**東沙環礁海洋國家公園採樣報告**

**6**

**執行單位： 國立中山大學海洋科學系**

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**摘要**

 星蟲是一類兩側對稱、身體不分節、具體腔及外型像蟲的海洋無脊椎動物，在西南太平洋沿岸的數量更為豐富，但在南中國海一帶仍只有零星的調查。此次前往東沙環礁海洋國家公園，目的是執行國科會台俄雙邊國際合作計「南中國海各國沿岸星蟲多樣性之研究」。自2013年6月27日至7月11日，與俄國研究人員Dr. Anastasia Maiorova 一同前往東沙採集沿岸的星蟲標本，共獲得3科8屬15種共672隻的星蟲標本，*Siphonosoma australe takatsuki*在東沙島有非常高的族群密度，以前僅有台灣和Yip島的記錄。此篇報告為首篇東沙星蟲種類的研究調查。

**前言**

 星蟲是一類兩側對稱、身體不分節、具體腔及外型像蟲的海洋無脊椎動物，目前已記錄的種類有2綱、6科、17屬及約150種(Cutler, 1994)。星蟲的身體前端有一能伸縮的縮吻，吻端為口器，口器的周圍有多條觸手，展開後觸手呈星芒狀為其特殊的特徵，故稱之為「星蟲」。牠們對於溫度及深度的適應度很高，從潮間帶到深海地區皆有分佈，星蟲從熱帶海域開始分佈，為世界性的海洋廣佈動物，在西南太平洋沿岸的數量更為豐富(Yan, 2002)。星蟲的棲所相當多樣，牠們常被發現在不同特性的棲息地，如:沙質、泥濘地、碎石下以及海草床的底部或是被其他生物覆蓋的石塊中，像是藻礁、紅樹林、管狀珊瑚、海綿、動物的空殼或空管中(Pancucci-Papadopoulou et al., 1999; Schulze & Rice, 2004)。

 大多數的星蟲為食碎屑動物(deposit feeders)，牠們以碎屑、殘渣、細菌、藻類及小型無脊椎動物等為食物。但是牠們也被魚、軟體動物、甲殼類等掠食者捕食(Cutler, 1994)。事實上星蟲是一種可用在養殖上的餌料生物，同時也可被人們食用，在南中國海沿岸一帶，是一道流傳已久的特別食材。

 台灣最早研究星蟲的分類是由 Sato 在1939所發表，他在台灣地區記錄了17種。之後有關台灣沿岸星蟲生物的文獻記錄，則由Li (1989), Hong & Li (1993), Hsueh et al. (2006), Hong et al. (2007)所發表。根據這些研究，有30種在台灣沿岸被發現。這些有關於台灣沿岸的星蟲研究，主要是著重於棲息在硬底質(碎石、珊瑚礁岩)物種的分類及分佈上，對於其他型式之棲地〔例如海草塲(seagrass meadow)及濕地(wetland)〕卻少有調查。

 根據Hong et al. (2007)調查的結果，在中國西南太平洋沿岸的星蟲動物有2綱4目6科12屬33種，以上的種類大多數是棲息在近岸的種類，而在Vietnam, Thailand, Indonesia, Malaysia and Philippines等國家的星蟲調查，在Stephen & Edmonds (1972)過去的文獻指出，有數種新紀錄種，因此現今對南海各國的星蟲物種多樣性，做進一步深入調查，應會發現更多的星蟲種類。

 莫顯蕎教授和泰國排名第三的大學Karetsart University (以農業為主之大學)漁業系的 Dr. Soranuth Sirisuay認識已有兩年多，以及越南海洋生態研究所 Dr. Qun 主任，經由莫教授的介紹後，他們協助研究人員在泰國與越南期間研究的相關事宜，主要目的為執行國科會台俄雙邊國際合作計劃「南中國海各國沿岸星蟲多樣性之研究」。今年度擬定與俄國研究人員Dr. Anastasia Maiorova申請前往貴處:墾丁國家公園採集星蟲標本，做進一步深入調查，以發現更多的星蟲種類並增加台灣海洋生物多樣性與海洋生物分類學國際交流合作研究之關係。

