New record of commensal scale worms, *Arctonoe vittata* (Grube, 1855) and *Hyperhalosydna striata* (Kinberg, 1856) (Polychaeta: Polynoidae) from Korean waters

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Two scale worms of the family Polynoidae, *Arctonoe vittata* (Grube, 1855) and *Hyperhalosydna striata* (Kingberg, 1856) were found for the first time from Korea by SCUBA diving survey. The two species are free-living organisms or associated commensally with a wide variety of other invertebrates. Specimens of *A. vittata* were collected from the East Sea and were closely associated with asteroids, holothuroids, gastropods and nudibranchs species. Specimens of *H. striata* were collected from Jeju-do Island, and of these, one specimen was collected in a tube of eunicid species. The two species can be easily distinguished from their congeners by distinct morphological characteristics as follows: (1) *A. vittata* has pigmented band near segment eight and two kinds of neurochaetae; (2) *H. striata* has reddish-brown longitudinal striped elytra. The morphological key characteristics of both species agreed well with their original descriptions and redescriptions. In this study, the descriptions, detailed illustrations and ecological photographs of two species based on Korean materials were provided.

Keywords: *Arctonoe*, commensal scale worm, *Hyperhalosydna*, Polychaeta, Polynoidae

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conducted under camera lucida, and digital line drawings were carried out with Adobe Illustrator CS6. Underwater photographs of the live specimens were taken using a Canon EOS 5D Mark II with Aquatica housing and Inon Z240 underwater strobes. Voucher specimens are housed at the National Institute of Biological Resources (NIBR), Incheon, Korea.

**Systematic Account**

Family Polynoidae Malmgren, 1867  
Subfamily Lepidonotinae Willey, 1902  
Genus *Arctonoe* Chamberlin, 1920  
유령비늘갯지렁이속 (신칭)

*Arctonoe* Chamberlin, 1920: 6B.  
*Halosyndodes* Seidler, 1924: 134.

**Diagnosis.** Body elongated, flattened, with numerous segments (around 100 and more). Numerous pairs of elytra on segments 2, 4, 5, 7, alternate segments to 21, 23, 26, 28, 29, 31, 33, continuing on alternate segments to end of body, some specimens having asymmetrical elytra sequence. Prostomium bilobed without prostomial peaks, with well defined lateral ceratophores inserted at anterior margin and converging ventrally. Antennae, tentacular cirri, dorsal cirri smooth. Facial tubercle poorly developed. Tentacular segment not visible dorsally, buccal segment with or without nuchal fold. Parapodia subbiramous. Notochaetae short, serrated, unidentate with notched tips, neurochaetae stouter, longer, unidentate hooked tips and/or with notched tips.

*Arctonoe vittata* (Grube, 1855) 유령비늘갯지렁이 (신칭) (Figs. 1, 3)  
*Polynoe* vittata Grube, 1855: 82.  
*Polynoe lordi* Johnson, 1897: 175, Pl. 7, figs. 35, 44, Pl. 8, fig. 51.  
*Acholoe* vittata Marenzeller, 1902: 576, Taf. III, fig. 13.  
*Arctonoe lia* Chamberlin, 1920: 6, Pl. 1, figs. 1–4, Pl. 2, figs. 1–3.  
*Halosyndodes* vittata Seidler, 1924: 134; Monro, 1928: 312; Okuda, 1936: 565–568, figs. 4–5.  
*Arctonoe vittata* Hartman, 1939: 29–30, Pl. 3, figs. 33–37; 1948: 11, fig. 2a–f; 1968: 49, figs. 1–3; Berkeley and Berkeley, 1948: 20, figs. 24–25; Pettibone, 1953: 57, Pl. 28, fig. 251, Pl. 29, figs. 259–271; Uschakov, 1955: 132, fig. 23E–1; Imajima and Hartman, 1964: 19; Hanley, 1989: 4, figs. 1A–F, 2A–L.

