fig. 3. continued.

Etymology. This species is named after Wondo where the holotype was collected.

Order Spirophorida Levi, 1973 스피로포리다목

Family Tetillidae Sollas, 1886 유두해면과

Genus Craniella 그라니해면속

4. *Craniella ellipsoida* Hoshino, 1982 타원그라니해면(신칭) **(Fig. 4).**

Craniella ellipsoida Hoshino, 1982, p. 142, Text-fig. 2, Pl. 7, figs. 8-9 and Pl. 8, figs. 1-7.

Material examined. Ch'ongsan Island (fish net), 15 July 1993.

Remarks. This sponge is ellipsoidal in form. Size up to 20 × 20 × 18 mm; rootlike spicules in bundles are attached to the sponge. A single oscule opens near the top of the sponge. Surface is even and minutely hispid. Texture is hard. Colour in spirits is whitish-gray.

Spicules. Megascles

(1) Oxeas ····· 430-3010 × 5-25 μm

(2) Anamonaenes ····· 850-2560 × 2.5-5 μm

(3) Protriaenes ····· 600-3350 m

(4) Anatriaenes ····· 3600 μm

Microscleres

(5) Sigmaspires ····· 12.5-16 μm

Distribution. Korea (South Sea) and Japan (Sagami Bay).

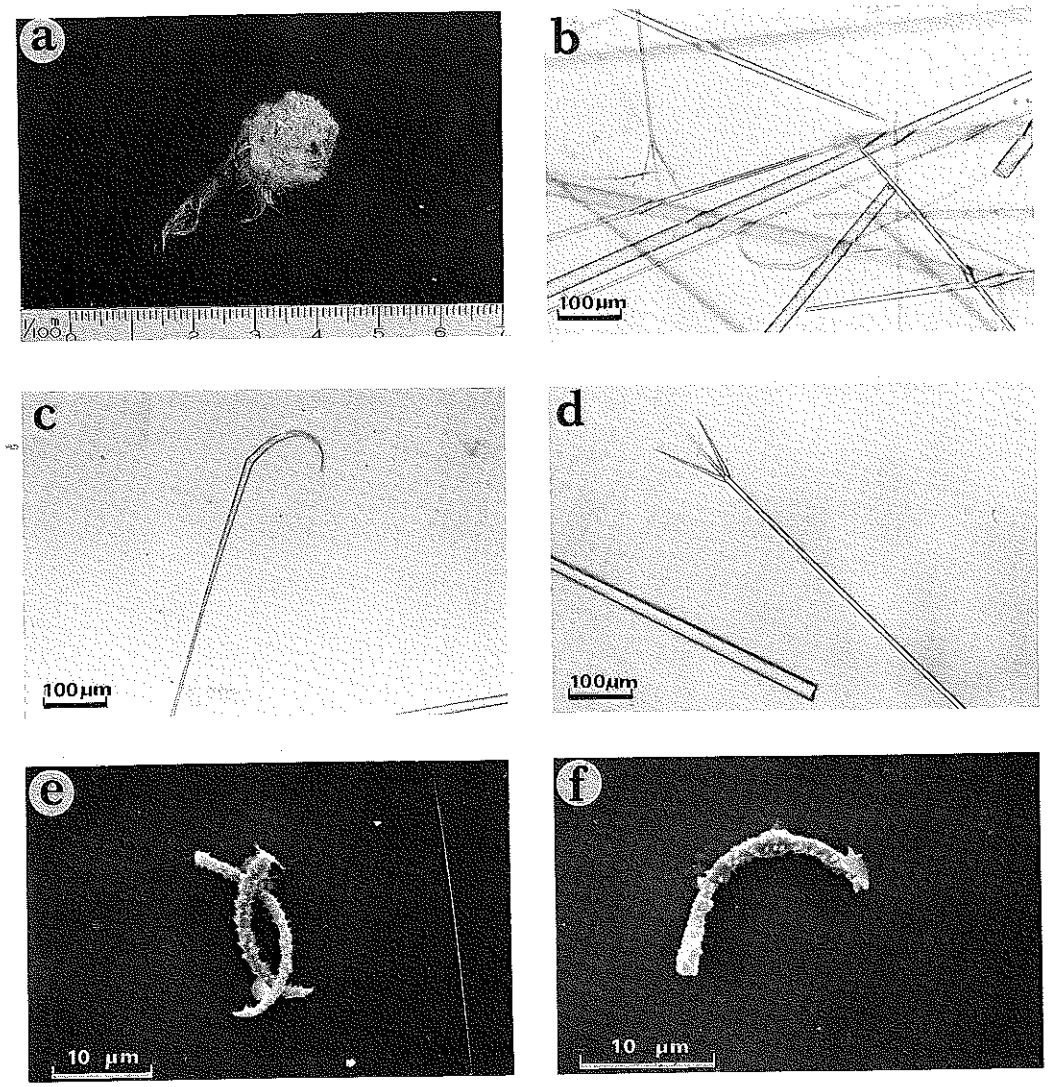

Fig. 4. *Craniella ellipsoida* Hoshino: a. entire animal; b, spicules; c, megascleres: anamonaene; d, protriaene; e-f, microscleres: sigmaspire.

