

Notes on Six Smittinid Bryozoans (Gymnolaemata: Cheilostomata) from Korea

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ABSTRACT

Six smittinid species were identified from Korean waters. Two of which were previously recorded in the Korean bryozoan fauna are reviewed. *Parasmittina raigii* (Audouin, 1826) reported from Gwabutan, Jeju Island is re-examined and reidentified as *Parasmittina serrula* Soule and Soule, 1973, which is new to the Korean fauna. *Smittoidea reticulata* (MacGillivray, 1847) is reported as species which doesn't occur in the Pacific Ocean. Accordingly, *Smittoidea reticulata* should be deleted from the Korean bryozoan fauna and the Korean specimen identified as *Smittoidea reticulata* is synonymous with *Smittoidea pacifica* Soule and Soule, 1973. Fourteen smittinid bryozoans from Korea are thus recorded so far.

Key words: Taxonomy, Smittinidae, Bryozoa, Korea

INTRODUCTION

The species belonging to the bryozoan family Smittinidae show the wide range of morphological variations. Many smittinid species are thus causing the confusion of synonymy. Harmer (1957) redescribed the taxon *raigii* Audouin, 1826 and European *Smittoidea reticulata* (MacGillivray, 1847) which was based on misidentifications. However, his synonymies were often too all-embracing (Ryland and Parker, 1994).

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Recently, comparative morphological studies on bryozoans have been greatly advanced by the use of scanning electron microscope, with significant consequence for taxonomy and classification (Hayward and Parker, 1994; Seo, 2002a).

Fifteen smittinids were reported from Korean waters so far (Rho and Lee, 1981; Rho and Kim, 1981; Song, 1985; Rho and Seo, 1986; Seo, 1993, 2002a, b). They are as follows: *Smittina landsborovii*, *S. malleolus*, *S. marsupium*, *Parasmittina areolata*, *P. contraria*, *P. crosslandi*, *P. delicatula*, *P. elongata*, *P. pyriformis*, *P. raigii*, *P. triangulis*, *Smittoidea levis*, *S. pacifica*, *S. prolifica* and *S. reticulata*.

This work is a part of systematic study of Korean Smittinidae. Some smittinid species were re-examined to solve the problems of doubtful and confusing identities. First of all, *Parasmittina raigii* has a very wide range of morphological variations within species and *Smittoidea reticulata* is likely to be found only in the Atlantic Ocean. Soule and Soule (1973) discussed these two species with their Hawaiian materials and Ryland and Hayward (1992) subsequently reported them with Heron Island's specimens, Great Barrier Reef. Besides, Hayward and Parker (1994) selected the neotype of *Parasmittina raigii* with the specimen from Egypt, thus stabilized the taxon *raigii* Audouin.

The purpose of this study is to clarify the synonymy in Korean *Parasmittina raigii* and *Smittoidea reticulata* with the addition of collection localities in the rest of four smittinid species.

The materials examined have been collected from six localities (Wadol-ri, Mipo, Gimyeong, Seogwipo, Chagwido, Gyokpo) of Korean waters from 1974 to 1997.

RESULTS

Phylum Bryozoa Ehrenberg, 1831 태형동물문
Class Gymnolaemata Allman, 1856 나후강
Order Cheilostomata Busk, 1852 순구목
Suborder Ascophora Levinsen, 1909 유낭아목
Family Smittinidae Levinsen, 1909 입이끼벌레과
Genus *Smittina* Norman, 1903 입이끼벌레속

***Smittina landsborovii* (Johnston, 1847) 배입이끼벌레**

Previous records in Korea. Wolseong, 9 Jun. 1985.

Material examined. Mipo (Busan), 12 May 1974 (B. J. Rho), on dead coral; Mipo (Busan), 22 Jun. 1985 (J. E. Seo), on shell; Gyokpo, 3 May 1997 (J. E. Seo), on shell.

