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박사학위논문

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지도교수 윤 성 명

이 논문을 이학 박사학위신청 논문으로 제출함

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최 현 기

최현기의 박사학위논문을 인준함

위원장	한국해양과학기술원 책임연구원	최 진 우(인)
위 원	이화여자대학교 교 수	정 종 우(인)
위 원	조선대학교 교 수	이 정 섭(인)
위 원	조선대학교 교 수	송 상 기(인)
위 원	조선대학교 교 수	윤 성 명(인)

2015년 12월

조선대학교 대학원

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ABSTRACT

A Systematics and Ecological Notes on Marine Polychaetes (Annelida, Polychaeta) from Korea, with the Secondary Production of *Hediste japonica* Population in Suncheon Bay

Hyun Ki Choi
Advisor : Prof. Seong Myeong Yoon, Ph.D.
Department of Biotechnology
Graduate School of Chosun University

In this study, the marine polychaetes were examined and identified, which were collected from various habitats at 85 localities in Korean waters during the time periods of August, 2006 to July, 2015. By the present study, 150 polychaete species belonging to 99 genera of 36 families were identified. Among them, four species, including *Sternaspis* sp. nov., *Pseudonereis* sp. nov. 1, *Pseudonereis* sp. nov. 2, and *Lagis* sp. nov., could be described as new species, and seven species such as *Glycera tesselata* Grube, 1863, *Arabella monroi* Colbth, 1989, *Scolelepis (Scolelepis) kudenovi* Hartmann-Schröder, 1981, *Heteromastus filiformis* (Claparède, 1864), *Naineris dendritica* (Kinberg, 1867), *Aphelochaeta monilaris* (Hartman, 1960), and *Praxillella pacifica* Berkeley, 1929, were newly recorded in Korean fauna. In addition, detailed descriptions and illustrations for the six species, *Glycera fallax* Quatrefages, 1850, *Glycinde bonhourei* Gravier, 1904, *Pista shizugawaensis* Nishi and Tanaka, 2006, *Armandia amakusaensis* Saito, Tamaki and Imajima, 2000, *Polyophthalmus qingdaoensis* Purschke, Ding and Müller, 1995, and *Nereiphylla hera* Kato and Mawatari, 1999, which were dealt in the recent papers published in 2015 by the author, were also provided, and *Goniada japonica* Izuka, 1912 was redescribed in this study. The keys for polychaete families, genera, and species from Korean waters also were provided in this study.

Polychaete fauna of the present study was constituted of Phyllodocida (46%),

Scolecida (19%), Terebellida (15%), Eunicida (10%), Spionida (5%), and Sabellida (5%) in the number of species grouped by order level. In the respect of the areas from which polychaete species were collected, 101 species among total 150 species occurred from Korea Strait, 73 species from the Yellow Sea, and 34 species from the East Sea. Concerning to habitats region and types, 127 species were found from intertidal region, 36 species from subtidal region, and 13 species from both regions. And 112 species were collected from soft bottom, 52 species from hard bottom, and 14 species from both types of bottom. In the analysis of feeding guild types, CMJ type was most abundant (20%), and followed by HMJ (16%), SDT (12%), BMX (12%), and CDJ (9%).

In the present study, the community structure of polychaetes in Suncheon Bay, Korea was examined during the period from January, 2012 to February, 2014. The polychaete community comprised a total of 20 species and its mean density was 1,524 ind./m^2 in the sampling site. *Hediste japonica* (39.17%), *Heteromastus filiformis* (29.17%), and *Sigambra hanaokai* (13.90%), were dominant species of polychaete community in terms of the individuals numbers. The values of diversity (H′), evenness (J′), richness (R), and dominance (D) were measured as 1.59±0.21, 0.82±0.10, 0.90±0.24, and 0.74±0.13, respectively.

The most important species in abundance and biomass in the polychaete community was *Hediste japonica*. *Hediste* population had two cohorts by the analysis of size frequency histogram (L3 length in mm). The annual secondary production (P) of the 2012 cohort existed from January to December, 2012 was estimated as 31.74 g/m^2year^{-1} with the mean annual biomass (B) of 6.10 g/m^2, and the P/B ratio of 5.20 $year^{-1}$. Those of the 2013 cohort present from March, 2013 to February, 2014 were estimated as 15.51 g/m^2year^{-1}, 4.49 g/m^2, and 3.45 $year^{-1}$, respectively.

1. Introduction

The polychaetes are one of the major groups in the marine invertebrates, composed of about 14,000-16,000 species considered valid (Blake, 1994a; Rouse and Pleijel, 2006; Eklöf, 2010). They are an important component in the benthic communities (Fauchald and Jumars, 1979) because of their higher species richness and frequency in mostly benthic environments (Barnard and Hartman, 1959; Reish, 1959; Boesch, 1972; Orth, 1973; Kohn and Lloyd, 1973; Hessler and Jumars, 1974). The polychaetes show a great morphological diversity, and have the most diverse life-styles from free-living predators to filter-feeding tube-builders, and are sometimes represented as the interstitial parasites (Rouse and Pleijel, 2001; Glasby, 2005; Eklöf, 2010).

The polychaetes have been distinguished from the oligochaetes and hirudineans, which are the major taxa of phylum Annelida with the polychaetes, by several characteristics such as dioeciousness, anterior appendages of various sorts (antennae, palps, tentacular cirri), and parapodia bearing numerous setae (Fauchald, 1977). Since the taxonomical descriptions of polychaetes were originally reported by Linne in 1758, the taxonomic boundary of this taxon had been largely divided into two group based on their ecological life habits, Errantia and Sedentaria (Audouin and Milne-Edwards, 1834; Quatrefages, 1866; Fauchald and Rouse, 1997). The polychaetes belonging to Errantia are usually free-living and predacious using jaws, while the sedentary polychaetes are consisted of tubicolous and burrowing species, they are also typically deposit or filter feeders (Fauchald, 1977). This taxonomic system of polychaetes had been widely used in the several monographs by Fauvel (1923, 1927, 1953), Uschakov (1955), Day (1967), and Hartmann-Schröder (1971). However, they complained about taxonomical limit of this separating system (Fauchald and Rouse, 1997). Although this classification was useful for easy classifying equally them into two large groups, it does not reflects their evolutionary history including taxonomic characters (Eklöf, 2010), and has been controversial by many studies (Dales, 1962, 1977; Fauchald, 1977; Pettibone, 1982; Rouse and Fauchald, 1997).

Currently, the cladistic analysis based on the morphological data, which was first conducted by Rouse and Fauchald (1997), is widely accepted in the polychaete classification (Rouse and Pleijel 2001; Eklöf, 2010). According to Rouse and Fauchald (1997), Polychaeta is classified into two major clades, Scolecida and Palpata, based on the absence or presence of palps, which is most typical synapomorphy. Scolecida was established by Rouse and Fauchald (1997), and derived from name Scoleciformia introduced by Benham (1896). This group has a component bearing sedentary palp-lacking forms with two or more pairs of pygidial cirri (Rouse and Pleijel 2001). Palpata is divided into Aciculata and Canalipalpata, and these groups were originated from their synapomorphy such as the presence of aciculae in Aciculata and the presence of grooved palps in Canalipalpata (Rouse and Fauchald, 1997). Aciculata is consisted of two clades, Phyllodocida and Eunicida, and Canalipalpata has three clades, Sabellida, Spionida, and Terebellida (Rouse and Fauchald, 1997; Rouse and Pleijel 2001). These clades with the families belonging to them are displayed in Table 1-1.

Here, the author adopt the classification system derived from Rouse and Fauchald (1997) in the present study on the taxonomy of the polychaetes from Korean waters. Also, the taxonomic ranks of the clades were determined based on the work by Nygren and Pleijel (2015).

In East Asia, about 710 species have been recorded from Japanese waters (Imajima and Hartman, 1964; Imajima, 1966, 1967, 1970, 1972, 1973, 1977, 1978, 1985, 1986, 1989, 1990a, c, 1991, 1992, 1997, 1999, 2001, 2003; Kitamori, 1967; Imajima and Gamo, 1970; Imajima and Higuchi, 1975; Miura, 1977, 1986; Uchida, 1978, 2004; Imajima and Takeda, 1985; Yamamoto and Imajima, 1985; Imajima and Shiraki, 1982; Imajima and Morita, 1987; Imajima and Ten-Hove, 1989; Sato-Okoshi, 1998; Yabe and Mawatari, 1998; Kato and Mawatari, 1999; Nishi, 1999, 2001; Saito *et al.*, 2000; Kato *et al.*, 2001; Misaka and Masanori, 2003; Sato and Nakashima, 2003; Nishi and Tanaka, 2006; Sato, 2013; Nishi *et al.*, 2014) and about 690 species were known from Chinese waters (Yang and Sun, 1988; Purschke *et al.*, 1995; Wu *et al.*, 1997; Sun and Yang, 2004, 2014; Paxton and Chou. 2000; Zhou *et al.*, 2009; Sui X, 2013; Sun and Qiu, 2012; Salazar-Vallejo *et al.*, 2014).

Table 1. The systematic arrangement of polychaetes used in this study based on the cladistic analyses of Rouse and Fauchald (1997).

Class	Polychaeta					
Subclass	Scolecida	Aciculata		Canalipalpata		
Order		Phyllodocida	Euncida	Sabellida	Spionida	Terebellida
Family	Arenicolidae Maldanidae Capitellidae Opneliidae Scalibregmatidae Orbiniiaae Paraonidae Questidae Cossuridae	Amphinomidae Eupnrosinidae Acoetidae Aphroditidae Eulepethidae Polynoidae Sigalionidae Pholoidae Chrysopetalidae Glyceridae Goniadidae Paralacydoniidae Pisionidae Lacydoniidae Phyllodocidae Nephtyidae Nereiaidae Hesionidae Pilargidae Sphaerodoridae Syllidae	Dorvilleidae Lumbrineridae Eunicidae Onuphidae Oenonidae	Siboglinidae Sabellariidae Sabellidae Serpulidae Oweniidae	Apistobranchidae Spionidae Trochochaetidae Longosomatidae Magelonidae Poecilochaetidae Chaetopteridae	Acrocirridae Flabelligeridae Cirratulidae Alvinellidae Ampharetidae Pectinariidae Terebellidae Trichobranchidae

In Korean waters, Kamita and Sato first described 10 polychaete species collected from Incheon in 1941 (Paik, 1989). Thereafter, the monograph of polychaeta including the total 265 species was reported by Paik (1989) based on many previous studies from Korean waters (Paik, 1972, 1973a, b, 1975a, b, 1976, 1977, 1978, 1979a-c, 1980a, b, 1982, 1984a, b, 1986a, b; Rho and Song, 1974, 1975, 1976, 1982; Lee, 1976; Lee and Jea, 1983, 1985; Hong, 1984; Jae *et al.,* 1985; Jae *et al,*. 1987; Rho and Lee, 1987, 1988). After this monograph, Lee *et al.* (1992) redescribed *Perinereis aibuhitensis* (Grube, 1878), and Lee and Rho (1992, 1994a, b) performed a few systematics studies of Syllidae Grube, 1850 including two new species. Jung and Hong (1996, 1997) described two species in Sabellidae Latreille, 1825 and nine species in Nephtyidae Grube, 1850. Jung *et al.* (1996, 1998) reported six species in Paraonidae Cerruti, 1909 and five *Prionospio* species. Paik (1997a-c) reported *Nicon sinica* Wu and Sun, 1979, *Cossura brunnea* Fauchald, 1972, and *Drilonereis filum* (Claparède, 1868). Yun *et al.* (1999a, b) recorded *Axiothella quadrimaculata* Augener, 1914 and *Iphione muricata* (Lamarck, 1818). Bhaud *et al.* (2002) reported *Spiochaetopterus koreana* Bhaud, Koh and Hong, 2002. Park and Kim (2007) revised the species of *Perinereis nuntia* group. Yokoyama and Choi (2010) reported three *Paraprionospio* species. Consequently, the Korean fauna of polychaetes currently contains about 295 species in 42 families (Paik, 1989; Bhaud *et al.,* 2002; Park and Kim, 2007; Yokoyama and Choi, 2010). However, it is very poor compared to those from adjacent Japanese and Chinese waters that comprise about more than 1,000 polychaete species (Imajima and Hartman, 1964, 2001, 2003; Wu *et al.*, 1997; Sun and Yang, 2004, 2014; Paxton and Chou. 2000; Salazar-Vallejo *et al.* 2014).

While, the macrobenthic communities of soft bottom are the key components in the marine ecosystem (Lu, 2005). They cause the physical and chemical changes in the sediments that affect many ecosystem processes such as the nutrient cycling, pollutant metabolism, dispersion, and secondary production (Snelgrove, 1998; Gaudencio and Cabral, 2007; Shou *et al.,* 2009).

Among them, the polychaete community is a significant component in the infaunal communities because it is one of the dominant groups in the abundance, biomass, and species richness (Sivadas *et al.*, 2010; Chu *et al.*, 2014). The polychaete community also performs an important role in terms of the stability and functioning of the benthic ecosystem (Hutchings, 1998; Belan, 2003). The polychaetes as the subject of ecological assessment have some following properties: they are the most abundant macrobenthic group, readily available and easy to sample; they include a great diversity of trophic guilds and reproductive strategies that could be the reason of their success in various environments; they respond to the disturbance induced by different kinds of pollution exhibiting quantifiable changes in the community structure (Sivadas *et al.*, 2010). Therefore, the study on the polychaete community is important for understanding the characteristics of macrobenthic communities in marine ecosystem.

Most studies on the polychaete communities have been reported from many regions along the south and west coasts of Korea such as Kyunggi Bay (Shin *et al.*, 1992; Lim and Choi, 1998), Garolim Bay (Wi *et al.*, 2014), Kwangyang Bay (Choi and Koh, 1984; Shin and Koh, 1990), Yoja Bay (Kim *et al.*, 2005), Deukryang Bay (Shin and Kim, 2002), Jinhae Bay (Lim and Shin, 2005; Jung *et al.*, 2009), etc. in Korean waters. Among these regions, Suncheon Bay, one of the Ramsar Site, has been concerned as the representative intertidal mud flat in the south coast of Korea. Hong *et al.* (2011) provided a list of the macrobentic fauna in Suncheon Bay, including 14 polychaete species. However, ecological study of this region have been poorly conducted in spite of its prominence.

In the population study of ecology, calculation of the secondary production is formed by the measurement of the heterotrophic biomass per unit area over time (Benke and Huryn, 2006). It represents the cumulative responses of a population in the abiotic and biotic stresses, and is widely used as an essential variable when quantifying food webs and ecosystem functioning such as the material cycling and energy flow (Benke and Huryn, 2010). The secondary production also reflects the population properties or processes (e.g. body mass, reproduction, recruitment, growth rate, survivorship rate, developmental time, life span, trophic status), and the biotic interaction (e.g. predtion, competition, facilitation), as well as the environmental conditions (Dolbeth *et al.*, 2012). Therefore, the secondary production may be represented as interesting proxy for the functional responses of the populations or communities in various environmental conditions (Dolbeth *et al.*, 2012).

The secondary production of polychaete population has been extensively studied (Oyenekan, 1986, 1988; Valderhaug, 1985; Ambrogi, 1990; Arias and Drake, 1995; Seitz and Schaffner, 1995; Gillet and Torresani, 2002; Garcia-Arberas and Rallo, 2004; Rouhi *et al.*, 2008, Daas *et al.,* 2011, etc.). In Korean waters, however, Choi and Lee (1997) investigated that of *Perinereis aibuhitensis* (Grube, 1878) in the intertidal mud flat in the west coast of Korea, and it is the only case of such study on polychaete populations.

In the present study, the taxonomic study was aimed to describe polychaete species poorly known from Korean waters with detailed descriptions and illustrations. The keys for distinguishing families, genera, and species from Korea waters are also provided. Also, the author was to investigate the structure and properties of the polychaete community in Suncheon Bay. This work also was performed to obtain the information on the secondary production and dynamics for the population of dominant species in the polychaete community.

2. Materials and Methods

2.1. Systematic study

The materials examined in this study were collected at 85 localities in South Korea during the period from August, 2006 to July, 2015 (Fig. 6, Appendix 1). Collections were made from various marine habitats such as littoral rocks, mud and sand flats, and subtidal regions by SCUBA diving or grab sampling. All samples were fixed initially with 10% formalin or 95% ethanol. In the laboratory, the specimens were sorted out under stereomicroscope (SMZ1500; Olympus, Tokyo, Japan) and preserved usually in 95% ethanol.

The characteristics of whole body were observed and the appendages were dissected in a petri dish by using dissection forceps or surgical knives and needles under the stereomicroscope. Dissected specimens were mounted on temporary slides using glycerol or permanent slides using polyvinyl lactophenol solution. Drawings were made by the stereomicroscope and light microscope (LABOPHOT-2; Nikon, Tokyo, Japan) with the aids of drawing tubes.

Photographs were taken on the appendages in a permanent slide, and the images of appendages were provided by a image system (i-SOLUTION/LITE, iMTechnology®, Vancouver, Canada).

All the types of new species and other materials examined are deposited in the Department of Biology, Chosun University and the National Institute of Biological Resources (NIBR) in Korea.

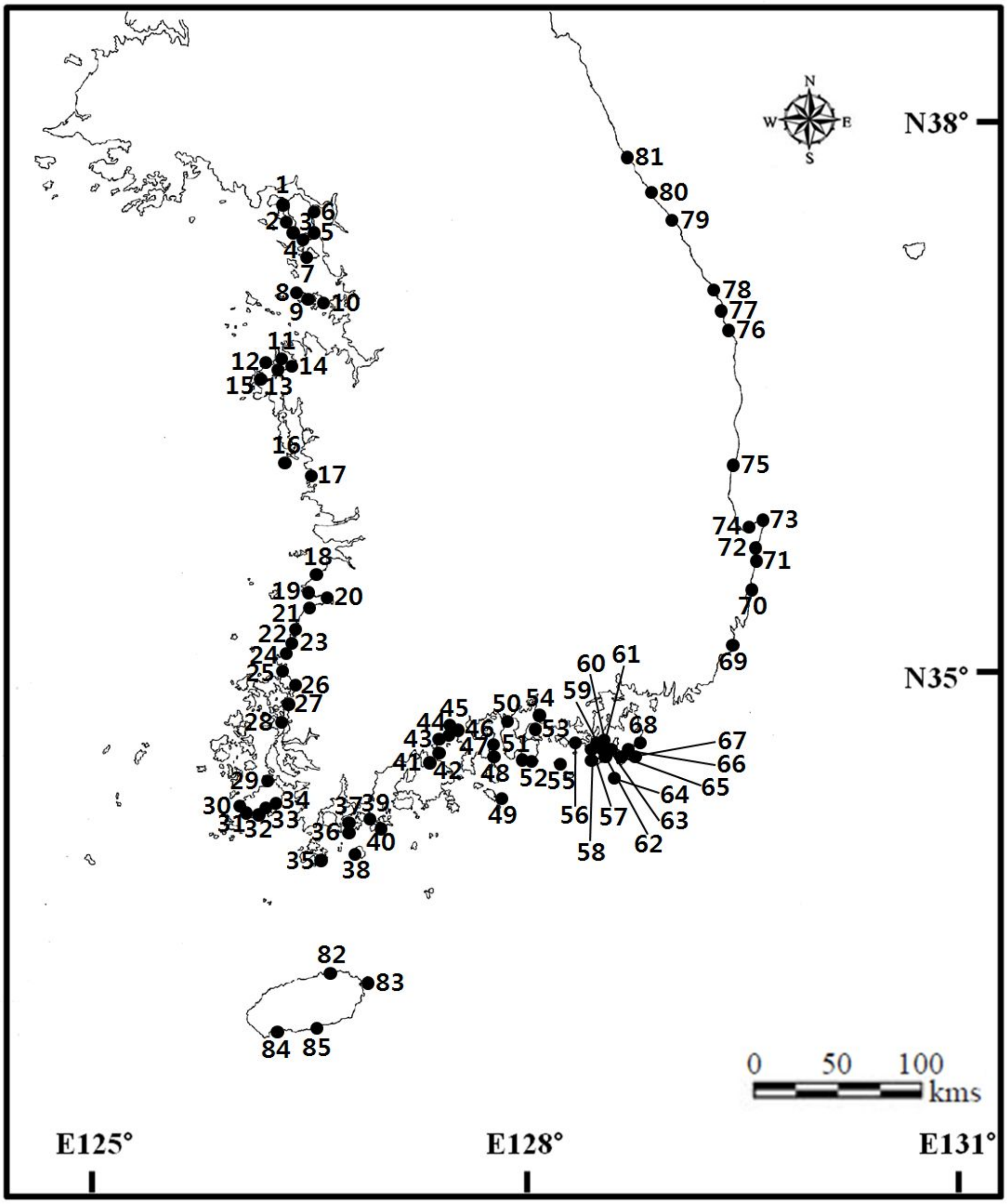

Fig. 1. Localities where specimens were collected. Detailed information on the sampling sites is provided in Appendix 1.

2.2 Morphology and taxonomic characters

The body of polychaetes is usually consisted of three region: the presegmental region including prostomium and peristomium, the segmented trunk bearing parapodia and setae generally, and the postsegmental pygidium with growth zone (Anderson 1973; Schroeder and Hermans 1975; Blake, 1994a; Fauchald and Rouse, 1997; Rouse and Pleijel 2001).

Head and head appendages

1. Prostomium (Figs. 2, 3): Most polychaetes have a distinct prostomium (Fauchald, 1977). The prostomium has most of the sense organs and often appendages such as antennae and palps, and these structures are very important in the taxonomy of polychaetes (Blake, 1994a; Fauchald and Rouse, 1997). The shape of prostomium is varied, simply conical (e.g. some spionids, capitellids, many orbiniids), square or pentagonal (e.g. nephtyids), and T-shaped (e.g. some spionids and scalibregmatids) or inverse T-shaped (e.g. nereidids) (Fauchald and Rouse, 1997; Rouse and Pleijel, 2001). In several families, it may be fused to the peristomium (Fauchald and Rouse, 1997). This joint structure is clearly separated from body as a distinct head in maldanids and paraonids (Pilgrim, 1966; Strelzov, 1973), and modified as a tentacular crown or a separated entity in sabellids and serpulids (Fitzhugh, 1989; Rouse and Fitzhugh, 1994; Fauchald and Rouse, 1997). The prostomium is also located on the free frontal edge of peristomium in terebellids and trichobranchids (Holthe, 1986).

2. Peristomium (Figs. 2, 3): In many polychaetes, the peristomium is one (e.g. arenicolids, cossurids, scalibregmatids, and sabellids) or two (e.g. oenonids and eunicids) rings separated from the prostomium and the first segment (Rouse and Pleijel, 2001). It surrounds the mouth in most taxa, but includes the roof of mouth in some taxa (e.g. terebellids, trichobranchids) (Fauchald and Rouse, 1997).

3. Antennae (Figs. 2, 3): Antennae are one of the prostomial appendages (Fauchald, 1977). They are usually composed of a pair of lateral antennae on the frontal edge of prostomium and one median antennae located behind the frontal margin of prostomium (Fauchald and Rouse, 1997). The shapes of them are simply digitiform (e.g. phyllodocids and nephtyids) (Rainer, 1984, 1989; Pleijel, 1991) or articulated (e.g. eunicids) (Fauchald, 1992) or a distal ceratostyle with basal ceratophore (e.g. polynoids) (Fauvel, 1923). The presence or absence, the number, and the shape of antennae are used as the significant taxonomic characters for the identification of polychaetes (Blake, 1994a). The median antenna are treated as the nuchal papilla in some phyllodocids (Pleijel, 1991) and arising from a posterior prolongation of the prostomium in some spionids (Foster 1971), and the lateral antennae are absent in the aphroditids (Fauvel, 1923).

4. Palps (Figs. 2, 3): The palps are nearly located on the dorsal side of prostomium or peristomium, and divided into two types, the feeding palps and the sensory palps (Blake, 1994a; Fauchald and Rouse, 1997). The feeding palps have longitudinally ciliated grooves (e.g. spionids, terebellids, and acrocirrids) (Söderström 1920; Dales 1955; Banse 1969), and they sometimes have many papillae instead of the groove in magelonids (Rouse and Pleijel, 2001). Most polychaetes bearing palps have a single pair of grooved palps, and its cross-sections are usually U-shaped or V-shaped (Fauchald and Rouse, 1997). The terebellids and trichobranchids have multiple grooved palps, attached along fusion line between prostomium and peristomium (Fauchald and Rouse, 1997). The grooved palps also constitute a prostomial branchial crown consisted of three or more pairs of radioles in the sabellids and serpulids (Orrhage, 1980; Fitzhugh, 1989; Rouse and Fitzhugh, 1994). The ventral sensory palps are more simple than the grooved palps (Fauchald and Rouse, 1997). They are usually digitiform, and tapering with pointed tips, and also are shorter than the grooved palps in most polychaetes bearing ventral palps (e.g. acoetids, phyllodocids) (Pettibone, 1989; Pleijel, 1991). The ventral palps are also bi-articulated in some taxa (e.g. some hesionids, nereidids) (Pleijel, 1993; Fauvel, 1923).

5. Proboscis (Eversible pharynx) (Figs. 2, 3): The anterior region of digestive tract can be eversible (Blake, 1994a; Fauchald, 1977). It is divided into two types, a ventral plate-muscle pharynx and an axial pharynx (Dales, 1962).

A ventral plate-muscle pharynx is appeared in the taxa belonging to Eunicea and Amphinomida, and an axial pharynx is developed symmetrically, which is present in other polychaetes as a strongly muscular region (e.g. nereidids, nephtyids, and glycerids). In some taxa, this musculature may be absent (e.g. arenicolids and maldanids) (Fauchald, 1977). Each family has a characteristic type of proboscis, but those of spionids are plate-muscle and axial pharynges (Fauchald, 1977). The detailed structures of eversible pharynx such as jaw, teeth, other chitinized structures, and soft papillae on the surface are used as the significant taxonomic characters for distinguishing the genera and species of polychaetes (Blake, 1994a; Fauchald, 1977).

Segmented body region

1. Parapodia (Fig. 4): The segments of metameric body have biramous or uniramous parapodia (Fauchald, 1977). The parapodia are commonly biramous, and consisted of a dorsal lobe or notopodium and a ventral lobe or neuropodium (e.g. nereidids), and uniramous parapodia show reduced or lost notopodia (Blake, 1994a). While, the parapodia of some sedentary polychaetes are greatly reduced or absent, it is called as the apodous condition (e.g. cirratulids) (Blake, 1994a). The rami of each notopodium and neuropodium are similar in size and structure, and they have pre- and postsetal lobes (e.g. spionids) or ligules (e.g. nereidids) (Rouse and Pleijel, 2001). The dorsal cirri are attached on the superior edge of notopodium or on the body wall above notopodium, and the ventral cirri are located on the inferior edge of neuropodium or on the adjacent body wall (Rouse and Pleijel 2001). They are usually slender and cirriform, but some taxa have the flattened ones (e.g. phyllodocids) or elytrae (e.g. polynoids) (Rouse and Pleijel, 2001).

2. Setae (Fig. 5): The setae show many different forms, and they are the significant characteristics for distinguishing the species. Their basic forms can be divided into the simple and compound setae, and they have varied tips such as entire, bifid, trifid, and multidentate tips (Blake, 1994a).

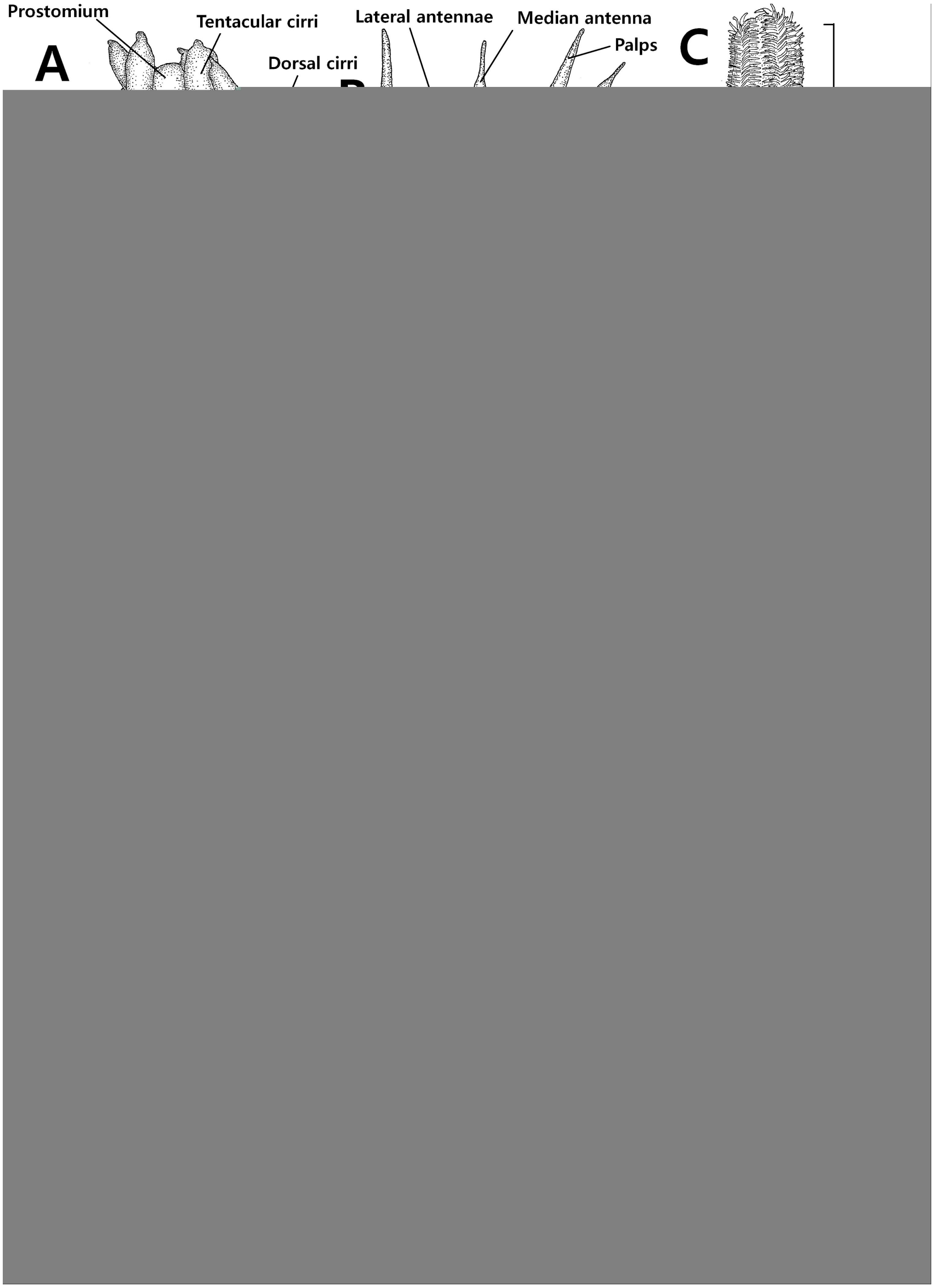

Fig. 2. Representative structures of anterior end in the polychaetes. A. Phyllodocidae; B, Polynoidae; C, Goniadidae; D, Oenonididae; E, Terebellidae; F, Serpulidae; G, Capitellidae; H, Orbiniidae; I, Cirratulidae.