Order 3. Lithistida Schmidt, 1870 리티스티다해면목

Family 4. Theonellidae Lendenfeld, 1903 테오넬라과

Genus 4. Discodermia Bocage, 1869 가죽해면속

5. Discodermia tuberosa Dendy, 1921 관가죽해면(신칭) **(Fig. 5).**

Discodermia tuberosa Dendy, 1921, p. 6, pl. 9, fig. 2a-g.

Material examined. Seogwipo (fish net), 9 Feb. 1971.

Remarks. Sponge massive, irregular. Size up to 50 × 35 × 13 mm. Surface uneven and covered with about 0.2 mm thick epidermis. Texture is hard. Colour in spirits is brown.

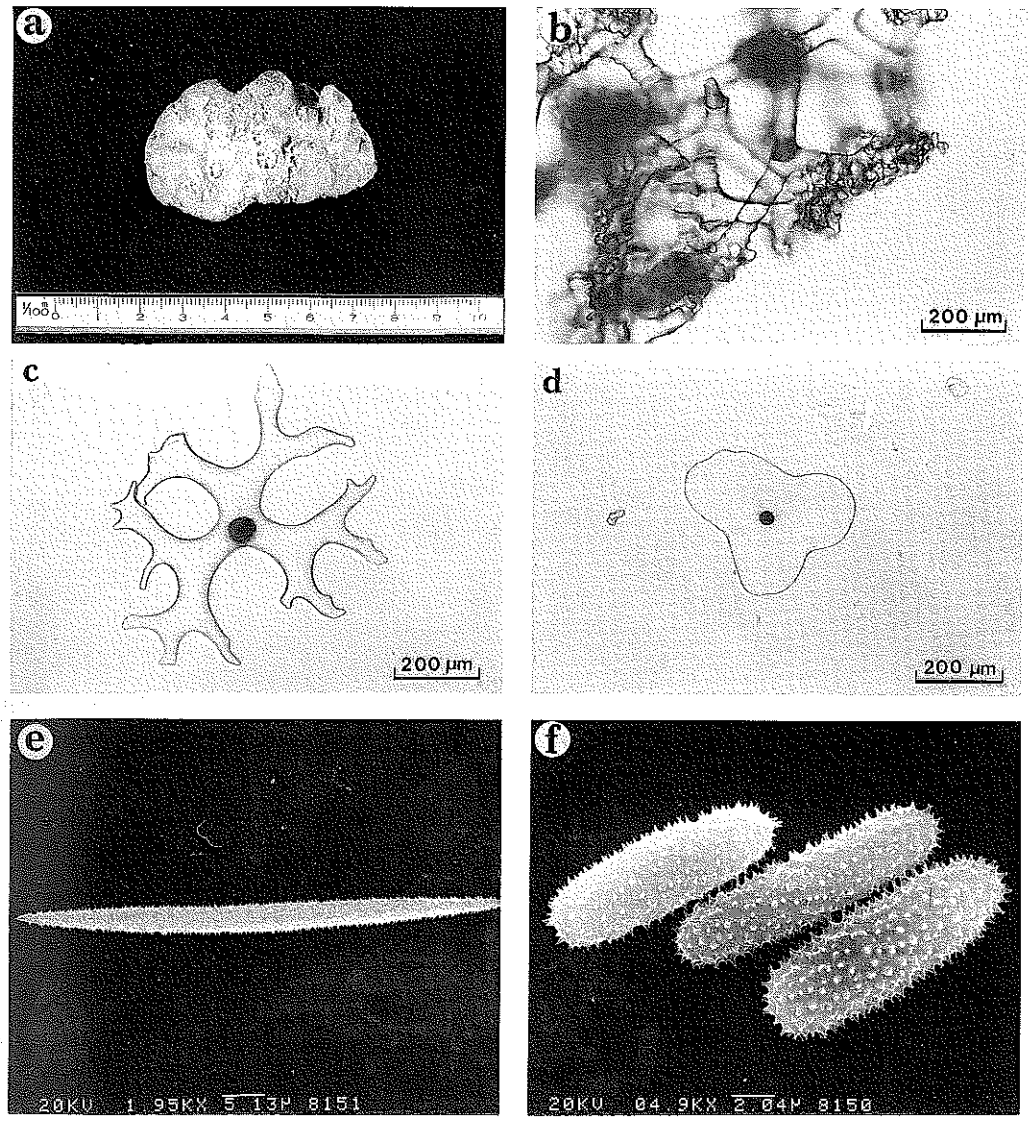

Fig. 5. *Discodermia tuberosa* Dendy: a. entire animal; b, megascleres: desmas; c-d, megascleres: discotriaenes; e. microscleres: microxea; f, megascleres: microstrongyles

