

A Systematic Study on the Korean Anthozoa
10. Antipatharia (Hexacorallia)

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韓國產 珊瑚蟲類의 系統分類學的 研究
10. 角珊瑚類(六放珊瑚 亞綱)

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摘 要

韓國產 산호충류 중 각산호류의 계통분류학적 研究를 하기 위하여 1965년부터 1986년까지 南韓의 三面沿岸과 여러 島嶼地方을 조사하였으나, 黃海 남부의 紅島, 南海 서부의 泗水島, 巨文島와 濟州島 海域(9個 地域)의 총 12個 地域으로부터 51개체가 채집되어 이들을 同定分類하였다. 그 결과 1科 2屬 3種이 밝혀졌으며 이 중 실해송(*Cirripathes anguina*)과 긴가지해송(*Antipathes lata*)은 韓國未記綠種이었다.

Key words: Systematic, Anthozoa, Antipatharia, Korea.

INTRODUCTION

The Antipatharia (The black or thorny corals) are colonial anthozoans characterized by a black, spiny and keratinlike axis. They are harvested commercially for jewelry, and an ancient belief that wearing pieces of its skeleton benefits the health gave this group its scientific name.

On the Korean antipatharians, Kamita and Sato (1941) recorded only one species, *Antipathes japonica* Brook which appeared in *Nomina Animalium Koreanorum III* (The Zoological Society of Korea, 1971).

For the faunal study of Korean antipatharians, the collections of them had been attempted at a lot of localities along the coasts of South Korea during the period from 1965 to 1986, but they were collected from Hongdo in the southern part of the Yellow Sea, and Kōmundo, Sasudo and Cheju

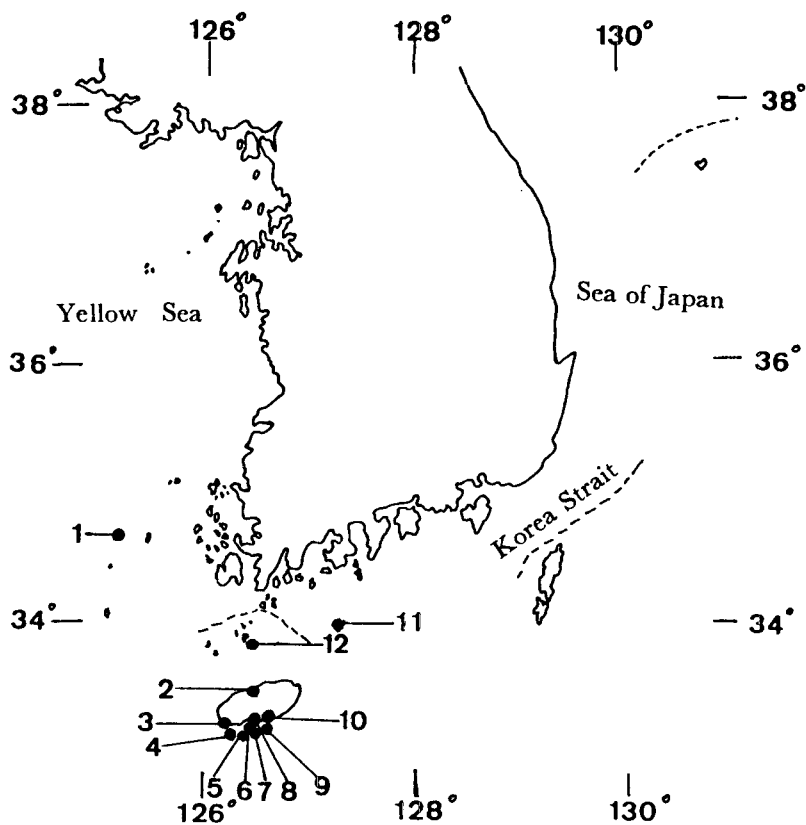


Fig. 1. A map showing localities where the specimens were collected. 1, Hongdo (紅島); 2, Cheju (濟州); 3, Mosulp'o (慕瑟浦); 4, Kapado (加波島); 5, Bōmdo (虎島); 6, Chodo (鳥島); 7, Mundo (蚊島); 8, Sōgwip'o (西歸浦); 9, Sōpdo (森島); 10, Wimi (爲美); 11, Kōmundo (巨文島); 12, Sasudo (泗水島).