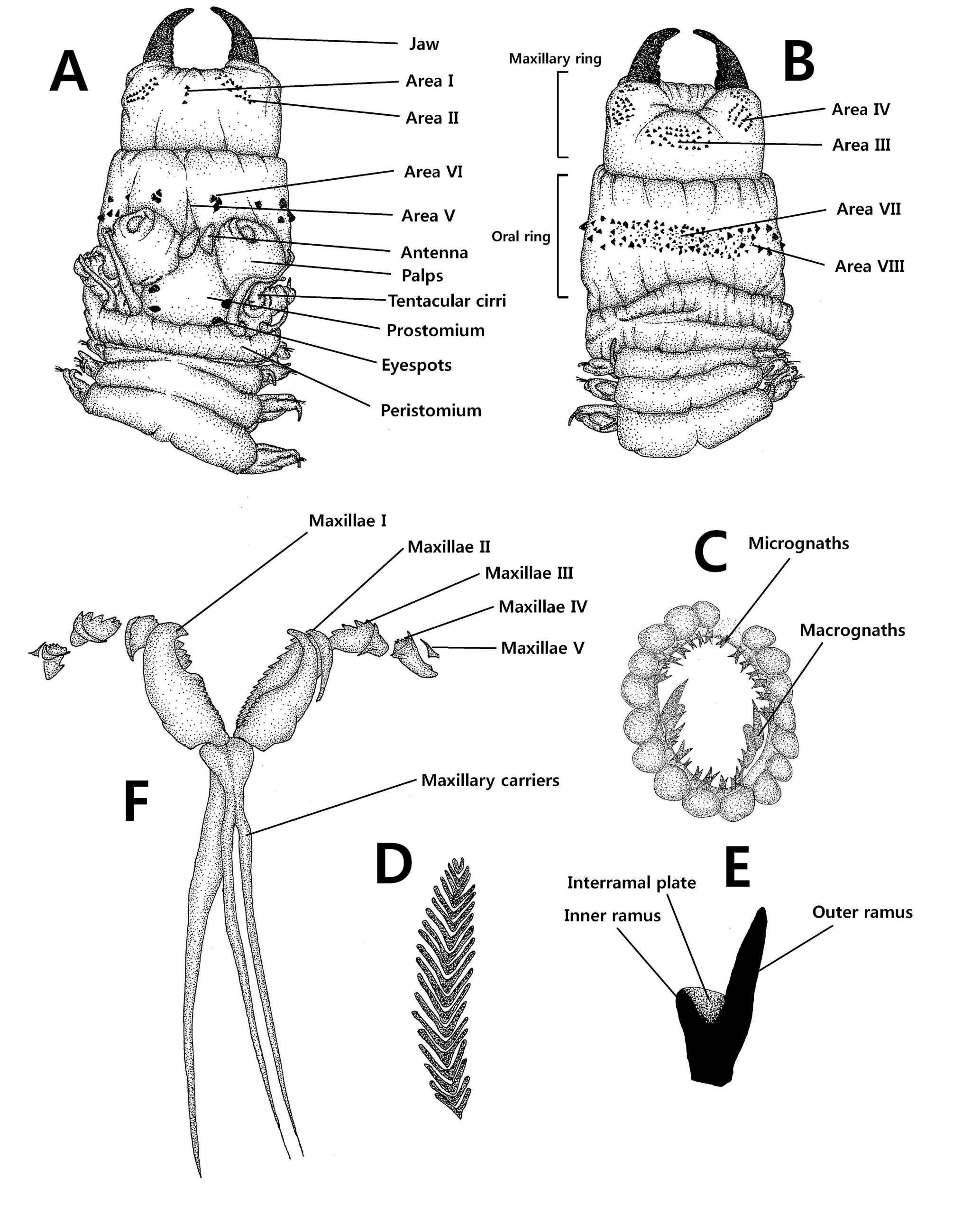

Fig. 3. Morphological characters of armature on proboscis in several polychaetes. A, B, nereidid polychaete, dorsal (A) and ventral (B) views of anterior end showing areas of proboscis and paragnaths; C, D, goniadid polychaete, macro- and micrognaths (C) and chevrons (D); E, glycerid polychaete, aileron; F, oenonids polychaete, maxillary apparatus.

The simple setae are two types of long, slender, and hairlike capillary setae and thick and rod-like acicular setae (Blake, 1994a; Rouse and Pleijel, 2001). Some simple setae also have the bent tips with a form of often bidentate or multidentate one and of hooded or half-hooded one, which are known as the hooded hooks (Blake, 1994a). The sedentary polychaetes particularly have short broadened modified hook, which are known as the uncini (Blake, 1994a). On the other hands, the compound setae are consisted of the proximal shaft and the distal blade (Blake, 1994a). The basic shape of blade is the spingers and falcigers, and the distal end of shaft is divided into the homogomph and heterogomph based on the shape of their notch (Fauchald, 1977; Blake, 1994a). Additionally, there are many kind of setae in the polychaetes such as the limbate setae, the pectinate setae, the sub-acicular hooks, and the furcate setae (Fauchald, 1977; Blake, 1994a; Rouse and Pleijel, 2001).

3. Branchiae (Figs. 2, 4): The most polychaetes bearing branchiae are closely associated to the dorsal cirri or the notopodial lobes (Fauvel, 1927; Fauchald, 1992). These parapodial branchiae are commonly single filaments (e.g. opheliids) or tufted (e.g. amphinomids) or pectinate ones (e.g. eunicids) (Fauvel, 1927; Gustafson, 1930; Fauchald, 1992a). On the other hand, the branchiae attached on the dorsum are separated from the notopodia, and these dorsal branchiae show many different shapes (Fauchald and Rouse, 1997). The simple digitiform or tapering branchiae are present on the many segments (e.g. cirratulids) or a few anterior segments only (e.g. ampharetids) (Fauvel, 1927; Holthe, 1986). The dorsal branched branchiae have a stalk and filamentous distal group, and their filaments are dichotomously branched (e.g. terebellids) or flattened and foliose (e.g. pectinariids) or irregularly branched and tufted (e.g. terebellids) (Holthe, 1986). The stalks are sometimes reduced or absent in some terebellids and trichobranchids so that their branchiae show a group of filaments only on the dorsum, called as the sessile branchiae (Hutchings and Glasby, 1987). The dorsal branchiae also show triangular structure, and are arranged in double-rows on the anterior segments (e.g. orbiniids, paraonids) (Hartman, 1957; Strelzov, 1973).

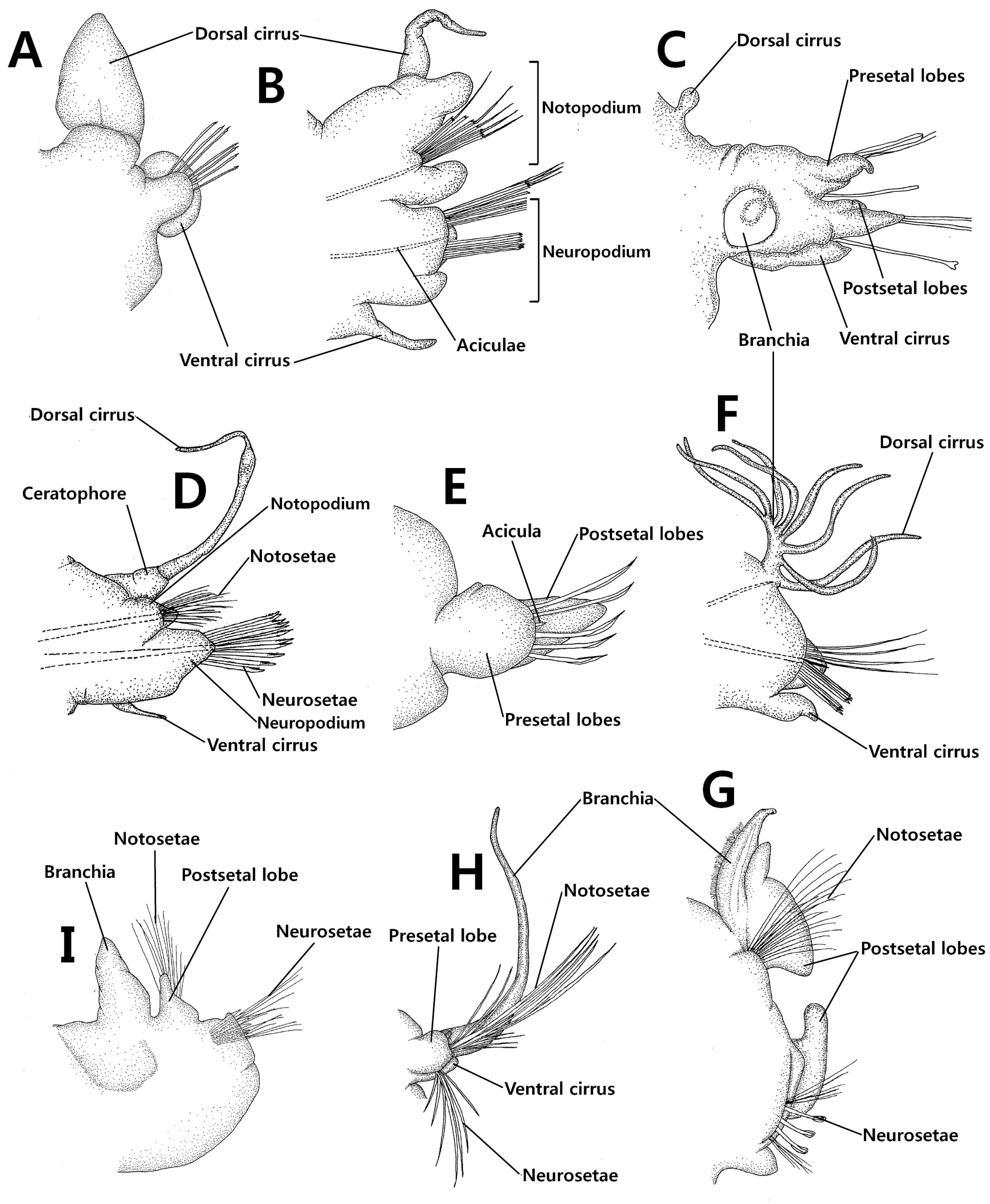

Fig. 4. Representative structures of parapodium in polychaetes. A. Phyllodocidae; B, Nereididae; C, Glyceridae; D, Polynoidae; E, Oenonidae; F, Euncidae; G, Spionidae; H, Opheliidae; I, Orbiniidae.

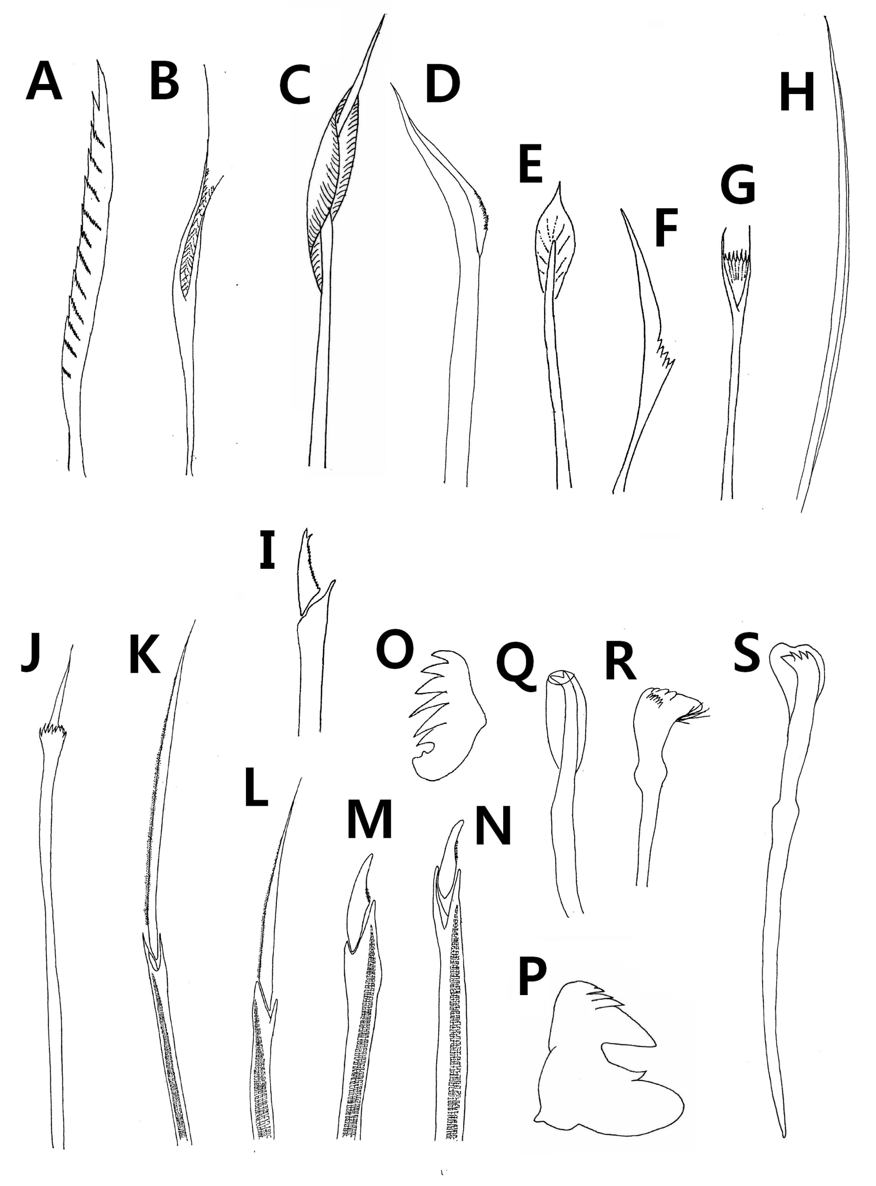

Fig. 5. Types of setae in polychaetes. A-H, simple setae, serrated seta (A), furcate or lyate seta (B), winged capillary seta (C), limbate seta (D), spatulate seta (E), bayonet seta (F), pectinate seta (G), and simple capillary seta (H); I-N, compound or composite setae, composite falcigers with bifid tip (I), composite seta with shaft bearing distal crown (J), homogomph spiniger (K), heterogomhp spiniger (L), heterogomhp falciger (M), and homogomph falciger (N); O-S, hooks and uncini, pectinate uncinus (O), avicular uncinus (P), hooded hook of spionids (Q), rostrate hook (R), and hooded hook of capitellids (S).

Additionally, some taxa of polychaetes have a unique shape of branchiae as the interramal branchiae (e.g. nephtyids), the branchial membrane (e.g. flabelligerids), and the single median structure on the anterior segment (e.g. cossurids) (Spies, 1973; Hartman, 1950; Fournier and Petersen, 1991).

Postsegmental pygidium

1. Pygidium (Fig. 6): The pygidium are the postsegmental part of body bearing anus (Blake, 1994a). It usually has one or more pairs of anal cirri, which are similar to the tentacular and dorsal cirri in the shape and size, but the anal cirri are sometimes absent in the taxa bearing small bodies (e.g. aeolosomatids and parergodrilids) (Fauchald and Rouse, 1997). The general pattern of anal cirri is the presence of one pairs only (e.g. nereidids) (Uschakov, 1955; Day, 1967; Imajima, 1972). They also are present as a single median cirrus (e.g. nepthtyids) or a ornate structure consisting of cirri of varying lengths (e.g. maldanids and opheliids) (Fauchald and Rouse, 1997). In some taxa, the pygidium has a modified simple funnel or the pads instead of anal cirri (e.g. spionids) (Fauchald and Rouse, 1997), and the pectinariids have a unique postsegmental structure such as the flattened caudal appendages, called as the scaph (Hutchings and Peart, 2002).

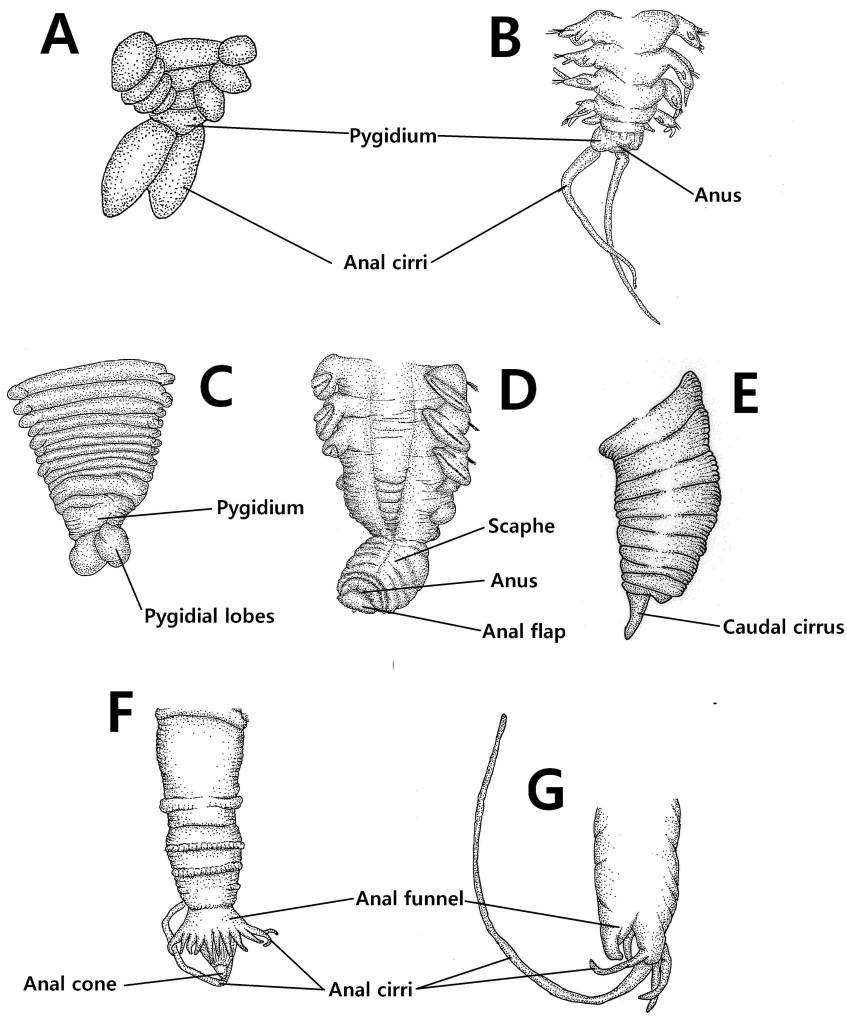

Fig. 6. Representative postsegmental structures in the polychaetes. A. Phyllodocidae; B, Nereididae; C, Oenonida; D, Pectinariidae; E, Capitellidae; F, Maldanidae; G,, Opheliidae.

2.3. Distribution and ecological information

Categories of polychaete feeding guilds were mainly based on Fauchald and Jumars (1979), and referred by several previous works on the polychaete communities in Korea (Choi and Koh, 1986, 1988, 1989, 1992).

2.4. Ecological study

2.4.1. Study site

The sampling site of the present study was situated at the inward region of semi-enclosed bay area, near a small channel exposed at ebb tide. It is located at the southern region of Suncheon Bay in Haksan-ri, Byeollyang-myeon, Suncheon-si, Jeollanam-do, Korea (127°29′03″E, 34°50′50″N). The bottom of sampling site was composed of muddy and sandy materials (Fig. 7).

2.4.2. Sampling

Samples were collected monthly from January, 2012 to February, 2014 at the ebb tide. Sampling was carried out along the transect line in a distance of 10 m. Three replicate samples by using the cylindrical core sampler of 10 cm in diameter were taken from bottom, and the specimens were sorted from substrates using a sieve of 20 cm in diameter, and 0.5 mm in mesh size. They were fixed initially with 5% formaldehyde-seawater solution and preserved in 85% ethyl alcohol after sorting in the laboratory.

2.4.3. Polychaete community analysis

Four kinds of indices were used to investigate the community structure of polychaete such as species diversity (H′; Shannon and Weaver, 1963), evenness (J′; Pielou, 1966), richness (R; Margalef, 1958), and dominance (D; Simpson, 1949). The formulas of the indices are as follows:

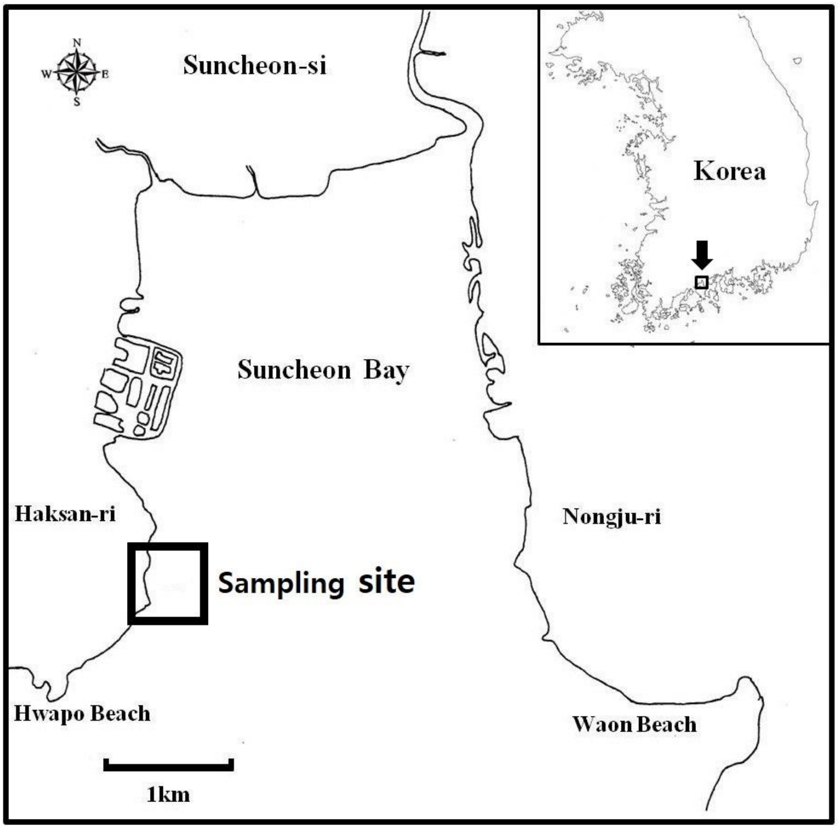

Fig. 7. Location of the sampling sites in Suncheon Bay, south coast of Korea.

$$H' = \Sigma \; Pi \times \ln \; (Pi)$$

where Pi is the proportion of total sample represented by the species i.

$$J' = H' \; / \; \ln \; (S)$$

where S is the total number of species in the sample.

$$R = (S-1)/\ln(N)$$

where N is the total number of individuals in the sample.

$$D = (Y_1 + Y_2) \; / \; Y$$

where Y is the total number of individuals, Y_1 and Y_2 are the number of individuals represented by dominant species and subdominant species, respectively.

2.4.4 Size frequency and cohort analysis

The size frequency was studied by the measuring L3 length (total length of prostomium, peristomium and setiger 1) of all individuals with an image analysis system (i-SOLUTION/LITE, iMTechnology®, Vancouver, Canada). The data of L3 length were grouped into size classes, a size class interval of 0.1 mm was selected. The size frequency histograms were treated by the method of Bhattacharya (1967) using FISAT II FAO software (Gayanilo *et al.* 2005).

2.4.5. Measurement of biomass

For the dry weight measurement, the specimens were dried for 24 h at 65 ℃ and individually weighed to the nearest 0.01 g by using electronic microbalance (OHAUS, AR1530).

2.4.6. Secondary production

The regression between the body weight (mg) and the L3 length (mm) was obtained in an equation of the form:

$$W = aL3^{b}$$

where a and b are constants.

The secondary production (P) was estimated by the removal summation method of Crisp in 1971 using the equation (Gillet and Torresani, 2002; van der Meer *et al.,* 2005; Daas *et al,* 2011);

$$P = (N_{t1} + N_{t2})(W_{t2} - W_{t1})/2$$

where N_{t1} and N_{t2} are representing the numbers of individuals in a cohort at times t_1 and t_2, respectively, W_{t1} and W_{t2} are the mean dry weight of a cohort at times t_1 and t_2, respectively.

3. Results and Discussion

3.1. Systematic study

List of Species

Class Polychaeta Grube, 1850 다모 강

Subclass Aciculata Rouse and Fauchald, 1997

Order Phyllodocida Örsted, 1843 부채발갯지렁이목

Family Phyllodocidae Williams, 1852 부채발갯지렁이과

Genus *Eteone* Savigny, 1820 작은부채발갯지렁이속

1. *Eteone longa* (Fabricius, 1780) 작은부채발갯지렁이

Genus *Eulalia* Savigny, 1817 불꽃부채발갯지렁이속

2. *Eulalia bilineata* (Johnston, 1840) 두줄불꽃부채발갯지렁이
3. *Eulalia viridis* (Linnaeus, 1767) 녹색불꽃부채발갯지렁이

Genus *Mysta* Malmgeren, 1865 혹부채발갯지렁이속

4. *Mysta ornata* (Grube, 1879) 혹부채발갯지렁이

Genus *Nereiphylla* Blainville, 1828 납작수염부채발갯지렁이 속

5. *Nereiphylla castanea* (Marenzeller, 1879) 납작수염부채발갯지렁이
6. *Nereiphylla hera* Kato and Mawatari, 1999 뾰족납작수염부채발갯지렁이

Genus *Phyllodoce* Lamarck, 1818 큰부채발갯지렁이속

7. *Phyllodoce maculata* (Linnaeus, 1767) 네모부채발갯지렁이
8. *Phyllodoce koreana* (Lee and Jae, 1985) 한국부채발갯지렁이

Family Glyceridae Grube, 1850 미갑갯지렁이과

Genus *Glycera* Savigny, 1818 참미갑갯지렁이속

9. *Glycera alba* (Müller, 1776) 짧은아가미미갑갯지렁이
10. *Glycera fallax* Quatrefages, 1850 구슬아가미미갑갯지렁이
11. *Glycera macintoshi* Grube, 1877 청동미갑갯지렁이
12. *Glycera nicobarica* Grube, 1868 치로리미갑갯지렁이
13. *Glycera onomichiensis* Izuka, 1912 오노미치미갑갯지렁이
14. *Glycera tesselata* Grube, 1863
15. *Glycera unicornis* Lamarck, 1818 어리미갑갯지렁이