**材料與方法**

在2013年6月27日至7月11日於自東沙島潮間帶採集研究樣本，於此區域漲退潮間的垂直距離進行軟底質與硬底質棲地中的星蟲採集，軟底質測站的採樣設計以潮間帶高潮及低潮間的溼地為樣區，調查方式為參考陸域蚯蚓的採樣方式，採樣體積為1m x1m x 0.3m (Edwards, 1998)。每區內各有逢機定量30個樣點進行採樣，每一採樣點表面為1m2。每一樣點採集方法皆使用1m2的鐵線框隨機置於此濕地上，使用釘耙挖出此範圍之底泥，此步驟每個月重複挖掘，共獲得60堆底泥(1m x1m x 0.3m)，接著各別計數每堆底泥中的星蟲數量。硬底質測站的採樣方式，除採樣方式是用鐵鎚及鑿子將石頭與礁岩擊碎後各別計數星蟲數量，其他方法皆相同。

捕捉後的星蟲，維持濕潤及低溫的環境，運送至實驗室，接著逐一標本使用顯微鏡及解剖工具進行種類鑑定。鑑定種類依循

Cutler (1994)之檢索表鑑定至種的尺度，形態特徵包括縮吻與體壁之長度、觸手之類型、腎管與收縮肌之長度等，確定其種名。本研究目的為調查潮間帶的星蟲物種多樣性，並描述物種分類及形態特徵。

**結果**

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 共獲得*Siphonosoma australe takatsukii****,*** *Siphonosoma cumanense****,*** *Phascolosoma albolineatum****,*** *Phascolosoma nigrescens, Phascolosoma pacificum, Phascolosoma perlucens,**Phascolosoma stephensoni, Apionsoma misakianum, Aspidosiphon elegans, Aspidosiphon muellri, Aspidosiphon steestrupii, Aspidosiphon tenuis, Lithacrosiphon cristatus,**Cloeosiphon aspergillus, Antillesoma antillarum* 等3科8屬15種共672隻的星蟲標本，各別種類星蟲結果與俄方研究人員討論後以英文描述如下:

**Phylum Sipuncula Linnaeus, 1766**

**Class Sipunculidea E. Cutler et Gibbs, 1985**

**Order Sipunculiformes E. Cutler et Gibbs, 1985**

**Family Sipunculidea Rafinesque, 1814**

**Genus *Siphonosoma* Spengel, 1912**

***Siphonosoma australe takatsuki* Satô, 1935**

**Material**. Dongsha Island: intertidal, 80 specimens.

**Description**. Trunk 20 - 135 mm in length and 4 - 14 mm in width in contracted specimen with inverted introvert; trunk pinky and whitish brown; introvert light brown, with hooks. Body wall with 14 longitudinal muscles, no dissepiments posterior to the attachment of retractor muscles. Dorsal retractor muscle originate 30 % and ventral retractor muscles originate at 70 % of trunk length to posterior end. Gut with 12 loops, spindle muscle attached posteriorly. Wide wing muscle. Contractile vessel with vesicles. Anus and nephridiopores open at the same level.

**Discussion**. This species is not very common in South China Sea, only two records somewhere near Taiwan and Yap Islands. Other species of the genus *Siphonosoma* have been noted in South China Sea – *S. vastum* and *S. rotumanum* from south of Taiwan, and *S. australe australe* from the Nha Trang Bay (Vietnam). *S. vastum* and *S. australe* are well distinguished from *S. a. takatsuki* by larger and more blunt hooks. In contrast to our species, *S. rotumanum* possesses distinctive introvert hooks associated with large papillae.

***Siphonosoma cumanense* (Keferstein, 1867)**

**Material**. Dongsha Island:intertidal, 10 specimens.

**Description**. Trunk 62 mm in length and 20 mm in width in contracted specimen with inverted introvert; trunk pinky and whitish brown; introvert light brown, without hooks. Body wall with 20 longitudinal muscles, with dissepiments posterior to the attachment of retractor muscles. Dorsal and ventral retractor muscles originate at the same level, 15% of trunk length to posterior end. Gut with 16 loops, spindle muscle attached posteriorly. Wide wing muscle. Contractile vessel with villi. Anus and nephridiopores open at the same level.

**Discussion**. This species is very common in South China Sea Other species of the genus *Siphonosoma* have been noted in South China Sea – *S. vastum* and *S. rotumanum* from Queensland, and *S. australe australe* from the Nothern Australia (see Edmonds, 1980; Cutler, 1994). *S. vastum* and *S. australe* are well distinguished from *S. cumanense* by lacking of distinct villi on the contractile vessel. In contrast to our species, *S. rotumanum* possesses distinctive introvert hooks associated with large papillae.