Island of the South Sea (Fig. 1). The samplings were made from the depth of 15-100 m by SCUBA diving and/or fishing nets. The small ones and fragments of them were preserved in 70-80 percent alcohol while most of the large colonies were dried.

For the identification of the specimens, the examinations were focused on the following characters: the growth form of the corallum, the mode of branching, the size and shape of the polyps and the spines, and the arrangement of the spines on the axis. The sclerenchyme and polyps were measured with an ocular micrometer.

The antipatharians identified in the present study turned out to be three species, two genera and one family, of which two species are newly recorded in Korean waters. Three species are described with figures and plate figures. The terminology follows that given by Brook (1889), van Pesch (1914) and Opresko (1972). The specimens are deposited in the Natural History Museum and the Department of Biology, Ewha Womans University.

SYSTEMATIC ACCOUNTS

Order Antipatharia Milne Edwards & Haime, 1857 각산호 목

Colonial Hexacorallia, possessing a continuous horny sclerobasic axis, which consists of thin concentric lamellae usually enclosing a central canal. The coenenchyme always thin, never contains any spicules, and consists of the fused bases of the zooids.

Family Antipathidae Verrill, 1865 해송 과

The individual zooids have typically six simple tentacles, which are contractile, but never retractile. Six primary mesenteries are always present, two of which occupy the transverse axis and bear the reproductive organs. There may be six or four secondary mesenteries which are always short.

Subfamily Antipathinae Brook, 1889 해송 아과

The six simple tentacles are springing from the peristome, or two, in the sagittal axis, may be inserted at a lower level. Zooids either radiate, oval and biradiate, or much elongated in the transverse axis.

Section Indivisae Brook, 1889 민가시해송 절 (신칭)

Corallum a simple flagellate stem, entirely without branches.

Genus *Cirripathes* Blainville, 1834 신태송 속 (신칭)

Polyps disposed all around the stem or leaving one side of the axis free.

1. *Cirripathes anguina* (Dana, 1846) 신태송 (신칭) (Pl. 1, figs. 1-6)

Antipathes anguina Dana, 1846, (p. 576).

Cirripathes anguina: Brook, 1889, (pp. 84-85); Silberfeld, 1909b, (p. 10); Pax, 1932, (pp. 407-408, 444-445).

Cirripathes propingua Brook, 1889, (pp. 82-83, pl. 10, figs. 9-13, pl. 12, fig. 14, pl. 14, fig. 7).

Cirripathes densiflora Silberfeld, 1909a, (p. 762); 1909b, (p. 10); Carlgren, 1940, (p. 15).

Cirripathes (Eucirripathes) anguina: van Pesch, 1914, (pp. 146-153, text-figs. 203-205, pl. 8, figs. 3-4, 7).

Cirripathes anguinus: Bayer, 1959, (p. 229).

Material examined: One specimen, Wimi, July 8, 1972(B.J.Rho); two sps., Cheju, July, 1986 (Cheju N. H. M.), with fishing nets.

Description: The colonies are unbranched, straight or curved, and the largest one shows an open S-shaped loop in the top part. The axis has distinct nodes every 0.5-1.5mm. Spines are 198-365 μ in length, arranged in 12-14 longitudinal rows which are slightly spiral round the axis. They are no conspicuous difference in length on opposite sides of the axis. The mutual distance of the spines is 336-720 μ , which value is variable. The shape is acute or blunt conical with slightly granulated top, and they are at right angles with the axis or distally inclined.

The polyps are \emptyset to 1 cm, 1.25 \times 2.00-1.58 \times 2.48mm, situated at every side of the axis except for a narrow streak on one side of the axis. The sagittal tentacles are inserted at a greater distance from the oral cone than the lateral ones. The oral cone has a elongated slit-like mouth. Between the polyps the cross-grooves in the coenenchyme are seen with a number of fine grooves which alternately converge and diverge.

In color, axis is black in the lower part and brown in the upper part, tip of spine brown, polyp dirty white in alcohol.

Measurements:

	Wimi	Cheju(1)	Cheju(2)
Hight of corallum(cm).....	47.....	194.....	140.....
Basal stem diameter(cm).....	2.....	7.5.....	4.....
Length of spines(μ).....	198-365.....	198-297.....	198-396.....
Mutual distance of spines(μ).....	336-720.....	165-336.....	264-495.....

Remarks: This species is new to Korean waters. The present specimens agree in general with van Pesch's(1914) description except the size of spines which is relatively long.