**Material examined.** 3 inds., Gangwon-do, Goseong-gun, Jugwang-myeon, Oho-ri, 4 Apr. 2009, depth 20 m, T Park (NIBRIV0000287225–7); 1 ind., Gangwon-do, Goseong-gun, Jungwang-myeon, Oho-ri, 23 Mar. 2010, depth 23 m, T Park and HJ Kil (NIBRIV0000226000); 3 inds., Gyeongsangbuk-do, Uijin-gun, Buk-myeon, Nagok-ri, Gijam point, 3 Aug. 2010, depth 11.8 m, T Park (NIBRIV0000287228, NIBRIV0000326189–90); 1 ind., Gyeongsangbuk-do, Uijin-gun, Buk-myeon, Nagok-ri, 24 Aug. 2010, depth 15 m, T Park (NIBRIV0000326191); 1 ind., Gangwon-do, Goseong-gun, Jugwang-myeon, Oho-ri, Goraebawi point, 16 Sep. 2010, depth 20 m, T Park, Y Eun (NIBRIV0000225978); 1 ind., Gangwon-do, Goseong-gun, Jugwang-myeon, Oho-ri, Daeseom point, 28 Jul. 2014, depth 12 m, T Park, (NIBRIV0000304745); 2 inds., Gangwon-do, Goseong-gun, Jugwang-myeon, Oho-ri, Goraebawi point, 29 Jul. 2014, depth 25 m, T Park (NIBRIV0000304746, 51); 2 inds., Gangwon-do, Goseong-gun, Jugwang-myeon, Oho-ri, Gangjeongseongae point, 30 Jul. 2014, depth 35 m, D Jung (NIBRIV000304754–5), 1 ind., Gyeongsangbuk-do, Ulleung-gun, Ulleung-eup, Dokdo-ri, 4 Jun. 2015, depth 15 m, SH Kim (NIBRIV0003242999); 1 ind., Gyeongsangbuk-do, Ulleung-gun, Ulleung-eup, Dokdo-ri, 11 Jun. 2015, depth 15 m, T Park (NIBRIV0000226138).

**Description.** Based on 16 specimens. Body elongated, flattened, with 45–82 segments, widest part of body about 1/3 from head, tapering rapidly anteriorly, gradually posteriorly. Length 12–57.8 mm, widest width 3–6.3 mm including parapodium. Body surface variably pigmented. Some specimens with brown streaky transverse bands across dorsal surface, and one broad band near segment 8 (Fig. 1A, Table 1).

Elytra large, smooth, usually attached on segments 2, 4, 5, 7, 9, 11, 13, (14), alternate segments to 23, 26, 28, 29, 31, thereafter attachment pattern variable among specimens, some specimens having asymmetrical elytra sequence (Table 1). Elytra tubercles, fringe of papillae absent (Fig. 1C). First pair of elytra overlapping medially covering prostomium but rest of dorsum exposed medially.

Prostomium bilobed, wider than long, prostomial peaks absent. Four small subequal eyes on posterior half. Palps not long, stout, abruptly tapering to tips, often with dark subterminal pigment bands. Three antennae; median antenna with large cylindrical ceratophore and short, smooth, clavate style, with long filiform terminal tip; lateral antennae with distinct ceratophores thinner and shorter than median ceratophores, styles similar with median style but shorter (Fig. 1A, B).

Tentacular (first) segment achaetous, invisible dorsally. Lateral tentaculophores large, with two pairs of dorsal and ventral subequal cirri similar in length and shape to median antenna. Facial tubercle not well developed. Buccal (second) segment without nuchal fold, with first pair of elytra, subbiramous parapodia, noto and neurochaetae. Ventral buccal cirri longer than following ven-
Fig. 1. *Arctonoe vittata* (Grube, 1855), NIBRIV0000326189. A, Anterior end without elytra, dorsal view (arrow indicates dorsal cirrophore); B, Anterior end, ventral view; C, anterior elytron pairs; D, Posterior end, dorsal view; E, Cirrigerous parapodium from segment 6, anterior view; F, Notochaeta from segment 6; G, Superior neurochaeta from segment 6; H, Inferior neurochaeta from segment 6; I, Posterior end, ventral view; J, Posterior segments with nephridial papillae, ventral view. Scale bar: A–D = 0.5 mm; E, I, J = 0.2 mm; F–H = 0.05 mm.
tral cirri (Fig. 1A, B).

