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Two New Marine Sponges of Genus *Tedania* (Demospongiae: Poecilosclerida: Tedaniidae) from Korea

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ABSTRACT

Two new marine sponges of family Tedaniidae, *Tedania* (*Tedania*) *songakensis* n. sp. and *Tedania* (*Tedania*) *sasuensis* n. sp. were collected from Jeju Island and Chuja Island, Korea between 2004 and 2005. *T.* (*T.*) *songakensis* n. sp. is similar to *T.* (*T.*) *purpurescen* Bergquist and Fromont, 1988 based on its type of spicules, but is distinguished from growth form and size of small onychaetes. The growth form of this species is massive, and is compared with thin encrusting of *Tedania* (*T.*) *purpurescen*. The onychaetes of the new species is twice as long as that of *T.* (*T.*) *purpurescen*. *T.* (*T.*) *sasuensis* n. sp. is closely related to *T.* (*T.*) *connectens* (Brønsted, 1924) in type of spicules. However, it is different in size of onychaetes and growth form. The large onychaetes of new species is larger than that of *T.* (*T.*) *connectens*. The small onychaetes of new species is smaller than that of *T.* (*T.*) *connectens*. The growth form is massive in new species, but thick encrusting in *T.* (*T.*) *connectens*. And *T.* (*T.*) *songakensis* n. sp. is similar to *T.* (*T.*) *sasuensis* n. sp. in growth form. However, the former is widely different from the latter in shape, color and size of all spicules.

Key words: Porifera, Tedaniidae, *Tedania*, new species, Korea

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INTRODUCTION

The genus *Tedania* contains three subgenera; *Tedania*, *Tedaniopsis*, *Trachytedania*. The genus *Tedania* Gray, 1864 (Demospongiae: Poecilosclerida: Tedaniidae) is a large group of sponges, of which about 65 species have been recorded worldwide (Hooper and van Soest, 2002). Six species of genus *Tedania* were already reported from Korean waters (Rho and Sim, 1979; Sim, 1985; Sim et al., 1992; Sim and Kim, 1994; Sim and Lee, 1998). The genus *Tedania* is characterized by ectosomal skeleton composed of tylotes or tornotes with microspined bases forming tangential or paratangential surface tract; choanosomal skeleton composed of styles with smooth or microspined bases, producing reticulate, plumo-reticulate, plumose or dendritic architecture; microscleres is onychaetes. The subgenus *Tedania* is smooth, relatively small styles, occasionally strongylote styles as structural megascleres and microspined tylotes as ectosomal megascleres (Hooper and Van Soest, 2002).

MATERIALS AND METHODS

The sponges were collected from Jeju Island and Chuja Island, Korea between 2004 and 2005 by SCUBA diving. Specimens were fixed in 95% ethyl alcohol or 99.9% absolute alcohol. Spicules and skeleton structures were observed using light microscope (Carl Zeiss Axioskop II) and Scanning Electron Microscope (SEM, HITACHI S-3000N). The identification was made on the basis of external features, shape, structure of skeleton, and size and form of spicules. Thin free-hand section was made with specimen hardened in alcohol using a surgical blade in order to observe the structure of skeleton. Spicules were prepared by dissolving a piece of sponge in sodium hypochlorite and were examined with SEM (Hooper, 1996, Rutzler, 1978). The new specimens are deposited in the Natural History Museum, Hannam University (HUNHM), Daejeon, Korea.

SYSTEMATIC ACCOUNTS

Phylum Porifera Grant, 1836
Class Demospongiae, Sollas, 1885
Order Poecilosclerida Topsent, 1928
*Suborder Myxillina Hajdu, Van Soest and Hooper, 1994
Family Tedaniidae Ridly and Dendy, 1886

****Tedania (Tedania) songakensis n. sp. (Figs. 1-2)**

Type specimen. Holotype (Por. 59), Songaksan (Jeju Island), 6 Dec. 2004 (H. J. Kim) by SCUBA diving, 20 m in depth, deposited in the HUNHM. Five Paratypes (Por. 59-1, 59-2, 59-3, 59-4,