Distribution: Korea(Cheju Is.), Japan(Uraga Channel), Fiji, N. Guinea, Ambon, Anchorage, Seychelles, Nilanda, Billiton, Ceylon, Cape Moresby, Suvadiva Atoll, Red Sea.

Section Ramosae Brook, 1889 가지해송 절(신칭)

Corallum branched, with or without confluence of branches.

Genus *Antipathes* Pallas, 1766 해송 속

Polyps large, rounded. Tentacles in the sagittal axis inserted much lower than the others. Colony sparsely to densely branched, branches simple or pinnulate. Spines strong and usually numerous.

Key to the species of *Antipathes*

- A. Pinnule short(average 7 mm), extending out wide angle (45°-55°) to ultimate branches
 *Antipathes japonica* 해송
- B. Pinnule long(average 15 mm), extending out narrow angle (30°-40°) to ultimate branches
 *Antipathes lata* 긴가지해송(신칭)

2. *Antipathes japonica* Brook, 1889 해송 (Pl. 2, figs. 1-6)

Antipathes japonica Brook, 1889, (pp. 169-170, pl. 11, fig. 25) Silberfeld, 1909b, (pp. 26-27); Pax, 1932, (pp. 407-408, 445-447); Opresko, 1974, (p. 49).

Antipathes bifaria Brook, 1889, (p. 170, pl. 11, fig. 20); Opresko, 1974, (p. 49).

Antipathes (Euantipathes) japonica: van Pesch, 1914, (pp. 50-52, text-figs. 25-28).

Material examined: Two sps., Bömdo, Feb. 7, 1971(B. J. Rho); two sps., Sögwip'o, Nov. 30, 1978(J. I. Song); six sps., Mundo, Dec. 3, 1978(J. I. Song); two sps., Sögwip'o, July 13, 1979(B. J. Rho); one sp., Bömdo, May 21, 1982(J. I. Song); one sp., Chodo, Apr. 9, 1984(Cheju Univ.); one sp., Mösulp'o, Jan. 17, 1985(J. H. Park); six sps., Mundo, July 13, 1985(J. I. Song); two sps., Kapado, Jan. 17, 1985(B. J. Rho); one sp., Cheju, July, 1986(Cheju N. H. M.), 20-100 m depth, by SCUBA diving and fishing nets.

Description: The largest colony attains 125cm, 100cm wide, 9cm thick, and 2cm in the basal diameter of the stem. The corallum is branching in a plane, excepting the short setose pinnules. Secondary branches are inserted antero-laterally, at an angle of over 45° with the axis, and afterward their course is more horizontal, while their top is curved upwards again. The length of branches is variable, ultimate branches 10-22mm long with 4-12mm long pinnules. The mode of insertion of the pinnules on ultimate branches is characteristic, at the angle of 45°-55° to ultimate branches and almost horizontal to the plane of corallum(Fig. 2, a-d).

The spines are 165×45-255×65 μ , subequal on every side of the axis, and arranged in five longitudinal rows. The mutual distance is 45-120 μ , and the spines do not perforate the polyps. They are inclined distally with a concave distal side and a convex proximal one, and slightly granulated at the top. On the older parts of the axis the spines become more slender, aculeate, and sometimes branched.