Parapodia subbiramous. Notopodium small, digitiform, on anterodorsal face of large neuropodium. Neuropodium notched dorsally and ventrally with rounded pre-, postchaetal lobes (Fig. 1E). Dorsal cirrophores on elytraless segment, large, cylindrical, styles basally cylindrical with subterminal inflation and long filiform tips (Fig. 1A). Ventral cirrip short, subulate (Fig. 1E). Nephridial papillae well developed from segment 6 (Fig. 1J).

Notochaetae short, slightly curved with subterminal serrations and notched tips (Fig. 1F). Notochaetae often lacking in median and posterior segments. Neuropodia long, thick, present on all chaetigerous segments. Superior neuropodia slender with prominent serration ravs and notched tips (Fig. 1G). Inferior neuropodia stouter, with relatively faint serration ravs and curved hooked tips (Fig. 1H).

Pygidium small, anus terminal, anal cirri similar to dorsal cirri but longer (Fig. 1D).

Remark. Genus Arctonoe Chamberlin, 1920 has three nominal species; A. vittata, A. fragilis (Baird, 1863) and A. pulchra (Johnson, 1897). Among these species, only A. vittata has been reported from northern part of eastern Asian waters (Osuka, 1936; Uschakov, 1955; Imajima and Hartman, 1964; Imajima, 1988; 2001) (Fig. 5). Arctonoe vittata is easily distinguished from its congener by two kinds of neurochaetae (curved hooked tip and notched tip) (Fig. 1F–H) and by pigmented dorsal band near segment 8 (Fig. 1A), in contrast to only hooked tip neurochaetae and absence of pigmented dorsal band in A. fragilis and A. pulchra. The present Korean specimens well agree with morphological characteristics of A. vittata in this respect. According to the original description of Polyneoe vittata by Grube (1855), the elytra were arranged on segments 2, 4, 5, and alternating segments to 26, 28, 29, 31, and subsequently on alternating segments to the end of the body. Later, Pettibone (1953) reported irregular elytra attachment patterns in elongated individuals based on specimens from Puget Sound and adjacent waters. Some of the present Korean specimens show irregularity in elytra attachment and seem closely related in individual size, as reported by Pettibone (1953) (Table 1).

Arctonoe vittata is both free-living and associated commensally with other invertebrates such as asteroids, gastropods or other tube dwelling polychaetes (Hanley, 1989; Ruff, 1995). However, all present specimens were associated with other invertebrates (Fig. 3, Table 2). Especially, some specimens were collected inside the mantle cavity of nudibranchs; Cadlina japonica Baba, 1937; Triopha catalinae (Cooper, 1863) for the first time. This is the first discovery of the symbiotic relationship between A. vittata and nudibranchs (Fig. 3F–H).

According to Pettibone (1953) and Ruff (1995), body coloration of A. vittata tends to be adapted to their host coloration. Among present Korean specimens, some individuals were well adapted in host coloration (Fig. 3A, D, H, I), while, some individuals show different body coloration from their hosts (Fig. 3B, E, G, J). Previous studies have reported that A. vittata individuals compete over hosts frequently (Palmer, 1968; Britayev, 1991) and switch hosts to increase survival rate (Tokaji et al., 2014). Therefore, A. vittata individuals with different coloration from the hosts seem to move to a new host and are not yet adapted to the new host’s coloration.

Genus Hyperhalosydna Augener, 1922

 몽개비늘것지렁이속(신청)

Halosydnoides Augener, 1922: 6.

Lucopia Pillai, 1965: 115.

Diagnosis. Body elongated, flattened, segments 46 to 51. Twenty two pairs of elytra on segments 2, 4, 5, 7, alternate segments to 39, 41 and 42. Elytra without fringe papillae. Prostomium bilobed, with two palps and three antennae. Ceratophore of median antenna large, inserted in anterior notch of prostomium. Lateral antennae inserted terminally on distal ends. Tentacular segment not visible dorsally, tentaculophores lateral to prostomium without chaetae. Buccal segment without mualch fold. Parapodia subbiramous, notopodium small, Neuropodium larger, deeply cut dorsally and ventrally. Notochaetae few in number, small, with rows of fine serrations below blunt or fine tips. Neurochaetae stout, with several rows of spine below bidentate tips. Nephridial papillae well developed. Anus dorsal on last two to four segments.