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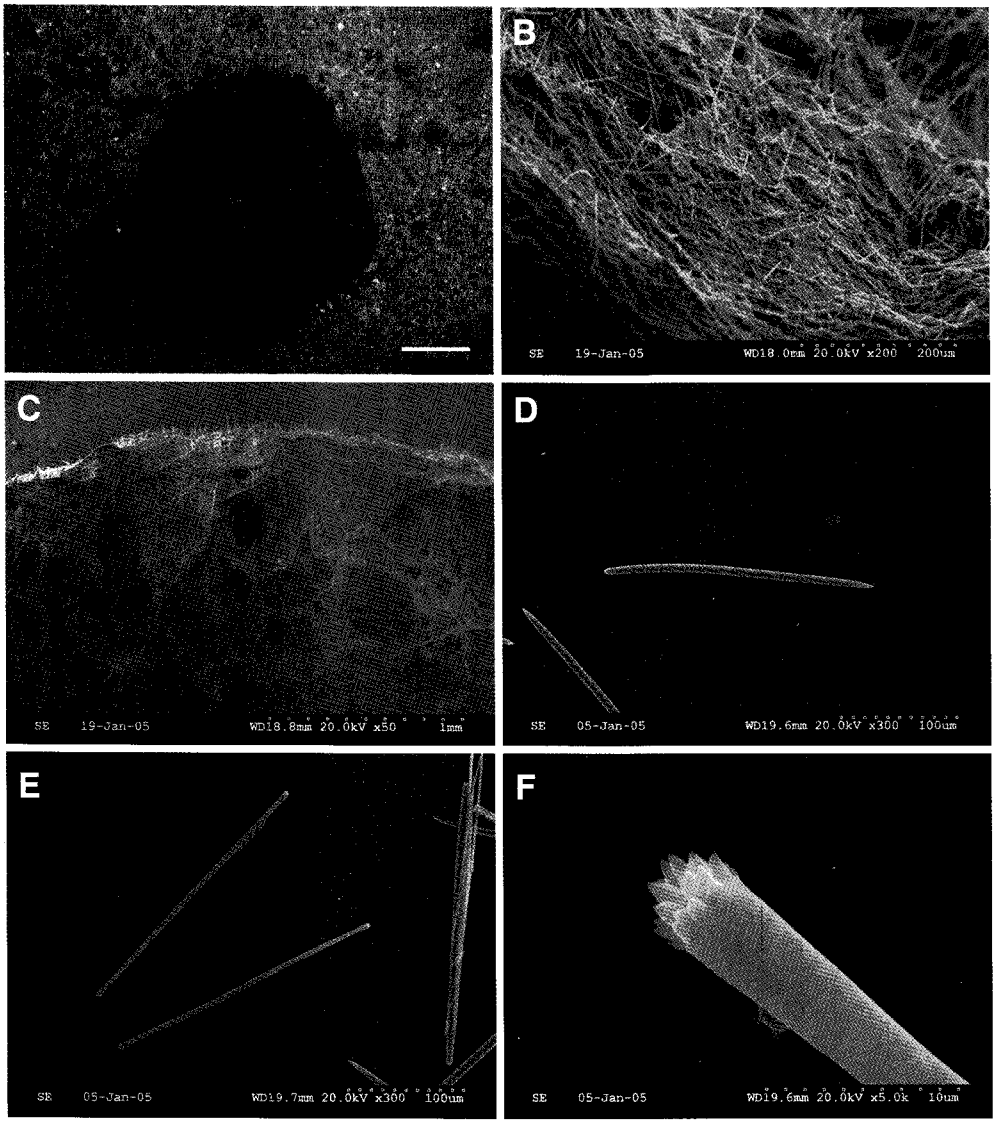

Fig. 1. *Tedania (Tedania) songakensis* n. sp. A, entire specimen; B, surface; C, skeletal structure; D, style; E, subtylotes; F, end of subtylote with spine. Scale bar = 30 mm (A).

59-5) collected with Holotype, deposited in the Department of Biological Sciences, Hannam University, Daejeon, Korea.