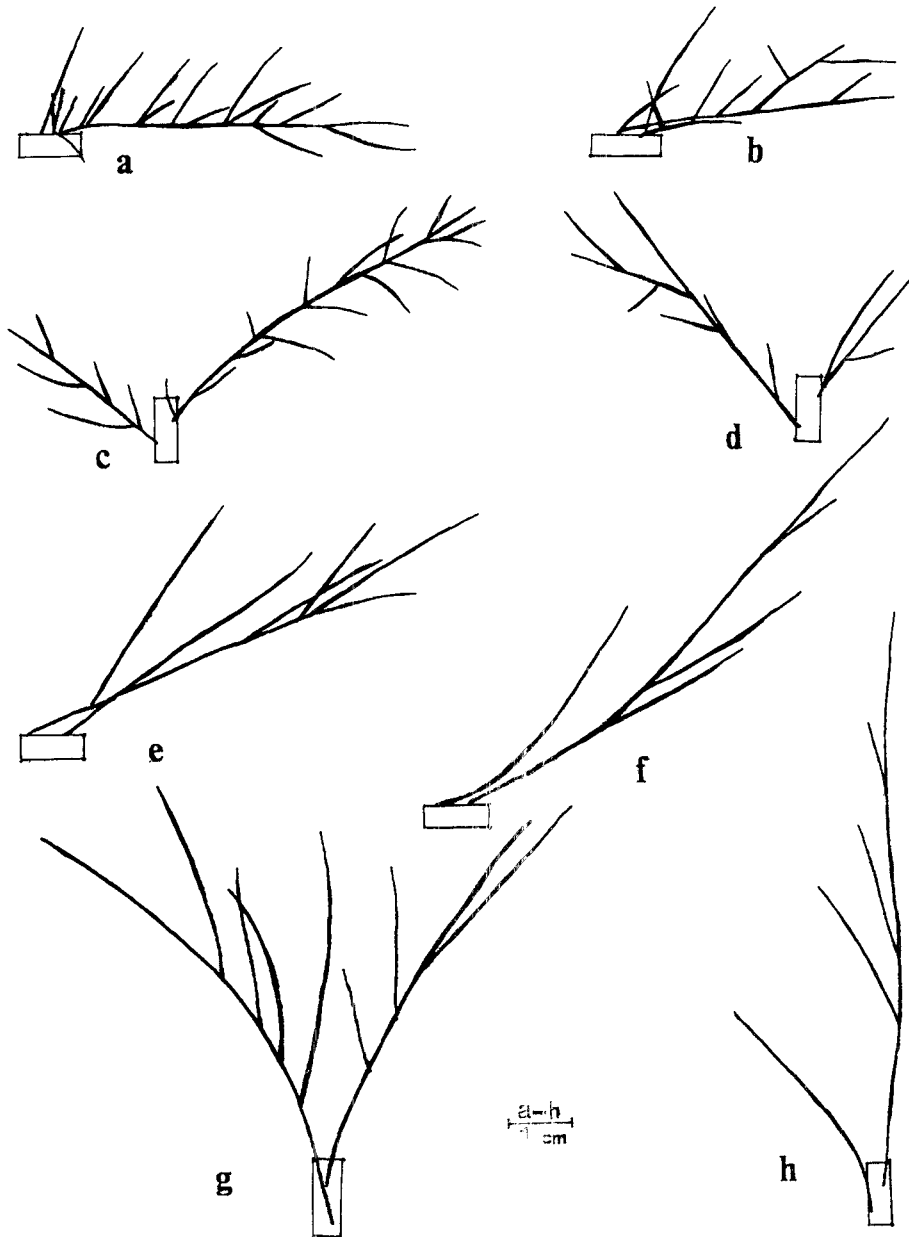


Fig. 2. a-d, Pinnules of *Antipathes japonica*: a, lateral view, from young colony; b, lateral view, from old colony; c, frontal view, from young colony; d, frontal view, from old colony. e-h, Pinnules of *Antipathes lata*: e, lateral view, from young colony; f, lateral view, from old colony; g, frontal view, from young colony; h, frontal view, from old colony.

The polyps are limited to one surface of the branches, oriented at a right angle to the length of the branches. The dome-shaped oral cone is 336-395 μ , and has an elongated mouth. The sagittal tentacles are inserted at a slightly lower level than the lateral ones.

Distribution: Korea (Cheju Is.), Japan (Sagami Bay, Enoshima), Formosa.

3. *Antipathes lata* Silberfeld, 1909 긴가지 해송 (신칭) (Pl. 3, figs. 1-6)
Antipathes lata Silberfeld, 1909a (p. 761); 1909b, (pp. 22-23, pl. 2, fig. 3); van Pesch, 1914, (p. 7); Pax, 1932, (pp. 407, 445-447).

Antipathes japonica: Kim and Kim, 1985, (p. 191); 1986, (p. 316).

Material examined: One sp., Cheju, July 8, 1965 (H. S. Kim); two sps., Sögwip'o, July 11, 1965 (B. J. Rho); one sp., Kōmundo, Oct. 10, 1965 (B. J. Rho); one sp., Söpdō, Feb. 15, 1976 (J. I. Song); three sps., Hongdo, July 20, 1978 (B. J. Rho); three sps., Mundo, Dec. 3, 1978 (J. I. Song); two sps., Söpdō-Mundo, May 22, 1982 (J. I. Song); one sp., Chodo, Apr. 9, 1984 (Cheju Univ.); two sps., Kōmundo, July 13, 1984 (H. S. Kim); one sp., Mostūlp'o, Jan. 17, 1985 (J. H. Park); one sp., Kapado, June 16, 1985 (B. J. Rho); four sps., Mundo, July 13, 1985 (J. I. Song); one sp., Sasudo, July 16, 1985 (H. S. Kim); one sp., Cheju, July, 1986 (Cheju N. H. M.), 15-100 m depth, by SCUBA diving and fishing nets.