Spicules. Megascleres

(1) Tetracrepid desmas ····· 500-750 μm (in diameter)

(2) Discotrianes ····· 180-400 μm

Microscleres

(3) Microxeas ····· 50-60 μm

(4) Microstrongyles ····· 15-20 μm

Distribution. Korea (Cheju Island) and Indian Ocean (Sealark).

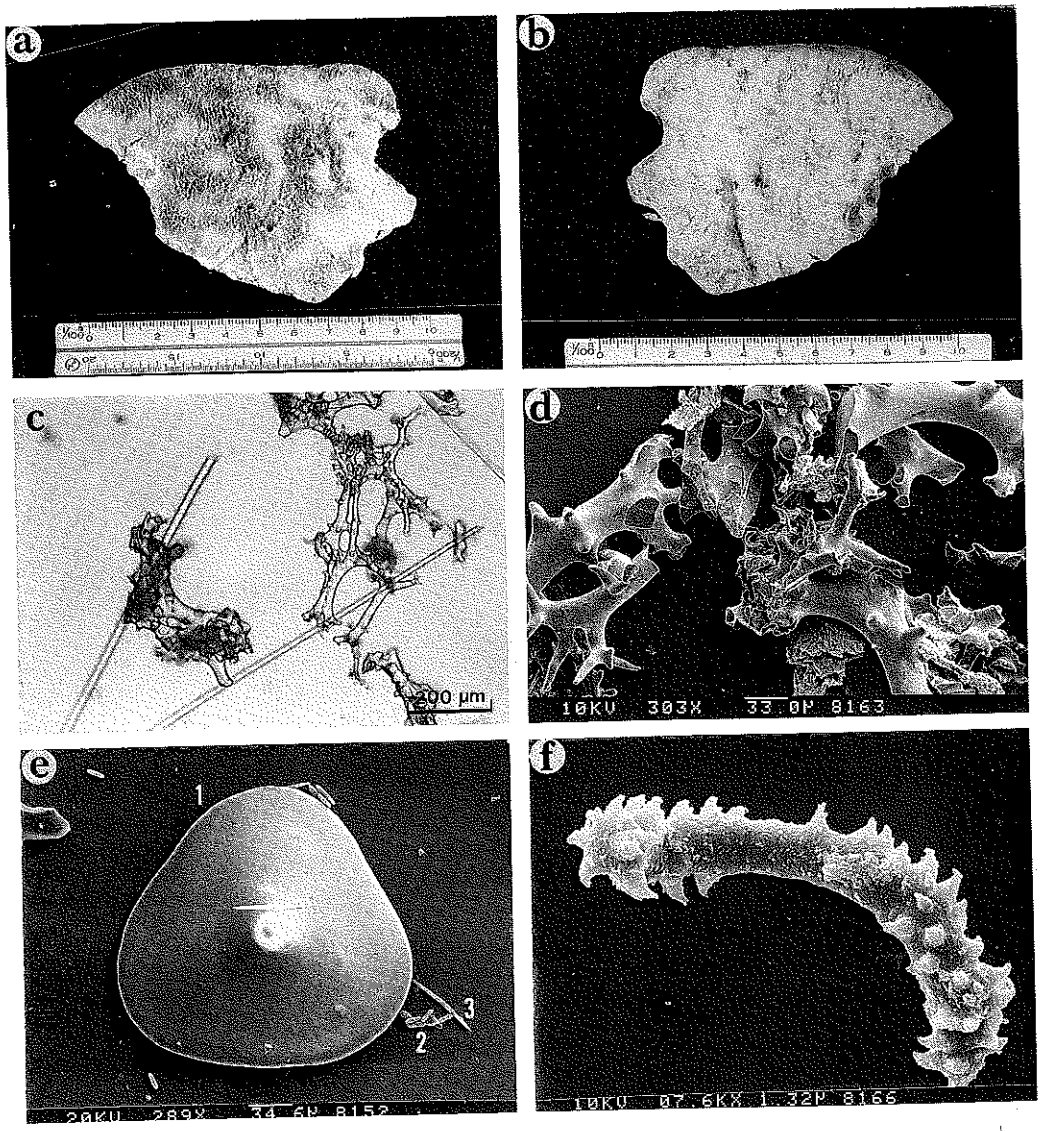

Fig. 6. *Discodermia panoplia* Sollas: a-b, entire animal; c, megasclere: oxea, Desmas; d, megasclere: desmas (SEM); e, megasclere: 1, discotriaene (SEM); microsclere: 2, microstrongles (SEM); 3, microxeas (SEM); f, microsclere: microstrongyle (SEM).