*S. cumanense* is widespread in tropical and subtropical water in Atlantic, Indian and Pacific oceans. In the West Pacific, the species is known from south Australia to Japan.

**Class Phascolosomatidea**

**Order Phascolosomatiformes**

**Family Phascolosomatidae**

**Genus *Phascolosoma* leuckart, 1828**

**Subgenus *Phascolosoma* (*Phascolosoma*) Leuckart, 1828**

***Phascolosoma nigrescens* (Keferstein, 1865)**

**Material**. sta#2, : more 40 specimens.

**Description**. Trunk 10-20 mm in length and 2.5-4 mm in width, light brown, with numerous pale and large dome-shaped brown papillae; introvert with or without pigmented bands, only slightly longer or one-and-half longer than trunk. Hooks in numerous rings running to the introvert base, 32-48 μm in height and 36-43 μm in width, with streak expanded in the middle and in the hook basement. Longitudinal musculature splits into 23-28 bands which occasionally anastomose. Ventral retractors originate from about 55-70% of trunk length to the posterior end, dorsal – from about 35-45% of trunk length to the posterior end. Gut with 11-15 loops. Spindle muscle is attached posteriorly to the body wall. Nephridia are about 45-50% of trunk length, about 50% attached to the body wall.

**Discussion**. *P. nigrescens* is well distinguished from all other representatives of the genus *Phascolosoma* by unique characters of hooks having streak with swelling in the midpoint and wide expansion in the basement. In  *P. albolineatum* the tip of each hook is bent at obtuse angle that is unique character for this species. Hooks of *P.* *perlucens* are characterized by presence of large rounded hump, or secondary tooth, on concave side. Hooks of *P. arcuatum* are without secondary teeth, warts or toes, with clear streak (apical canal) widely expanded basally and arranged in numerous (up to 100) complete and incomplete rings. Hooks of *P. annulatum* and *P. scolops* are with a distinct triangle separated well from the narrow streak. Hooks of *P. stephensoni* are characterized by presence of smooth narrow streak, clear crescent and distinct triangle. Hooks of *P. noduliferum* have a narrow clear streak without basal expansion, lack a triangle and have no secondary tooth. *P. pacificum* is characterized by having of very long nephridia equal to the trunk length.

*P. nigrescens* is circumtropical species, widespread in intertidal and shallow waters. It inhabits sand, dead coral and mollusk shells. In the West Pacific, it was found from South Australia to Tonkin Bay in South China Sea.

***Phascolosoma pacificum* Keferstein, 1866**

**Material**. sta#18, 1 specimen.

**Description**. Trunk 35 mm in length and 9 mm in width, covered with numerous light brown conical papillae of similar size; introvert with light brown stripes, about twice longer than trunk. Hooks arranged in distal complete and proximal incomplete rings, about 70 μm in height, with humplike secondary tooth, clear streak with swelling in the midpoint and distinct triangle. Longitudinal musculature is split into 45 anastomosing bands. Ventral retractor muscles originate at 43% of trunk length to the posterior end, dorsal retractor muscles originate at about 23% of trunk length. Nephridia about 95% of trunk length, smooth, brown, completely attached to the body wall.

**Discussion**. *P. pacificum* is well distinguished from other representatives of the genus by structure of hooks with humplike secondary tooth, swelling of clear streak in the midpoint and with distinct triangle. This species is also characterized by remarkably long nephridia equal to the trunk length.

*P. pacificum* is widespread shallow water species common in the West pacific from north Australia to south Japan. The species is also found in the Red Sea and Indian Ocean.

***Phascolosoma perlucens* Baird, 1868**

**Material**. 54 specimens.

**Description**. Trunk 12-20 mm in length and 3-4 mm in width; trunk whitish-brown, sometimes pinkish in living specimens, with large brown cone-like, posteriorly directed preanal papillae on the dorsal base of introvert; posterior trunk also with brown conical papillae; introvert about equal to trunk length, usually with patches of dark pigment on dorsal side. Hooks 50-53 μm in height and 48-52 μm in width, with rounded secondary tooth, narrow clear streak, internal triangle and basal warts. Longitudinal musculature is split into about 18-20 bands. Ventral retractors originate from 60-70% of trunk length to the posterior end, dorsal – from 55-65% of trunk length to the posterior end. Gut with 15 loops. Spindle muscle is attached posteriorly to the body wall. Nephridia 45-55% of trunk length, 3/4 attached to the body wall.