Genus *Hemipodus* Quatrefages, 1865 반다리미갑갯지렁이속

16. *Hemipodia yenourensis* (Izuka, 1912) 반다리미갑갯지렁이

Family Goniadidae Kinberg, 1866 고리갯지렁이과

Genus *Goniada* Audduin and Milne Edwards, 1833 갈고리갯지렁이속

17. *Goniada japonica* Izuka, 1912. 큰갈매기고리갯지렁이

18. *Goniada maculata* Oersted, 1843 작은갈매기고리갯지렁이

Genus *Glycinde* Müller, 1858 헛고리갯지렁이속

19. *Glycinde bonhourei* Gravier, 1904 외돌기헛고리갯지렁이

Family Hesionidae Grube, 1850 수염갯지렁이과

Genus *Micropodarke* Okuda, 1938 작은수염갯지렁이속

20. *Micropodarke dubia* (Hessle, 1925) 작은수염갯지렁이

Genus *Ophiodromus* Sars, 1862 뱀수염갯지렁이속

21. *Ophiodromus pugettensis* (Johnson, 1901) 뱀수염갯지렁이

Family Pilargidae Saint-Joseph. 1899 투구갯지렁이과

Genus *Ancistrosyllis* McIntosh, 1879

22. *Ancistrosyllis matsunagaensis* (Kitamori, 1960) 뿔투구갯지렁이

Genus *Sigambra* Müller, 1858 앞뿔투구갯지렁이속

23. *Sigambra hanaokai* (Kitamori, 1960) 앞뿔투구갯지렁이

Family Syllidae Grube, 1850 염주발갯지렁이과

Genus *Syllis* Lamarck, 1818 큰염주발갯지렁이속

24. *Syllis gracilis* Grube, 1840 줄염주발갯지렁이

25. *Syllis spongiphila* Verrill, 1885 흰점염주발갯지렁이

Genus *Typosyllis* Langerhans, 1879 참염주발갯지렁이

26. *Typosyllis adamanteus kurilensis* Chlebovitsh, 1959 쿠릴염주발갯지렁이

27. *Typosyllis fasciata* (Malmgren, 1867) 긴수염염주발갯지렁이

28 *Typosyllis prolifera* Krohn, 1852 분열염주발갯지렁이

Family Nereididae Blainville, 1818 참갯지렁이과

Genus *Alitta* Kinberg, 1865

29. *Alitta virens* (Sars, 1835) 큰참갯지렁이

Genus *Ceratonereis* Kinberg, 1865 뿔참갯지렁이속

30. *Ceratonereis hircinicola* (Eisig, 1870) 턱이빨참갯지렁이

Genus *Hediste* Malmgren, 1867

31. *Hediste japonica* (Izuka, 1908) 참갯지렁이

Genus *Leonnates* Kinberg, 1865 사자머리참갯지렁이속

32. *Leonnates nipponicus* Imajima, 1972 사자머리참갯지렁이

Genus *Lycastopsis* Augener, 1922 세수염참갯지렁이속

33. *Lycastopsis augeneri* Okuda, 1937 세수염참갯지렁이

Genus *Neanthes* Kinberg, 1866 참갯지렁이속

34. *Neanthes cautata* (Delle Chiaje), 1828 둥근얼굴참갯지렁이

Genus *Nectoneanthes* Imajima, 1972 넓적발참갯지렁이속

35. *Nectoneanthes oxypoda* (Marenzeller, 1879) 넓적발참갯지렁이

Genus *Nereis* Linnaeus, 1758 원참갯지렁이속

36. *Nereis heterocirrata* Treadwell, 1931 굵은앞더듬이참갯지렁이

37. *Nereis multignatha* Imajima and Hartman, 1964 깨점박이참갯지렁이

38. *Nereis neoneanthes* Hartman, 1948 큰깨점박이참갯지렁이

39. *Nereis nichollsi* Kott, 1951 뱃사공참갯지렁이

40. *Nereis pelagica* Linnaeus, 1758 원참갯지렁이

41. *Nereis surugaense* Imajima, 1972 민숭참갯지렁이

Genus *Paraleonnates* Khlebovich and Wu, 1962 흰이빨참갯지렁이속

42. *Paraleonnates uschakovi* Khlebovich and Wu, 1962 흰이빨참갯지렁이

Genus *Perinereis* Kinberg, 1866 눈썹참갯지렁이속

43. *Perinereis aibuhitensis* (Grube, 1878) 두토막눈썹참갯지렁이

44. *Perinereis cultrifera* (Grube, 1840) 한토막눈썹참갯지렁이

45. *Perinereis floridana* (Ehlers, 1868) 플로리다참갯지렁이

46. *Perinereis mictodonta* (Marenzeller, 1879) 긴눈썹참갯지렁이

47. *Perinereis wilsoni* Glasby and Hsieh, 2006 긴수염눈썹참갯지렁이

Genus *Platynereis* Kinberg, 1865 좁쌀이빨참갯지렁이

48. *Platynereis bicanaliculata* (Baird, 1863) 두점참갯지렁이

Genus *Pseudonereis* Kinberg, 1865 반쪽이빨참갯지렁이속

49. *Pseudonereis* sp. nov. 1

50. *Pseudonereis* sp. nov. 2

Genus *Simplisetia* Hartmann-Schröder, 1985

51. *Simplisetia erythraeensis* (Fauvel, 1918) 붉은집참갯지렁이

Genus *Tylorrhynchus* Grube, 1869 실참갯지렁이속

52. *Tylorrhynchus heterochaetus* (Qustrefages, 1865) 실참갯지렁이

Family Nephtyidae Grube, 1850 백금갯지렁이과

Genus *Micronephtys* Friedrich, 1939 꼬마백금갯지렁이속

53. *Micronephthys sphaerocirrata orientails* Lee and Jae, 1983 꼬마백금갯지렁이

Genus *Nephtys* Cuvier, 1917 백금갯지렁이속

54. *Nephtys caeca* (Fabricius, 1780) 북방백금갯지렁이

55. *Nephtys californiensis* Hartman, 1938

56. *Nephtys ciliata* (Müller, 1776) 털보백금갯지렁이

57. *Nephtys longosetosa* Oersted, 1843 긴털백금갯지렁이

58. *Nephtys oligobranchia* Southern, 1921 광염백금갯지렁이

59. *Nephtys polybranchia* Southern, 1921 남방백금갯지렁이

Family Polynoidae Malmgren, 1867 비늘갯지렁이과

Genus *Euphione* McIntosh, 1885 아가미비늘갯지렁이속

60. *Euphione chitoniformis* (Moore, 1903) 아가미비늘갯지렁이

Genus *Halosydna* Kinberg, 1855 미륵비늘갯지렁이속

61. *Halosydna brevisetosa* Kinberg, 1855 짧은미륵비늘갯지렁이

Genus *Harmothoe* Kinberg, 1855 눈비늘갯지렁이속

62. *Harmothoe forcipata* (Marenzeller, 1902) 짝눈비늘갯지렁이

63. *Harmothoe imbricata* (Linnaeus, 1767) 옆눈비늘갯지렁이

Genus *Lagisca* Malmgren, 1866 열대꼬리비늘갯지렁이속

64. *Lagisca waahli* (Kinberg, 1856) 열대꼬리비늘갯지렁이

Genus *Lepidasthenia* Malmgren, 1867 긴비늘갯지렁이속

65. *Lepidasthenia izukai* Imajima and Hartman, 1964 이즈카긴비늘갯지렁이

Genus *Lepidonotus* Leach, 1816 예쁜이비늘갯지렁이속

66. *Lepidonotus dentatus* Okuda and Yamada, 1954 이예쁜이비늘갯지렁이

67. *Lepidonotus elongatus* Marenzeller, 1902 긴예쁜이비늘갯지렁이

68. *Lepidonotus helotypus* (Grube, 1877) 송곳예쁜이비늘갯지렁이

Genus *Paradyte* Pettibone, 1969 주머니비늘갯지렁이속

69. *Paradyte crinoidicola* (Potts, 1910) 나리주머니비늘갯지렁이

Family Chrysopetalidae Ehlers, 1864 등가시갯지렁이과

Genus *Chrysopetalum* Ehlers, 1864 황금비늘갯지렁이속

70. *Chrysopetalum occidentale* Johnson, 1897 황금비늘갯지렁이

Order Eunicida Fauchald, 1977 털갯지렁이목

Family Onuphidae Kinberg, 1865 집갯지렁이과

Genus *Diopatra* Audouin and Milne Edwards, 1833 집갯지렁이속

71. *Diopatra sugokai* Izuka, 1907 털보집갯지렁이

Genus *Onuphis* Audouin and Milne Edwards, 1833 수염집갯지렁이속

72. *Onuphis shirikishinaiensis* (Imajima, 1960) 실집갯지렁이

Family Eunicidae Savigny, 1818 털갯지렁이과

Genus *Eunice* Cuvier, 1817 두수염털갯지렁이속

73. *Eunice northioidea* Moore, 1903 염주털갯지렁이

Genus *Leodice* Lamarck, 1818

74. *Leodice antennata* Lamarck, 1818 고리털갯지렁이

Genus *Lysidice* Lamarck, 1818 솜털갯지렁이속

75. *Lysidice collaris* Grube, 1870 노란솜털갯지렁이

Genus *Marphysa* Quatrefages, 1865 바위털갯지렁이속

76. *Marphysa sanguinea* (Montagu, 1815) 바위털갯지렁이

77. *Marphysa tamurai* Okuda, 1934 민머리털갯지렁이

Family Lumbrineridae Malmgren, 1867 송곳갯지렁이과

Genus *Lumbrineris* Blainille, 1828 송곳갯지렁이속

78. *Lumbrineris heteropoda* (Marenzeller, 1879) 긴다리송곳갯지렁이

79. *Lumbrineris japonica* (Marenzeller, 1879) 참송곳갯지렁이

80. *Lumbrineris latreilli* Audouin and Milne-Edwards, 1834 긴가시송곳갯지렁이

81. *Lumbrineris longifolia* Imjiam and Higuch, 1975 긴자락송곳갯지렁이

82. *Lumbrineris nipponica* Imajima and Higuchi, 1975. 짧은다리송곳갯지렁이

Family Dorvilleidae Chamberlin, 1919 구슬수염갯지렁이과

Genus *Schistomeringos* Jumars, 1974 구슬수염갯지렁이속

83. *Schistomeringos matsushimaensis* (Okuda and Yamada, 1954) 구슬수염갯지렁이

Family Oenonidae Kinberg, 1865 홍점갯지렁이과

Genus *Arabella* Gube, 1850 홍점갯지렁이 속

84. *Arabella monroi* Colbath, 1989

Genus *Drilonereis* Claparède, 1870 바늘갯지렁이속

85. *Drilonereis filum* (Claparède, 1868) 날씬바늘갯지렁이

Subclass Canalipalpata Rouse and Fauchald, 1997

Order Spionida Grube, 1850 얼굴갯지렁이목

Family Spionidae Grube, 1850 얼굴갯지렁이과

Genus *Boccardiella* Blake and Kudenov, 1978

86. *Boccardiella hamata* (Webster, 1879) 유령얼굴갯지렁이

Genus *Laonice* Malmgren, 1867 납작얼굴갯지렁이

87. *Laonice cirrata* (Sars, 1851) 납작얼굴갯지렁이

Genus *Paraprionospio* Caullery, 1914

88. *Paraprionospio coora* Wilson, 1990

Genus *Prionospio* Malmgren, 1867 예쁜얼굴갯지렁이속

89. *Prionospio* (*Aquilaspio*) *krusadensis* Fauvel, 1929 깃예쁜얼굴갯지렁이

90. *Prionospio (Minuspio) multibranchiata* Berkeley, 1927

91. *Prionospio membranacea* Imajima, 1990

92. *Prionospio japonicus* Okuda, 1935 매끈예쁜얼굴갯지렁이

Genus *Scolelepis* Blainville, 1828

93. *Scolelepis (Scolelepis) kudenovi* Hartmann-Schröder, 1981

Family Poecilochaetidae Hannerz, 1956 사천왕갯지렁이과

Genus *Poecilochaetus* Claparède in Ehlers, 1875 사천왕갯지렁이속

94. *Poecilochaetus johnsoni* Hartman, 1939 사천왕갯지렁이

Family Magelonidae Cunningham and Ramage, 1888 양손갯지렁이과

Genus *Magelona* Muller, 1858 양손갯지렁이속

95. *Magelona japonica* Okuda, 1937 양손갯지렁이

Order Terebellida Malmgren, 1867 유령갯지렁이목

Family Cirratulidae Carus, 1863 실타래갯지렁이과

Genus *Aphelochaeta* Blake, 1991

96. *Aphelochaeta monilaris* (Hartman, 1960)

Genus *Chaetozone* Malmgren, 1867 바퀴실타래갯지렁이속

97. *Chaetozone setosa* Malmgren, 1867 솜털바퀴실타래갯지렁이

98. *Chaetozone spinosa* Moore, 1903 긴털바퀴실타래갯지렁이

Genus *Cirratulus* Lamarck, 1801 가는실타래갯지렁이속

99. *Cirratulus cirratus* (Müller, 1776) 가는실타래갯지렁이

Genus *Cirriformia* Hartman, 1936 명주실타래갯지렁이속

100. *Cirriformia chrysoderma* (Claparede, 1868) 매끈명주실타래갯지렁이

101. *Cirriformia tentaculata* (Montagu), 1808 명주실타래갯지렁이

Genus *Timarete* Kinberg, 1866 모듬실타래갯지렁이

102. *Timarete antarcticus* (Monro, 1930) 모듬실타래갯지렁이

Family Flabelligeridae Saint-Joseph, 1894 더덕갯지렁이과

Genus *Brada* Stimpson, 1854 황금더덕갯지렁이속

103. *Brada villosa* (Rathke, 1843) 황금더덕갯지렁이

Genus *Pherusa* Oken, 1807 더덕갯지렁이속

104. *Pherusa plumosa* (Müller, 1776) 깃더덕갯지렁이

Family Sternaspidae Carus, 1863 오뚜기갯지렁이과

Genus *Sternaspis* Otto, 1821 오뚜기갯지렁이속

105. *Sternaspis* sp. nov.

Family Pectinariidae Quatrefages, 1866 빗갯지렁이과

Genus *Lagis* Malmgren, 1866 잎빗갯지렁이

106. *Lagis* sp. nov.

Family Ampharetidae Malmgren, 1866 사슴갯지렁이과

Genus *Ampharete* Malmgren, 1866 작은사슴갯지렁이속

107. *Ampharete arctica* Malmgren, 1866 작은사슴갯지렁이

Genus *Amphicteis* Grube, 1850 큰사슴갯지렁이속

108. *Amphicteis gunneri* (Sars, 1835) 큰사슴갯지렁이

Family Terebellidae Malmgren, 1867 유령갯지렁이과

Genus *Amphitrite* Müller, 1771 꽃유령갯지렁이속

109. *Amphitrite edwardsii* (Quatrefages, 1866) 에드워드유령갯지렁이

Genus *Loimia* Malmgren, 1865 괴물유령갯지렁이속

110. *Loimia medusa* (Savigny, 1818) 괴물유령갯지렁이

Genus *Pista* Malmgren, 1866 총채유령갯지렁이

111. *Pista cristata* (Müller, 1776) 총채유령갯지렁이

112. *Pista shizugawaensis* Nishi and Tanaka, 2006 넓은총채유령갯지렁이

Genus *Terebella* Linnaeus, 1767 고목유령갯지렁이속

113. *Terebella ehrenbergi* Grube, 1870 고목유령갯지렁이

Genus *Thelepus* Leuckart, 1849 비유령갯지렁이속

114. *Thelepus japonicus* Marenzeller, 1884 긴싸리비유령갯지렁이

115. *Thelepus setosus* (Quatrefages, 1866) 마당비유령갯지렁이

116. *Thelepus toyamaensis* Okuda, 1936 짧은싸리비유령갯지렁이

Family Trichobranchidae Malmgren, 1866 조름털갯지렁이과

Genus *Trichobranchus* Malmgren, 1866

117. *Trichobranchus glacialis* Malmgren, 1866 여섯조름털갯지렁이

Order Sabellida Malmgren, 1867 꽃갯지렁이목

Family Oweniidae Rioja, 1917 싸리버섯갯지렁이과

Genus *Owenia* Delle Chiaje, 1844 싸리버섯갯지렁이속

118. *Owenia fusiformis* Delle Chiaje, 1844 싸리버섯갯지렁이

Family Sabellidae Malmgren, 1867 꽃갯지렁이과

Genus *Chone* Krøyer, 1856 빗꽃갯지렁이속

119. *Chone infundibuliformis* Krøyer, 1856 빗꽃갯지렁이

Genus *Pseudopotamilla* Bush, 1904, 안점꽃갯지렁이속

120. *Pseudopotamilla occelata* Moore, 1905 안점꽃갯지렁이

Genus *Sabellastarte* Krøyer, 1856 꽃갯지렁이속

121. *Sabellastarte spectabilis* (Grube, 1878) 남색꽃갯지렁이

Family Serpulidae Rafinesque, 1815 석회관갯지렁이과

Genus *Hydroides* Gunnerus, 1768 우산석회관갯지렁이속

122. *Hydroides ezoensis* Okuda, 1934 우산석회관갯지렁이

123. *Hydroides uncinatus* (Philippi, 1844) 갈고리석회관갯지렁이

Genus *Spirobranchus* Blainville, 1818 큰조름석회관갯지렁이속

124. *Spirobranchus kraussii* (Baird, 1865) 굵은석회관갯지렁이

Subclass Scolecida Rouse and Fauchald, 1997

Family Orbiniidae Hartman, 1942 갯모갯지렁이과

Genus *Haploscoloplos* 갯모갯지렁이속

125. *Haploscoloplos elongatus* (Johnson, 1901) 갯모갯지렁이

Genus *Naineris* Blainville, 1828 모자갯지렁이속

126. *Naineris dendritica* (Kinberg, 1867)

Genus *Phylo* Kinberg, 1866 고깔갯지렁이속

127. *Phylo felix asiaticus* Wu, 1962 아시아고깔갯지렁이

Genus *Scoloplos* Blainville, 1828 삼각모자갯지렁이속

128. *Scoloplos armiger* (Müller, 1776) 삼각모자갯지렁이

Family Paraonidae Cerruti, 1909 별난가시갯지렁이과

Genus *Aricidea* Webster, 1879 긴코별난가시갯지렁이속

129. *Aricidea* (*Aricidea*) *pacifica* Hartman, 1944 태평양별난가시갯지렁이

130. *Aricidea* (*Acesta*) *assimilis* Tebble, 1959 솜털별난가시갯지렁이

Family Opheliidae Malmgren, 1867 요정갯지렁이과

Genus *Armandia* Filippi, 1861 보석요정갯지렁이속

131. *Armandia amakusaensis* Saito *et al*., 2000 아가미보석요정갯지렁이

132. *Armandia lanceolata* Willey, 1905 침보석요정갯지렁이

133. *Armandia simodaensis* Takahashi, 1938 둥근보석요정갯지렁이

Genus *Ophelina* Örsted, 1843 매끈요정갯지렁이속

134. *Ophelina acuminata* Örsted, 1843 매끈요정갯지렁이

Genus *Polyophthalmus* Quatrefages, 1850 무늬요정갯지렁이속

135. *Polyopthalmus pictus* (Dujardin, 1839) 무늬요정갯지렁이

136. *Polyophthalmus qingdaoensis* Purschke *et al*., 1995 안점무늬요정갯지렁이

Genus *Travisia* Johnston, 1840 벌레요정갯지렁이속

137. *Travisia japonica* Fujiwara, 1933 벌레요정갯지렁이

138. *Travisia pupa* Moore, 1906 번데기요정갯지렁이

Family Capitellidae Grube, 1862 버들갯지렁이과

Genus *Capitella* Blainville, 1828 등가시버들갯지렁이속

139. *Capitella capitata* (Fabricius, 1780) 등가시버들갯지렁이

Genus *Dasybranchus* Grube, 1850 굵은버들갯지렁이속

140. *Dasybranchus caducus* (Grube, 1846) 굵은버들갯지렁이

Genus *Heteromastus* Eisig, 1887

141. *Heteromastus filiformis* (Claparède, 1864)

Genus *Notomastus* Sars, 1851 가는버들갯지렁이속

142. *Notomastus latericeus* Sars, 1851 가는버들갯지렁이

Family Arenicolidae Johnston, 1846 검은갯지렁이과

Genus *Abarenicola* Wells, 1959 큰검은갯지렁이속

143. *Abarenicola pacifica* Healy and Wells, 1959 큰검은갯지렁이

Family Maldanidae Malmgren, 1867 대나무갯지렁이과

Genus *Asychis* Kinberg, 1867 수술대나무갯지렁이속

144. *Asychis biceps* (Sars, 1861) 투구대나무갯지렁이

145. *Asychis pigmentata* Imajima and Shiraki, 1982 점박이대나무갯지렁이

Genus *Maldanella* McIntosh, 1885 둥근대나무갯지렁이속

146. *Maldanella harai* (Izuka, 1902) 둥근대나무갯지렁이

Genus *Microclymene* Arwidsson, 1906 꼬마대나무갯지렁이속

147. *Microclymene propecaudata* Lee and Paik, 1986

Genus *Nicomache* Malmgren, 1865 큰대나무갯지렁이속

148. *Nicomache lumbricalis* (Fabricius, 1780) 톱니대나무갯지렁이

Genus *Praxillella* Verrill, 1881 꼬리대나무갯지렁이속

149. *Praxillella pacifica* Berkeley, 1929

Genus *Rhodine* Malmgren, 1865 깃대나무갯렁이속

150. *Rhodine loveni* Malmgren, 1865 깃대나무갯지렁이

Description of species

Class Polychaeta Grube, 1850 다모강

Key to the subclasses of class Polychaeta from Korea

1. Head appendage absent except nuchal organ .... Scolecida
- Head appendage present 2
2. Aciculae present in parapodium; grooved palps absent .... Aciculata
- Aciculae absent; grooved palps present .... Canalipalpata

Subclass Aciculata Rouse and Fauchald, 1997

Key to the orders of Aciculata Rouse and Fauchald, 1997 from Korea

1. Ventral muscularized proboscis present .... Eunicida
- Axial muscular probosics present .... Phyllodocida

Order Phyllodocida Örsted, 1843 부채발갯지렁이목

This order is represented by 15 families in Korea, and about 20 families known in the world. They are characterized by the ventral palps with sensory function and well developed proboscis. Most species of this group are active predators.

Key to the families of Phyllodocida Örsted, 1843 from Korea

1. Dorsal surface more or less covered with elaytra or paleae or felt 2
- Dorsal surface not covered with elaytra or paleae 5
2. Dorsum with felt .... Aphroditidae
- Dorsum with elaytra or paleae 3
3. Paleae covered dorsum .... Chrysopetalidae
- Elaytra covered dorsum 4
4. Only simple setae present .... Polynoidae
- Compound neurosetae present in neuropodia .... Sigalionidae
5. Notosetae arranged in transverse rows across dorsal surface .... Euphrosinidae
- Notosetae arising from defined fascicles or absent 6

6. Prostomium with conspicuous caruncle ········· Amphinomidae
- Prostomium without conspicuous caruncle ········· 7
7. Dorsal and ventral cirri flattened ········· Phyllodocidae
- Dorsal and ventral cirri not flattened ········· 8
8. Prostomium conical, annulated with 4 antennae distally; tentacular cirri absent ········· 9
- Prostomium otherwise; tentacular cirri usually present ········· 10
9. Body with all similar parapodia ········· Glyceridae
- Body with both uniramous parapodia and biramous parapodia ········· Goniadidae
10. Prostomium with 4 minute antennae anteriorly ········· 11
- Prostomium with 3 or 5 or 7 antennae anteriorly ········· 12
11. Noto- and neurosetae all simple; proboscis with internal jaws ········· Nephtyidae
- Notosetae sipmle and neurosetae compound; proboscis without internal jaw ········· Lacydoniidae
12. Neurosetae compound or with blade partially fused to shaft ········· 13
- Neurosetae all simple ········· Pilargidae
13. Parapodia biramous or subbiramous ········· 14
- Parapodia uniramous ········· Syllidae
14. Parapodia with noto- and neuropodial ligules; notosetae compound · Nereididae
- Parapodia without ligules; notosetae simple or absent ········· Hesionidae

Family Phyllodocidae Williams, 1852 부채발갯지렁이과

Prostomium with 4 antennae. Tentacular cirri 2-4 pairs. Parapodia uniramous. Dorsal and ventral cirri flattened or globular.

Type genus. *Phyllodoce* Lamarck, 1818.

Key to the genera of family Phyllodocidae from Korea

1. Tentacular cirri 2 pairs ········· 2
- Tentacular cirri 4 pairs ········· 3
2. Proboscis diffusely papillated or smooth ········· *Eteone*
- Proboscis with large lateral papillae in rows ········· *Mysta*

3. Parapodia biramous ······ *Notophyllum*
 - Parapodia uniramous ······ 4
4. Prostomium with 5 antennae ······ 5
 - Prostomium with 4 antennae ······ 6
5. Tentacular segments 1 and 2 fused; proboscis smooth ······ *Eumida*
 - Tentacular segments 1 and 2 free; proboscis with papillae ······ *Eulalia*
6. Nuchal papillae absent ······ *Nereiphylla*
 - Nuchal papillae present ······ *Phyllodoce*

Genus *Eteone* Savigny, 1820 작은부채발갯지렁이속

Prostomium with 4 antennae; nuchal papillae absent or present. Proboscis diffusely papillated or smooth. Tentacular cirri 2 pairs on first segment; dorsal cirri absent on 2nd segment.

Type species. *Eteone flava* (Fabricius 1780).

1. *Eteone longa* (Fabricius, 1780) 작은부채발갯지렁이

Nereis longa Fabricius, 1780: 300.

Eteone longa: Bergström, 1914: 192, fig. 72; Fauvel, 1923: 172, fig. 62a-d; Berkeley and Berkeley, 1948: 41, figs. 57-58; Pettibone, 1963: 73, fig. 16e; Imajima and Hartman, 1964: 61, pl. 12, figs. d-g; Banse and Hobson, 1974: 38, fig. 8; Paik, 1982: 770, pl. 6o-p; 1984: 148; 1989: 208-209, fig. 13; Lee and Jae, 1985: 38.

Material examined. 4 specimens, Bunmae-ri, Aphae-eup, Shinan-gun, Jeollanam-do (126°17′34″E, 34°51′10″N), 06 April 2012, Choi HK; 1 specimen, Haeun-ri, Hyeongyeong-myeon, Muan-gun, Jeollanam-do (126°25′40″E, 35°03′33″N), 08 Apr 2013, Choi HK; 1 specimen, Woosan-ri Byeollyang-myeon, Suncheon-si, Jeollanam-do (127°27′08″E, 34°51′36″N), 29 Jun 2013, Choi HK.

Diagnosis. Prostomium sub-triangular, with 4 antennae. Eyespots present. Nuchal papillae visible. Proboscis smooth basally, with terminal papillae. First segment with 2 pair of reduced tentacular cirri. Dorsal cirri flat and sub-oval shaped, present from 3rd segment.

Distributions. Korea, Japan, China, Bering Sea, North Atlantic Ocean, North Pacific Ocean.

Genus *Eulalia* Savigny, 1817 불꽃부채발갯지렁이속

Prostomium with 5 antennae; nuchal papillae indistinct. Proboscis diffusely papillated. Tentacular cirri 4 pairs. Three tentacular segments free. Parapodia uniramous.

Type species. *Eulalia viridis* (Linnaeus, 1767).

Key to the species of *Eulalia* Savigny, 1817 from Korea

1. Dorsal cirri long ovoid shaped without pointed tip ································ *E. bilineata*
 \- Dorsal cirri lanceolate shaped with pointed tip ·· *E. viridis*

2. *Eulalia bilineata* (Johnston, 1840) 두줄불꽃부채발갯지렁이

Phyllodoce bilineata Johnston, 1840: 227, pl. 6, figs. 7-10.

Eulalia bilineata: McIntosh, 1908: 50, pl. 43, fig. 5; pl. 50, fig. 4; pl. 67, figs. 6, 7; pl. 77, figs. 23, 24; Fauvel, 1923: 162, fig. 58; Berkeley and Berkeley, 1948: 48, fig. 71; Pettibone, 1963: 86, fig. 20; Imajima and Hartman, 1964: 61. pl. 13. fig. a-d; Paik, 1984a: 194, pl. 1, figs. d-e; 1984b: 148; Paik, 1989: 213, Fig. 16; Imajima, 2003: 77.

Material examined. 4 specimens, Cheongsan-ri, Wonbuk-myeon, Taean-gun, Chungcheongnam-do (126°15′50″E, 36°49′15″N), 23 Jun 2012, Choi HK.

Diagnosis. Body with 2 longitudinal patterns usually. Prostomium with 4 frontal antennae and 1 median antennae. Eyespots present. Proboscis with diffusely covered papillae. Segments 1 to 3 complete, with 4 pair of tentacular cirri. Tentacular formula: 1+S1/1+S1/V. Dorsal cirri ovoid, longer than broad. Pygidium with 2 long anal cirri.

Distribution. Arctic Ocean, North Atlantic Ocean, Mediterrianean Sea, North Sea, South Africa, North Pacific Ocean, Western Canada, Yellow Sea, Japan, Korea.

3. *Eulalia viridis* (Linnaeus, 1767) 녹색불꽃부채발갯지렁이

Nereis viridis Linnaeus, 1767: 1086.

Eulalia viridis: Izuka, 1912: 205, pl. 21, fig. 6; Southern, 1914: 65; Fauvel, 1923: 160, fig. 57a-h; Hartman, 1942: 112, fig. 9a-b; Pettibone, 1963: 85, fig. 19; Imajima and Hartman, 1964: 63; Banse and Hobson, 1974: 43; Rho and Song, 1975: 101, pl. 2, fig. 10; Paik, 1978: 368, pl. 1, figs. 1-4; 1982: 771, pl. 7a; 1989: 211, fig. 15.

Material examined. 1 specimen, Na-ri, Gunnae-myeon, Jindo-gun, Jeollanam-do (126°12′52″E, 34°33′35″N), 09 Apr 2013, Choi HK; 2 specimens, Noil-ri Gwayeok-myeon, Goheung-gun, Jeollanam-do (127°16′50″E, 34°40′04″N), 30 Apr 2013, Choi HK; 3 specimens, Woljeong-ri, Namyang-myeon, Goheung-gun, Jeollanam-do (127°21′57″E, 34°44′65″N), 30 Apr 2013, Choi HK; 1 specimen, Sindeok-dong, Yeosu-si, Jeollanam-do (127°48′07″E, 34°47′47″N), 25 Sep 2014, Choi HK; 1 specimen, Donghae-si, Daejin-dong Gangwon-do (129°11′25″E, 37°33′50″N), 16 Sep 2014, Choi HK; 1 specimen, Punghwa-ri, Sanyang-eup, Tongyeong-si, Gyeongsangnam-do (128°24′34″E, 34°48′04″N), 21 Mar 2014, Choi HK; 1 specimen, Sujeong-dong, Yeosu-si, Jeollanam-do (127°47′47″E, 34°44′25″N), 31 Mar 2014, Choi HK.

Diagnosis. Prostomium conical shaped, with 4 frontal antennae and 1 median antennae. Eyespots present. Proboscis with diffusely covered papillae. Tentacular cirri 4 pairs, cylindrical. Tentacular formula: 1+S1/1+S1/V. Dorsal cirri elongate and lanceolate with pointed tips.

Distributions. Arctic Ocean, North Sea, Mediterranean Sea, Caribbean Sea, West Africa, Atlantic Ocean, Western Canada. Alaska, Indian Ocean, Yellow Sea, Japan, Korea.

Genus *Mysta* Malmgeren, 1865 혹부채발갯지렁이속

Prostomum with 4 antennae, nuchal papilla absent. Tentacular cirri 2 pairs; cirri cylindrical-shaped. Proboscis with large lateral papillae in rows.

Type species. *Mysta barbata* Malmgren, 1865.

4. *Mysta ornata* (Grube, 1878) 혹부채발갯지렁이

Eteone ornata Grube, 1878a: 106.

Mysta maculata Treadwell, 1920: 593, figs. 1-4.

Eteone ornata: Izuka, 1912: 201.

Mysta ornata: Imajima and Hartman, 1964: 65; Paik, 1982: 770; 1989: 207, fig. 12.

Material examined. 1 specimen, Na-ri, Gunnae-myeon, Jindo-gun, Jeollanam-do (126°12′52″E, 34°33′35″N), 09 April 2013, Choi HK.

Diagnosis. Prostomium sub-circular shaped, with 4 antennae and 2 eyespots, Proboscis with large soft papaillae and small spinous tubercles in lateral rows. Nuchal papilla absent. Tentacular cirri 2 pairs on first segment, cylindrical. Dorsal cirri small oval-shaped, symmetrical, and longer than wide on median segments. Rostrum of setal shafts with single tooth on each side.

Distribution. Korea, Japan, Philippine Islands, India.

Genus *Nereiphylla* Blainville, 1828 납작수염부채발갯지렁이속

Prostomium with 4 antennae, short wide prostomium. Nuchal papilla. Indistinct. First and second segment fused dorsally. Tentacular cirri cylindrical or flattened. Parapodia uniramous. Ventral citrus reniform.

Type species. *Nereiphylla paretti* Blainville, 1828.

Key to the species of *Nereiphylla* Blainville, 1828 from Korea

1. Tentacular cirri cylindrical, reaching to segment 7–13; dorsal cirri slightly longer than width ······································ *N. castanea*
- Tentacular cirri flattened, reaching to segment 4–6; dorsal cirri much longer than width ······································ *N. hera*

5. *Nereiphylla castanea* (Marenzeller, 1879) 납작수염부채발갯지렁이

Carobia castanea Marenzeller, 1879: 127, pl. 3, fig. 2; Izuka, 1912: 199, pl. 21, fig. 2.

Genetyllis castanea: Bergström, 1914: 158, fig. 53; Imajima and Hartman, 1964:

65.

Phyllodoce (Genetyllis) castanea: Berkeley and Berkeley, 1948: 44; Day, 1967: 149, fig. 5. 3d-f.

Nereiphylla castanea: Pleijel, 1991: 257; Blake, 1994b: 166, fig. 4. 23.

Material examined. 2 specimens, Geumgap-ri, Uisin-myeon, Jindo-gun, Jeollanam-do (126°19′24″E, 34°22′59″N), 02 May 2015, Choi HK.

Diagnosis. Prostomium oval-shaped, with 2 pair of antennae and 2 eyespots. Nuchal papilla present laterally on prostomium. Proboscis with diffusely distributed papillae. Segments 1 and 2 fused dorsally. Tentacular cirri cylindrical and 4 pairs; longest cirri extending to segment 13. Tentacular formula: (1+S1/1)+S1/N. Dorsal cirri rounded heart shaped. Ventral cirri small and lanceolate. Pygidium with 2 slightly flattened and cylindrical anal cirri.

Distribution. Australia, Indian Ocean, Massachusetts to North Carolina, Gulf of Mexico, west coast of North America, Sea of Okhotsk, Japan, Korea.