Description: The largest colony attains 70cm high, 83cm wide, 20cm thick, and 2cm in the basal diameter of the stem. The corallum is densely branching, thicker than *Antipathes japonica* in the thickness of plane. Branches have slender branchlets and ultimate branches which pinnules arranges biserially. The length of branches is variable, and ultimate branches 12-42mm long with 10-22mm long pinnules. The pinnules are branching at the angle of 30°-40° to ultimate branches and the angle is decreasing to 3°-15° in the higher branches. They are inserting at the angle of 10°-30° to the plane of corallum (Fig. 2, e-h).

The spines are 135×45-155×65 μ, subequal on every side of the axis, and arranged in five longitudinal rows. The mutual distance is 45-105 μ, and the spines do not perforate the polyps. The shape of spines is straighter and obtuse at the top in comparing with *Antipathes japonica*. On the older parts of the axis the spines become more slender and aculeate.

The polyps are arranged in a single series, oriented at a right angle to the length of the branches. The dome-shaped oral cone is 390-495 μ, and has a elongate mouth.

In color, axis is dark brown, polyp and coenenchyme light pink but white with milky white spots in alcohol.

Remarks: This species is new to Korean waters. *Antipathes japonica* reported by Kim and Kim (1985, 1986) is corrected to *Antipathes lata* by the reexamination of specimens.

Distribution: Korea (Southern part of Yellow Sea-Western part of South Sea), Japan (Misaki).

DISCUSSION

On the Korean antipatharians, Kamita and Sato (1941) recorded one species, *Antipathes japonica* from Inchon Bay, but the record is very doubtful, because in Korea the species is distributed only in Cheju Island as a subtropical species. *Antipathes japonica* reported by Kim and Kim (1985, 1986) must be corrected to *Antipathes lata* as a result of reexamining the specimens.

The thorny corals newly recorded in Korean waters by the present study are *Cirripathes anguina* and *Antipathes lata*. *Cirripathes anguina*, which is widely distributed in the tropical and subtropical

region of the Pacific and the Indian Ocean, occurs only in Cheju Island in Korea. On the other hand *Antipathes lata*, which has been known from Japan, is distributed at Hongdo in the southern part of the Yellow Sea, and Kōmundo, Sasudo and Cheju Island in the western part of the South Sea.

ABSTRACT

The antipatharians were collected at Hongdo in the southern part of the Yellow Sea, and Kōmundo, Sasudo and Cheju Island (9 localities) in the South Sea during the period from 1965 to 1986. The thorny corals identified in the present study turned out to be three species, two genera and one family, of which two species, *Cirripathes anguina* and *Antipathes lata* are newly recorded in Korean waters. In Korea, the former was found only in Cheju Island and the latter is distributed in the southern part of the Yellow Sea and in the western part of the South Sea.

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EXPLANATION OF PLATES 1-3

PLATE 1

Figs. 1-6. *Cirripathes anguina* (Dana, 1846).

1. A young colony with bryozoans in the middle part.
2. Upper part of axis, showing the arrangement of spines.
3. One spine on the upper part of axis.
4. Three polyps on the lower part of axis.
5. Lower part of axis, from old colony.
6. Two old colonies.

PLATE 2

Figs. 1-6. *Antipathes japonica* Brook, 1889.

1. Anterior surface of a small colony.
2. Posterior surface of a small colony.
3. Polyps on a pinnule.
4. A part of pinnule, showing the arrangement of spines.
5. Spines on the older part of branches.
6. A large colony.

PLATE 3

Figs. 1-6. *Antipathes lata* Silberfeld, 1909.

1. Anterior surface of a small colony.
2. Posterior surface of a small colony.
3. Spines on the older part of branches.
4. Polyps on a pinnule.
5. A part of pinnule, showing the arrangement of spines.
6. A large colony.