**Discussion**. *P. perlucens* is well distinguished from all other representatives of the genus *Phascolosoma* by having of large conical preanal papillae on the dorsal base of the introvert and by structure of introvert hooks with rounded secondary tooth.

It is circumtropical shallow-water species, common in coral rubble, dead coral and coarse sand. In the West Pacific, it was found from Queensland, Australia, to Japan.

***Phascolosoma stephensoni* (Stephen, 1942)**

**Material**. sta#16, 2 specimens.

**Description**. Trunk 20-22 mm in length and 4 mm in width, whitish grey or pale-straw, with conical brown papillae in posterior trunk and around introvert base in preanal area; introvert about one-and-half longer than trunk, with wide pigmented patches on dorsal side. Anteriormost introvert, bearing hook rings, remarkably brown-red in living specimens. Hooks 61-63 μm in height and 50-51 μm in width, with smooth narrow streak, clear crescent, distinct internal triangle, minute secondary tooth on concave side and with about six cuticular warts at the basement. Longitudinal musculature splits into 20 anastomosed bands. Ventral and dorsal retractors originate correspondently at 60% and 40% of trunk length to the posterior end. Gut with about 12 loops. Spindle muscle is attached posteriorly to the body wall. Nephridia are about 50% of trunk length, about 3/4 attached to the body wall; nephridiopores minute posterior to anus.

**Discussion**. So, specimens from Indo-West-Pacific are characterized by more dark coloration of posterior and anterior trunk and have some differences in arrangement of retractor muscles (see Adrianov & Maiorova, 2011). The Australian specimens of *P. stephensoni* are more similar to those from Hawaii and their posterior extremitie of the trunk is the same colour as, or just a little darker than, the pale-straw middle trunk (see Edmonds, 1980).

*P. stephensoni* is shallow water species, common in sand and mollusk shells. In West Pacific, it has been reported from Queensland, Australia, to South China Sea and Hawaii.

**Genus *Apionsoma* Sluiter, 1902**

**Subgenus *Apionsoma* (*Apionsoma*) Sluiter, 1902**

***Apionsoma (Apionsoma) aff. misakianum* (Ikeda, 1904)**

**Material**. Sta#11, 15, 5 specimens.

**Description**. Trunk spindle-shaped, 3-7 mm in length and about 0.3-0.9 mm in width, with papillae more numerous on posterior end; introvert 7 times longer than trunk. Body wall pale and translucent. Hooks 28-31 μm in height and 24-27 μm in width, arranged in rings, with accessory comb of 3-5 basal spinelets. Body wall with continuous muscle layer. Ventral retractor muscles originate at 30-35% of trunk length to the posterior end. Dorsal retractor muscles originate between nephridiopores and ventral retractors. Gut with 5-6 loops, spindle muscle attached to posterior end of the trunk. Nephridia bilobed, free, 30% of trunk length, ventral lobe about twice longer than dorsal one.

**Order Aspidosiphoniformes E. Cutler et Gibbs, 1985**

**Family Aspidosiphonidae Baird, 1868**

**Genus *Aspidosiphon* Diesing, 1851**

**Subgenus *Aspidosiphon* (*Aspidosiphon*) (Diesing, 1851)**

***Aspidosiphon (Aspidosiphon) elegans* (Chamisso et Eysenhardt, 1821)**

**Material**. sta#2, 3, 9, 12, 13, 14, 16, 17, 18, 19, more 120 specimens.

**Description**. Trunk 2-12 mm in length, 0.8-2 mm in width, pale, transparent, with minute papilla; introvert in living specimens about one-and-half longer than trunk, covered by numerous dark teeth. Anal shield yellow-brown, ungrooved, composed of fine brown polygonal units; yellow-brown caudal shield weakly developed or absent. Bidentate compressed hooks 25-36 μm in height and 24-31 μm in width, are arranged in rings in the distal introvert; less compressed unidentate hooks, 24-28 μm in height and 30-31 μm in width, and conical (pyramidal) hooks, 40-41 μm in height and 19-24 μm in width, are scattered proximally. Body wall with continuous muscle layer. Retractor muscles originate at 90-95% of trunk length toward the posterior end. Gut with 5-6 loops, spindle muscle is attached posteriorly to the body wall. Nephridia are about 45-50% of trunk length, nephridiopores at the anus level.