***Smittina malleolus* (Hincks, 1884) 해머입이끼벌레**

Previous records in Korea. Mipo, 25 Apr. 1975; Seogwipo, 22 May 1982.

Material examined. Seogwipo (Jeju I.), 9 Jul. 1985 (J. I. Song), on the other bryozoans.

Genus *Parasmittina* Osburn, 1952 측입이끼벌레속

***Parasmittina contraria* Seo, 1993 반향측입이끼벌레**

Previous records in Korea. Seogwipo, 13 Dec. 1969; Seogwipo, 1, 2 Aug. 1970; Supseom, 8 Feb. 1972; Seogwipo, 13 Jul. 1978; Daepo, 16 Jan. 1985; Beomseom, 17 Jan. 1985;

Moseulpo, 18 Jun. 1985; Biyangdo, 19 Jun. 1985; Jeju Port, 21 Jun. 1985; Jisepo, 8 Jul. 1993.

Material examined. Seogwipo (Jeju I.), 13 Jul. 1979 (H. K. Kim); Seogwipo (Jeju I., 15–20 m deep), 9 Oct. 1986; Gimyeong (Jeju I.), 15 Jul. 15 1991 (J. E. Seo). Substrata unknown.

Remarks. The pointed mandibles of avicularia of Seogwipo's specimens show much variation in size.

***Parasmittina elongata* (Okada and Mawatari, 1936) 길죽입이끼벌레**

Previous records in Korea. Mipo, 25 Apr. 1975; Moseulpo, 18 Jun. 1985; Supseom, 14 Jul. 1987.

Material examined. Chagwido (Jeju I.), 23 Oct. 1991 (J. I. Song), on oyster shell.

***Parasmittina serrula* Soule and Soule, 1973 톱니조두체입이끼벌레 (신징)**

Parasmittina serrula Soule and Soule, 1973, p. 386, fig. 3 D-F, Gordon, 1984, p. 96, pl. 35, B-C; Ryland and Hayward, 1992, p. 272, figs. 23 e-f, 24a; Gordon and D'Hondt, 1997, p. 21, fig. 27.

Smittina raigii: Rho and Seo, 1986, pp. 40, 41, pl. 10, figs. 3, 4.

Previous records in Korea. Gwabutan (Jeju I., 3 m deep), 18 Jun. 1985 (H. S. Choi), on the other bryozoans.

Remarks. This species is reviewed with the previous record. The specimen from Gwabutan was redescribed by Rho and Seo (1986) as *Smittina raigii* (Audouin, 1826) with illustrations. Harmer (1957) redescribed *Smittina raigii* by conflating the several similar species after Audouin's original description. It was erroneously identified, because this species shows a variety of morphological structures in the shape of the lyrula and condyles, and avicularia. Fortunately Soule and Soule (1973) distinguished a very wide range of variations of *Parasmittina raigii* with Hawaiian materials and identified them into a few of different species. Additionally, Hayward and Parker (1994) stabilized the taxon *raigii* by selection the neotype of *Parasmittina raigii* from Egypt. My specimen is not similar to this neotype at all. Especially the serration of giant avicularia, which is characteristic in *Parasmittina serrula*, is not shown in *Parasmittina raigii*.

The illustration of *P. serrula* from Philippines shows quite differences from the one of Egypt in both unequal-size and acute triangular shape of paired small avicularia (Gordon and D'Hondt, 1997). The specimen from New Zealand has slender avicularia with finely serrate rostrum, whereas this specimen shows rarely serration. The Korean specimen is rather most similar to Heron's one than the ones of Philippines or New Zealand, in the shape of giant avicularia especially.

Distribution. Korea (Jeju I.); Hawaiian Is.; Belize and Jamaica; Philippines; New Zealand; Heron I.

Genus *Smittoidea* Osburn, 1952 태양입이끼벌레속

***Smittoidea pacifica* Soule and Soule, 1973 태양입이끼벌레**

Smittoidea pacifica Soule and Soule, 1973, pp. 380–382, fig. 1 F-H; Ryland and Hayward, 1992, p. 268, fig. 24 e-f.