Description. This new species massive, sized up to 115 mm wide, 130 mm height and 70 mm thick, loosely attached to rocky substrate. Texture, fragile and little soft. Surface with pointed projection and bumpy. Most solitary oscules, 0.5-1.5 mm in diameter, scattered on surface. Color, red in life, gradually changed to beige in alcohol. Skeleton of ectosome consist of bundles of tylotes and styles, partly tangential, perpendicular or brushes in surface. Skeletal structure in choanosome

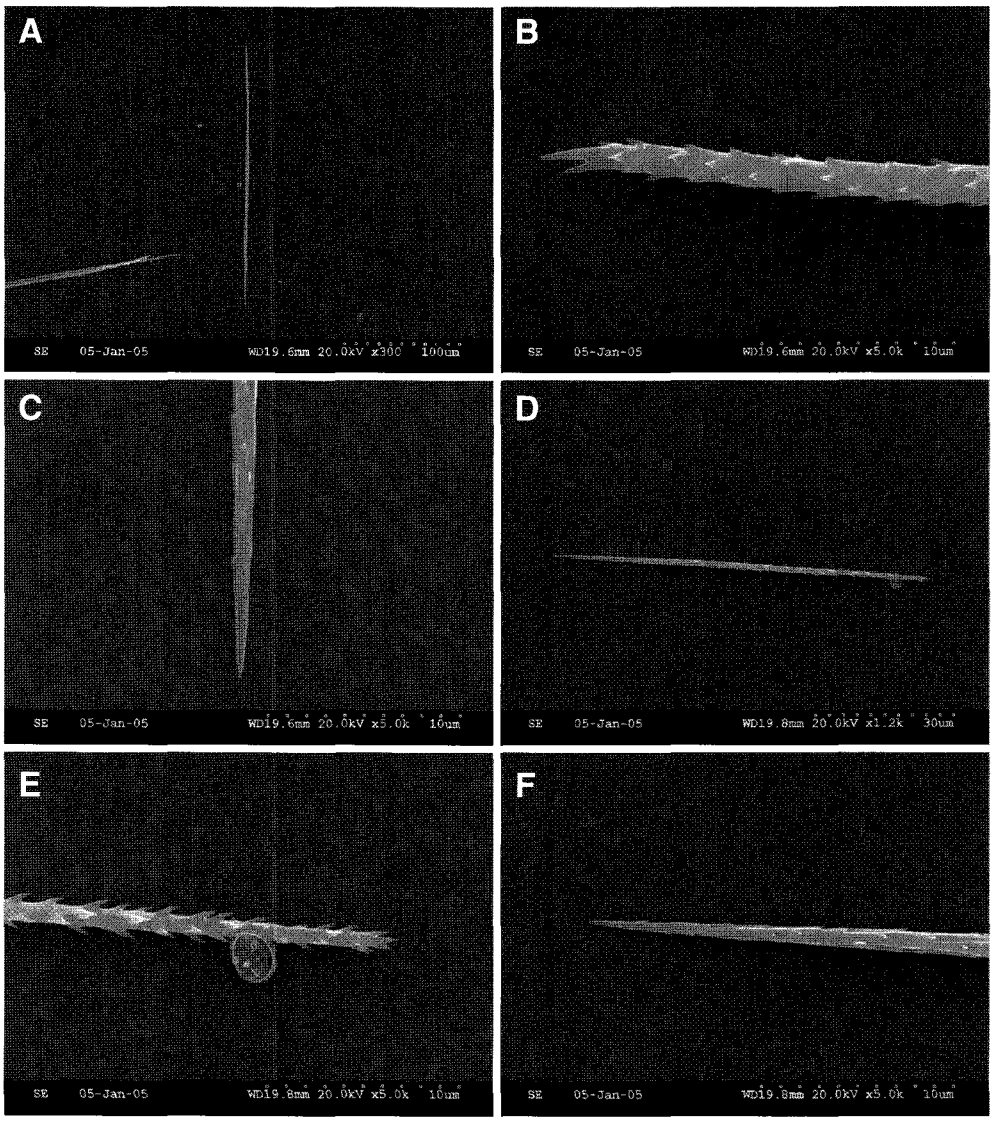

Fig. 2. *T.* (*T.*) *songakensis* n. sp. A, large onychaete (all arround with spine); B, head of large onychaete with spine; C, end of large onychaete with spine; D, small onychaete (all arround with spine); E, head of small onychaete with spine; F, end of small onychaete with spine.

formed multispicular reticulation of style and many spicules loosely arranged in indistinct spongin. Megascleres, slightly curved styles without spine. Subtylotes with small spine at both ending part. Two kinds of onychaetes have spined through whole body. Microscleres absent.

Megascleres

styles ..... 250-300 × 8-10 μm

subtylotes ..... 200-280 × 5-7 μm

Table 1. Comparison between four species of *Tedania* (*Tedania*).