PLATE 1

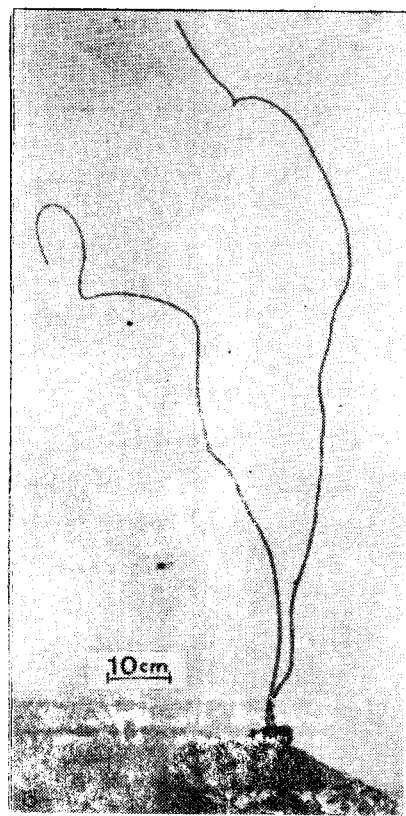
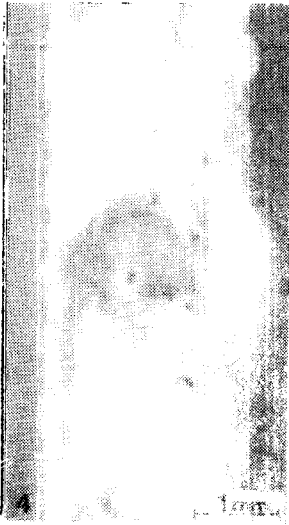
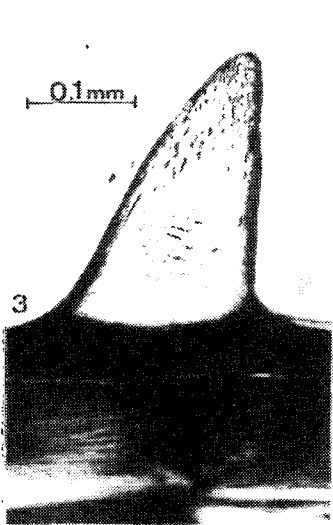
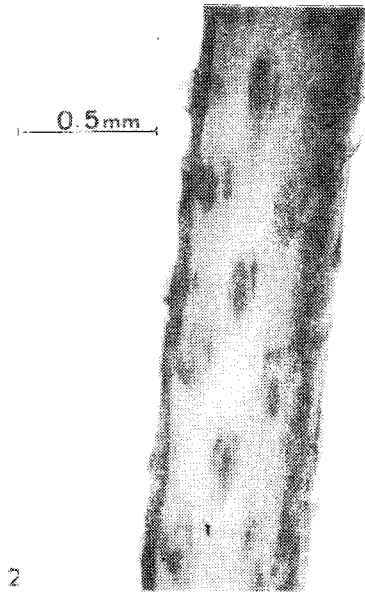
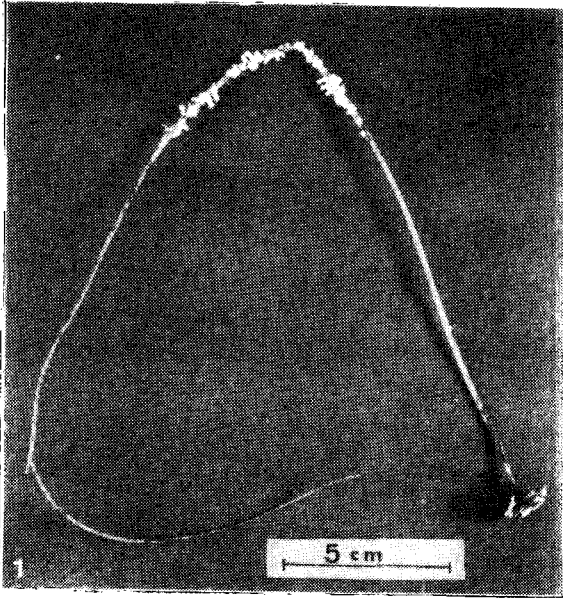