**Discussion**. *A. elegans* is distinguished from other representatives of the subgenus *Aspidosiphon* by presence of compressed bidentate and less compressed or conical unidentate hooks and by ungrooved yellow-brown anal shield with fine polygonal units. *A gracilis* is characterized by weakly developed anal shield and conical caudal shield with radial grooves, and by presence of only unidentate hooks with bifurcated posterior edge. *A. misakiensis* differs by arranged in distal rings bidentate hooks with secondary tooth and by scattered proximally unidentate hooks also heavily compressed from lateral sides. This species has the anal shield composed of closely packed granular irregular units with poorly delineated borders. *A. muelleri* is well distinguished by structure of the anal shield with individual units that are arranged into longitudinal ridges above the dorsal region.

*A. elegans* is widespread tropical species. It inhabits dead corals, coral rubbles and soft rocks in intertidal and shallow-water areas. In the West Pacific, it was found from Queensland to Japan and Hawaii.

***Aspidosiphon (Aspidosiphon) muelleri*** Diesing, 1851

**Material**. sta#2, 11 - 2 specimens.

**Description**. Trunk 3-5 mm in length, 0.5-1.2 mm in width; pale, sometimes glossy, hemi-transparent, with minute papillae distributed over the entire trunk. Anal shield yellow-brown, sometimes concave, with units arranged into groups of various sizes separated by transverse furrows distally and laterally and by evident longitudinal dorsal furrows more proximally; margins of shield composed of minute wart-like units; usually with cone-shaped units near ventral margin. Caudal shield yellow-brown, with 22-23 radial grooves. Introvert about one-and-half or twice longer than trunk. Bidentate compressed hooks 12-19 µm in height and 16-19 µm in width, arranged in distal rings, with minute comb-like structures at the posterior base; unidentate compressed hooks, 14-16 μm in height and 21-22 μm in width, and pyramidal hooks scattered proximally. Continuous longitudinal musculature layer splits into separate bands underneath the anal shield. Retractor muscles originate at about 95% of trunk length to posterior end or almost from the caudal shield. Gut with 6-7 loops, spindle muscle attached posteriorly to the body wall, with one fixing muscle. Nephridia 50-55% of trunk length, about 2/3 attached to the body wall, nephridiopores open at the anus level.

**Discussion**. The species is well distinguished from other representatives of the subgenus *Aspidosiphon* by structure of the anal shield with groups of units separated by transverse and longitudinal furrows. For example, specimens of *A. muelleri* from the Vietnamese coast have only unidentate compressed hooks and their introvert is 2-3 times longer that trunk.

*A. muelleri* is widespread from shallow water to bathyal depth. It inhabits discarded gastropod or scaphopod shells and dead coral. In the West Pacific, it was found from Australia to Japan.

***Aspidosiphon* (*Paraspidosiphon*) *steenstrupii* Diesing, 1859**

**Material**.sta#18: dead coral, 30 specimens.

**Description**. Trunk 8-48 mm in length and 2-8 mm in width, light brown; introvert about subequal to trunk length. Anal shield brown, ungrooved, composed of uniform granular units, sometimes with calcium carbonate cap. Caudal shield brown, with about 20 radial grooves. Compressed bidentate hooks 65-69 μm and 69-74 μm in width in large specimens, arranged in rings, with tongue-like extension on the internal clear streak and basal warts; pyramidal hooks scattered proximally; tubular papillae scattered between rings and pyramidal hooks. Longitudinal musculature splits into 20-23 bands. Retractor muscles originate at 75-85% of trunk length to the posterior end. Gut with 7-15 loops, spindle muscle attached posteriorly. Nephridia about 50-60% of trunk length, about 2/3 attached to the body wall.

**Discussion**. An ungrooved anal shield with calcium carbonate cap, rings of compressed bidentate hooks with tongue-like extension of the clear streak and basal warts, scattered pyramidal hooks, and tubular papillae, all characters that separate *Aspidosiphon* (*Paraspidosiphon*) *steenstrupii* from all other representatives of the subgenus *Paraspidosiphon*.

*A.* (*Paraspidosiphon*) *steenstrupii* is widespread tropical and subtropical shallow water species inhabiting coral rocks and mollusk shells. In the West Pacific, it is found from Australia to Korea and Japan.