Characters / Species	Spicules (μm)				Growth form onychaetes	Color
	Styles	Subtylotes	Large	Small onychaetes		
Tedania (*Tedania*) *songakensis* n. sp.	250-300 ×8-10	200-280 ×5-7	180-250 ×2-3	68-138 ×2-3	Massive	Red
T. (*T.*) *purpurescen*	230-300 ×4-6.5	270-300 ×3-5	110-133	45-55	Thin encrusting	Dark Purple
T. (*T.*) *sasuensis* n. sp.	370-450 ×10-13	320-350 ×4-7	310-360 ×2-3	50-60 ×1	Massive	Dark Yellow
T. (*T.*) *connectens*	355-430 ×5-10	280-340 ×4-5.5	270-308	70-95	Thick encrusting	Flesh Colored

large onychaetes ..... 180-250 × 2-3 μm
small onychaetes ..... 68-138 × 0.5-1.5 μm

Etymology. This species name, *songakensis*, is named after its type locality.

Remarks. This new species is similar to *Tedania* (*Tedania*) *purpurescen* Bergquist and Fromont, 1988 based on its type of spicules, but the new species is distinguished from growth form and size of small onychaetes. The growth form is massive, comparing with thin encrusting of *T.* (*T.*) *purpurescen*. The onychaetes is twice as long as that of *T.* (*T.*) *purpurescen*'s (Bergquist and Fromont, 1988) (Table 1).

*Tedania (Tedania) sasuensis n. sp. (Figs. 3-4)

Type specimen. Holotype (Por. 62), Sasudo (Chuja Island), 24 May 2005 (H. J. Kim and H. S. Kim), by SCUBA diving, 39 m in depth, deposited in the HUNHM. One Paratype (Por 62-1) collected with Holotype, deposited in the Department of Biological Sciences, Hannam University, Daejeon, Korea.

Description. This species massive, sized up to 115 mm wide, 130 mm height and 70 mm thick, and attached to rocky substrate. Texture, little soft, fragile and easily torn. Surface with thick projection and bumpy rarely. Oscules, 0.3-1.2 mm in diameter, scattered on surface. Color, dark yellow in life, gradually changed to beige in alcohol. Ectosomal skeletal structure of bundles with styles and subtylotes formed partly tangential, perpendicular or brushes in surface. Skeleton of choanosome consist of multispicular reticulation of styles. Megascleres, slightly curved styles without spine. Subtylotes with small spine at both ending part. Two kinds of onychaetes have spined through whole body. Microscleres absent.

Megascleres
styles ..... 370-450 × 10-13 μm
subtylotes ..... 320-350 × 4-7 μm
large onychaetes ..... 300-360 × 2-3 μm