Hyperhalosydna striata (Kinberg, 1856)

 몽개비늘것지렁이속(신청)(Figs. 2, 4)

Lepidonostris striata Kinberg, 1856: 384.

Polyneoe fulvovittata Grube, 1876: 63; 1878: 33, 34, Pl. III, fig. 1.

Polyneoe platycirrus McIntosh, 1885: 111, Pl. III, fig. 4, Pl. XVI, fig. 2, Pl. XIX, fig. 3, Pl. VIII, figs. 14–15, Pl. IX, fig. 1; Knox, 1951: 62.

Halosydnoides carinata Moore, 1903: 417, Pl. XXIII, figs. 16–17.

Hyperhalosydna striata: Augener, 1922: 4; 1927: 105; Fauvel, 1932: 26; 1939: 260; Hartman, 1938: 113; 1954: 622; 1975: 194; Imajima & Hartman, 1964: 21; Uschakov, 1982: 96, Pl. XXV, 1–5.

Lucopia maginicirra Pillai, 1965: 117, figs. 2G–H, 3A–C.

Material examined. 1 ind., Jeju-do, Seogwipo-si, near Beomseom (islet), 25 Feb. 2009, depth 25 m, T Park
Fig. 2. Hyperhalosydna striata (Kinberg, 1856). NIBRIV0000326200. A, Anterior end with elytra, dorsal view; B, Proboscis, frontal view; C, Right elytron from segment 11; D, Posterior end, dorsal view; E, Anterior end without elytra, dorsal view (arrow indicate dorsal cirrophore); F, Notopodium with notochaeta (arrow) from segment 14; G, Cirrigorous parapodium from segment 14, anterior view; H, Posterior end, ventral view; I, Posterior segments with nephridial papillae, ventral view; J, Neurochaeta from segment 14. Scale bar: A–E, H = 1 mm; F, J = 0.05 mm; G = 0.3 mm; I = 0.2 mm.
Fig. 3. Various host invertebrates of *Arctonoe vittata* (Grube, 1855) found in this study. A, *Solaster dawsoni* Verrill, 1880; B and C, *Aphelasterias japonica* (Bell, 1851); D, *Haliotis discus hannai* Ino, 1953; E, *Scelidotoma gigas* (Martens, 1881); F, *Triopha catalinae* (Cooper, 1863); G and H, *Cadlina japonica* Baba, 1937; I, *Niveotectura pallida* (Gould, 1859); J, *Apostichopus japonicus* (Selenka, 1867).
Table 1. Elytra attachment and pigmentation variations of *Arctonoe vittata* from Korea.