PLATE 2

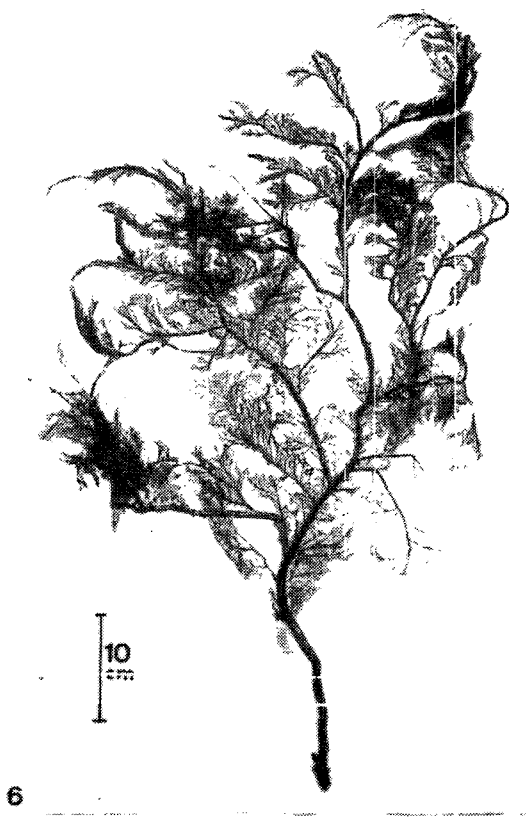
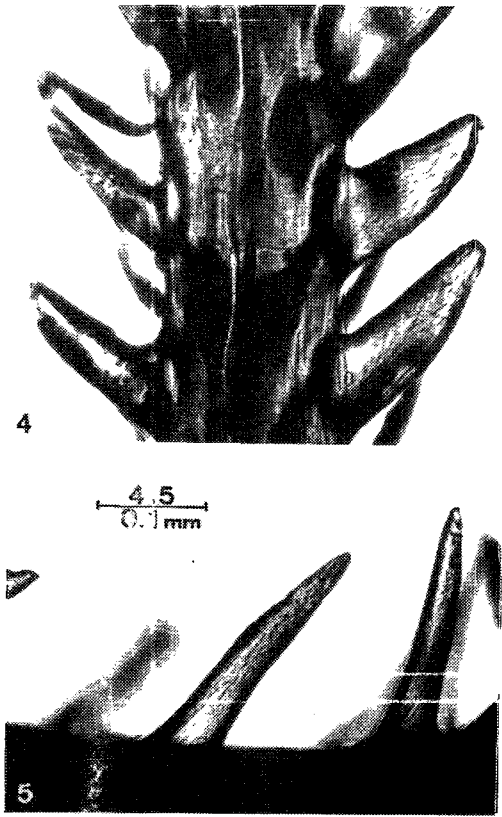
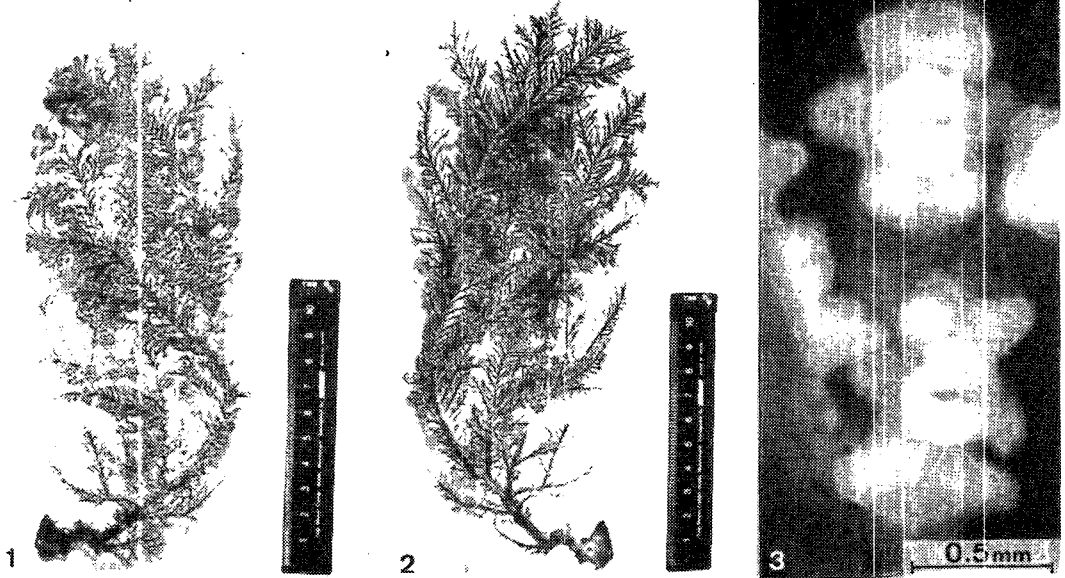


PLATE 3