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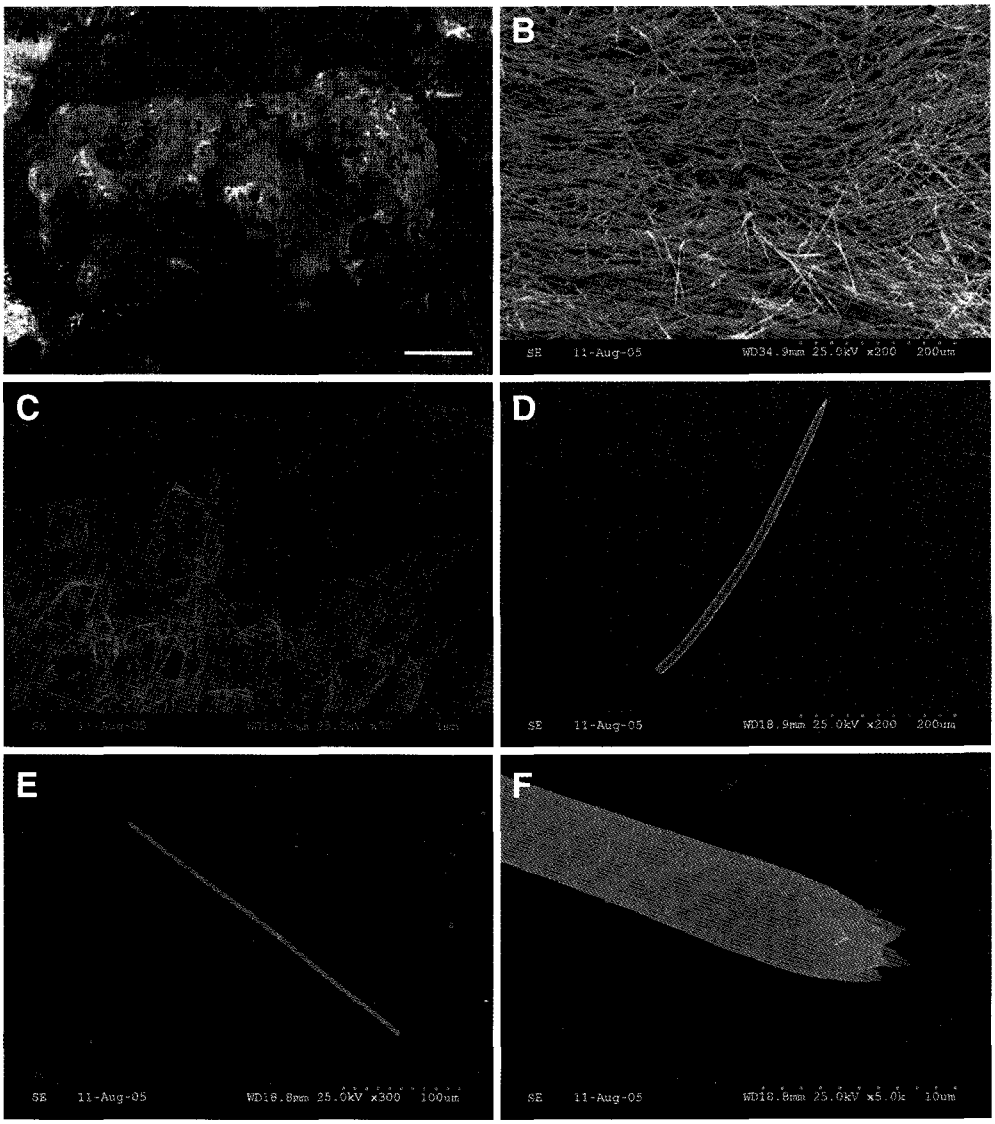

Fig. 3. *Tedania (Tedania) sasuensis* n. sp. A, entire animal; B, surface; C, skeletal structure; D, style; E, subtylote; F, end of subtylote with spine (rare). Scale bar = 20 mm (A).

small onychaetes ..... 50-60 × 1 μm

Etymology. This species name, *sasuensis*, is named after its type locality, Sasudo, Chuja Island.

Remarks. *Tedania (Tedania) sasuensis* n. sp. is closely related to *T. (T.) connectens* (Brønsted, 1924) in the type of spicules. However it is different in size of onychaetes and growth form. The large onychaetes is larger than that of *T. (T.) connectens*. The small onychaetes is smaller than that of *T. (T.) connectens*. The growth form is massive, comparing with thick encrusting of *T. (T.) connectens* (see Bergquist and Fromont, 1988). *T. (T.) songakensis* is similar to *T. (T.) sasuensis*