| Specimen No.    | Body segments | Length/Width (mm) | Dorsum pigmentation | Elytra attached on segments 2,4,5,7,9,11,13 and there after: (...) means alternate sequence; R: right, L: left | No. of elytra |
|-----------------|---------------|-------------------|---------------------|------------------------------------------------------------------|--------------|
| NIBRIV0000225978 | Incomplete    | 36.6/4.8          | Band on segment 8,  | 15,...,23,26,28,29,31,...,51,52,54,56,... | ?            |
|                 |               |                   | Irregular through   |                                                                  |              |
|                 |               |                   | dorsum              |                                                                  |              |
| NIBRIV0000226000| 59            | 26.9/4.5          | Band on segment 8   | 15,...,23,26,28,31,...,57                                        | 28 pairs     |
|                 |               |                   |                     |                                                                  |              |
| NIBRIV0000226138| 71            | 45/4.8            | Based on segment 8–9| 14,...,26,29,31,32,34,36,...,58,...,70,71 (L)                    | 36 pairs     |
|                 |               |                   |                     | 14,...,26,29,31,32,...,58,61,62,65,...,71 (R)                     |              |
| NIBRIV0000287225| Incomplete    | 19.4/4.1          | Band on segment 8   | 15,...,23,26,28,29,31,~ (L)                                      | ?            |
|                 |               |                   |                     | 15,...,23,27,28,30,~ (R)                                        |              |
| NIBRIV0000287226| 70            | 52.2/5.3          | Band on segment 6–8 | 15,...,23,26,28,29,31,...,42,43,44,46,...,68 (L)                  | 36 pairs     |
|                 |               |                   |                     | 15,...,23,26,28,29,31,...,41,42,43,44,45,47,...,67 (R)            |              |
| NIBRIV0000287227| 53            | 36.8/6.3          | Band on segment 8,  | 15,...,23,26,28,29,31,...,37,38,40,...,52                        | 27 pairs     |
|                 |               |                   | Irregular until segment 35 |                                                                  |              |
| NIBRIV0000287228| 45            | 14.2/3.7          | Band on segment 7–8 | 15,...,23,26,28,29,31,...,41,42                                  | 22 pairs     |
| NIBRIV0000326189| 45            | 12/3              | Band on segment 8–9,| 15,...,23,26,28,29,31,...,43                                  | 22 pairs     |
|                 |               |                   | Irregular through   |                                                                  |              |
|                 |               |                   | dorsum              |                                                                  |              |
| NIBRIV0000326190| 53            | 21.4/4.5          | Band on segment 8   | 15,...,23,26,28,29,31,...,51                                    | 26 pairs     |
| NIBRIV0000326191| Incomplete    | 42.9/5.7          | Band on segment 7–8 | 15,...,23,26,28,29,31,...,55,~                                   | ?            |
|                 |               |                   | Irregular through   |                                                                  |              |
|                 |               |                   | dorsum              |                                                                  |              |
| NIBRIV0000304745| 49            | 32/3.8            | Based on segment 7–8| 15,...,23,26,28,29,31,...,37,38,40,...,46                        | 24 pairs     |
|                 |               |                   | Irregular through   |                                                                  |              |
|                 |               |                   | dorsum              |                                                                  |              |
| NIBRIV0000304746| 68            | 51.2/4.5          | Based on segment 8–9| 15,...,23,26,28,29,31,...,33,35,36,37,...,65 (L)                | 34 pairs     |
|                 |               |                   |                     | 15,...,23,26,28,29,31,...,53,54,55,...,65 (R)                    |              |
| NIBRIV0000304751| 69            | 53.4/4.3          | Based on segment 8  | 15,...,23,26,28,29,31,...,66                                    | 34 pairs     |
| NIBRIV0000304754| 56            | 25/2.8            | Based on segment 7–8| 15,...,23,26,28,29,31,...,39,40,...,54                          | 28 pairs     |
| NIBRIV0000304755| 64            | 28.6/3.4          | Based on segment 8, | 15,...,23,26,28,29,31,...,45,46,...,62 (L)                      | 32 pairs     |
|                 |               |                   | Irregular through   | 15,...,23,26,28,29,31,...,33,34,35,36,37,39,...,45,46,...,62 (R) | 34 (R)      |
|                 |               |                   | dorsum              |                                                                  |              |
| NIBRIV0000324299| 82            | 57.8/6.3          | Based on segment 8–9| 15,...,23,26,28,29,31,...,65,66,67,68,69,...,77,79             | 42 pairs     |
Table 2. Host species of Arctonoe vittata (Grube, 1855) and Hyperhalosydna striata (Kinberg, 1856).