6. *Nereiphylla hera* Kato and Mawatari, 1999 뾰족납작수염부채발갯지렁이 (Fig. 8)

Nereiphylla hera Kato and Mawatari, 1999: 353, figs. 1-3; Choi *et al.*, 2015: 280, fig. 1.

Material examined. 4 specimens, Namae-ri, Hyeon-nam-myeon, Yangyang-gun, Gangwon-do (37°55′46″N, 128°45′20″E), 15 Sep 2014, Choi HK; 5 specimens, Daepo-dong, Sokcho-si, Gangwon-do (38°10′17″N, 128°37′40″E), 15 Sep 2014, Choi HK; 8 specimens, Gyeongjeong-ri, Chuksan-myeon, Yeongdeok-gun, Gyeongsangbuk-do (36°27′53″N, 129°29′39″E), 17 Sep 2014, Choi HK.

Description. Body slender, about 16.0 to 28.0 mm long and width about 0.8 to 1.3 mm, with tapering posterior segments.

Prostomium sub-pentagonal in shape, with rounded anterior margin; 4 antennae on anterior margin as long as prostomium, thick, medially inflated, and distally tipped; paired eye spots large, rounded, and located nearly on lateral margin. Proboscis with numerous minute papillae irregularly distributed; terminal papillae absent (Fig. 8A, B).

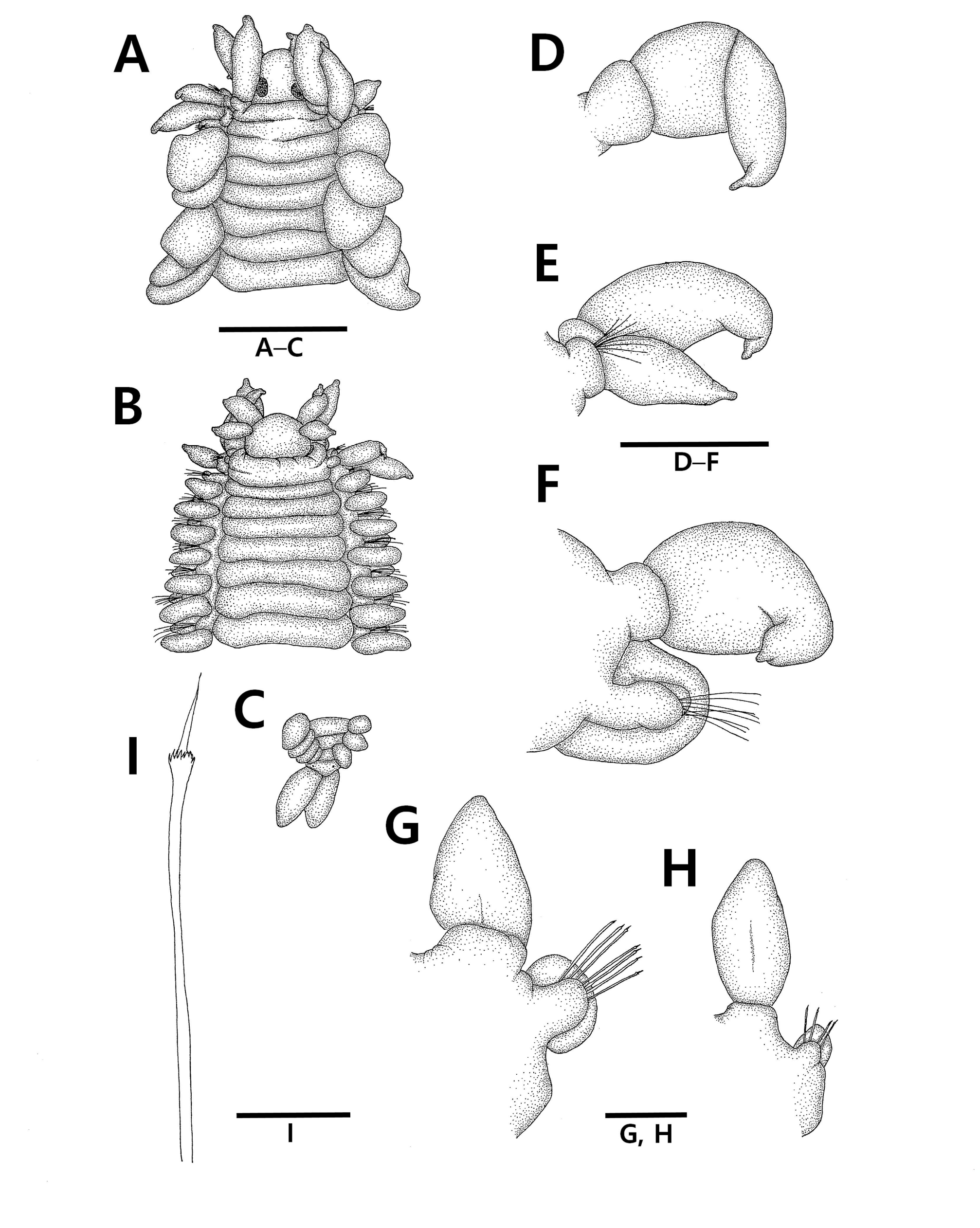

Fig. 8. *Nereiphylla hera* Kato and Mawatari, 1999. A, anterior end, dorsal view; B, anterior end, ventral view; C, dorsal view of pygidium; D, anterior view of tentacular cirri on 1st segment; E, anterior view of tentacular cirri on 2nd segment; F, anterior view of tentacular cirri on 3rd segment; G, anterior view of 55th parapodium; H, anterior view of posterior parapodium; I, composite seta of median parapodium Scale bars: A – C=0.5 mm, D – F=0.2 mm, G, H=0.2 mm, I=0.05 mm.

Tentacular cirri 4 pairs, flat, with narrow and distinct tip; tentacular cirri on segment 1 slightly short, extending to segment 5; dorsal tentacular cirri on segment 2 and 3 long, reaching to segment 6; ventral tentacular cirri on segment 2 short, extending to segment 4. Tentacular formula: (1+S1/1)+S1/N (Fig. 8A, D - F).

Segments 1 and 2 fused dorsally (Fig. 8A, B); segment 2 without neuropodia but with setae arising from cirrophores of ventral tentacular cirri (Fig. 8E).

Parapodia uniramous, with neuropodia and well developed dorsal and ventral cirri; neuropodia sub-retangular, with rounded margins; dorsal cirri heart-shaped, elongated, arising from well-developed cirrophores, and partially covering dorsum; ventral cirri expanded, broader than neuropodia, and attached on posterior side of neuropodia (Fig. 8G, H).

Setae composite, 13 - 15 about per parapodium; rostrum of setal shaft with distal crown bearing numerous teeth; setal blades short, with small teeth arranged in one side (Fig. 8I).

Pygidium with 2 cirri slightly flattened (Fig. 8C).

Remarks. *Nereiphylla* materials of the present study agree well with the original description of *N. hera* from Japanese waters in that the tentacular cirri are flat and spatulate with a narrow and distinct tip and broader than their cirrophores, and the parapodia possess elongated dorsal cirri (Kato and Mawatari 1999). However, Korean materials of *N. hera* show the following minor differences: the tentacular cirrus on 1st segment is extending to segment 5 in Korean materials, while that of Japanese materials is extending to segment 4; the pygidial papilla is invisible in Korean materials, but that of Japanese materials is distinct (Kato and Mawatari 1999).

Nereiphylla hera is distinguishable from two *Nereiphylla* species, *N. castanea* and *N. crassa*, recorded from East Asia, by several characteristics. *N. hera* differs from *N. castanea* in the morphologies of tentacular and dorsal cirri: the tentacular cirri are flattened, reaching to segments 4 - 6 in *N. hera*, while those of *N. castanea* are cylindrical, extending to segments 7 - 13; the dorsal cirri are much longer than broad in *N. hera*, but those of *N. castanea* are slightly longer than broad (Blake 1994b; Kato and Mawatari 1999; Imajima 2003). Although *N. crassa* has also flattened tentacular cirri with a narrow and distinct tip as *N. hera,* it shows some differences in the prostomial eye spots and dorsal cirri: the small lenses on prostomial eye spots are absent in *N. hera,* while those are present in *N. crassa*; the dorsal cirri of *N. hera* are elongated with smooth surface and partially covering the dorsum, whereas those of *N. crassa* are circular shaped with undulate surface and covering the dorsum completely (Kato and Mawatari 1999; Imajima 2003).

This species was reported only from Hokkaido in northern Japan by the original description (Kato and Mawatari 1999). The present study is the second report of *N. hera* and the first record from the region beyond Japan.

Distribution. Japan, Korea.

Genus *Phyllodoce* Lamarck, 1818 큰부채발갯지렁이속

Antennae 4 on prostomium. Nuchal papilla in the crevice between lobes. First segment dorsally reduced and fused to the second segment. Tentacular cirri cylindrical-shaped. Proboscis diffusely papillated.

Type species. *Phyllodoce laminosa* Savigny 1818.

Key to the species of genus *Phyllodoce* from Korea

1. Setae present from third tentacular segment ························ *Phyllodoce maculata*
 - Setae absent from third tentacular segment ·· 2
2. Proboscis with 2 median row composed of 4 or 5 scale-like papillae; pygidium with 2 small and conical anal cirri ·· *Phyllodoce chinensis*
 - Proboscis without median row; pygidium with 2 long and digitate anal cirri ···· ··· *Phyllodoce koreana*

7. *Phyllodoce koreana* (Lee and Jae, 1985) 한국부채발갯지렁이

Anaitides koreana Lee and Jae, 1985: 32-36. fig. 1; Paik, 1989: 216, fig. 19.

Material examined. 1 specimen, Noil-ri, Gwayeok-myeon, Goheung-gun, Jeollanam-do (127°16′50″E, 34°40′04″N), 30 Apr 2013, Choi HK.

Diagnosis. Prostomium heart shaped, with 2 pair of antennae and 2 eyespots. Nuchal papilla present in posterior cleft. Proboscis expanded basally, with papillae arranged in 6 longitudinal rows but median row absent, and with 17 marginal papillae. Segments 1 and 2 fused and reduced dorsally. Tentacular cirri attached on segments 1 to 3, cylindrical. Tentacular formula: (1+O1/1)+O1/N. Dorsal cirri rounded heart shaped. Ventral cirri board and pointed at tip. Pygidium with 2 long and digitate anal cirri.

Distribution. Korea.

8. *Phyllodoce maculata* (Linnaeus, 1767) 네모부채발갯지렁이

Nereis maculata Linnaeus, 1767: 287.

Phyllodoce groenlandica: Izuka, 1912: 198, pl. 21, fig. 2.

Anaitides citrina Bergström, 1914: 140, fig. 41.

Phyllodoce maculata: McIntosh, 1908: 89; Southern, 1914: 69; Fauvel, 1923: 152, fig. 53; Okuda and Yamada, 1954: 181; Pettibone, 1963: 78, fig. 18d.

Anaitides maculata: Imajima and Hartman, 1964: 59, pl. 12, figs. a-c; Paik, 1976: 234, figs. 11-13; 1982: 771, pl. 7b-d; 1989: 214, fig. 17.

Material examined. 1 specimen, Bunmae-ri, Aphae-eup, Shinan-gun, Jeollanam-do (126°17′34″E, 34°51′10″N), 06 Apr 2012, Choi HK; 1 specimen, Hwangchon-ri, Wonbuk-myeon, Taean-gun, Chungcheongnam-do (126°11′20″E, 36°52′53″N), 23 Jun 2012, Choi HK; 2 specimens, Ho-ri, Palbong-myeon, Seosan-si, Chungcheongnam-do (126°17′59″E, 36°48′37″N), 23 Jun 2012, Choi HK; 3 specimens, Yongdam-ri, Yeongheung-myeon, Ongjin-gun, Incheon-si (126°27′46″E, 37°14′17″N), 17 Jul 2012, Choi HK.

Diagnosis. Prostomium cordiform, with 4 antennae and 2 eyespots. Nuchal papilla present in posterior cleft. Proboscis with papillae arrnged in 6 longitudinal rows and 16-17 marginal papillae. Segments 1 and 2 fused and reduced dorsally. Tentacular cirri attached on segments 1 to 3, cylindrical. Tentacula formula: (1+O1/1)+S1/N. Dorsal cirri large sub-retangular shaped. Ventral cirri sub-oval shaped.

Distributions. Alaska, North Pacific Ocean, Columbia, Europe, France, Iceland, North Atlanic Ocean, Norway to North Sea, West Greenland, West Africa. Japan, Korea.

Family Glyceridae Grube, 1850 미갑갯지렁이과

Body elongate. Prostomium conical and annulated, with 4 short antennae terminally. Proboscis well developed with 4 jaws. Parapodia uniramous or biramous. Dorsal cirri small and globular. Ventral cirri large and conical.

Type genus. *Glycera* Lamarck, 1818.

Key to the genera of Glyceridae Grube, 1850 from Korea

1. Parapodia uniramous; aileron rod-like ·········· *Hemipodia*
 – Parapodia biramous excepting first 2 parapodia; aileron triangular or deeply incised bases ·········· *Glycera*

Genus *Glycera* Savigny, 1818 참미갑갯지렁이속

Prostomium long, with 5-10 rings. Proboscis with several kind of papaillae. Aileron with triangular base or deeply incised bases. Parapodia biramous, Setae simple capillary and composite spinigers.

Type species. *Glycera unicornis* Savigny, 1818.

Key to the species of *Glycera* Savigny, 1818 from Korea

1. Probocidial papillae without terminal fingernail structure ·········· 2
 – Probocidial papillae with terminal fingernail structure ·········· 8
2. All parapodia with single postsetal lobe ·········· *G. capitata*
 – Parapodia of mid-body with 2 postsetal lobe ·········· 3
3. Ailerons with deeply incised bases; postsetal lobe short, rounded; branchiae absent ·········· *G. tesselata*
 – Ailerons with interramal plate; postsetal lobe variable; branchiae present or absent ·········· 4
4. Probocidal papillae with more than 3 ridges ·········· *G. dentribranchia*
 – Probocidal papillae with up to 3 ridges ·········· 5

5. Notopodial postsetal lobe longer than neuropodial one in mid-body 6
 - Notopodial and neuropodial postsetal lobes nearly equal in length in mid-body 7
6. Branchiae simple, retractile, and digitiform ramus .... *G. nicobarica*
 - Branchiae 1-6 retractile and digitiform rami .... *G. macintoshi*
7. Postsetal lobes on mid-body blunt and more or less rounded; parapodia with simply blister-like branchiae .... *G. fallax*
 - Postsetal lobes on mid-body slender and triangular-shaped parapodia with one or two digitform branchiae .... *G. unicornis*
8. Parapodia without branchiae .... *G. onomichiensis*
 - Parapodia with branchiae 9
9. Probocidal papillae with long stalk .... *G. alba*
 - Probocidal papillae with short stalk .... *G. tridactyla*

9. *Glycera alba* (Müller, 1776) 짧은아가미미갑갯지렁이

Nereis alba Müller, 1776: 217.

Glycera alba: Moore, 1903: 464; McIntosh, 1905: 56; Izuka, 1912: 247, pl. 23, figs. 8-9; Southern, 1914: 92; Fauvel, 1923: 385, fig. 150; Imajima and Hartman, 1964: 160; Day, 1967: 360, fig. 16-2; Lee, 1984: 15, pl. 2A-C; Paik, 1989: 228, fig. 26; Imajima, 2003: 107, fig. 64a-h; Böggemann, 2002: 72, figs. 109-111.

Material examined. 1 specimen, Woljeong-ri, Namyang-myeon, Goheung-gun, Jeollanam-do (127°21′57″E, 34°44′65″N), 30 Apr 2013, Choi HK; 1 specimens, Yeongun-ri, Sanyang-eup, Tongyeong-si, Gyeongsangnam-do (128°28′24″E, 34°47′33″N), 24 Mar 14, Choi HK.

Diagnosis. Probocidial papillae with fingernail structure and long stalk. Aileron with pointed triangular base. Prostomium long conical shaped, consisting of 9-10 rings. Parapodia composed of notopodial and neuropodial lobes; notopodial lobes slender and triangular and neuropodial lobes sub-rounded, shorter than notopodial ones in mid-body. Branchiae non-retractile, simple, and digitiform.

Distribution. Atlantic Ocean, Madeira, Norwegian Sea, British Isles, North Sea, France, Mediterranean Sea, Black Sea, Red Sea, South Africa, Madagascar, Indian Ocean, Bay of Bengal, North Pacific, Vietnam, China Sea, Japan, Korea.

10. *Glycera fallax* Quatrefages, 1850 구슬아가미미갑갯지렁이 (Fig. 9)

Glycera fallax Quatrefages, 1850: 358; Böggemann, 2002: 59, figs. 73-75; Choi *et al.*, 2015: 274, Fig. 1.

Glycera gigantea Quatrefages, 1866: 183; Fauvel, 1923: 387, fig. 152d-k; Okuda, 1938: 125, fig. 3; Berkeley, 1941: 34; Hartman, 1950: 75; Imajima and Hartman, 1964: 162; Day, 1967: 362, fig. 16.2l-n; Gibbs, 1971: 156.

Material examined. 4 specimens, Haeun-ri, Hyeongyeong-myeon, Muan-gun, Jeollanam-do (126°25′40″, 35°03′33″) 19 Dec 2011, Choi HK.

Description. Body smooth, about 33.0 mm long with 95 segments and width 1.5 mm including parapodium at 20th setiger; life color red, whitish brown in alcohol. Body rings biannulated anterior annulus with parapodia and dorsal cirriposterior annulus slightly longer than anterior ones (Fig. 9A, B).

Prostomium large conical-shaped, consisted of 10 or 11 rings, and length slightly longer than basal width; 4 short antennae present on anterior end (Fig. 9A, B).

Proboscis bat-shaped, with 4 sickle-shaped jaws on anterior end and vertical white rows on mid-region (Fig. 9A, B), and closely covered with 2 kinds of soft papillae; most papillae long oval shaped and with 3 ridges (Fig. 9C), and remaining other papillae broadly subglobular form without ridges (Fig. 9D).

Ailerons (jaw support) with single prolongation and sub-triangular base, without denticle (Fig. 9E).

Parapodia uniramous on first 2 setigers, and biramous on following setigers with 2 presetal and 2 postsetal lobes. Presetal lobes of parapodia digitiform, pointed distally, deeply divided, and much longer than postsetal lobes notopodial lobes on anterior and mid-body regions as long as neuropodial lobes, and notopodial and neuropodial lobes onposterior region nearly equal in length. Postsetal lobes of parapodia short, blunt, slightly divided, and nearly equal in length notopodial lobes bluntly triangular in shape on anterior regions, but bluntly rounded on mid-body and posterior region, and neuropodial lobes bluntly

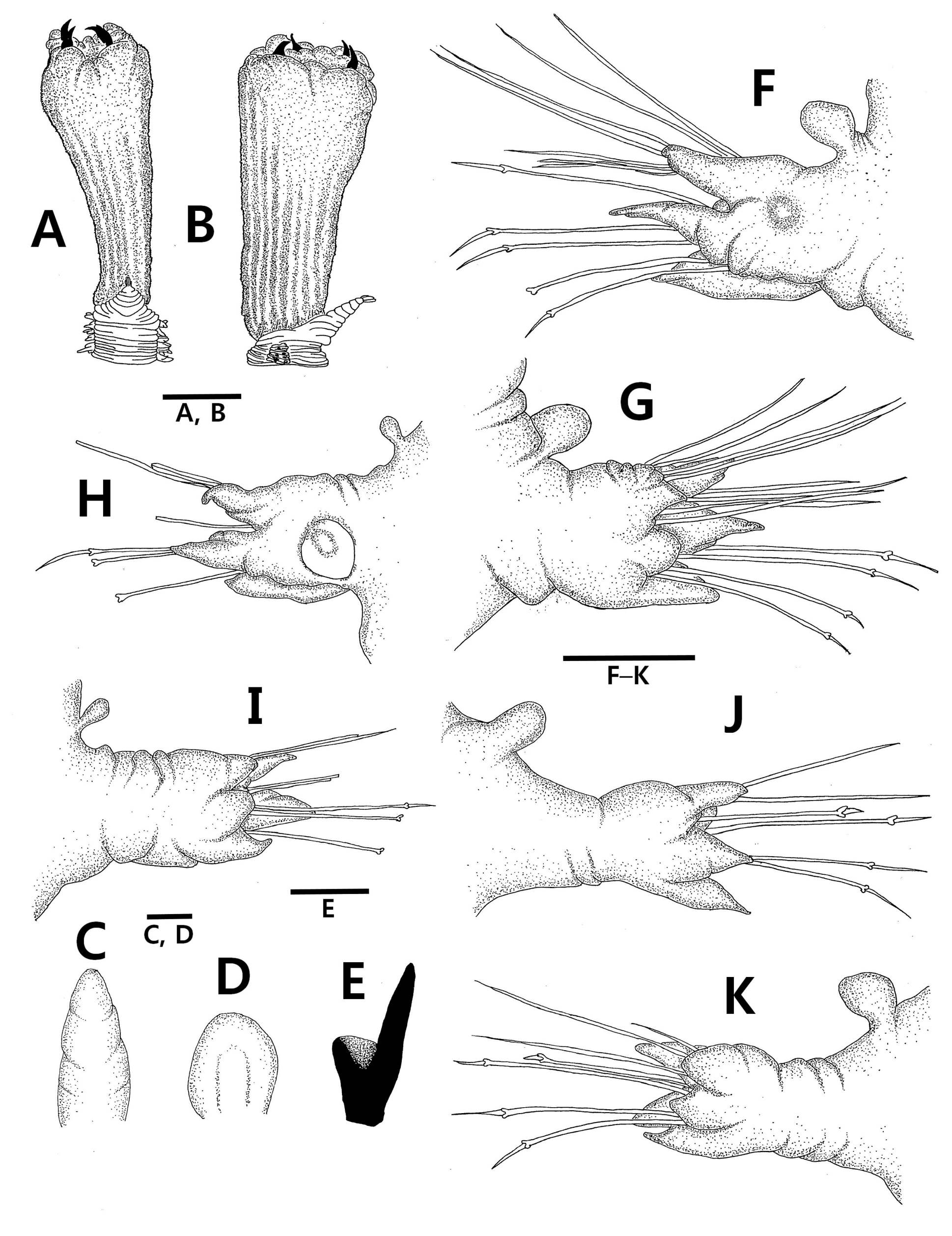

Fig. 9. *Glycera fallax* Quatrefages, 1850. A, dorsal view of anterior end; B, lateral view of anterior end; C, D, proboscidial papillae; E, aileron (jaw support); F, anterior view of 25th parapodium; G, posterior views of 25th parapodium; H, anterior view of 55th parapodium; I, posterior view of 55th parapodium; J, anterior view of posterior parapodium; K, posterior view of posterior parapodium. Scale bars: A, B=1.0 mm, C–H=0.2 mm, I, J=0.01 mm, K=0.1 mm.

rounded (Fig. 9F - K).

Dorsal cirrus from 3rd parapodium, oval-shaped, attached above parapodial basis (Fig. 9F - K).

Ventral cirrus large, slender, triangular-shaped, and shorter than presetal lobes but longer than postsetal lobes (Fig. 9F-K).

Branchiae (Fig. 9H) single, blister-like in shape, attached on anterior surface of parapodia, present on 45 - 60 segment regions, and usually retractile state (Fig. 9F).

Remarks. *Glycera fallax* had long been ignored because of its poor original description (Quatrefages 1850). Instead of this species, *G. gigantea* Quatrefages, 1866 had long been widely known in the genus *Glycera* (Fauvel 1923; Berkeley and Berkeley 1941; Hartman 1950; Imajima and Hartman 1964 Day 1967). However, recent work revealed that *G. fallax* is a valid species and *G. gigantea* is a junior synonym of *G. fallax* based on the examination of their type materials (Böggemann 2002).

In this study, the authors examined the *Glycera* materials from Korean waters, and could find that those can be classified as *G. fallax* according to the following distinguishable characteristics: the proboscis has the conical papillae bearing three ridges and subglobular papillae; the ailerons have sub-triangular bases the postsetal lobes on mid-body are blunt and more or less rounded, and the length of them are nearly similar; the branchiae are simply retractile and blister-like on the anterior surface of parapodia (Böggemann 2002). However, a minor difference is observed in Korean materials in the number of prostomial ring, 10 or 11 rings are in Korean materials while 14 - 17 rings are in the type materials of *G. fallax* (Böggemann 2002).

Among *Glycera* species known from Korean waters, *G. unicornis* Lamarck, 1818, which was previously reported as *G. rouxii*, is appeared to be closely resembled with *G. fallax* in the following common diagnostic features: conical-shaped papillae with three ridges on the proboscis, two postsetal lobes of nearly equal length, and retractile branchiae (Lee, 1984; Paik, 1989; Böggemann 2002). However, these two species differ from each other in term of the postsetal lobesand branchiae: the postsetal lobes on mid-body of *G. fallax* are blunt and more or less rounded usually, while those of *G. unicornis* are slender and triangular-shaped; the parapodia on mid-body possess simply blister-like branchiae in *G. fallax*, but those in *G. unicornis* possess one or two digitiform ones (Böggemann 2002).

Distribution. North Atlantic, New Britain, Western and Southern Europe, Mediterranean, Laccadive Sea, Northeastern Australia, Northeastern Pacific Ocean, Southern California, Panama, Japan, Korea.

11. *Glycera macintoshi* Grube, 1877 청동미갑갯지렁이

Glycera subaenea Grube, 1877: 184, pl. 8, fig. 8; Fauvel, 1919: 425, pl. 16, figs. 48-51; Okuda and Yamada, 1954: 187, fig. 5; Imajima and hartman, 1964: 164; Day, 1967: 363, fig. 16. 3k-n; Rho and Lee, 1987: 84, fig. 6; Paik, 1989: 231. fig. 2.

Glycera macintoshi Böggemann, 2002: 55, figs. 64-66.

Material examined. 2 specimens, Yongjeong-ri, Sangha-myeon, Gochang-gun, Jeollabuk-do (126°32′29″E, 35°28′08″N), 04 May 2015, Choi HK.

Diagnosis. Proboscis with both conical and oval papillae; mainly conical papillae with 3 U-shaped ridges. Aileron with rounded and triangular base. Parapodia with slender triangular notopodial postsetal lobes much longer than rounded neuropodial ones. Branchiae retractile, with 1-6 branchial rami.

Distribution. Indian Ocean, Indo-Pacific, Australia, Philippine, Chian, Japan, Korea.

12. *Glycera nicobarica* Grube, 1868 치로리미갑갯지렁이

Glycera nicobarica Grube, 1868: 24, taf, III, fig. 1; Böggemann, 2002: 57, figs. 67-69; Imajima, 2003: 112, fig. 67a-h.

Glycera chirori Izuka, 1912: 245, pl. 2, fig. 18; pl. 24, fig. 13; Okuda, 1938: 125, fig. 2; Imajima and Hartman, 1964: 161; Imajima, 1970: 116; 1997: 168; Paik, 1973b: 125, pl. 2, fig. A; 1982: 49, pl. 16f; 1984b: 154; 1989: 233, Fig. 31; Rho and Song, 1974: 78, figs. 20-24; 1975: 102; 1976: 62; Lee, 1984: 16, fig. 1.

Glycera decipiens Marenzeller, 1879: 140, pl. 6, Fig. 3; Imajiam and Hartman, 1964: 162; Rho and Song, 1974: 78, figs. 25-27; 1975: 102; Paik, 1975: 416, pl. 6, fig. 49; 1978: 6, pl. 5, figs. 6-8; 1982: 794, pl. 16g; 1989: 234, fig. 32.

Material examined. 2 specimen, Unseo-dong, Jung-gu, Incheon-si (126°29′16″E, 37°24′08″N), 07 Jul 2010, Choi HK; 1 specimen, Nongju-ri, Haeryong-myeon, Suncheon-si, Jeollanam-do (127°29′03″E, 34°51′49″N), 28 Feb 2012, Choi HK; 2 specimens, Yeongun-ri, Sanyang-eup, Tongyeong-si, Gyeongsangnam-do (128°28′24″E, 34°47′33″N), 28 Aug 14, Choi HK; 2 specimens, Daegok-ri, Sinji-myeon, Wando-gun, Jeollanam-do (126°48′46″E, 34°20′07″N), 02 Jul 2015, Choi HK; 2 specimens, Siran-dong, Sacheon-si, Gyeongsangnam-do (128°10′46″E, 34°52′48″N), 14 May 2014, Choi HK.

Diagnosis. Proboscis with both conical and oval papillae; mainly conical papillae with 3 U-shaped ridges. Jaw with aileron bearing triangular base. Parapodia with slender and triangular notopodial and rounded neuropodial postsetal lobes; notopodial lobes longer than neuropodial ones. Branchiae retractile, simple, and digitiform.

Distribution. Indian Ocean, Indo-Pacific, China Sea, Japan, Korea.

13. *Glycera onomichiensis* Izuka, 1912 오노미치미갑갯지렁이

Glycera onomichiensis Izuka, 1912: 244, pl. 24, fig. 10-12; Imajima and Hartman, 1964: 162; Lee, 1984: 14, pl. 1D-F. fig. 1; Paik, 1989: 227, fig. 25; Imajima, 2003: 112, fig. 68a-f; Böggemann, 2002: 68, figs. 94-96.

Material examined. 1 specimen, Haeun-ri, Hyeongyeong-myeon, Muan-gun, Jeollanam-do (126°25′40″E, 35°03′33″N), 05 April 2011, Choi HK; 4 specimens 19 Dec 2011, Choi HK; 2 specimens, Unseo-dong, Jung-gu, Incheon-si (126°29′16″E, 37°24′08″N), 07 Jul 2010, Choi HK; 2 specimens, Ganggye-ri, Imhoe-myeon, Jindo-gun, Jeollanam-do (126°15′16″E, 34°23′30″N), 09 April 2013, Choi HK; 2 specimens, Bunmae-ri, Aphae-eup, Shinan-gun, Jeollanam-do (126°17′34″E, 34°51′10″N), 06 Apr 2012, Choi HK; 1 specimen, Ho-ri, Palbong-myeon, Seosan-si, Chungcheongnam-do (126°17′59″E, 36°48′37″N), 23 Jun 2012, Choi HK; 1 specimen, Punghwa-ri, Sanyang-eup, Tongyeong-si, Gyeongsangnam-do (128°24′34″E, 34°48′04″N), 21 Mar 2014, Choi HK.

Diagnosis. Probocidial papillae with fingernail structure and long stalk. Aileron with pointed triangular base. Parapodia of mid-body with slender notopodial and neuropodial postsetal lobes nearly equal in length. Branchiae absent.

Distribution. West Pacific Ocean, New Zealand, Bengal of Bay, China, Japan, Korea.

14. *Glycera tesselata* Grube, 1863 (Fig. 10)

Glycera tesselata Grube, 1863: 41; Ehlers, 1864: 654, pl. 24, figs. 2, 33; Moore, 1903: 464; Izuka, 1912: 241, pl. 24, figs. 5, 6; Benham, 1916: 143; Hartman, 1950: 77, pl. 10, fig. 11; Imajima and Hartman, 1964: 165; Day, 1967: 362, fig. 16.2a-c; Böggemann, 2002: 47, figs. 37-39; Imajima, 2003: 117, fig. 69h-l; Rizzo *et al.*, 2007: 46, fig. 13.