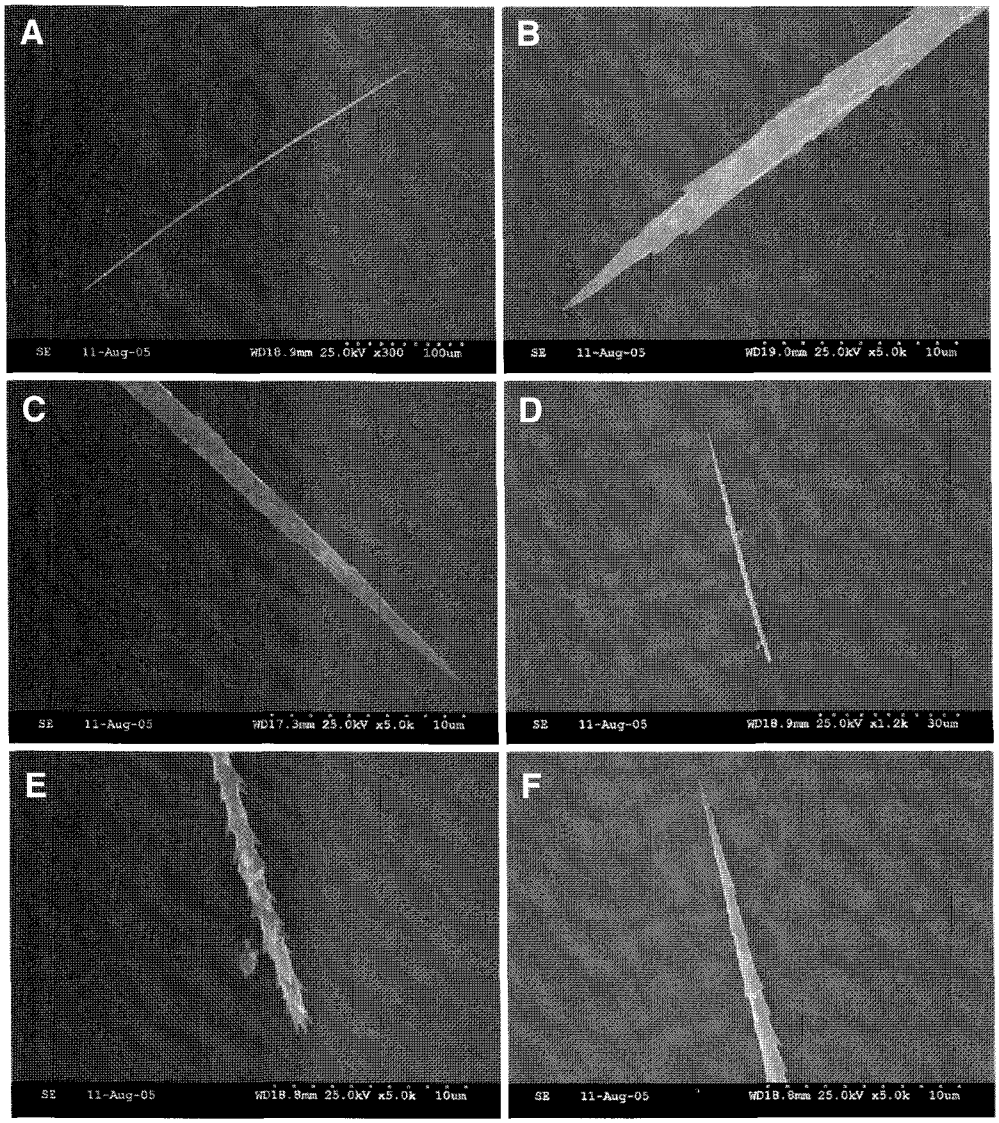

Fig. 4. *T.* (*T.*) *sasuensis* n. sp. A, large onychaete (all arround with spine); B, head of large onychaete with spine; C, end of large onychaete with spine; D, small onychaete (all arround with spine); E, head of small onychaete with spine; F, end of small onychaete with spine.

n. sp. in growth form. However, the former is widely different from the latter in shape, color and size of all spicules (Table 1).

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한국 테다니해면속(보통해면강: 다골해면목: 테다니해면과)의 2신종

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요 약

제주도와 추자도에서 2004년과 2005년에 SCUBA 다이빙을 하여 채집된 해면동물을 동정·분류한 결과 테다니해면속(*Tedania*)의 2종, 송악테다니해면[*Tedania* (*Tedania*) *songakensis* n. sp.]과 사수테다니해면(*Tedania* (*Tedania*) *sasuensis* n. sp.]이 신종으로 밝혀졌다. 송악테다니해면은 *T.* (*T.*) *purpurescen*과 골편 형태에 있어서는 유사하지만 onychaete 크기와 성장형태에 있어 차이가 있다. 송악테다니해면의 onychaete 길이는 *T.* (*T.*) *purpurescen onychaete*의 두 배이며 성장형태에 있어 *T.* (*T.*) *purpurescen*은 얇게 덮어 싸는 형태이나 송악테다니해면은 덩어리 형태이다. 사수테다니해면은 *T.* (*T.*) *connectens*의 골편 구성과 형태는 유사하지만 골편크기와 성장형태에 있어 차이가 있다. 사수테다니해면의 큰 onychaete는 *T.* (*T.*) *connectens*의 큰 onychaete 보다 더 크고, 작은 onychaete도 *T.* (*T.*) *connectens*의 작은 onychaete 보다 더 작다. 성장형태에 있어서도 사수테다니해면은 덩어리 형태이지만 *T.* (*T.*) *connectens*는 두껍게 덮어 싸는 형태이다. 또한 송악테다니해면과 사수테다니해면의 성장형태는 유사하나 외형, 색깔과 모든 골편의 크기에 있어서 많은 차이를 보였다.