| Species               | Host group | Host species                          | Literature                                                                 |
|-----------------------|------------|---------------------------------------|-----------------------------------------------------------------------------|
| Arctonoe vittata      | Asteroid   | Apherelastaria japonica               | Britayev, 1991; Present study                                               |
|                       |            | Asterias amurensis                    | Okuda, 1936; Britayev, 1991; Tokaji et al., 2014                           |
|                       |            | Asterias rathbuni                     | Britayev et al., 1989; Britayev, 1991                                       |
|                       |            | Crossaster papposus                   | Pettibone, 1953; Britayev, 1991                                            |
|                       |            | Dermasterias imbricata                | Johnson, 1901; Hartman, 1944; Hartman & Reish, 1950; Pettibone, 1953; Wagner et al., 1979; Britayev, 1991; Ruff, 1995 |
|                       |            | Evasterias retifera                   | Tokaji et al., 2014                                                          |
|                       |            | Evasterias echinosoma                 | Britayev, 1991                                                              |
|                       |            | Henricia leviuscula                   | Pettibone, 1953; Britayev, 1991                                            |
|                       |            | Leptasterias camtschatica             | Britayev, 1991                                                              |
|                       |            | Luidia foliolata                      | Moore, 1908; Britayev, 1991                                                |
|                       |            | Pteraster tesselatus                  | Pettibone, 1953; Britayev, 1991                                            |
|                       |            | Solaster dawsoni                      | Britayev, 1991; Present study                                              |
|                       |            | Solaster endeca                       | Britayev, 1991                                                              |
|                       |            | Solaster papposus                     | (Crossaster papposus)                                                       |
|                       |            | Solaster stimpsoni                   | Pettibone, 1953; Britayev, 1991                                            |
|                       | Cnidarian  | Metridium senile                      | Britayev, 1991                                                              |
|                       | Gastropod  | Acmaea nitra                          | Pettibone, 1953; Britayev, 1991                                            |
|                       |            | Acmaea pallida                        | Britayev, 1991; Present study                                              |
|                       |            | = (Niveotectura pallida)              |                                                                             |
|                       |            | Cidarina cidaris                      | Berkeley & Berkeley, 1948; Britayev, 1991                                  |
|                       |            | Diodora aspera                        | Baird, 1865; Johnson, 1901; Hanley, 1989; Berkeley, 1923; Pettibone, 1953; Britayev, 1991; Ruff, 1995 |
|                       | Polychaetes| Fusitriton oregonensis                | Pettibone, 1953                                                             |
|                       |            | Haliothis kamtschakata                | Okuda, 1936; Britayev, 1991                                                |
|                       |            | Haliothis discus hannai               | Present study                                                               |
|                       |            | Patelloydia sp.                       | Okuda, 1936                                                                 |
|                       |            | Puncturella cuculata                  | Pettibone, 1953; Britayev, 1991                                            |
|                       |            | Puncturella multistrigata             | (Cranopis cuculata)                                                        |
|                       |            | = (Cranopis multistrigata)            | Berkeley & Berkeley, 1948; Britayev, 1991                                  |
|                       |            | Tugalia gigas                         | Tokaji et al., 2014; Present study                                         |
|                       |            | = (Scelidotoma gigas)                 |                                                                             |
|                       | Nudibranchia | Cadilla japonica                      | Present study                                                               |
|                       |            | Triophia catalinae                    | Present study                                                               |
|                       | Polyplacophora | Cryptochiton stelleri                | Johnson, 1897; 1901; Hartman, 1944; Hartman & Reish, 1950; Pettibone, 1953; Webster, 1968; Britayev, 1991; Ruff, 1995 |
|                       | Holothuroid | Parastichopus californicus            | Britayev, 1991                                                              |
|                       |            | = (Apostichopus californicus)         | Britayev, 1991; Present study                                              |
|                       |            | Stichopus japonicas                   | Britayev, 1991                                                              |
|                       |            | = (Apostichopus japonicus)            | Britayev, 1991                                                              |
|                       |            | Amphirite robusta                     | Berkeley & Berkeley, 1948; Britayev, 1991                                  |
|                       |            | = (Neoamphirite robusta)              |                                                                             |
|                       |            | Neoamphirite sp.                      | Britayev, 1991                                                              |
|                       |            | Thelepus crispus                      | Berkeley, 1923; Britayev, 1991                                             |
| Hyperhalosydna striata| Polychaete | Eunicidae spp.                        | Hanley & Burke, 1991; Present study                                        |

BRIV0000326194); 2 inds., Jeju-do, Seogwipo-si, near Supseom (islet), 30 Apr. 2009, depth 10 m, T Park (NIBR IV0000326198), (NIBRIV0000326201, associated with eunicid species); 1 ind., Jeju-do, Jeju-si, Udo-myeon (island), Boseopbonguji point, 20 Oct. 2011, depth 22 m, T Park and Y Eun (NIBRIV0000326196); 2 inds., Jeju-do, Seogwipo-si, near Supseom (islet), 30 Oct. 2013, depth 34.5 m, T Park (NIBRIV0000326199–200).