Material examined. 1 specimen, Haeun-ri, Hyeongyeong-myeon, Muan-gun, Jeollanam-do (126°25′40″, 35°03′33″), 19 Dec 2011, Choi HK; 2 specimens, 27 Feb 2012, Choi HK; 1 specimen, 12 Oct 2012, Choi HK.

Description. Body about 5.4 cm to 6.5 cm long with 90 to 98 segments, maximum width about 2.5 mm including parapodium at 20th setiger, following segments tapered, surface smooth, and life color red, whitish brown or whitish green in alcohol; body rings biannulated, anterior annulus slightly shorter than posterior, and anterior annulus with parapodia and dorsal cirri (Fig. I-9A, B).

Prostomium elongate and conical shaped, composed of 8 or 9 rings, and length slightly longer than basal width anteriorly distal ring with 2 pairs of short antennae (Fig. 10A, B).

Proboscis (Fig. 10A, B) thick anteriorly and gradually slender, with 4 sickle-shaped jaws located at anterior end, with many vertical white rows, closely covered with 2 kinds of flesh papillae numerous papillae long digitiform, with two faintly longitudinal ridges medially, and other papillae broadly conical shape, with longitudinal ridge medially (Fig. 10I).

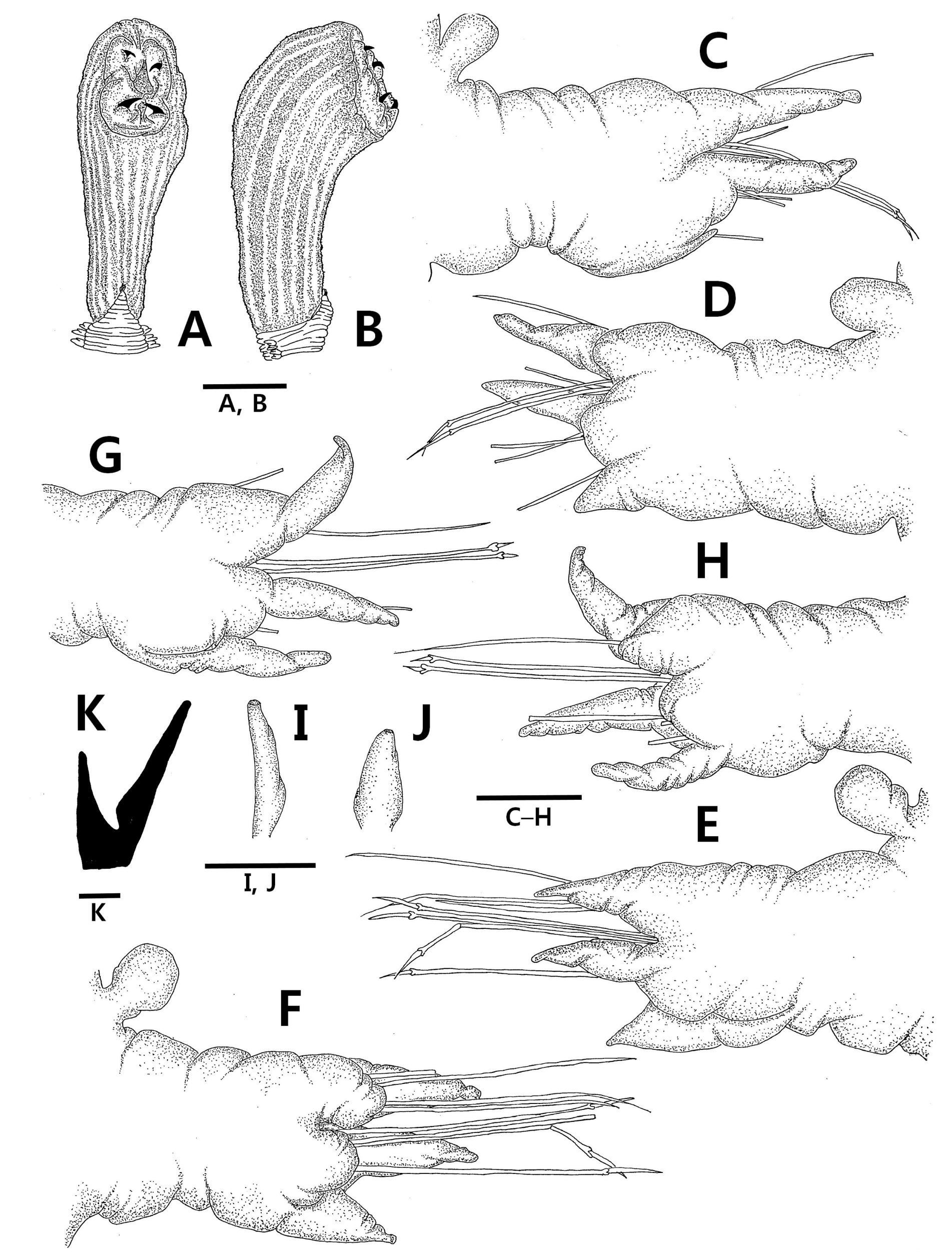

Fig. 10. *Glycera tesselata* Grube, 1863. A, dorsal view of anterior end; B, lateral view of anterior end; C, anterior view of 25th parapodium; D, posterior view of 25th parapodium; E, anterior view of 55th parapodium; posterior view of 55th parapodium; G, anterior view of posterior parapodium; posterior view of posterior parapodium; I, J, proboscidial papillae; J, aileron (jaw support). Scale bars: A, B=2.5 mm, C–H=0.2 mm, I, J=0.05 mm, K=0.1 mm.

Ailerons (jaw support) with both long and short prolongations, with deeply incised base, and without denticle (Fig. 10J).

Parapodia biramous, but first 2 parapodia uniramous parapodial lobes with 2 presetal lobes and 2 postsetal lobes, and presetal lobes much longer than postsetal lobes presetal lobes long digitiform and triangular shaped, with pointed end, deeply divided presetal neuropodial and notopodial lobes nearly equal in length postsetal lobes short and distally rounded, slightly divided postsetal notopodial and neuropodial lobes of anterior region nearly equal in length, and postsetal notopodial lobes of mid-body and posterior region slightly longer than postsetal neuropodial lobes, with blunt-subtriangular end (Fig. 10C-H).

Dorsal cirrus from 3rd parapodium, ovoid, attached above parapodial superior basis (Fig. 10C-H).

Ventral cirrus long conical shaped, distally pointed, shorter than presetal lobes and longer than postsetal lobes (Fig. 10C-H).

Branchiae absent.

Remarks. Korean materials of the present study show the several characteristics generally agreed well with several previous description of *G. tesselata* as follows: the proboscis mainly has long digitiform papillae and sometimes has broadly conical papillae; the ailerons have deeply incised bases; the parapodia of mid-body have short and rounded postsetal lobes; the branchiae are absent (Hartman, 1950; Imajima and Hartman, 1964; Day, 1967; Böggemann, 2002; Imajima, 2003). However, Korean materials of the present study show a difference in the ridge on probocidial papillae from some previous literatures: Korean materials have the main papillae on proboscis with two faintly longitudinal ridges, while the materials of the previous literatures possess the main papillae with a distinctly longitudinal ridge (Böggemann, 2002), U-shape ridge (Benham, 1916), and more than two longitudinal ridges (Hartman, 1950).

Glycera tesselata resembles *G. onomichiensis* Izuka, 1912 previously reported from Korean waters in that the anterior surface of parapodia are lacking branchiae (Lee, 1984; Paik, 1989). However, *G. tesselata* differs from *G. onomichiensis* by the following characteristics: the proboscis of *G. tesselata* mainly has the long digitiform papillae, while that of *G. onomichiensis* has the papillae bearing terminal fingernail structure and long stalk; *G. tesselata* possesses the ailerons bearing deeply incised bases, but those of *G. onomichiensis* bear the triangular bases; the postsetal lobes of *G. tesselata* are rounded, while those of *G. onomichiensis* are slender and triangular shaped (Izuka, 1912; Imajima and Hartman, 1964; Lee, 1984; Paik, 1989; Böggemann, 2002; Imajima, 2003).

Distribution. North Atlantic Ocean, Mediterranean Sea, Indo Pacific area, South Viet Nam, Madagascar, Western Canada to California, Japan, Korea.

15. *Glycera unicornis* Lamarck, 1818 어리미갑갯지렁이

Glycera goesi: Moore, 1903: 464; Izuka, 1912: 238, pl. 24, fig. 1-2.

Glycera rouxii: Fauvel, 1923: 389, fig. 153a-c; Okuda and Yamada, 1954: 188; Imajima and Hartman, 1964: 164; Day, 1967: 362, fig. 16.3A-D; Paik, 1975: 416, pl. 6, fig. 50; 1982: 793, pl. 16d-e; 1989: 232, fig. 30; Lee, 1984: 16, fig. 1; Imajima, 2003: 115, fig. 69a-g.

Glycera unicornis: Böggemann, 2002: 60, figs. 79-81.

Material examined. 1 specimen, Haeun-ri, Hyeongyeong-myeon, Muan-gun, Jeollanam-do (126°25′40″E, 35°03′33″N), 11 Apr 2012, Choi HK; 1 specimen, Docheong-ri, Byeonsan-myeon, Buan-gun, Jeollabuk-do (126°29′40″E, 35°34′56″N), 29 Nov 2009, Choi HK; 1 specimen, Na-ri, Gunnae-myeon, Jindo-gun, Jeollanam-do (126°12′52″E, 34°33′35″N), 09 Apr 2013, Choi HK.

Diagnosis. Proboscis with both conical and oval papillae; mainly conical papillae with 3 U-shaped ridges. Aileron with triangular base. Parapodia with two slender and triangular postsetal lobes of about same length. Branchiae retractile, composed of 1-2 digitiform rami.

Distribution. Mediterranean Sea, Atlantic Ocean, Indian Ocean, South Africa, California, Japan, Korea.

Genus *Hemipodia* Quatrefages, 1865 반다리미갑갯지렁이속

Prostomium slender and consisting of 7-10 rings. Parapodia uniramous.

Aileron rod-like form. Setae all composite spinigers.

Type species. *Hemipodia simplex* (Grube, 1857).

16. *Hemipodia yenourensis* (Izuka, 1912) 반다리미갑갯지렁이

Hemipodus yenourensis Izuka, 1912: 250-251. pl. 23, figs. 14-15; Imajima and Hartman, 1964: 165; Rho and Song, 1975: 102, pl. 1, fig. 5, pl. 7, figs. 8-10; Paik, 1982: 793, pl. 16a; 1989: 223, fig. 23.

Hemipodia yenourensis: Böggemann, 2002: 79, Figs. 130-132.

Material examined. 1 specimen, Bunmae-ri, Aphae-eup, Shinan-gun, Jeollanam-do (126°17′34″E, 34°51′10″N), 06 April 2012, Choi HK; 1 speciman, Songseok-ri, Haeje-myeon, Muan-gun, Jeollanam-do (126°19′33″E, 35°08′12″N), 16 Oct 2012, Choi HK.

Diagnosis. Proboscis with conical papillae bearing about 9-18 ridges. Aileron rod-like. Parapodia with single and short rounded or blunt postsetal lobe. Branchiae absent. Ventral cirri conical to oval in anterior parapodia, and elongate and digitiform in posterior parapodia.

Distribution. New Zealand, Australia, Japan, Korea.

Family Goniadidae Kinberg, 1866 고리갯지렁이과

Body with 2-3 region, anterior uniramous region, transitional region, and posterior biramous region. Dorsal and ventral cirri conical or digitate. Proboscis well developed with both macrognaths and micrognaths. Chevron usually present on poboscis.

Type genus. *Goniada* Audduin and Milne Edwards, 1833.

Key to the genera of Goniadidae Kinberg, 1866 from Korea

1. Proboscis with chevron ··· *Goniada*
 \- Proboscis without chevron ··· 2
2. Proboscis with papillae composed of 1 or 2 types ··· *Ophioglycera*
 \- Proboscis with papillae composed of many types ··· *Glycinde*

Genus *Goniada* Audduin and Milne Edwards, 1833 갈고리갯지렁이속

Proboscis with chevron. Parapodia divided into uniramous and biramous region. Notosetae acicular or capillary. Neurosetae composite spinigers.

Type species. *Goniada emerita* Audouin and Milne-Edwards, 1833.

Key to the species of *Goniada* Audduin and Milne Edwards, 1833 from Korea

1. Notosetae acicular; parapodia with distinct transitional middle region ·· *G. japonica*
- Notosetae capillary; parapodia with indistinct transitional middle region ·· *G. maculata*

17. *Goniada japonica* Izuka, 1912 큰갈매기고리갯지렁이 (Figs. 11, 12)

Goniada japonica Izuka, 1912: 232, pl. 23, figs. 1-6; Hartman, 1950: 35; Imajima and Hartman, 1964; 239; Paik, 1982: 794, pl. 16h-j; 1989: 236, fig. 25; Imajima, 1997: 168; Böggemann, 2005: 43, figs. 17-18.

Material examined. 2 specimens, Haeun-ri, Hyeongyeong-myeon, Muan-gun, Jeollanam-do (126°25′40″E, 35°03′33″N), 05 April 2011, Choi HK; 2 specimens, 21 Aug 2011, Choi HK; 3 specimens, 19 Dec 2011, Choi HK; 1 specimen, Ganggye-ri, Imhoe-myeon, Jindo-gun, Jeollanam-do (126°15′16″E, 34°23′30″N), 09 April 2013, Choi HK; 1 specimen, Ho-ri, Palbong-myeon, Seosan-si, Chungcheongnam-do (126°17′59″E, 36°48′37″N), 23 Jun 2012, Choi HK; 1 specimen, Gomso-ri, Jinseo-myeon, Buan-gun, Jeollabuk-do (126°38′28″E, 35°35′04″N), 14 Aug 2014, Choi HK; 1 specimen, Daegok-ri Sinji-myeon, Wando-gun, Jeollanam-do (126°48′46″E, 34°20′07″N), 02 Jul 2015, Choi HK.

Description. Body about 7.8 cm long with about 287 segments, maximum width 1.8 mm including parapodium at setiger 27 in uniramous region and 2.3 mm including parapodium at setiger 79 in biramous region. Body rings uniannulate but slightly biannulate on dorsal side of median region.

Prostomium (Fig. 11A, B) long conical in shape, composed of 9 to 10 rings, with 4 short appendage terminal on annulus.

Proboscis long cylindrical-shaped, with numerous papillae on surface and weakly longitudinal rows on lateral and ventral surface; basal papillae relatively rounded heart shape; dorsal papillae long heart shape with slightly pointed tips; lateral papillae smaller heart shape with slightly laterally bent tips; ventral papillae smaller rounded heart shape; terminal papillae 17, globular-shaped, and located on around mouth (Fig. 11A-G)

Macrognath with 4-5 teeth and located on both sides in proboscis. Micrognath H-shaped bearing 1 piece, 11-15 on dorsal arc and 5-7 on ventral arc in proboscis (Fig. 11G). Chevrons attached on posterior region of proboscis, and consisted of 8-24 (Fig. 11J).

Parapodia divided into 4 region by states of notopodium; uniramous region composed of about first 37-42 segments, with neuropodia only consisted of 2 presetal and 1 postsetal lobes except segment 1 bearing only small lateral cirri and segments 2-5 bearing 1 pre- and postsetal lobe, and postsetal lobe distinctly shorter than presetal lobes; transitional middle (subbiramous) region with about 18-22 following segments bearing only small notopodial aciculae under dorsal cirri; reduced notopodium (initial biramous) region composed of about following 9-10 segments with small notopodial aciculae and reduced notopodia notopodial lobe slender and conical digitiform; posterior biramous region (distinctly separated notopodium) present in other segments with well developed noto- and neuropodia (Fig. 12A-D).

Dorsal cirri on uniramous and transitional middle region digitiform, shorter than neuropodial postsetal lobes, and ones on biramous region conical-shaped, slightly longer than postsetal lobes (Fig. 12A-D).

Ventral cirri on uniramous and transitional middle region digitiform, sub-equal or slightly longer than presetal lobes, and ones on biramous region conical-shaped, longer than postsetal lobes (Fig. 12A-D).

Notoseatae acicular, located on between dorsal cirri and notopodia; transitional middle region and reduced notopodium region with 1 acicular notoseatae, and biramous region with 2 acicular notoseatae (Fig. 12A-D).

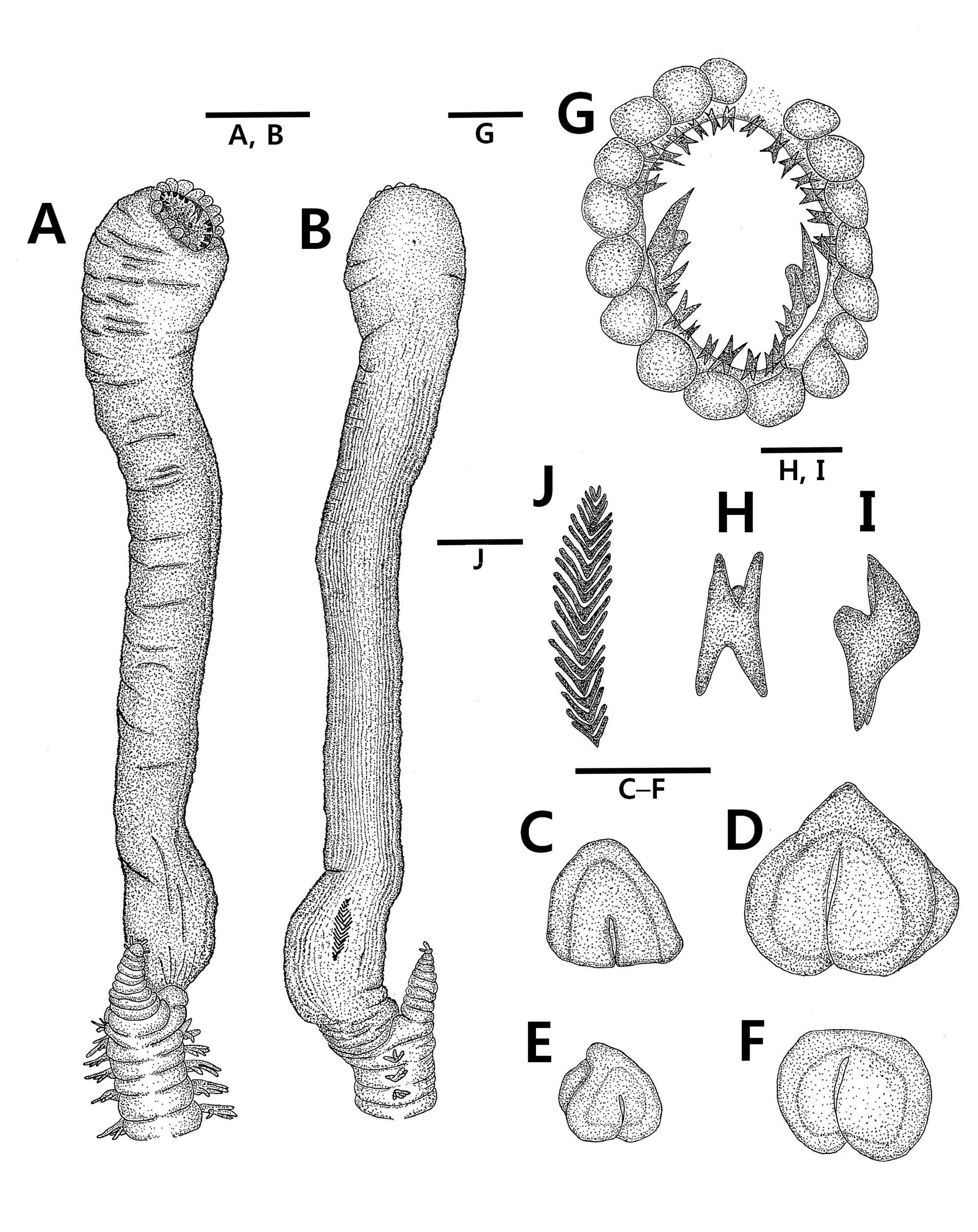

Fig. 11. *Goniada japonica* Izuka, 1912. A, dorsal view of anterior end; B, lateral view of anterior end; C, proboscidial papillae, basal papillae; D, same, dorsal papillae; E, same, lateral papillae; F, same, ventral papillae; G, terminal papillae and arrangements of macrognath and micrognath; H, micrognath, H-shape; I, same. lateral view; J, chevrons. Scale bars: A, B=1.0 mm, C-F=0.025 mm, G=0.2mm, H-I=0.01 mm, J=0.25 mm.

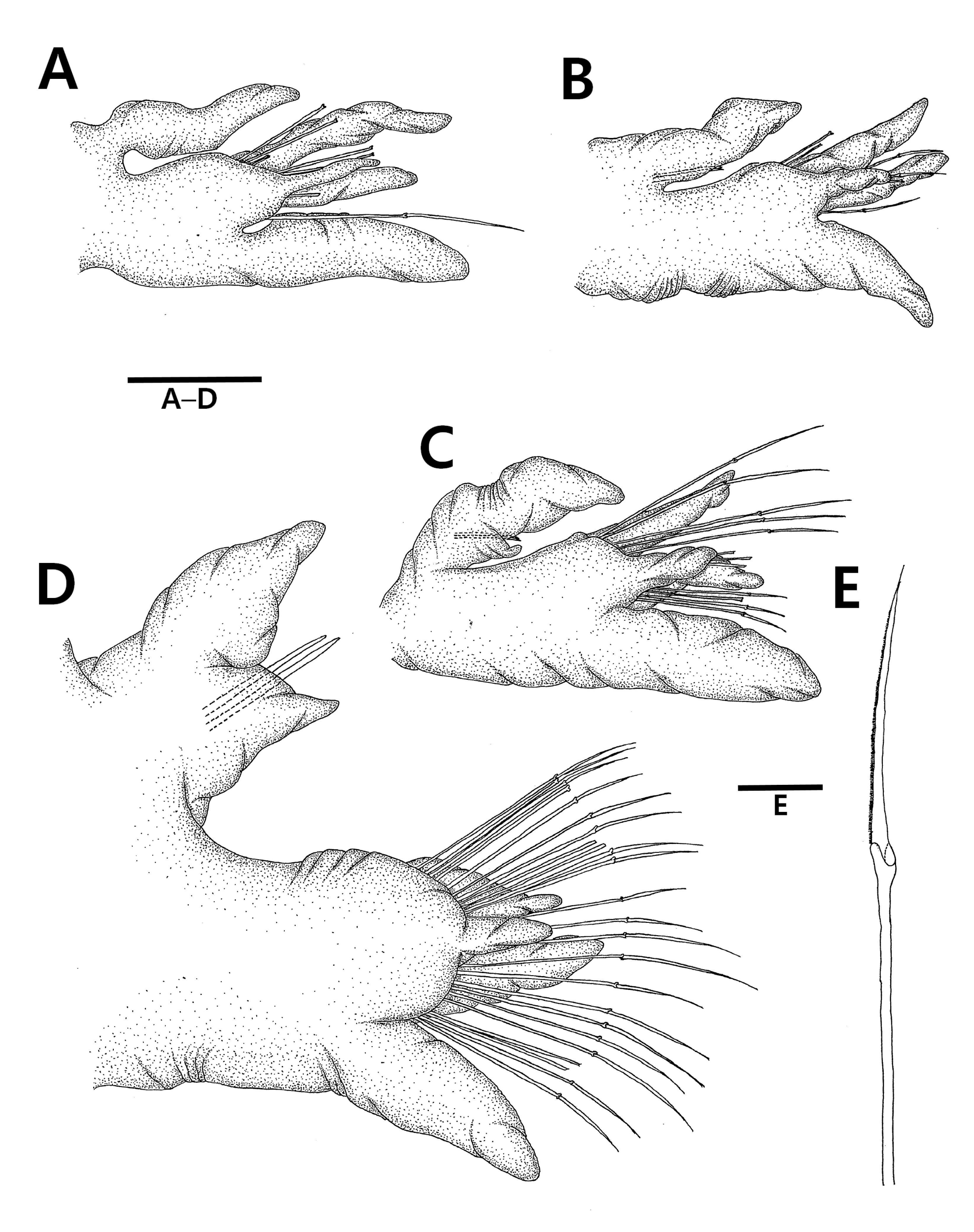

Fig. 12. *Goniada japonica* Izuka, 1912. A, posterior view of 20th parapodium in uniramous region; B, posterior view of 50th parapodium in transitional middle (subbiramous) region; C, posterior view of 70th parapodium in reduced notopodium (initial biramous) region; D, posterior view of 100th parapodium in biramous region; E, Neurosetae. Scale bars: A–D=0.2 mm, E=0.05 mm.

Neurosetae compound spinigers; shaft with heterogomph sockets of Y-shape, and blades with minute serrations and pointed tip (Fig. 12E).

Remarks. The taxonomic descriptions of *G. japonica* from Korean waters were performed, based on the descriptions of Japanese materials (Izuka, 1912; Imajima and Hartman, 1964; Paik, 1982, 1989). According to them, *G. japonica* has 18 pairs of chevrons on the proboscis, and this characteristic had been regarded as a significant diagnostic characteristic of *G. japonica*. However, Böggemann (2005) described that the number of chevron in *G. japonica* was very variable (6-24 pairs), based on the type materials of *G. japonica*, and suggested the real diagnostic characteristics of *G. japonica* as follows: the notosetae are acicular and situated between a dorsal cirrus and notopodium; the chevrons are less than 30 pairs; the proboscis has heart-shaped or rounded papillae; the body is composed of four sections such as the uniramous region without notopodium, the transitional middle region consisted of subbiramous parapodia with only notopodial aciculae, the biramous region with reduced notopodia, and the posterior region with enlarged and clearly separated noto- and neuropodia. In this respect, Korean materials agree well with the description of Böggemann (2005). On the other hand, Korean materials of *G. japonica* are different to those of Böggemann (2005) in the shape of micrognath: Korean materials have H-shaped micrognaths, while the those of Böggemann (2005) possess H+v/w or W+v/w-shaped micrognaths.

Between the species from Korean waters, *G. japonica* is clearly distinguished from *G. maculata* by the following characteristics: the notosetae are acicular in *G. japonica*, while those of *G. maculata* are capillary; the subbiramous regrion and the biramous region are distinct in *G. japonica*, but those of *G. maculata* are indistinct (Böggemann, 2005).

Distribution. Northern coast of Australia, China, Japan, Korea.

18. *Goniada maculata* Oersted, 1843 작은갈메기고리갯지렁이

Goniada maculata: McIntosh, 1910: 463, fig. 58; Southern, 1914: 92; Fauvel, 1923: 392, fig. 154a-g; Hartman, 1950: 20, pl. 1, figs. 7-8; Imajima and Hartman, 1964:

239; Banse and Hobson, 1974: 81; Day, 1967: 367, fig. 16.4K-N; Paik, 1982: 794, pl. 16k-n; 1989: 237.

Material examined. 1 specimen, Haeun-ri, Hyeongyeong-myeon, Muan-gun, Jeollanam-do (126°25′40″E, 35°03′33″N), 21 Aug 2011, Choi HK; 2 specimen, 19 Dec 2011, Choi HK.

Diagnosis. Proboscis with slightly different types of papillae. Prostomium with 9-10 rings and 4 biarticulate appendages. Micrognaths Y-shaped on dorsal arc and H+v/w shaped on ventral arc. Chevron 3-11 pairs. Uniramous parapodia about 31-51 segments. Subbiramous parapodia and the biramous region with reduced notopodia indistinct. Notosetae capillary. Neurosetae spinigers.

Distributions. Atlantic Ocean, Barent Sea, Mediterranean Sea, West Europe, Bering Sea, Alaska, North east coast of North America, Caribbean Sea, Gulf of Iran, Japan, Korea.

Genus *Glycinde* Müller, 1858 혓고리갯지렁이속

Proboscis with several different types of papillae; papillae arranged in longitudinal row. Parapodia divided into uniramous and biramous region. Notosetae stout, with hooked tip bearing pointed hood. Neurosetae composite spinigers.

Type species. *Glycinde multidens Müller, 1858.*

19. *Glycinde bonhourei* Gravier, 1904 외돌기혓고리갯지렁이 (Fig. 13)

Glycinde gurjanovae Uschakov and Wu, 1979: 50, fig. 16a-g.

Glycinde nipponica Imajima, 1967: 426, fig. 8a-x.

Glycinde bonhourei Gravier, 1904: 474; Böggemann, 2005: 226, figs. 132-133; Choi *et al.*, 2015: 93, fig. 1.

Material examined. 2 specimens, Janggyeong-ri, Yeongheung-myeon, Ongjin-gun, Incheon-si (37°15′46″N, 126°25′20″E), 17 Jul 2012, Choi HK; 4 specimens, Gomso-ri, Jinseo-myeon, Buan-gun, Jeollabuk-do (35°35′11″N, 126°36′55″E), 14 Aug 2014, Choi HK; 1 specimen, Danghang-ri, Changseon-myeon, Namhae-gun, Gyeongsangnam-do (128°28′24″E, 34°47′33″N), 31 Jul 14, Choi

HK.

Description. Body length about 20 mm long with approximately 96 segments, slender and cylindrical shaped; segments uniannulate or sometimes biannulate dorsum present on median segments.

Prostomium long conical shaped, composed of about 9 rings; anterior end with 4 short appendages subdistal annulus without eyespots and basal annulus with pair of eyespots (Fig. 13A).

Proboscis with numerous papillae arranged in longitudinal rows, composed of several different types; area I with 1 row of small teapot-shaped papillae bearing lateral protrusion; area II-1 with short and unidentate papillae bearing wide base; area II-2 to II-6 with long fang-shaped papillae II-2 to II-3 with unidentate and II-4 to II-6 with bidentate; area III with 1 row of small and rectangular papillae bearing narrow base and 2 short protrusions area IV with 1 row of duckfoot-shaped papaillae bearing rounded teeth; area V with 1 row of straightly conical papillae bearing slightly bifid tip; area VI without papillae (Fig. 13A-H).

Macrognaths large, with 3 teeth, and present on ventral side. Micrognaths H+v-shaped, with sub-globular bases, composed of 5 or 6 on dorsal side, and absent on ventral side (Fig. 13I). Chevrons absent (Fig. 13A).

Parapodia uniramous in anterior segments, and following parapodia biramous; anterior uniramous composed of approximately 24 - 26 setigers, with only neuropodial lobes; neuropodial presetal lobe broadly conical shaped; neuropodial postsetal lobe conical shaped and slightly shorter than presetal lobe; biramous more enlarged than uniramous, with distinctly separated notopodium; notopodial presetal lobe long oval-shaped, longer than rounded postsetal lobes; neuropodial presetal lobe broadly conical shaped and slightly slender distally, much longer than rounded postsetal lobe; notopodial presetal lobe and neuropodial postsetal lobe gradually reduced on posterior biramous (Fig. 13J-K).