Smittoidea reticulata: Seo, 1993, p. 40, pl. 6.

Previous records in Korea. Seogwipo, 13 Apr. 1973; Supseom, 14 Jul. 1987.

Material examined. Wadol-ri (Ulreung I.), 7 Aug. 1992 (J. G. Park), on shell.

Remarks. The Korean specimens are almost identical with descriptions and illustrations of the Heron's and Hawaiian materials. However there is some variation in rostrum's edges, being denticulate in Heron's and Hawaiian materials and smooth in Korean specimens (Soule and Soule, 1973; Ryland and Hayward, 1992). They also show difference from each other in the number of spine. The specimens from Seogwipo and Supseom (Seo, 1993) had four spines in only one zooecium, while no spine was seen in the Ulreung I. material. Also, none was found on both Hawaiian and Heron Island specimens, whereas six spines were seen on one zooecium from the Galapagos's (Soule and Soule, 1973). Ryland and Hayward (1992) explained that Osburn's Galapagos material does not belong to *Smittoidea reticulata*, and is possible not *Smittoidea pacifica* either. They seem to consider it as a different species because of its spines. However, I agree with Soule and Soule (1973) that the specimens from the Galapagos Islands were synonymous with *Smittoidea pacifica* from Hawaii.

Smittoidea reticulata is distributed in the eastern Atlantic region from the Mediterranean to the Barents Sea. In terms of geographical distribution, Soule and Soule (1973) and Ryland and Hayward (1992) mentioned that *Smittoidea reticulata* doesn't seem to occur in the Pacific Ocean. Accordingly, it seems clear that Korean waters should be deleted from the geographical distribution of *Smittoidea reticulata*, which is removed from the Korean bryozoan fauna.

The records from two localities of Jeju Island, Wolseong and Seochon about *Smittoidea pacifica* are very questionable (Rho and Kim, 1981; Song, 1985). The photomicrograph of Rho and Kim (1981) clearly shows median suboral avicularium with round mandible, whereas *Smittoidea pacifica* has pointed suboral avicularium. Song (1985) subsequently cited Rho and Kim (1981) to clarify the change of the species of the fouling animals. *S. pacifica* from Rho and Kim (1981) and Song (1985) thus seems to be misidentified.

Korean *Smittoidea reticulata* is synonymous with *Smittoidea pacifica* Soule and Soule, 1973, thus the specific name of *Smittoidea pacifica* is still included in Korean bryozoan fauna.

Okada (1929)'s description, which its avicularia with an acute mandible pointed downwards, didn't coincide with his illustration that shows round suboral mandible. However, his specimen was lost, thus Japanese *Smittoidea pacifica* is still doubtful.

Distribution. Korea (Jeju I., East Sea); Hawaiian Is.; Galapagos Is.; Heron I.

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한국산 입이끼벌레(태형동물: 나후강: 순구목) 6종

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요 약

한국산 입이끼벌레과에 속하는 6종을 동정하였으며 그 중 2종에 대해 재검토를 하였다. 그 결과 제주도의 과부탄으로부터 보고되었던 라이기입이끼벌레 [*Smittina raigii* (Audouin, 1826)]는 한국미기록종인 톱니조두체이끼벌레 (*Parasmittina serrula* Soule and Soule, 1973)로 재보고한다. 또한 망태양입이끼벌레 [*Smittoidea reticulata* (MacGillivray, 1847)]는 태평양에는 서식하지 않는 종이므로 한국의 태형동물상에서 삭제되고 망태양입이끼벌레로 동정되었던 한국산 표본은 태양입이끼벌레 (*Smittoidea pacifica* Soule and Soule, 1973)로 동종이명처리된다. 따라서 한국산 입이끼벌레류는 14종이 된다.