**Description.** Based on 6 specimens. Body elongated, flattened, tapering anteriorly and posteriorly. Length 30–42 mm, widest width 4–7 mm including parapodium. Body tinged with reddish-brown pigment on ceratophores,
cirrophores, styles of antennae and cirri (Fig. 2A, E).

Twenty two pairs of elytra on segment 2, 4, 5, 7, 9, alternate segments to 39, 41, and 42. Elytra large, overlapping medially and posteriorly, covering dorsum. Elytra with five reddish-brown longitudinal stripes and white spot above elytreophore. Surface of elytron smooth except for a band of numerous microtubercles along outer edge (Fig. 2A, C).

Prostomium bilobed, wider than long, without cephalic peaks. Two pairs of eyes, anterior eyes large, lying dorsolaterally near widest part of prostomium; posterior eyes smaller, lying near rear of prostomium. Palps long, stout basally, tapering to abruptly tapered tips. Three antennae; median antenna with large cylindrical ceratophore, basally cylindrical style, subterminally swollen and abruptly tapered filiform tip; lateral antennae with ceratophores inserted terminally on prostomium thinner than median ceratophores, styles similar with median style but thinner and shorter (Fig. 2E). Everted proboscis dorsally and ventrally with total 18 soft papillae, and two pairs of jaws (Fig. 2B).

Tentacular (first) segment achaetous, invisible dorsally. Lateral tentaculophores moderate length, with two pairs of dorsal and ventral tentacular cirri, dorsal tentacular cirri longer than ventral cirri; styles smooth, slender, with slight subterminal swelling and abruptly tapered filiform tip. Facial tubercle small, well developed. Buccal (second) segment without nuchal fold, with first pair of elytra, subbiramous parapodia, noto and neurochaetae. Ventral buccal cirri longer than following ventral cirri (Fig. 2A, E).

Parapodia subbiramous. Notopodium small, digitiform, with distal groove on anterodorsal face of large neuropodium. Neuropodium notched dorsally and ventrally with bluntly rounded pre-, postchaetal lobes (Fig. 2G, I). Dorsal cirrophores on elytraless segment, large, cylindrical, styles basally cylindrical with slight subterminal swelling and abruptly tapered filiform tips (Fig. 2E). Ventral cirri short, subulate. Nephridial papillae well developed from segment 8 (Fig. 2I).

Notochaetae very small, often absent, mostly hidden between notopodial lobes or by acicular, slightly curved, with several rows of spines below unidentate tips (Fig. 2F). Neurochaetae much larger, numerous, with several rows of spines below bidentate tips (Fig. 2J).

Pygidium small, with pair of anal cirri similar to dorsal cirri (Fig. 2H). Anus dorsally on last 3–4 chaetigers (Fig. 2D).

Remarks. Genus Hyperhalosydna Augener, 1922 consists of three species; *H. striata*, *H. alleni* (Day, 1934) and *H. bicornis* Averincev, 1978. Among these species, only *H. striata* has been reported from southern part of
eastern Asian waters (Moore, 1903; Okuda, 1936; Uschakov, 1982; Uchida, 1988; 1992; Imajima, 2001) (Fig. 5). *Hyperhalosydna striata* is easily distinguishable from its congeners by unique striped elytra (Fig. 2A, C). Examined specimens agree well with previous redescriptions of Hanley and Burke (1991) and Wehe (2006). The number of elytron pairs on adults of this species reportedly show a considerable variation (Marenzeller, 1902; Rullier, 1965). Later, Hanley and Burke (1991) and Wehe (2006) confirmed the number of elytron pairs as constant 22. All specimens examined from this study agree with this number.

Previous records of this species make no mention of commensal association except Hanley and Burke (1991). Thirteen individuals were closely related with eunicid polychaetes and this commensal association was confirmed in this study (Fig. 4A).

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