Dorsal cirri on uniramous long digitiform, as long as neuropodial postsetal lobe; dorsal cirri on biramous relatively short, but slightly longer than notopodial presetal lobe; dorsal cirri on posterior biramous shorter than those of mid-biramous, as long as notopodial postsetal lobe (Fig. 13J-K).

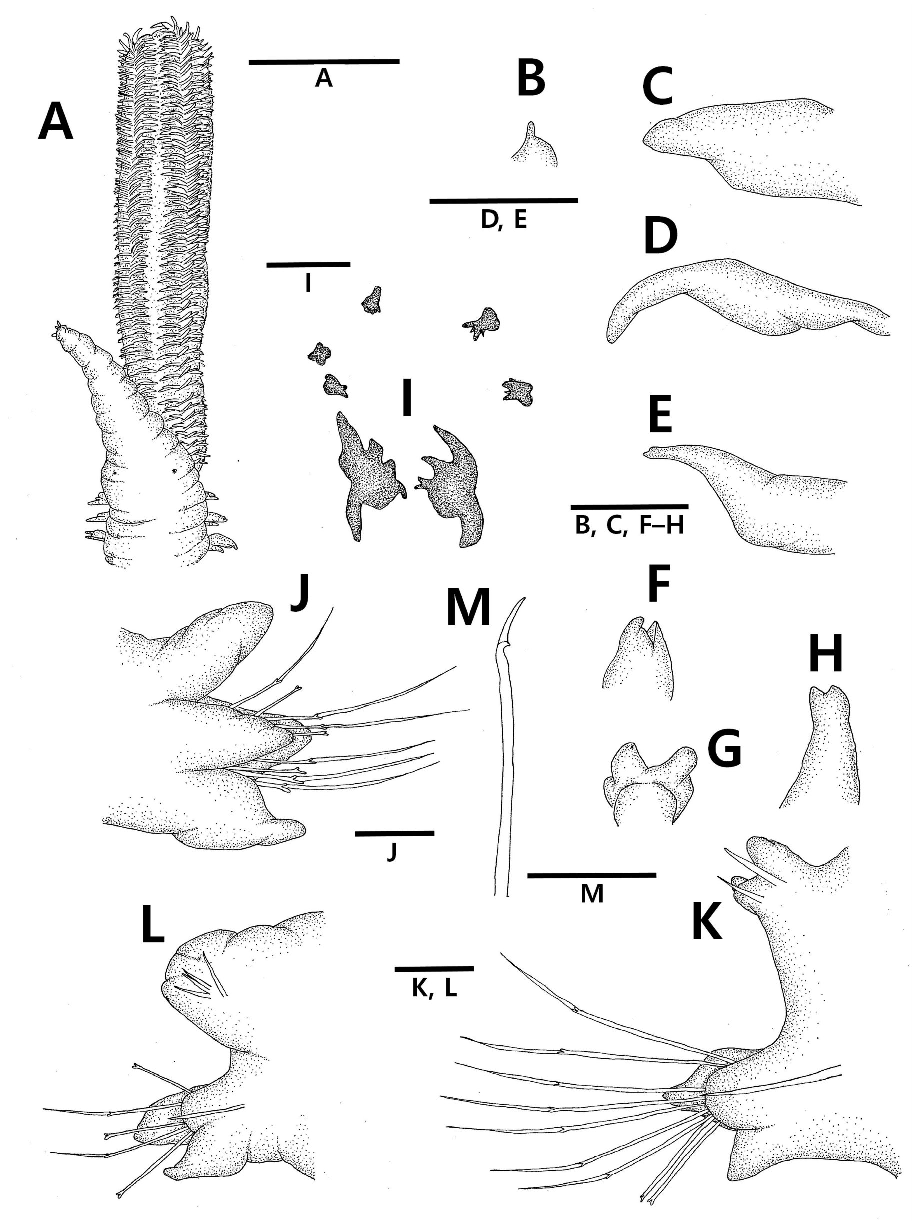

Fig. 13. *Glycinde bonhourei* Gravier, 1904. A, anterior dorsal view; B, papilla on area I of probosics; C, papilla on area II-1; D, papilla of area II-2 to II-3; E, papilla of area II-4 to II-6; F, papilla of area III; G, papilla of area IV; H, papilla of area V; I, arrangement of macrognath and micrognath; J, posterior view of parapodia, 12th parapodium; K, posterior view of 41th parapodium; L, posterior view of posterior parapodium; M, notosetae. Scale bars: A=1.0 mm, B, C, F-H = 0.025 mm, D, E = 0.1mm, I, J, M=0.05 mm, K-L=0.2 mm.

Ventral cirri on uniramous long conical shaped, as long as neuropodial presetal lobe; ventral cirri on biramous sub-triangular shaped and as long as neuropodial postsetal lobe; ventral cirri on posterior biramous broadly conical shaped and slightly shorter than neuropodial presetal lobe (Fig. 13J-K).

Notosetae stout, hook shaped, with pointed hood distally (Fig. 13M).

Neurosetae compound spinigers with blades (Fig. 13J-K).

Remarks: *Glycinde bonhourei* was originally described from the Red Sea by Gravier (1904). This species had been regarded as *G. gurjanovae* or *G. nipponica* Imajima, 1967 from East Asia (Imajima, 1967; Uschakov and Wu, 1979). Böggemann (2005) revised the type materials of *G. gurjanovae* and *G. nipponica,* and suggested that these species were regarded as *G. bonhourei* based on the following characteristics: the area II-1 on proboscis has unidentate papillae bearing broad base the area IV on proboscis bears the papillae of duct's foot-shaped with rounded teeth the area V on proboscis possesses straightly conical papillae bearing slightly bifid tip 4 - 16 micrognaths are appeared on the dorsal side (Korean materials have 5 or 6); all parapodia have one neuropodial presetal lobe; uniramous parapodia are present on 19 - 26 anterior segments (Korean materials show 24 - 26) (Imajima, 1962; Uschakov and Wu, 1979; Böggemann, 2005). In this respect, Korean materials of the present study generally agree well with the description of *G. bonhourei* described by Böggemann (2005). On the other hand, Korean materials of *G. bonhourei* show the minor differencesas follows: Korean materials have only a pair of eyespots on the basal annulus of prostomium, while the materials described by Böggemann (2005) have a pair of eyespots each on both subdistal and basal annulus of the prostomium Korean materials possess short and rounded dorsal cirri on the posterior segments, but the materials described by Böggemann (2005) possess slender and elongated ones.

Glycinde bonhourei is closely related to *G. kameruniana* Augener, 1918 reported from Cameroon in that the area II-1 on proboscis has unidentate papillae, the area V on proboscis possesses straightly conical papillae, and each parapodium has one neuropodial presetal lobe. However, *G. bonhourei* differs from *G. kameruniana* by the characteristic feature such that *G. bonhourei* has 4-16 dorsal micrognaths, while *G. kameruniana* has only four (Augener 1918 Böggemann 2005).

Distribution. Indian Ocean, Red Sea, Mediterranean Sea, North Atlantic Ocean, China (the Yellow Sea), Japan, Korea.

Family Hesionidae Grube, 1850 수염갯지렁이과

Prostomium with 2-3 antennae and 2 palps. Proboscis without jaw. Tentacular cirri 2-8 pairs. Tentacular segments without setae. Parapodial ligules absent. Notosetae simple or absent.

Type genus. *Hesione* Lamarck, 1818.

Key to the genera of Hesionidae Grube, 1850 from Korea

1. Tentacular cirri more than 7 pairs ··· 2
 - Tentacular cirri 6 pairs ··· 3
2. Proboscis with 21-27 distal papillae ··· *Hesiospina*
 - Proboscis smooth distally ··· *Hesione*
3. Parapodia all uniramous ··· *Micropodarke*
 - Some parapodia sub-biramous or biramous ··· *Ophiodrmous*

Genus *Micropodarke* Okuda, 1938 작은수염갯지렁이속

Antennae paried, present on prostomium. Palps biarticulated. Tentacular cirri 6 pairs. Proboscis with distal papillae, and without jaw. Parapodia all uniramous.

Type species. *Micropodarke dubia* (Hessle, 1925).

20. *Micropodarke dubia* (Hessle, 1925) 작은수염갯지렁이

Kefersteinia dubia Hessle, 1925: 32, fig. 11.

Micropodarke amemiyai Okuda, 1938: 89, Fig. 10..

Micropodarke dubia: Imajima and Hartman, 1964: 83; Paik, 1982: 773, pl. 7m-o; 1989: 244, fig. 37; Uchida, 2004: 27, figs. 1-2, pl. 1, fig. 1; Pleijel and Rouse, 2005: 1313, figs. 1-6.

Material examined. 9 specimens, Punghwa-ri, Sanyang-eup, Tongyeong-si, Gyeongsangnam-do (128°24′34″E, 34°48′04″N), 21 Mar 2014, Choi HK; 1 specimen, Dueok-ri, Hansan-myeon, Tongyeong-si, Gyeongsangnam-do (128°29′39″E, 34°47′15″N), 28 Aug 14, Choi HK.

Diagnosis. Prostomium sub-rectangular with 2 antennae and 2 bi-articulated palps. Proboscis without teeth or jaws, with circle of 20 papillae. Tentacular cirri articulated, 6 pairs on 3 segments. Parapodia uniramous; superior lobe of parapodial presetal lobe almost as large as inferior lobe and postsetal lobe almost as long as presetal lobe in median setigers. Neurosetae all compound.

Distribution. Japan, Korea.

Genus *Ophiodromus* Sars, 1862 뱀수염갯지렁이속

Antennae 3 on prostomium. Tentacular cirri 6 pairs. Parapodia sub-biramous or biramous. Proboscis with minute papillae distally. Setae beginning from second segment.

Type species. *Oxydromus flexuosus* (Delle Chiaje, 1827).

21. *Ophiodromus pugettensis* (Johnson, 1901) 뱀수염갯지렁이

Podarke pugettensis Johnson, 1901:. 397, pl. 3, figs. 23-25; Uschakov, 1955: 198, fig. 59; Hilbig, 1994: 251, fig. 9. 7.

Ophiodromus pugettensis: Hessle, 1925: 20; Imajima and Hartman, 1964: 83; Banse and Hobson, 1974: 49; Lee, 1976: 65, fig. 8F-H; Paik, 1982: 773, pl. 7h-l; Uchida, 2004: 62, fig. 14.

Material examined. 1 specimen, Yeongun-ri, Sanyang-eup, Tongyeong-si, Gyeongsangnam-do (128°28′24″E, 34°47′33″N), 24 Mar 2014, Choi HK.

Diagnosis. Prostomium wider than long, with 3 antennae, 2 bi-articulated palps, and 2 pairs of eyespots. Proboscis without teeth or jaws, with circle of 20 papillae. Tentacular cirri 6 pairs, arising from segments 1-3. Parapodia biramous; notopodial cirrophores of medium length with constriction on cirrophore, situated rather proximally, and the diameter reduced on distal part from the constriction. Neurosetae all compound.

Distribution. Western Washington, California, Western Mexico, Peru, Japan, Korea.

Family Pilargidae Saint-Joseph. 1899 투구갯지렁이과

Prostomium with 2-3 antennae. Palps simple or biarticulate. Tentacular cirri 2 pairs. Tentacular segments without parapodia and setae. Proboscis without jaw or teeth. Notopodia reduced. Noto- and neurosetae simple.

Type genus. *Pilargis* Saint-Joseph, 1899.

Key to the genera of Pilargidae Saint-Joseph. 1899 from Korea

1. Antennae shorter than palps; integument papillated ························· *Ancistrosyllis*
 - Antennae longer than palps; integument smooth ····································· *Sigambra*

Genus *Ancistrosyllis* McIntosh, 1879

Body surface with numerous papillae. Prostomium with 3 antennae and 2 biarticuate papls; antennae shorter than palps. Peristomium dorsally incised. Dorsal and ventral cirri distinct. Notopodia with recurved emergent hooks.

Type species. *Ancistrosyllis groenlandica* McIntosh. 1879.

22. *Ancistrosyllis matsunagaensis* (Kitamori, 1960) 뿔투구갯지렁이

Pilargis matsunagaensis Kitamori, 1960: 1088, fig. 2.

Material examined. 1 specimen, Danghang-ri, Changseon-myeon, Namhae-gun, Gyeongsangnam-do (128°28′24″E, 34°47′33″N), 31 Jul 14, Choi HK.

Diagnosis. Body closely covered with many papillae. Prostomium with 2 antennae; antennae shorter than palps. First segment with pair of tentacular cirri on each side. Notopodia reduced, with well developed emergent hooks. Neuropodia with simple setae, distally pointed and serrated setae and falcate with bifid tip.

Distribution. Japan, Korea.

Genus *Sigambra* Müller, 1858 앞뿔투구갯지렁이속

Body surface smooth. Prostomium with 3 antennae and 2 biarticuate papls; antennae longer than palps. Peristomium dorsally incised. Parapodia biramous, with emergent hooks.

Type species. *Sigambra grubii* Muller, 1858.

23. *Sigambra hanaokai* (Kitamori, 1960) 앞뿔투구갯지렁이

Ancistrosyllis hanaokai Kitamori, 1960: 1086, fig. 1; Imajima and Hartman, 1964: 86; Paik, 1982: 775, pl. 8h-k, pl. 9a; 1989: 237, fig. 40.

Sigambra hanaokai: Pettibone, 1966: 181; Nishi *et al.*, 2007: 57, figs. 1-2.

Material examined. 2 specimens, Unseo-dong, Jung-gu, Incheon (126°29′16″E, 37°24′08″N), 11 Dec 2012, Choi HK; 1 specimen, Noil-ri, Gwayeok-myeon, Goheung-gun, Jeollanam-do, (127°16′50″E, 34°40′04″N), 30 April 2013, Choi HK; 5 specimens, Danghang-ri, Changseon-myeon, Namhae-gun, Gyeongsang-nam-do (128°28′24″E, 34°47′33″N), 31 Jul 14, Choi HK.

Diagnosis. Body flattened, tapering posteriorly. Prostomium rounded, wider than long. Palps biaticulate. Antennae consisting of 2 lateral and 1 median ones; median antennae extending to setigers 7-8. Peristomium with 2 pairs of tentacular cirri. Proboscis with 14 rounded maginal papillae. Parapodia biramous, with emergent hooks from setigers 4-8. Supra-acicular neurosetae slender capillary and slightly serrated. Sub-acicular neurosetae straight denticulate and slightly bent pectinate.

Distribution. Japan, Korea.

Family Syllidae Grube, 1850 염주발갯지렁이과

Prostomium with 3 antennae and 2 palps. Tentacular cirri 1-2 pairs. Tentacular segments without parapodia and setae. Parapodia uniramous. Neurosetae compound.

Type genus. *Syllis* Lamarck, 1818.

Key to the genera of Syllidae Grube, 1850 from Korea

1. Ventral cirri absent; dorsal cirri smooth ·· *Myrianida*

- Ventral cirri present; dorsal cirri smooth or articulated ········· 2
2. Palps fused for at least half ········· 3
- Palps not fused or only fused basally ········· 5
3. Tentacular cirri 2 pairs ········· *Brania*
- Tentacular cirri 1 pairs ········· 4
4. Dorsal cirri papilliform or ovoid ········· *Exogone*
- Dorsal cirri pyriform or flask-shaped ········· *Sphaerosyllis*
5. Palps fused basally; dorsal cirri smooth or irregularly articulated ········· 6
- Palps not fused; dorsal cirri regularly articulated ········· 7
6. Proboscis with large tooth ········· *Pionosyllis*
- Proboscis with single series of small teeth ········· *Odontosyllis*
7. Proboscis with trepan of small teeth ········· *Trypanosyllis*
- Proboscis without trepan of small teeth, and with single tooth only ········· 8
8. Mid-dorsal tooth on proboscis attached posteriorly ········· *Opisthosyllis*
- Mid-dorsal tooth on proboscis attached anteriorly ········· 9
9. Setae all simple, furcate or bossed distally ········· *Haplosyllis*
- Setae including compound ones ········· 10
10. Dorsal cirri on poaterior parapodia long and slender or large and bulbously fusiform ········· *Parasphaerosyllis*
- Dorsal cirri long or short, and with similar thickness ········· 11
11. Parapodia with compound falcigers, dorsal and ventral simple setae, and pseudocompound setae ········· *Syllis*
- Parapodia with compound falcigers ········· *Typosyllis*

Genus *Syllis* Lamarck, 1818 큰염주발갯지렁이속

Prostomium with 3 articulated antennae and paired palps; palps not fused. Dorsal cirri regularly articulated. Proboscis with 1 mid-dorsal tooth on attached anteriorly. Parapodia with compound falcigers, dorsal and ventral simple setae, and pseudocompound setae.

Type species. *Syllis monilaris* Lamarck, 1818.

Key to the species of *Syllis* Lamarck, 1818 from Korea

1. Median and posterior parapodia without pseudocompound setae 2
 - Median and posterior parapodia with pseudocompound setae 3
2. Simple setae on median parapodia Y-shaped .... *S. gracilis*
 - Simple setae on median parapodia obliquely truncate .... *S. amica*
3. Posterior parapodia with unidentate simple setae .... *S. cirrita*
 - Posterior parapodia with bidentate simple setae .... *S. spongiphila*

24. *Syllis spongiphila* Verrill, 1885 흰점염주발갯지렁이

Syllis spongiphila Verrill, 1885: 435; Hartman, 1944a: 339, pl. 24, fig. 10; Pettibone, 1963: 114, fig. 30g-h; Imajima, 1966: 250, fig. 49l-s; Banse and Hobson, 1974: 61; Paik, 1989: 259:, fig. 45; Kudenov and Harris, 1995: 73, fig. 1. 27.

Syllis sclerolaema: Imajima and Hartman, 1964: 122, pl. 28, figs. I-j, pl. 29, figs. a-i; Paik, 1979: 51, fig. 6a-f.

Syllis (*Typosyllis*) *sclerolaema* Uschakov, 1955: 179, fig. 50d.

Material examined. 5 specimens, Jeonchon-ri, Gampo-eup, Gyeongju-si Gyeongsangbuk-do (129°34′38″E, 35°46′25″N), 03 Feb 2007, Choi HK.

Diagnosis. Prostomium sub-globular, with 2 pairs of eyespots and 3 antennae; median antennae consisting of 25-30 articles. Proboscis with 10 soft papillae and mid-dorsal tooth. Dorsal cirri slender, with 20-45 articles. Anterior parapodia with composite falcigers with bifid tip and serrations along cutting margin. Median and posterior parapodia with pseudocomposite setae instead of composite setae.

Distribution. Massachusettes, Falkland Islands, Chile, western Canada, Japan, Korea.

25. *Syllis gracilis* Grube, 1840 줄염주발갯지렁이

Syllis gracilis Grube, 1840: 77, pl. 31a-l; Fauvel, 1914: 102; Southern, 1914: 39; Banse and Hobson, 1974: 61; Paik, 1989: 260, fig. 46; Imajima, 2003: 157; Çinar and Gambi, 2005: 757

Syllis (Syllis) gracilis: Fauvel, 1923: 259, fig. 96f-i; Day, 1967: 241, fig. 12. 1m-p.

Material examined. 3 specimens, Docheong-ri, Cheongsan-myeon, Wando-gun, Jeollanam-do (126°53′31″E, 34°10′19″N), 03 Feb 2007, Choi HK.

Diagnosis. Anterior segment with 2 brown bands on dorsum. Prostomium sub-globular, with 3 articulated antennae and 2 pairs of eyespots. Proboscis with mid-dorsal tooth. Dorsal cirri slender and articulated; anterior dorsal cirri longer than median and posterior ones. Anterior and median parapodia with bifid composite setae. Median parapodia with 2-3 furcate simple setae. Posterior aciculae slender and curved distally.

Distribution. North Atlantic Ocean, North Sea, England, Mediterranean Sea, Spain, France, Ionian Sea, Italy, Gulf of Naples, Adriatic Sea, Aegean Sea, Israel, Black Sea, Red Sea, Madagascar, Mozambique, South Africa, South Pacific Ocean, Gulf of Mexico, Caribbean Sea, Japan, Korea.

Genus *Typosyllis* Langerhans, 1879 참염주발갯지렁이속

Prostomium with 3 articulated antennae and paired palps; palps fused basally. Tentacular cirri 2 pairs, articulated. Proboscis with large tooth attached anteriorly. Dorsal cirri smooth or irregularly articulated.

Type species. *Typosyllis krohnii* (Ehlers, 1864).

Key to the species of *Typosyllis* Langerhans, 1879 from Korea

1. Dorsal cirri on median parapodia with fewer than 20 articles 2
 - Dorsal cirri on median parapodia with more than 20 articles 3
2. Compound setae on median parapodia with distinct secondary tooth .... *T. nipponica*
 - Compound setae on median parapodia with reduced secondary tooth .... *T. aciculata orientalis*
3. Compound setae with entire tips in anterior and median parapodia 4
 - Compound setae with bifid tips in anterior and median parapodia 5
4. Posterior parapodia with 2 simple setae .... *T. adamanteus kurilensis*

- Posterior parapodia with 1 simple seta ·· *T. fasciata*

5. All compound setae with reduced secondary tooth ······················ *T. ehlersioides*

- All compound setae with distinct secondary tooth ······································· 6

6. Dorsum with light transverse bands irregularly; proventriculus extending segments 10-13 ·· *T. variegata*

- Dorsum without light transverse band; proventriculus extending segments 5-6 ··· *T. prolifera*

26. *Typosyllis adamanteus kurilensis* Chlebovitsh, 1959 쿠릴염주발갯지렁이

Typosyllis adamanteus kurkilensis: Imajima and Hartman, 1964: 134, pl. 33, figs. a-i; Rho and Song, 1982: 38, pl. 2, figs. 1-2; Paik, 1989: 265, fig. 49.

Material examined. 1 specimen, Woljeong-ri, Namyang-myeon, Goheung-gun, Jeollanam-do (127°21′57″E, 34°44′65″N), 30 April 2013, Choi HK; 1 specimen, Sujeong-dong, Yeosu-si, Jeollanam-do (127°47′47″E, 34°44′25″N), 31 Mar 2014, Choi HK.

Diagnosis. Body long, with transversely oval white spots on mid-dorsum. Prostomium broader than long, with 3 articulated antennae and 2 pairs of eyespots. Palps paired, and only fused basally. Proboscis with large tooth and 10 papillae distally. Dorsal cirri slender and distinctly articulated. Anterior and median parapodia with unidentate composite setae. Posterior parapodia with 2 simple setae.

Distribution. Northern Japan, Kurile Island, Korea.

27. *Typosyllis fasciata* (Malmgren, 1867) 긴수염염주발갯지렁이

Syllis fasciata Malmgren, 1867: 43, pl. 8, fig. 47, pl. 9, fig. 52.

Syllis (Typosyllis) fasciata: Uschakov, 1955: 180, figs. 109-110.

Typosyllis fasciata: Imajima and Hartman, 1964: 135, pl. 33, figs. j-o; Imajima, 1966: 276; Paik, 1976: 234, fig. 14; 1982: 779, pl. 10a-d; 1989: 267, fig. 50.

Material examined. 6 specimens, Geumjin-ri, Ganggu-myeon, Yeongdeok-gun, Gyeongsangbuk-do (129°28′04″E, 36°21′38″N), 17 Sep 2014, Choi HK.

Diagnosis. Prostomium sub-globular, with 4 eyes and 3 articulated antennae.

Palpi are as long as the prostomium, and fused at their bases. Proboscis with 10 triangular pointed papillae and subterminal tooth. Dorsal cirri articulated with 40-50 articles. Compound setae with entire tips. Posterior parapodia with 1 simple seta.

Distribution. North Atlantic Ocean, Pacific Ocean, Japan, Korea.

28. *Typosyllis prolifera* (Krohn, 1852) 분열염주발갯지렁이

Syllis prolifera Krohn, 1852: 66.

Syllis (Typosyllis) prolifera: Fauvel, 1923: 261, fig. 97a-g.

Typosyllis prolifera: Paik, 1989: 270, fig. 53; Imajima, 2003: 166.

Material examined. 3 specimens, Gusan-ri, Giseong-myeon, Uljin-gun, Gyeongsangbuk-do (129°30′10″E, 36°44′17″N), 17 Sep 2014, Choi HK.

Diagnosis. Body with proventriculus extending segments 5-6. Prostomium broader than long, with 3 articulated antennae and 2 pairs of eyespots; median antennae much longer than prostomium and with about 35 articles. Proboscis with thick and subterminal tooth. Dorsal cirri articulated with 30-37 articles. Setae all bifid composite setae and simple setae on posterior setigers additionally. Posterior aciculae with rounded and hollow tips.

Distribution. North Atlantic Ocean, Mediterranean Sea, South Africa, Indian Ocean, Gulf of Mexico, Caribbean Sea, Cuba, China, Japan, Korea.

Family Nereididae Blainville, 1818 참갯지렁이과

Prostomium with 2 antennae and 2 biarticulated palps. Proboscis with 2 dentate jaws and usually paragnaths. Parapodial ligules well developed. Parapodia with compound setae.

Type genus. *Nereis* Linnaeus, 1758.

Key to the genera of Nereididae Blainville, 1818 from Korea

1. Parapodia uniramous; peristomium with 3 pairs of short cirri ·········· *Lycastopsis*
 - Parapodia biramous; peristomium with 4 pairs of cirri ······································· 2
2. Proboscis smooth ·· *Nicon*

\- Proboscis with papillae or paragnaths ························ 3

3\. Proboscis without chitinous paragnaths; only fleshy papillae present ························ 4

\- Proboscis with chitinous paragnaths; fleshy papillae present or absent ························ 5

4\. Proboscidial papillae present on oral ring; neuropodia with 2 ventral cirri and anterior notopodia with accessory ligules ························ *Tambalagamia*

\- Proboscidial papillae present on maxillary ring; neuropodia with single ventral cirrus and notopodia without accessory ligules ························ *Tylorrhynchus*

5\. Both fleshy papillae and chitinous paragnaths present on proboscis ························ 6

\- Only chitinous paragnaths present on proboscis ························ 7

6\. Neuropodial homogomph falcigers present on posterior setigers ························ *Leonnates*

\- Neuropodial homogomph falcigers absent ························ *Paraleonnates*

7\. Peristomium with ventral collar projecting forward ························ *Cheilonereis*

\- Peristomium not enlarged ventrally ························ 8

8\. Paragnaths small denticles and arranged in pectinate form ························ *Platynereis*

\- Paragnaths conical or transverse bars ························ 9

9\. Oral ring on proboscis without paragnath ························ 10

\- Oral ring on proboscis with paragnaths ························ 11

10\. Posterior parapodia with large and stout simple falciger ························ *Simplisetia*

\- Posterior parapodia without simple falciger ························ *Cerotonereis*

11\. Markedly elongated or expanded notopodial ligules present ························ 12

\- Markedly elongated or expanded notopodial ligules absent ························ 14

12\. Presetal notopodial lobs absent ························ *Pseudonereis*

\- Presetal notopodial lobs present at least anterior setigers ························ 13

13\. Ovoid lobe above dorsal cirri absent; setae including spinigers and falcigers ························ *Alitta*

\- Ovoid lobe above dorsal cirri present; setae all spinigers ························ *Nectoneanthes*

14\. Area VI on proboscis with transverse bar-shaped paragnaths ························ *Perinereis*

\- Area VI on proboscis with conical paragnaths ························ 15

15\. Posterior neuropodia with stout and simple spines ························ *Hediste*

\- Posterior neuropodia without stout and simple spines ························ 16

16\. Notopodial falcigers present on posterior setigers ························ *Nereis*

– Notopodial falcigers absent ·· *Neanthes*

Genus *Alitta* Kinberg, 1865

Probocidial paragnaths on area II-IV arranged in irregular rows. Dorsal notopodial ligules markedly broader on posterior setigers. Ovoid lobe above dorsal cirri absent; setae including spinigers and falcigers.

Type species. *Alitta virens* (Sars, 1835).

Key to the species of *Alitta* Kinberg, 1865 from Korea

1. Dorsal notopodial ligules markedly elongate and broader on posterior setigers ·· *A. succinea*

– Dorsal notopodial ligules markedly broader only on posterior setigers ·· *A. virens*

29. *Alitta virens* (Sars, 1835) 큰참갯지렁이

Nereis virens Sars, 1835: 58, fig. 27a-c.

Nereis dyamushi Moore, 1910: 344; Izuka, 1912: 161, pl. 18, figs. 1-7.

Nereis (Neanthes) virens: Fauvel, 1923: 348, fig. 134g-k; Berkely and Berkely, 1948: 62, fig. 92; Treadwell, 1941: 3; Pettibone, 1963: 170, fig. 44f.

Nereis virens: Okuda and Yamada, 1954: 183.

Neanthes virens: Hartman, 1944a: 339; Imajima and Hartman, 1964: 145; Imajima, 1972: 110, fig. 33; Paik, 1975: 412, pl. 3, figs. 16-24; 1977: 200, fig. 29A-F; 1982: 789, pl. 14j-i; 1989: 339, fig. 89.

Alitta virens Bakken and Wilson, 2005: 517.

Material examined. 2 specimens, Haeun-ri, Hyeongyeong-myeon, Muan-gun, Jeollanam-do (126°25′40″E, 35°03′33″N), 03 Apr 2013, Choi HK.

Diagnosis. Prostomium with entire anterior margin. Peristomial cirri with distinct cirrophores; longest cirri extending to setigers 4-5. Proboscis with conical paragnaths arranged in irregular rows. Dorsal notopodial ligules markedly broader on posterior setigers. Notosetae all homogomph spinigers. Neurosetae homo- and heterogomph spinigers, and heterogomph falcigers.

Distribution. Norway, Iceland, North Sea to France, Virginia, Northern Pacific Ocean, Alaska to central California, Bering Sea, Okhotsk Sea, Japan, Korea.

Genus *Ceratonereis* Kinberg, 1865 뿔참갯지렁이속

Only chitinous paragnaths present on proboscis. Paragnaths conical, present on maxillary ring only, and absent on oral ring. Posterior parapodia without simple falciger.

Type species. *Ceratonereis mirabilis* Kinberg, 1866.

Key to the species of *Ceratonereis* Kinberg, 1865 from Korea

1. Prostomium with deep cleft anteriorly; posterior notopodia with falcigers ·································· *C. mirabilis*
- Prostomium without deep cleft; posterior notopodia without falcigers ·································· *C. hircinicola*

30. *Ceratonereis hircinicola* (Eisig, 1870)털이빨참갯지렁이

Nereis hircinicola Eisig, 1870: 103, pl. 11, figs. 3-4.

Ceratonereis bartletti: Hartman, 1938c: 13.

Ceratonereis hircinicola: Fauvel, 1923: 350, fig. 136g-n; Day, 1967: 327; Imajima. 1972: 67, fig. 14a-m, fig. 17; 2003: 168; Rho and Lee, 1982: 38, pl. 3, fig. 1; Paik, 1982: 785, pl. 11p; 1989: 303, fig. 69.