***Aspidosiphon*** ***(Paraspidosiphon) tenuis* Sluiter, 1886**

**Material**. sta#2, 3, 6, 7, 8, 9, 12, 16, 19, dead corals - more 80 specimens.

**Description**. Trunk 6-11 mm in length, 1.5-3 mm in width, pale or light-brownish, sometimes pinkish, semitransparent; introvert about equal to trunk length or one-and-half longer than trunk. Anal shield green or brown-green, smooth and glossy, sometimes saddle-like or concave, composed of small dark brown-green units, with short marginal grooves, sometimes with white calcareous material. Caudal shield brown-green, with radial grooves. Anteriormost introvert light brown or yellowish. Bidentate hooks 31-38 μm in height and 33-42 μm in width, arranged in distal rings, unidentate hooks 30-31 μm in height and 31-32 μm in width, scattered proximally; pyramidal hooks absent. Longitudinal musculature splits into about 20-25 anastomosing bands. Retractor muscles originate at 80-85% of trunk length to the posterior end. Gut with about 10 loops, spindle muscle attached posteriorly. Nephridia are 45-50% of trunk length, about 2/3 attached to the body wall, nephridiopores at the anus level.

**Discussion**. *A.* (*Paraspidosiphon*) *tenuis* differs from other representatives of the subgenus by structure and coloration of saddle-shaped anal shield with small dark units and marginal grooves, by having of bidentate and unidentate hooks and by absence of pyramidal hooks.

*A.* (*Paraspidosiphon*) *tenuis* is tropical shallow water species. It inhabits coral rocks and mollusk shells from intertidal to shelf depth. In the West Pacific, it was found from Australia to Taiwan.

**Genus *Lithacrosiphon* Shipley, 1902**

***Lithacrosiphon cristatus* (Sluiter, 1902)**

**Material**. sta#9, 1 specimens.

**Description**. Trunk 8 mm in length, 2 mm in width, light brown; introvert subequal to trunk length. Anal shield brown, conical-shaped, furrowed longitudinally with 23-27 grooves, usually covered with red algae and calcareous deposit. Caudal shield absent. Bidentate hooks arranged in 16-20 rings on the distal introvert, unidentate hooks scattered over the proximal introvert. Longitudinal musculature splits into 18-22 bands. Retractor muscles originate at about 80% of trunk length to posterior end. Gut with 8-9 loops. Nephridia are about 70-75% of trunk length.

**Discussion**. The species differs from the only other representative of the genus *Lithacrosiphon*, *L. maldiviensis*, in structure of the anal shield, which is ungrooved, granular and bullet-shaped in *L. maldiviensis*. *L. cristatus* shows remarkable variations in nephridia length, which ranges from 25 to 150% (see Cutler, 1994). Australian *L. cristatus* are very similar to our specimens from the South China Sea, which have shorter nephridia, only about 40-45% of trunk length (see Adrianov, Maiorova, 2012).

*L. cristatus* is a tropical shallow water species. It inhabits coral rocks. In the West Pacific, it is found from Australia to Japan and Hawaii.

**Genus *Cloeosiphon* Grube, 1868**

***Cloeosiphon aspergillus* (de Quatrefages, 1856)**

**Material**. sta# 18, dead corals, 3 specimens.

**Description**. Trunk 6-30 mm in length, 1.52-4 mm in width, pale, transparent, with brown papillae, especially concentrated on posterior and anteriormost trunk; introvert shorter than trunk. Anal shield consists of white rhomboid or polygonal, mosaic arranged calcareous units, each with brown central pore. Introvert protruded through the center of the anal shield. Bidentate hooks, 66-90 μm in height and 65-92 μm in width, arranged in rings distally. Caudal shield absent. Longitudinal musculature continuous. Retractor muscles originate in the middle of the trunk. Nephridia are about one-half of the trunk length, completely attached to the body wall.

**Discussion**. The only species of the genus *Cloeosiphon*, and because of its unique configuration of the anal shield makes it the most distinctive of sipunculans.

*C. aspergillus* is a widespread tropical shallow water species. It inhabits coral rocks. In the West Pacific, it was found from Australia to Japan.

**結論**

 此篇報告為首次紀錄東沙島上的星蟲種類，一共發現5科8屬15種星蟲，於東沙島周圍沿岸共發現14種種類，在外環礁發現僅發現*Phascolosoma stephensoni*一種星蟲，*Siphonosoma australe takatsuki*在東沙島有非常高的族群密度;結果與先前文獻比對(see Cutler, 1994)，目前南中國海沿岸的星蟲種類共有31種之紀錄。此次調查為第一次在東沙島針對星蟲生物進行的研究，對於東沙島沿岸星蟲的分類與生態，具有初步之了解，未來希望能進行東沙亞潮帶海域之星蟲生物調查，以建構更進一步的東沙星蟲生物多樣性。

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