6. *Discodermia panoplia* Sollas, 1888 투구가죽해면(신청) (Fig. 6).

Discodermia panoplia Sollas, 1888, p. 295, pl. 32, figs. 12-25.

Material examined. Seogwipo (SCUBA), Nov. 1992.

Remarks. This sponge is like a plate in form. Size is up to 90 × 73 × 12 mm. Texture is hard and stony. The surface protrudes with a bundle of hairlike spicules. Pores are dispersed on the body. Colour in spirits is beige.

Spicules. Megascleres

(1) Desma ····· 1000 μm (in diameter)

(2) Discotrianes ····· 160-500 μm

(3) Oxeas ····· 600-2000 × 3-9 μm

Microscleres

(4) Microxeas ····· 60-87 μm

(5) Microstrongyles ····· 12.5-15 μm

Distribution. Korea (Cheju Island) and South Papua (Ki Island).

ACKNOWLEDGEMENTS

We would like to thank Dr. Jee H. Jung of the Marine Natural Products Laboratory, Korea Ocean Research & Development Institute, for collecting the materials.

REFERENCES

Dendy, A., 1921. Report on the Sigmatotetraxonida collected by H.M.S. 'Sealark' in the Indian Ocean. Trans. Sinn. Soc. London. **18:** 1-164.

Dendy, A., 1924. Porifera. Part I: Non-Antartic sponges, British Antarctic (Terra Nova) Expedition, 1910. Brit. Mus. Nat. Hist, Zool., **7**(3): 269-392.

Hoshino, T., 1982. Description of the dominant species of the class Demospongia dredged from the coastal area of the Izu Peninsula, Sagami Bay. Mem. Natn. Sci. Mus. (Tokyo), **15:** 140-148.

Koltun, V.M., 1966. Four rayed sponges of the north and Far Eastern seas of the U.S.S.R. (Otriad Tetraxonida). Opred. Faune SSSR, Zool. Inst. Acad. Nauk SSSR, **90**: 1-107 (in Russian, translated into English in 1971).

Sim, C.J., 1981. A systematic study on the marine sponges in Korea. 1. Ceractinomorpha and Tetractinomorpha. Soong Jun Univ., Essays & Papers, **11:** 83-105.

Sim, C.J., 1982. A taxonomic study on the marine sponges in Korea. 4. Choristida (Geodiidae). Korean J. Zool., **25(1):** 1-8.

Sim, C.J., H.Y. Kim and H.S. Byeon, 1990. A systematic study on the marine sponges in Korea. 8. Tetractinomorpha. Korean J. Syst. Zool., **6**(1): 123-144.

Sim, C.J. and H.S. Byeon, 1991. A systematic study on the marine sponges from the Sorth Sea of Korea -Three new record for Korea-. Korean J. Syst. Zool., **7**(1): 111-116.

Sim, C.J ., Y.S. Kim and Y.H. Kim, 1992. Systematic study on marine sponges in Korea. 10. Demosponges of Cheju Island. Korean J. Syst. Zool., **8**(2): 301-324.

Sim, C.J. and Y.H. Kim, 1994. A systematic study of Marine sponges in Korea. 11. Sponges of islets near the coast of Cheju Island. Korean J. Syst. Zool., **10(1):** 17-37.

Sollas, W.J., 1886. Preliminary account of the tetractinillid sponges dredged by H.M.S. Challenger, 1872-1876. Part I: The Choristida. Sci. Proc. R. Dublin Soc., **5:** 177-199.

Sollas, W.J., 1888. Report on the Tetractinellida collected by H.M.S. Challenger, during the years 1873-1876. Rep. Challenger, Zool., **25:** 1-458.

RECEIVED: 12 May 1995
ACCEPTED: 12 June 1995

한국산 해산 해면류의 계통분류학적 연구
12. 사축해면류(해면동물문: 보통해면강)

심 정 자·김 영 아
(한남대학교 이과대학 생물학과)

요 약

본 연구는 1992년부터 1994년까지 제주도, 청산도 거문도, 동해의 근덕 등에서 채집된 재료와 한남대 생물학과에 보관되어 있던 해면동물들을 동정 분류한 결과 5과 5속 6종이 분류되었고 이중 2종은 신종으로 밝혀져 자세한 기록과 도판을 첨가하였으며 나머지 4종은 한국미기록종이었다.