Material examined. 1 specimen, Daepo-ri, Beolgyo-eup, Boseong-gun Jeollanam-do (127°23′16″E, 34°47′16″N), 30 Apr 2013, Choi HK.

Diagnosis. Frontal antennae 1 pair, present on prostomium. Eyespots present, 2 pairs. Paragnaths on proboscis conical-shaped, present on maxillary ring only; area I without paragnaths. Anterior parapodia with 2 notopodial ligules. Notosetae all homogomph spinigers. Neurosetae homogomph spinigers and heterogomph falcigers.

Distribution. Mediterranean Sea, South Africa, Madagascar, Yellow Sea, Japan, Korea.

Genus *Hediste* Malmgren, 1867

Paragnaths conical, present both oral ring and maxillary ring on proboscis. Markedly elongated or expanded notopodial ligules absent. Posterior neuropodia with stout and simple setae.

Type species. *Hediste diversicolor* (Müuller, 1766).

31. *Hediste japonica* (Izuka, 1908) 참갯지렁이

Nereis diversicolor: Marenzeller, 1879: 122.

Nereis japonica Izuka, 1908: 295, fig. 4; 1912: 163, pl. 17, figs. 14-16, 18, fig. 4; Okuda, 1933: 247, pl. 13, figs. i-j; 1935: 243; Okuda and Yamada, 1954: 182, fig. 3A.

Neanthes diversicolor: Imajima and Hartman, 1964: 143.

Neanthes japonica: Imajima, 1972: 102, fig. 30; Paik, 1972: 132-135, fig. 3a-i; 1977: 196; 1978: 371, pl. 4, figs. 8-9, pl. 5, figs. 1-2; 1979b: 54, fig. 7n-p; 1982: 789, pl. 14d-f; 1989: 335, fig. 87; Rho and Song, 1974: 80; 1975: 101.

Hediste japonica Imajima, 2003: 171; Sato and Nakashima, 2003: 405, figs 2-3, fig. 8-9.

Material examined. 10 specimens, Haksan-ri, Byeollyang-myeon, Suncheon-si Jeollanam-do (127°29′03″E, 34°50′50″N), 29 Jul 2011, Choi HK; 3 specimens, Dongmak-ri, Hwado-myeon, Ganghwa-gun, Incheon-si (126°25′32″E, 37°34′59″N), 05 Jul 2012, Choi HK; 5 specimen, Donggeom-ri, Gilsang-myeon, Ganghwa-gun, Incheon-si (126°26′47″E, 37°34′31″N), 05 Jul 2012, Choi HK; 1 specimen, Namdong-ri, Imhoe-myeon, Jindo-gun, Jeollanam-do (126°09′10″E, 34°21′35″N), 09 Apr 2013, Choi HK; 1 specimen, Daepo-ri, Beolgyo-eup, Boseong-gun, Jeollanam-do (127°23′16″E, 34°47′16″N), 30 Apr 2013, Choi HK; 1 specimen, Janggyeong-ri, Yeongheung-myeon, Ongjin-gun, Incheon-si (126°25′20″E, 37°15′46″N), 17 Jul 2012, Choi HK; 1 specimen, Odu-ri, Bureun-myeon, Ganghwa-gun, Incheon-si (126°28′44″E, 37°39′49″N), 05 Jul 2012, Choi HK; 3 specimens, Daehang-ri, Byeonsan-myeon, Buan-gun Jeollabuk-do (126°35′15″E, 35°41′20″N), 13 Aug 2014, Choi HK.

Diagnosis. Frontal antennae present on prostomium. Peristomial cirri 4 pairs.

Proboscis with paragnaths on both maxillary and oral rings; area II with relatively few and large cones. Postsetal ligules in parapodia with digitate lobe distally. Notosetae all homogomph spinigers. Neurosetae homogomph spinigers and falcigers, and heterogomph falcigers; heterogomph spinigers absent. Posterior neuropodia with stout and simple spines.

Distribution. south Sakhalin, Yellow Sea, Japan, Korea.

Genus *Leonnates* Kinberg, 1865 사자머리참갯지렁이속

Proboscis with chitinous paragnaths and fleshy papillae. Neuropodial homogomph falcigers present on posterior setigers.

Type species. *Leonnates indicus* Kinberg, 1865.

32. *Leonnates nipponicus* Imajima, 1972 사자머리참갯지렁이

Leonnates nipponicus Imajima, 1972: 41, fig. 2a-l; Paik, 1977: 20, fig. 7A-G; 1982: 783, pl. 10q-s; 1989: 288, fig. 62.

Material examined. 2 specimens, Haeun-ri, Hyeongyeong-myeon, Muan-gun, Jeollanam-do (126°25′40″E, 35°03′33″N), 09 Jun 2013, Choi HK; 1 specimen, Dongho-ri, Haeri-myeon, Gochang-gun, Jeollabuk-do (126°31′34″E, 35°30′29″N), 04 May 2015, Choi HK.

Diagnosis. Frontal antennae present on prostomium. Peristomial cirri 4 pairs. Proboscis with conical paragnaths on maxillary ring and soft papillae on oral ring; area III with 3-4 small papillae. Anterior parapodia with 3 notopodial ligules. Notosetae all homogomph spinigers. Neurosetae homogomph spinigers and falcigers.

Distribution. Pacific Ocean, Japan, Korea.

Genus *Lycastopsis* Augener, 1922 세수염참갯지렁이속

Prostomial antennal and papls short. Probocidal papillae and paragnaths absent. Tentacular cirri 3 pairs. Uniramous parapodia present.

Type species. *Lycastopsis beameri* Augener, 1922.

33. *Lycastopsis augeneri* Okuda, 1937 세수염참갯지렁이

Lycastopsis augeneri: Uschakov, 1955: 204, fig. 62A-E; Imajima, 1972: 39, fig. 1a-f, fig. 7; Paik, 1977: 15, fig. 1A-C; 1989: 282, fig. 59.

Mamanereis quadraticeps: Imajima and Hartman, 1964: 142.

Material examined. 45 specimens, Oryu 1-ri, Gampo-eup, Gyeongju-si, Gyeongsangbuk-do (129°32′21″E, 35°48′13″N), 19 May 2015, Choi HK.

Diagnosis. Prostomium with 2 short antennae and biarticulated palps. Peristomium with 3 pairs of reduced cirri. Proboscis smooth. Parapodia uniramous. Neurosetae heterogomph spinigers and falcigers. Dorsal and ventral cirri short.

Distribution. Peter Bay, Yellow Sea, Sakhalin, Japan, Korea.

Genus *Neanthes* Kinberg, 1866 참갯지렁이속

Paragnaths present on both oral ring and maxillary ring. Area VI with conical paragnaths. Markedly elongated or expanded notopodial ligules absent. Posterior neuropodia without stout and simple spines. Notopodial falcigers absent.

Type species. *Neanthes vaalii* Kinberg, 1865.

34. *Neanthes caudata* (Delle Chiaje, 1827) 둥근얼굴참갯지렁이

Nereis arenaceodentata Moore, 1903: 720, pl. 40, figs. 1-10.

Nereis (Neanthes) cautata: Fauvel, 1923: 347, fig. 135a-e.

Nereis (Neanthes) arenaceodentata: Pettibone, 1963: 162, fig. 44i, fig. 45e.

Nereis (Neanthes) caudata: Day, 1967: 321, fig. 14. 9f-j.

Neanthes caudata: Imajima, 1972: 105, fig. 31a-l, Fig. 37; Paik, 1977: 198, fig. 28A-G; 1982: 789, pl. 14g-i; 1989: 338, fig. 88; Imajima, 2003: 171.

Material examined. 1 specimen, Dumi-ri, Yokji-myeon, Tongyeong-si, Gyeongsangnam-do (128°06′02″E, 34°40′08″N), 09 May 2010, Choi HK; 3 specimens, Jinha-ri, Seosaeng-myeon, Ulju-gun, Ulsan-si (129°20′16″E, 35°22′19″N), 18 May 2012, Choi HK.

Diagnosis. Prostomium subcircular-shaped, wider than long. Peristomial cirri 4 pairs; longest cirri extending to setiger 5. Area VII-VIII on proboscis with irregularly scattered paragnaths. Notosetae all homogomph spinigers. Neurosetae homogomph spinigers and heterogomph falcigers.

Distributions. Mediterranean Sea, England, South Africa, India, Chincoteague Bay, Florida, southern California, Mexico, Australia, northeastern Tasmania, New Zealand, Philippine Islands, Japan, Korea.

Genus *Nectoneanthes* Imajima, 1972 넓적발참갯지렁이속

Paragnaths present on both maxillary and oral ring, and those of area II-IV arranged in irregular rows. Markedly elongated or expanded notopodial ligules present. Ovoid lobe above dorsal cirri present; setae all spinigers.

Type species. *Nectoneanthes oxypoda* (Marenzeller, 1879).

35. *Nectoneanthes oxypoda* (Marenzeller, 1879) 넓적발참갯지렁이

Nereis oxypoda Marenzeller, 1879: 120, pl. 2, fig. 3; Izuka, 1912: 171, pl. 18, figs. 8-11.

Neanthes oxypoda Imajima and Hartman, 1964: 145.

Nectoneanthes oxypoda Imajima, 1972: 113, fig. 35a-k, fig. 36a-d; Paik, 1972: 135, fig. 4a-h; 1977: 204, fig. 31a-h; 1978: 371, pl. 5, figs. 3-5; 1982: 790, pl. 14p-r; 1989: 343, fig. 91.

Nectoneanthes latipoda Paik, 1973a: 81-84, figs. 1a-j, 2.

Nectoneanthes oxypoda Sato, 2013: 4, figs. 1, 2, figs. 3A-C, 4A, figs. 5-9.

Material examined. 1 specimen, Haeun-ri, Hyeongyeong-myeon, Muan-gun, Jeollanam-do (126°25′40″E, 35°03′33″N), 16 Oct 2012, Choi HK; 2 specimens, Haksan-ri, Byeollyang-myeon, Suncheon-si, Jeollanam-do (127°29′03″E, 34°50′50″N), 23 May 2013, Choi HK.

Diagnosis. Prostomium with entire anterior margin. Antennae and palps 1 pairs. Proboscis with conical paragnaths on both maxillary and oral ring; cones arranged in irregular rows; area VII-VIII with cones in 2-3 transverse rows. Dorsal notopodial ligules markedly broader, with prominent ovoid lobes above dorsal cirri on median and posterior notopodia. Notosetae homo- and sesquigomph spinigers. Neurosetae homo-, hetero-, and sesquigomph spinigers

Falcigers absent.

Distribution: Western Australia, Indochina, Amoy, China, Yellow Sea, Korea.

Genus *Nereis* Linnaeus, 1758 윈참갯지렁이속

Paragnaths present on both maxillary and oral ring. Markedly elongated or expanded notopodial ligules absent. Posterior neuropodia without stout and simple spines. Notopodial falcigers present on posterior setigers.

Type species. *Nereis pelagica* Linnaeus, 1758.

Key to the species of *Nereis* Linnaeus, 1758 from Korea

1. Area VII-VIII on proboscis without paragnaths ···································· 2
 - Area VII-VIII on proboscis with paragnaths ······································· 3
2. Area III on proboscis with paragnaths arranged in 2 transverse rows; notopodial facigers with appendages bearing serrations ·················· *N. surugaense*
 - Area III on proboscis with paragnaths arranged in 1 transverse row; notopodial facigers without appendages bearing serrations ··················· *N. longior*
3. Paragnaths on area VII-VIII arranged in transverse row, large cones only ··· 4
 - Paragnaths on area VII-VIII arranged in several transverse rows, both large and small cones ·· 5
3. Notopodial falcigers with slender teeth only ··························· *N. nichollsi*
 - Notopodial falcigers with 2-3 large teeth and minute serrations ·························· ··· *N. denhamensis*
5. Oral side on area VII-VIII with transverse band consisting of minute paragnaths ··· 6
 - Oral side on area VII-VIII without transverse band ·································· 7
6. Area V with paragnaths ·· *N. neoneanthes*
 - Area V without paragnaths ·· *N. multignatha*
7. First ventral peristomial cirri short and thick as flask-shaped; area VII-VIII with large cones arranged in 2-4 rows and minute cones distributed between large cones on area VII ··· *N. heterocirrata*
 - First ventral peristomial cirri normal; area VII-VIII with large cones arranged

in 2-4 rows and small ones scattered ········· 8

8. Notopodial superior ligules on posterior notopodia long and straplike ········· *N. vexillosa*

- Notopodial superior ligules on posterior notopodia normal ········· 9

9. Dorsum with transverse bands; anterior notopodial ligules conical and pointed distally ········· *N. zonata*

- Dorsum without transverse band; anterior notopodial ligules thick and rounded distally ········· *N. pelagica*

36. *Nereis heterocirrata* Treadwell, 1931 굵은앞더듬이참갯지렁이

Nereis heterocirrata Treadwell, 1931: 1, fig. 1a-c; Imajima and Hartman, 1964: 146; Imajima, 1972: 125, figs. 41-42, 51; Paik, 1977: 187, fig. 23; 1978: 370, pl. 4; 1982: 788, pl. 13; 1984b: 148; 1989: 329, fig. 83.

Material examined. 8 specimens, Bunmae-ri, Aphae-eup, Shinan-gun, Jeollanam-do (126°17′34″E, 34°51′10″N), 06 Mar 2008, Choi HK; 3 specimens, Hyangho-ri, Jumunjin-eup, Gangneung-si, Gangwon-do (126°21′58″E, 33°12′19″N), 15 Sep 2014, Choi HK; 4 specimens, Janggil-ri, Nam-gu, Guryongpo-eup, Pohang-si, Gyeongsangbuk-do (129°35′05′′E, 35°56′17′′N), 19 May 2015, Choi HK; 7 specimens, Guman-ri, Nam-gu, Homigot-myeon, Pohang-si, Gyeongsangbuk-do (129°34′31″E, 36°04′35″N), 19 May 2015, Choi HK, 1 specimen, Ibam-ri, Nam-gu, Donghae-myeon, Pohang-si, Gyeongsangbuk-do (129°35′23″E, 35°57′21″N), 19 May 2015, Choi HK..

Diagnosis. Prostomium with 2 antennae. Peristomial cirri 4 pairs: first ventral cirri thick and flask-shaped, with enlarged cirrophores. Area VII-VIII on proboscis with paragnaths; large cones arranged in 2-4 rows and minute cones distributed between large cones on area VII. Posterior notopodial ligules slightly elongate. Notosetae homogomph spinigers and falcigers. Neurosetae homo- and heterogomph spinigers, and heterogomph falcigers.

Distribution. Taiwan, Yellow Sea, Japan, Korea.

37. *Nereis multignatha* Imajima and Hartman, 1964 깨점박이참갯지렁이

Nereis pelagica: Okuda and Yamada, 1954: 184, fig. 3D.

Nereis pelagica multignatha Imajima and Hartman, 1964: 148.

Nereis multignatha: Imajima, 1972: 136, figs. 45a-k, 51; 2003: 172; Paik, 1975a: 414, pl. 5, figs. 35-43; 1977: 185, fig. 22; 1982: 788, pl. 13j-l; 1989: 327, fig. 82.

Material examined. 1 specimen, Jinsan-ri, Soan-myeon, Wando-gun, Jeollanam-do (126°40′49″E, 34°06′52″N), 24 Aug 2006, Choi HK; 5 specimens, Docheong-ri, Cheongsan-myeon, Wando-gun, Jeollanam-do, (126°53′31″E, 34°10′19″N), 03 Feb 2007, Choi HK; 3 specimens, Deugam-ri, Yaksan-myeon, Wando-gun, Jeollanam-do (126°58′24″E, 34°20′49″N), 25 Aug 2006, Choi HK; 4 specimens, Galgot-ri, Nambu-myeon, Geoje-si, Gyeongsangnam-do (128°41′47″E, 34°44′35″N), 18 May 2014, Choi HK; 1 specimen, Namae-ri, Hyeonnam-myeon, Yangyang-gun, Gangwon-do (128°51′06″E, 37°55′46″N), 15 Sep 2014, Choi HK.

Diagnosis. Prostomium pentagonal-shaped, with 2 antennae and 4 pairs of eyespots. Area V on proboscis without paragnaths. Area VII-VIII on proboscis with large cones in transverse row and widely transverse band consisting of minute cones. Median parapodia with distally pointed notopodial ligules. Notosetae homogomph spinigers and falcigers. Neurosetae homo- and heterogomph spinigers, and heterogomph falcigers.

Distribution. Korea, Japan, Yellow Sea.

38. *Nereis neoneanthes* Hartman, 1948 큰깨점박이참갯지렁이

Nereis neoneanthes Hartman, 1948: 26, fig. 7; Imajima, 1972: 133, fig. 44; Paik, 1975a: 413, pl. 4, figs. 25-34; 1977: 182, fig. 21; 1989: 324, fig. 80; Imajima, 2003: 173.

Material examined. 2 specimens, Ibam-ri, Nam-gu, Donghae-myeon, Pohang-si, Gyeongsangbuk-do (129°35′23″E, 35°57′21″N), 19 May 2015, Choi HK.

Diagnosis. Prostomium subpentagonal-shaped. Peristomial cirri 4 pairs; longest cirri extending to setiger 1. Area VII-VIII on proboscis with paragnaths arranged in 2 transverse rows of large cones and dense transverse band of minute cones. Area V on proboscis with 2-18 paragnaths. Notosetae initially homogomph spinigers, then replaced by homogomph falcigers. Neurosetae homo- and heterogomph spinigers, and heterogomph falcigers.

Distribution. Alaska, Oregon, Possjet Bay, Japan, Korea.

39. *Nereis nichollsi* Kott, 1951 뱃사공참갯지렁이

Nereis nichollsi: Imajima and Gamo, 1970: 10, fig. 44-48; Imajima, 1972: 122, fig. 39a-p, fig. 40a-c, fig. 51; 2003: 173; Paik, 1977: 180, fig. 19a-f; 1982: 787, pl. 13a-c; 1989: 322.

Material examined. 1 specimen, Woljeong-ri, Namyang-myeon, Goheung-gun, Jeollanam-do (127°21′57″E, 34°44′65″N), 30 Apr 2013, Choi HK.

Diagnosis. Prostomium with 2 antennae, large palps, and dark brown patterns. Peristomium broad. Proboscis with conical paragnaths; area VII-VIII with about 15 large cones in 1 row. Notosetae homogomph spinigers and falcigers; Notopodial falcigers with slender teeth only. Neurosetae homo- and heterogomph spinigers, and heterogomph falcigers.

Distributions. Red Sea, Indian Ocean, Australia, Japan, China, Yellow Sea, Korea.

40. *Nereis pelagica* Linnaeus, 1758 원참갯지렁이

Nereis pelagica: Marenzeller, 1879: 122; Moore, 1903: 431; 1910: 342; Izuka, 1912: 154, pl. 17, figs. 1-6; Pryde, 1914: 293; Southern, 1914; 80; Fauvel, 1923: 336, fig. 130a-f; Berkeley and Berkeley, 1941: 31; Okuda and Yamada, 1954: 184, fig. 3D; Pettibone, 1963: 179, fig. 42d-h; Imajima and Hartman, 1964: 147; Day, 1967: 315, fig. 17.7f-j; Imajima, 1972: 142, fig. 48a-m, fig. 49a-d, fig. 51; Banse and Hobson, 1974: 70; Paik, 1977: 193-195, fig. 26A-F; 1982: 788, pl. 14a-c; Imajima, 2003: 174; Bakken and Wilson, 2005: 45, fig. 12.

Material examined. 2 specimens, Haeun-ri, Hyeongyeong-myeon, Muan-gun, Jeollanam-do (126°25′40″E, 35°03′33″N), 08 Apr 2013, Choi HK; 4 specimens, Sindeok-dong, Yeosu-si, Jeollanam-do (127°48′07″E, 34°47′47″N), 25 Sep 2014, Choi HK; 1 specimen, Yeonpyeong-ri, Udo-myeon, Jeju-si, Jeju-do (127°00′12″E, 33°29′19″N), 24 Jun 2014, Choi HK; 1 specimen, Oryu 1-ri, Gampo-eup, Gyeongju-si, Gyeongsangbuk-do (129°32′21″E, 35°48′13″N), 19 May 2015, Choi HK.

Diagnosis. Prostomium broad, with 2 antennae and large palps. Proboscis with conical paragnaths; area VII-VIII with large cones in 1 row and small cones in 3-4 rows. Anterior notopodial ligules thick and rounded distally. Notosetae homogomph spinigers and falcigers. Neurosetae homo- and heterogomph spinigers, and heterogomph falcigers.

Distribution. Cosmopolitan.

41. *Nereis surugaense* Imajima, 1972 민숭참갯지렁이

Nereis surugaense Imajima, 1972: 129, fig. 43a-l, fig. 51; Paik, 1982: 787, pl. 12s-u; 1989: 320, fig. 77.

Material examined. 1 specimen, Woljeong-ri, Namyang-myeon, Goheung-gun, Jeollanam-do (127°21′57″E, 34°44′65″N), 30 Apr 2013, Choi HK.

Diagnosis. Prostomium wide basally and narrow anteriorly. Peristomial cirri 4 pairs; longest cirri extending to setiger 3. Proboscis with paragnaths arranged in 2 transverse rows on area III. Dosal cirri longer than notopodial ligules. Notosetae homogomph spinigers and falcigers; notopodial falcigers with appendages bearing minute serrations. Neurosetae homo- and heterogomph spinigers, and heterogomph falcigers.

Distribution. Pacific Ocean, Japan, Korea.

Genus *Paraleonnates* Khlebovich and Wu, 1962 흰이빨참갯지렁이속

Both fleshy papillae and chitinous paragnaths present on proboscis, and maxillary ring on proboscis with sclerotized papillae. Neuropodial homogomph falcigers absent.

Type species. *Paraleonnates uschakovi* Chlebovitsch and Wu, 1962.

42. *Paraleonnates uschakovi* Khlebovich and Wu, 1962 흰이빨참갯지렁이

Periserrula leucophryna Paik, 1977: 153, 220, fig. 8A-J; 1978: 569, pl. 1, figs. 7-9; 1982: 783, pl. 11a-c; 1989: 290, fig. 63A-I.

Paraleonnates uschakovi: Hong *et al.*, 2012: 52, figs. 2-5, fig. 6A-D.

Material examined. 2 specimens, Haeun-ri, Hyeongyeong-myeon, Muan-gun, Jeollanam-do (126°25′40″E, 35°03′33″N), 27 Feb 2012, Choi HK; 1 specimen, 08 Apr 2013, Choi HK; 2 specimens, Piseo-ri, Mangun-myeon, Muan-gun, Jeollanam-do (126°25′22″E, 34°58′04″N), 27 Mar 2009, Choi HK.

Diagnosis. Prostomium with deep cleft. Peristomium with 4 pairs of tentacular cirri; longest cirri reaching to segment 10-15. Maxillary ring on proboscis with sclerotized papillae (paragnaths) arranged in 2 transverse rows. Oral ring on proboscis with fleshy papillae. Neuropodial postsetal lobes bilobate. Notopodia and neuropodia with homogomph, sesquigomph, and heterogomph spinigers; anteriormost notopodia with heterogomph spinigers bearing short and poorly serrated blades. Falcigers absent.

Distribution. Thailand, Taiwan, China, Korea.

Genus *Perinereis* Kinberg, 1866 눈썹참갯지렁이속

Markedly elongated or expanded notopodial ligules absent. Area VI on proboscis with 1 or several transverse bar-shaped paragnaths, and other areas with conical paragnaths.

Type species. *Perinereis novaehollandiae* Kinberg, 1866.

Key to the species of *Perinereis* Kinberg, 1866 from Korea

1. Bar-shaped paragnath on area VI single ······ 2
 - Bar-shaped paragnaths on area VI multiple ······ 3
2. Area V with 1 paragnath only; longest prostomial cirri reaching to setiger 11 ······ *P. floridana*
 - Area V with 3 paragnaths in triangle; longest prostomial cirri reaching to setiger 6 ······ *P. cultrifera*
3. Area VI with 2 bars ······ *P. aibuhitensis*
 - Area VI with more than 2 bars ······ 4
4. Dorsal cirri much longer than notopodial ligules; area V with 2-3 cones in longitudinal line ······ *P. wilsoni*

– Dorsal cirri equal to or slightly longer than notopodial ligules; area V with 3 cones in triangle ·· *P. mictodonta*

43. *Perinereis aibuhitensis* (Grube, 1878) 두토막눈썹참갯지렁이

Nereis (Perinereis) aibuhitensis Grube, 1878b: 89, pl. 5, fig. 3.

Nereis (Neanthes) orientalis Treadwell, 1936: 270, fig. 19

Perinereis vancaurica tetradentata Imajima, 1972: 86, fig. 23, 27; Paik, 1975: 7, pl. 6, figs. 44-46; 1977: 172, fig. 16; 1989: 309, fig. 72.

Perinereis aibuhitensis: Hutchings *et al.*, 1991: 245, fig. 2; Lee *et al.*, 1992: 2, figs. 1-3.

Material examined. 5 specimens, Dongmak-ri, Hwado-myeon, Ganghwa-gun, Incheon-si (126°25′32″E, 37°34′59″N), 05 Jul 2012, Choi HK; 8 specimens, Janggyeong-ri, Yeongheung-myeon, Ongjin-gun, Incheon-si (126°25′20″E, 37°15′46″N), 17 Jul 2012, Choi HK; 2 specimens, Donggeom-ri, Gilsang-myeon, Ganghwa-gun, Incheon-si (126°26′47″E, 37°34′31″N), 05 Jul 2012, Choi HK; 1 specimen, Namdong-ri, Imhoe-myeon, Jindo-gun, Jeollanam-do (126°09′10″E, 34°21′35″N), 09 Apr 2013, Choi HK; 4 specimens, Daehang-ri, Byeonsan-myeon, Buan-gun, Jeollabuk-do (126°35′15″E, 35°41′20″N), 13 Aug 2014, Choi HK; 15 specimens, Dongho-ri, Haeri-myeon, Gochang-gun, Jeollabuk-do (126°31′34″E, 35°30′29″N), 04 May 2015, Choi HK.

Diagnosis. Prostomium with 4 pairs of eyespots and 2 frontal antennae. Peristomial cirri 4 pairs; longest cirri reaching to setiger 6. Proboscis with both conical-shaped and bar-shaped paragnaths; area VI with 2 short bars; area VII-VIII with cones in 2-3 rows. Notosetae all homogomph spinigers. Neurosetae homo- and heterogomph spinigers, and heterogomph falcigers.

Distribution: Palau, Taiwan, China, Japan, Korea.

44. *Perinereis cultrifera* (Grube, 1840) 한토막눈썹참갯지렁이

Nereis cultrifera Grube, 1840: 74; Southern, 1914: 80

Perinereis cultrifera: Fauvel, 1923: 352, fig. 137a-l; Okuda and Yamada, 1954: 185, fig. 3F; Imajima and Hartman, 1964: 152; Uschakov and Wu, 1965: 200;

Day, 1967: 337, fig. 14.13o-q; Imajima, 1972: 88, figs. 24, 27; Paik, 1977: 174, fig. 17A-G; 1982: 786, pl. 12m-o; 1989: Imajima, 2003: 176; Bakken and Wilson, 2005: 52.

Material examined. 1 specimen, Sindeok-dong, Yeosu-si, Jeollanam-do (127°48′07″E, 34°47′47″N), 25 Sep 2014, Choi HK; 1 specimens, Daehang-ri, Byeonsan-myeon, Buan-gun, Jeollabuk-do (126°35′15″E, 35°41′20″N), 13 Aug 2014, Choi HK; 1 specimen, Yeonpyeong-ri, Udo-myeon, Jeju-si, Jeju-do (127°00′12″E, 33°29′19″N), 24 Jun 2014, Choi HK.

Diagnosis. Prostomium wider than long, with 2 longitudinal bands. Palps thick, with globular palpostyle. Peristomial cirri 4 pairs; longest cirri reaching to setiger 6. Proboscis with both conical-shaped and bar-shaped paragnaths; area V with 3 cones in triangle; area VI with single bar only. Notosetae all homogomph spinigers. Neurosetae homo- and heterogomph spinigers, and heterogomph falcigers.

Distribution. Mediterranean Sea, Atlantic Ocean, North Sea, South Africa, Indian Ocean, Taiwan, Yellow Sea, Japan, Korea.

45. *Perinereis floridana* (Ehlers, 1868) 플로리다참갯지렁이

Nereis floridana Ehlers, 1868: 503.

Perinereis cultrifera floridana Imajima, 1972: 91, fig. 25a-b, fig. 27; Rho and Lee, 1982: 39, pl. 3, figs. 2-3; Paik, 1989: 316, fig. 75.

Material examined. 5 specimen, Jinha-ri, Seosaeng-myeon, Ulju-gun, Ulsan-si (129°20′16″E, 35°22′19″N), 18 May 2012, Choi HK.

Diagnosis. Prostomium wider than long, with 2 frontal antennae. Peristomial cirri 4 pairs; longest cirri reaching to setiger 11. Proboscis with both conical-shaped and bar-shaped paragnaths; area V with 1 cones only; area VI with single bar only. Notosetae all homogomph spinigers. Neurosetae homo- and heterogomph spinigers, and heterogomph falcigers.

Distribution. Atlantic Ocean (France, Moroco), England, Mediterranean sea, Red Sea, Indian Ocean, New Caledonia Island, Malay, Siam Bay, Indonesia, Yellow sea, Japan, Korea.

46. *Perinereis mictodonta* (Marenzeller, 1879) 긴눈썹참갯지렁이

Nereis mictodonta Marenzeller, 1879: 118, pl. 2, fig. 2; Izuka, 1912: 148, pl. 16, fig. 1-6.

Perinereis brevicirris: Imajima and Hartman, 1964: 151.

Perinereis nuntia var. *brevicirris*: Okuda and Yamada, 1954: 184, fig. 3e; Imajima, 1972: 94, fig. 26l-m; Paik, 1972: 131, fig. 2i-j; Rho and Song, 1974: 80.

Perinereis mictodonta: Wilson and Glasby, 1993: 264; Glasby and Hsieh, 2006: 558, fig. 4, 5a-f; Park, 2007: 23, fig. 5-7a, 8b; Park and Kim, 2007: 76, figs. 2-6.

Material examined. 7 specimens, Gwan-ri, Iwon-myeon, Taean-gun, Chungcheongnam-do (126°14′19″E, 36°53′05″N), 23 May 2012, Choi HK; 7 specimens, Cheongsan-ri, Wonbuk-myeon, Taean-gun, Chungcheongnam-do (126°17′24″E, 36°49′25″N), 23 Jun 2012, Choi HK; 5 specimens, Yongdam-ri, Yeongheung-myeon, Ongjin-gun, Incheon-si (126°27′46″E, 37°14′17″N), 17 Jul 2012, Choi HK; 5 specimens, Noil-ri, Gwayeok-myeon, Goheung-gun, Jeollanam-do (127°16′50″E, 34°40′04″N), 30 Apr 2013, Choi HK; 4 specimens, Daebu-dong, Danwon-gu, Ansan-si, Gyeonggi-do (126°32′36″E, 37°16′10″N), 17 Jul 2012, Choi HK; 1 specimen, Namdong-ri, Imhoe-myeon, Jindo-gun, Jeollanam-do (126°09′10″E, 34°21′35″N), 09 Apr 2013, Choi HK; 2 specimens, Hwangchon-ri, Wonbuk-myeon, Taean-gun, Chungcheongnam-do (126°11′20″E, 36°52′53″N), 23 Jun 2012, Choi HK; 5 specimens, Woljeong-ri, Namyang-myeon, Goheung-gun, Jeollanam-do (127°21′57″E, 34°44′65″N), 30 Apr 2013, Choi HK; 3 specimens, Ho-ri, Palbong-myeon, Seosan-si, Chungcheongnam-do (126°17′59″E, 36°48′37″N), 23 Jun 2012, Choi HK; 2 specimen, Na-ri, Gunnae-myeon, Jindo-gun, Jeollanam-do (126°12′52″E, 34°33′35″N), 09 Apr 2013, Choi HK; 2 specimens, Janggyeong-ri, Yeongheung-myeon, Ongjin-gun, Incheon-si (126°25′20″E, 37°15′46″N), 17 Jul 2012, Choi HK; 1 specimen, Maeeum-ri, Samsan-myeon, Ganghwa-gun, Incheon-si (126°16′04″E, 37°37′49″N), 04 Jul 2012, Choi HK; 7 specimens, Uihang-ri, Sowon-myeon, Taean-gun, Chungcheongnam-do (126°08′41″E, 36°48′25″N), 23 Jun 2012, Choi HK; 12 specimens, Hahyo-dong, Seogwipo-si, Jeju-do (126°39′02″E, 33°14′68″N), 25 Jun 2014, Choi HK; 4 specimens, Sangju-ri, Sangju-myeon, Namhae-gun, Gyeongsangnam-do (128°06′40″E, 34°40′34″N), 15 Mar 2014, Choi HK; 22 specimens, Gusu-ri, Baeksu-eup, Yeonggwang-gun, Jeollanam-do (126°26′20″E, 35°21′21″N), 20 Apr 2015, Choi HK; 4 specimens, Gyema-ri, Hongnong-eup, Yeonggwang-gun, Jeollanam-do (126°25′50″E, 35°23′34″N), 20 Apr 2015, Choi HK; 10 specimens, Gajwa-ri, Hwasan-myeon, Haenam-gun, Jeollanam-do (126°30′01″E, 34°29′30″N), 01 May 2015, Choi HK.

Diagnosis. Prostomium slightly wider than long. Peristomial cirri 4 pairs; longest cirri reaching to setiger 7-13. Proboscis with both conical-shaped and bar-shaped paragnaths; cones on oral ring much larger than ones on maxillary ring; area V with 3 cones in triangle; area VI with 5-9 bars of uneven length, and outermost bar much longer than others. Dorsal cirri equal to or slightly longer than notopodial ligules Notosetae all homogomph spinigers. Neurosetae homo- and heterogomph spinigers, and heterogomph falcigers.

Distribution. Taiwan, China, Japan, Korea.

47. *Perinereis wilsoni* Glasby and Hsieh, 2006 긴수염눈썹참갯지렁이

Perinereis nuntia var. *vallata*: Paik, 1972: 131, fig. 2a-h; Imajima, 1972: 92.

Perinereis wilsoni Glasby and Hsieh, 2006: 570, fig. 10a-f; Park and Kim, 2007: 76, figs. 2-4.

Material examined. 1 specimen, Nae-ri, Hwado-myeon, Ganghwa-gun, Incheon-si (126°22′05″E, 37°37′55″N), 05 Jul 2012, Choi HK; 3 specimens, Uihang-ri, Sowon-myeon, Taean-gun, Chungcheongnam-do (126°08′41″E, 36°48′25″N), 23 Jun 2012, Choi HK; 6 specimens, Gujora-ri, Irun-myeon, Geoje-si, Gyeongsangnam-do (128°43′14″E, 34°47′50″N), 26 Aug 2014, Choi HK; 1 specimen, Sujeong-dong, Yeosu-si, Jeollanam-do (127°47′47″E, 34°44′25″N), 26 Aug 2014, Choi HK.

Diagnosis. Prostomium with 2 frontal antennae and 4 pairs of eyespots.

Peristomial cirri 4 pairs; longest cirri reaching to setiger 8-14. Proboscis with both conical-shaped and bar-shaped paragnaths; cones on oral ring slightly larger than ones on maxillary ring; area V with 2-3 cones in longitudinal line; area VI with 4-8 bars of uneven length, and outermost bar much longer than others. Dorsal cirri much longer than notopodial ligules Notosetae all homogomph spinigers. Neurosetae homo- and heterogomph spinigers, and heterogomph falcigers.

Distribution. Taiwan, South China Sea, Yellow Sea, Japan, Korea.

Genus *Platynereis* Kinberg, 1865 좁쌀이빨참갯지렁이

Paragnaths small denticles and arranged in pectinate form except area I, II, and V. Dorsal cirri slender and elongate. Setae both spinigers and facigers.

Type species. *Platynereis magalhaensis* Kinberg, 1866.

Key to the species of *Platynereis* Kinberg, 1865 from Korea

1. Notopodia with homogomph spinigers and simple hooks bearing bifid tip ··· *P. bicanaliculata*
- Notopodia with homogomph spinigers and falcigers ························ *P. dumerilii*

48. *Platynereis bicanaliculata* (Baird, 1863) 두점참갯지렁이

Nereis bicanaliculata Baird, 1863: 109.

Nereis agassizi Ehlers, 1868: 542.

Nereis dumerilii: Marenzellar, 1879: 123, pl. 2, fig. 4a, 4b.

Platynereis agassizi: Okuda and Yamada, 1954: 185, fig. 3g.

Platynereis bicanaliculata: Imajima and Hartman, 1964: 152; 1972: 76, figs. 18, 19, 22; Banse and Hobson, 1974: 72; Paik, 1977: 158, fig. 10A-G; 1982: 784, pl. 11g-i; 1989: 295, fig. 65; Imajima, 2003: 177.

Material examined. 2 specimens, Hyangho-ri, Jumunjin-eup, Gangneung-si, Gangwon-do (126°21′58″E, 33°12′19″N), 15 Sep 2014, Choi HK; 1 specimen, Mukhojin-dong, Donghae-si, Gangwon-do (129°06′50″E, 37°32′21″N), 16 Sep 2014, Choi HK; 6 specimens, Daejin-dong, Donghae-si, Gangwon-do (129°11′2

5″E, 37°33′50″N), 16 Sep 2014, Choi HK; 2 specimens, Daepo-dong Sokcho-si, Gangwon-do (128°38′18″E, 38°10′27″N) 15 Sep 2014, Choi HK; 1 specimens, Geumjin-ri, Ganggu-myeon, Yeongdeok-gun, Gyeongsangbuk-do (129°28′04″E, 36°21′38″N), 17 Sep 2014, Choi HK; 5 specimens, Minam-ri, Sanyang-eup, Tongyeong-si, Gyeongsangnam-do (128°26′39″E, 34°45′03″N), 21 Mar 2014, Choi HK; 1 specimens, Guman-ri, Nam-gu, Homigot-myeon, Pohang-si, Gyeongsangbuk-do (129°34′31″E, 36°04′35″N), 19 May 2015, Choi HK; 3 specimens, Oryu 1-ri, Gampo-eup, Gyeongju-si, Gyeongsangbuk-do (129°32′21″E, 35°48′13″N), 19 May 2015, Choi HK; 6 specimens, Janggil-ri, Nam-gu, Guryongpo-eup, Pohang-si, Gyeongsangbuk-do (129°35′05′′E, 35°56′17′′N), 19 May 2015, Choi HK.

Diagnosis. Prostomium pentagonal-shaped. Peristomial cirri slender, 4 pairs, and longest ones extending to setiger 11. Proboscis with small paragnaths arranged in pectinate form. Dorsal cirri slender and elongate. Notosetae homogomph spinigers and simple hooks bearing bifid tip. Neurosetae homo- and heterogomph spinigers, and heterogomph falcigers.

Distribution. Australia, Western Canada to Western coast of Mexico, Hawaii, North Pacific Ocean, Taiwan, Japan, Yellow Sea, Korea.

Genus *Pseudonereis* Kinberg, 1865 반쪽이빨참갯지렁이속

Paragnaths conical or transverse bars, present on both oral ring and maxillary ring, and those of area II-IV. usually arranged in comb-like rows. Markedly elongated or expanded notopodial ligules present.

Type species. *Pseudonereis gallapagensis* Kinberg, 1865.

Key to the species of *Pseudonereis* Kinberg, 1865 from Korea

1. Area VI with bar-shaped paragnaths ·························· 2
 - Area VI with conical paragnaths ·························· *P.* sp. nov. 2
2. Area II-IV with pointed bars; area VI with shield-shaped bar ·························· 3
 - Area II-IV with cones; area VI without shield-shaped bar ·········· *P.* sp. nov. 1
3. Dorsal cirri terminally attached on posterior parapodia ·············· *P. gallapagensis*

-Dorsal cirri subterminally attached on posterior parapodia except last few setigers .... *P. variegata*

49. *Pseudonereis* sp. nov. 1 (Figs. 14, 15)

Type materials. Holotype: complete specimen (70.4 mm long, 4.0 mm width), Sangju-ri, Sangju-myeon, Namhae-gun, Gyeongsangnam-do (128°06′40″E, 34°40′34″N), 15 Mar 2014, Choi HK. Paratypes: complete specimen (40.2 mm long, 2.5 mm width); complete specimen (50.2 mm long, 4.2 mm width), collection details are same as holotype.

Additional materials. 11 specimens, Manheung-dong, Yeosu-si, Jeollanam-do (127°42′55″E, 34°45′41″N), 24 Jul 2014, Choi HK.; 4 specimens, Gujora-ri, Irun-myeon, Geoje-si, Gyeongsangnam-do (128°4i0′41″E, 34°47′50″N), 26 Aug 2014, Choi HK.

Description. Holotype complete (Figs. I-14, 15). Body length about 70.4 mm, width about 4.0 mm.

Prostomium bluntly conical shaped, with 1 pair of frontal antennae and 2 pairs of eyespots; frontal antennae cirriform, slightly longer than half as long as prostomium, and eyespots subcircular-shaped, with black pigments. Palpi thick, slightly longer than prostomium, with semi-globular palpodes distally. Tentacular cirri composed of 4 pairs, with distinct cirrophores; longest cirri reaching to setiger 3-4 (Figs. I-14A, 15A).

Jaws chitinous, dark brown, and with cutting edge bearing 4-5 teeth (Figs. I-14A, B, 15A, B).

Proboscis with paragnath on both maxillary and oral ring. Paragnaths on area I-IV on maxillary ring conical-shaped without p-bar, regularly arranged in 3-4 rows as pectinate-form; area I with 1 cone; area II with 13-34 cones in 3 pectinated rows; area III with 59-76 cones in 4 pectinated rows; area IV with 63-87 cones in 4-5 pectinated rows. Paragnaths on area V-VIII on oral ring larger than paragnaths on maxillary ring, and sparsely distributed; area V with 1 cone; area VI with 2 short and thickly sub-triangular bars not shield-shaped; area VII-VIII with 18-21 cones in 2 rows (Figs. I-14A, B, 15).

Peristomium without parapodia, much longer than setiger 1 (Figs. I-14A, B, 15A, B).

Notopodia without notopodial presetal lobes. Dorsal notopodial ligules alternate form; anterior and median notopodial ligules short and rounded, and posterior ones markedly elongated and expanded. Ventral notopodial ligule rounded on anterior notopodia, but changed to slightly angular on posterior notopodia. Dorsal cirri simple and slender, without cirropohore; anterior cirri slightly longer than posterior ones, located on bases of dorsal notopodial ligules; median and posterior cirri attached on sub-terminal of dorsal notopodial ligules(Fig. I-14C-F).

Neuropodia with short and sub-triangular postsetal lobes similar to acicular neuropodial ligules; ventral neuropodial ligules well developed, bluntly conical-shaped, and reaching to acicular neuropodial ligules. Ventral cirri slender, completely separated from ventral neuropodial ligules, and as long as acicular neuropodial ligules or slightly shorter (Fig. I-14C-F).

Notosetae homogomph spinigers; long and slender appendages finely serrated on one side (Fig. I-14G).

Neurosetae including homogomph spinigers and heterogomph falcigers and spinigers; homogomph spinigers and heterogomph falcigers present in dorsal fascicle; heterogomph falcigers present in ventral fascicle and heterogomph spinigers present from about setiger 40 additionally in ventral fascicle; heterogomph falcigers with short and rounded blades distally; homogomph and heterogomph spinigers with finely serrated appendages, and notopodial homogomph spinigers longer than neuropodial heterogomph spinigers (Fig. 14H, I).

Pygidium with many wrinkles and 2 anal cirri.

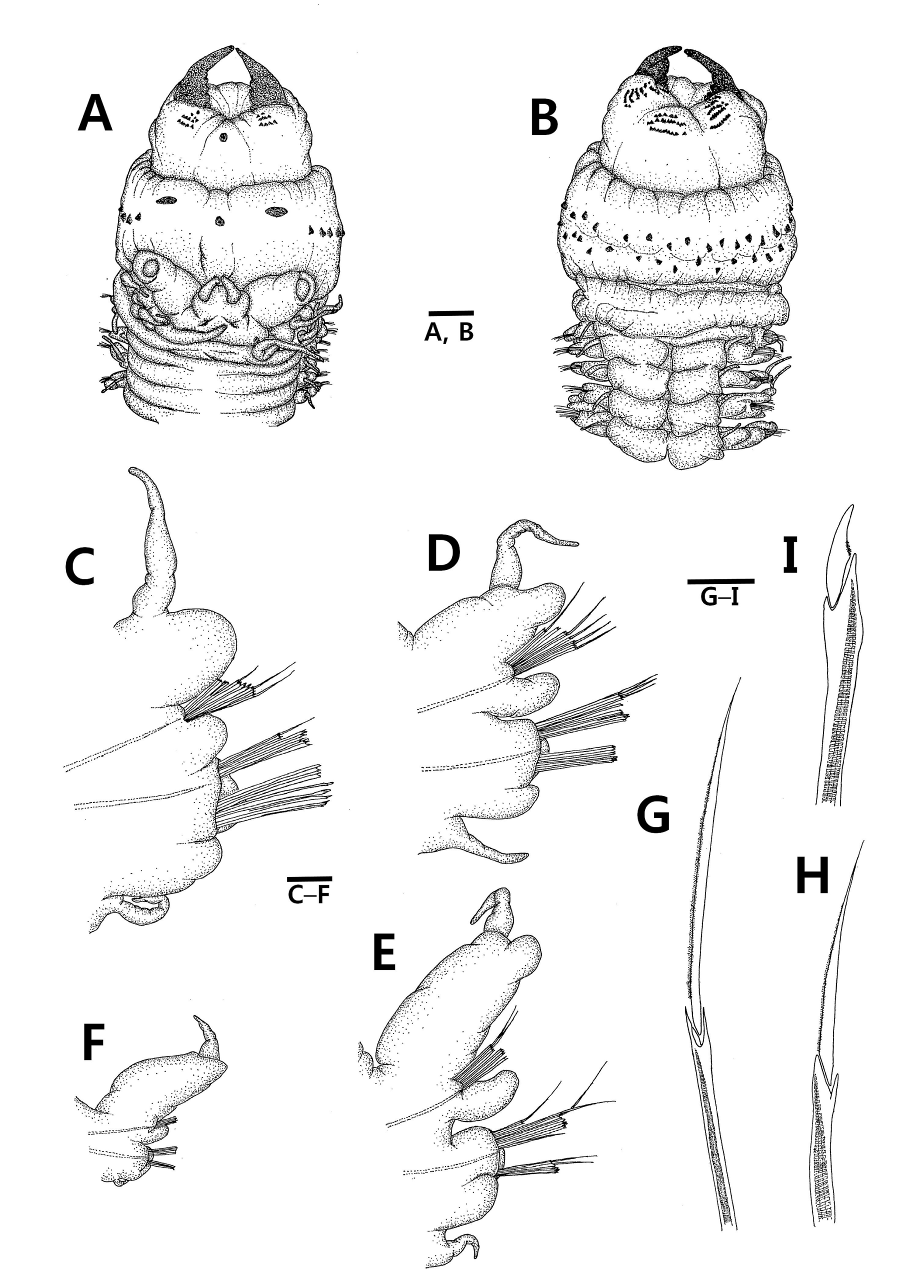

Fig. 14. *Pseudonereis* sp. nov. 1. A, dorsal view of anterior end; B, ventral view of anterior end; C, anterior views of 6th parapodium; D, anterior views of 40th parapodium; E, anterior views of 80th parapodium; F, anterior views of 2th from last parapodium; G, notopodial homogomph spiniger; H, neuropodial heterogomph spiniger; I, neuropodial heterogomph falciger. Scale bars: A, B=1.0 mm; C–F=0.2 mm; G–I=0.05 mm.

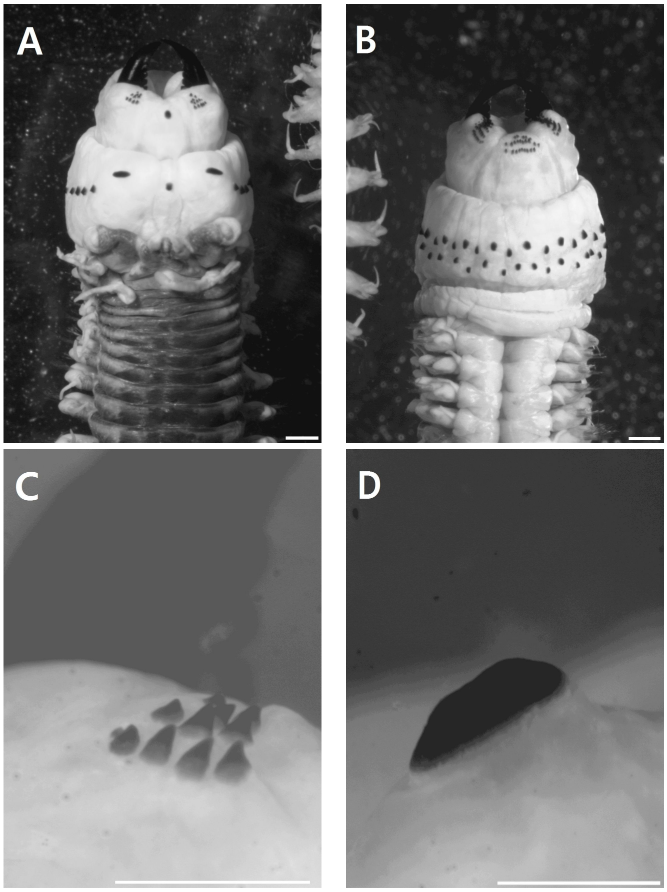

Fig. 15. *Pseudonereis* sp. nov. 1. A, dorsal view of anterior end; B, ventral view of anterior end; C, conical paragnaths on area II; D, bar-shaped paragnath on area VI. Scale bars: A, B=1.0 mm; C, D=0.5 mm.

Remarks. Bakken (2007) suggested that the most species of the genus *Pseudonereis* have a bar-shaped paragnath on the area VI of proboscis based on the type materials and described that it shows a unique shape such as a high and shield-shaped bar composed of a projected shield and the soft tissue. Although the new species of the present study also has a bar-shaped paragnath on the area VI of proboscis, the new species is generally distinguished from *Pseudonereis* species described by Bakken (2007) in the shape that the new species has a low and smooth bar on the area VI of proboscis as like as that of *Perinereis* species. Additionally, the new species can be generally distinguished from the most species of the genus *Pseudonereis* in the paragnaths on the area II-IV of proboscis as follows: the area II-IV of the new species has only conical paragnath, while that in the most *Pseudonereis* species possess the low and bar-shaped paragnaths bearing a pointed tip skewed over to one end, called as the p-bar (Bakken, 2007).

In the respect, the new species of the present study is closely related to *P. palpata* (Treadwell, 1923) in the shapes of paragnath on the area II-IV and VI. However, the new species differs from *P. palpata* by the following characteristics: the dorsal cirrus of the new species is sub-terminally attached on the notopodial ligules of posterior parapodium, while that of *P. palpate* is terminally attached on the notopodial ligules of posterior parapodia; the new species has a bar-shaped paragnath only on the area VI of proboscis, while *P. palpata* has both the bar-shaped and conical paragnaths on the area VI of proboscis (Bakken, 2007).

Among the species known in East Asia, the new species resembles *P. variegate* (Grube, 1857) in the arrangement of paragnaths, the shape of dorsal notopodial ligules, and the setal composition (Imajima, 1972; Paik, 1989; Bakken, 2007). However, these species easily distinguishable from each other by the morphologies of paragnaths on the area II-IV and IV of proboscis mentioned above (Bakken, 2007). Moreover, the dorsal cirri in last few setigers are sub-terminally attached on the notopodial ligules in the new species, while those of *P. variegate* are terminally attached on the notopodial ligules (Bakken, 2007).

50. ***Pseudonereis* sp. nov. 2 (Figs. 16, 17)**

Type materials. Holotype: complete specimen (47.3 mm long, 4.2 mm width), Sangju-ri, Sangju-myeon, Namhae-gun, Gyeongsangnam-do (128°06′40″E, 34°40′34″N), 15 Mar 2014, Choi HK. Paratypes: complete specimen (43.0 mm long, 5.0 mm width); complete specimen (62.5 mm long, 4.8 mm width), collection details are same as holotype.

Additional materials. 2 specimens, Manheung-dong Yeosu-si, Jeollanam-do (127°42′55″E, 34°45′41″N), 25 Sep 2014, Choi HK.; 1 specimen, Punghwa-ri, Sanyang-eup, Tongyeong-si, Gyeongsangnam-do (128°24′34″E, 34°48′04″N), 21 Mar 2014, Choi HK.

Description. Holotype complete (Figs. 16, 17). Body length about 47.3 mm, width about 4.2 mm.

Prostomium wider than long in base, with 1 pair of frontal antennae and 2 pairs of eyespots adjacent to lateral margin; frontal antennae cirriform, slightly longer than half as long as prostomium; eyespots subcircular-shaped, with black pigments. Palpi thick, slightly longer than prostomium, with semi-globular palpodes distally. Tentacular cirri 4 pairs, with distinct cirrophores; longest cirri reaching to setiger 1-2 (Figs. 16A, 17A).

Jaws chitinous, brightly brown, and with cutting edge bearing 4-5 teeth (Figs. 16A B, 17A, B).

Proboscis with paragnath both on maxillary and oral ring. Paragnath on area I-IV on maxillary ring conical shaped without p-bar, loosely arranged in 3-4 rows; area I with 3 cone in 1 longitudinal row; area II with 28-29 cones in 3 rows formed crescent shaped; area III with 40-50 cones in 4 loosely transverse rows; area IV with 47-48 cones in 4-5 oblique rows. Paragnaths on oral ring absent in area V and 3 large cones formed triangle in area VI. Paragnaths on area VII-VIII on oral ring with 23-28 large cones in irregular rows, and numerously minute paragnaths present among large cones on area VII (Figs. 16A, B, 17).

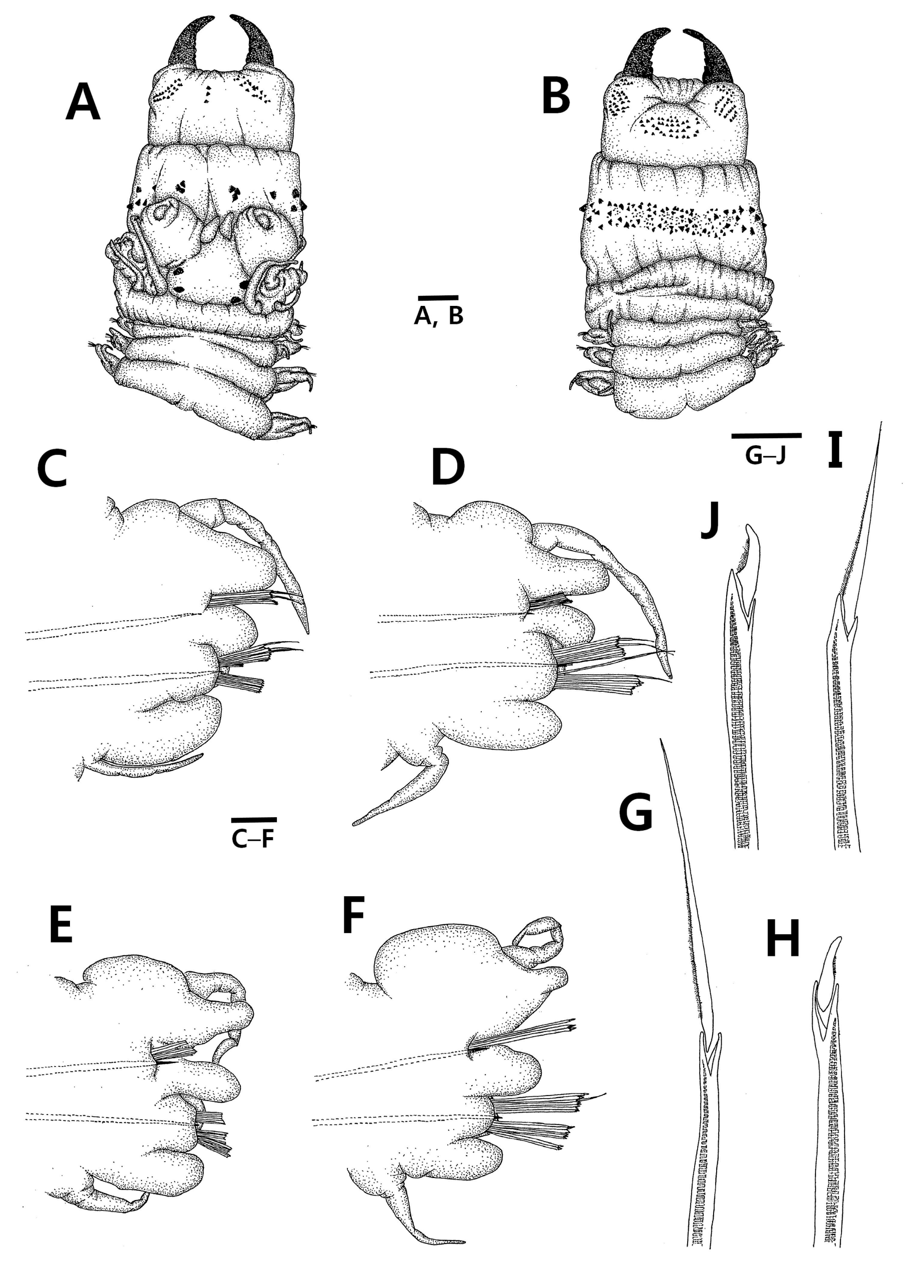

Fig. 16. *Pseudonereis* sp. nov. 2. A, dorsal view of anterior end; B, ventral view of anterior end; C, anterior views of 6th parapodium; D, anterior views of 30th parapodium; E, anterior views of 50th parapodium; F, anterior views of posterior parapodium; G, notopodial homogomph spiniger; H, notopodial homogmph falciger; I, neuropodial heterogomph spiniger; J, neuropodial heterogomph falciger. Scale bars: A, B=1.0 mm; C–F=0.2 mm; G–I=0.05 mm.

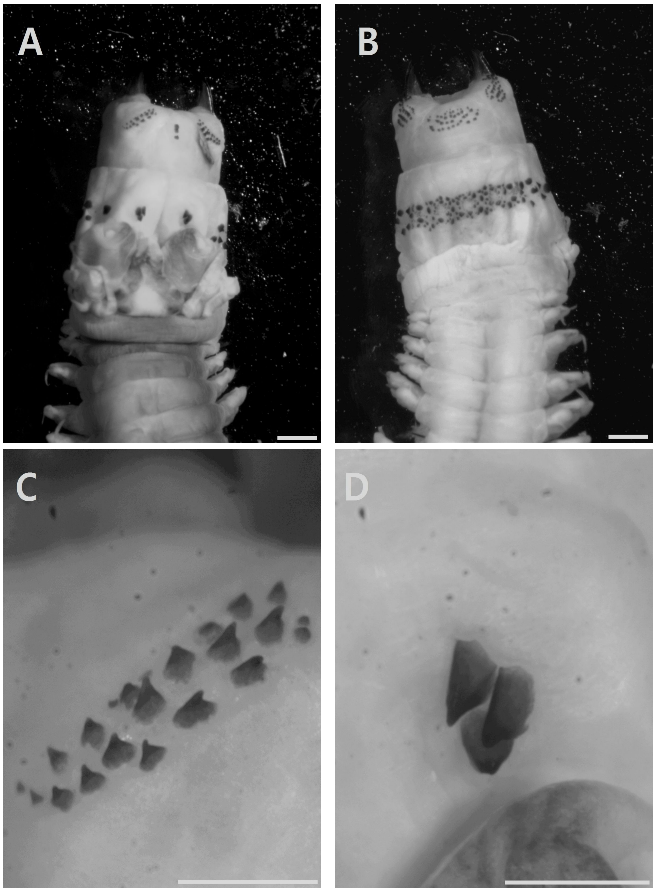

Fig. 17. *Pseudonereis* sp. nov. 2. A, dorsal view of anterior end; B, ventral view of anterior end; C, conical paragnaths on area II; D, large conical paragnath on area VI Scale bars: A, B=1.0 mm; C, D=0.5 mm.

Peristomium without parapodia, much longer than setiger 1 (Figs. 16A B, 17A, B).

Notopodia without notopodial presetal lobes. Dorsal notopodial ligules with alternate size; anterior and median notopodial ligules short and rounded as long as ventral notopodial ligules, and posterior ones markedly boarder and elongate. Ventral notopodial ligule rounded on anterior notopodia, but changed to slightly angular on posterior notopodia. Dorsal cirri simple and slender, without cirropohore; anterior and median cirri longer than posterior ones, located on bases of dorsal notopodial ligules, and posterior ones attached on sub-terminal of dorsal notopodial ligules (Fig. 16C-F).

Neuropodia with sub-triangular neuropodial postsetal lobes as long as acicular neuropodial ligules; ventral neuropodial ligules well developed, bluntly conical shaped, and slightly longer than acicular neuropodial ligules. Ventral cirri slender, completely separated from ventral neuropodial ligules, and as long as acicular neuropodial ligules or slightly longer (Fig. 16C-F).

Notosetae homogomph spinigers in anterior and median setigers, replaced by homogomph falcigers in posterior setigers; homogomph spinigers with long and short blades bearing finely serrations; homogomph falcigers with short and finely serrated appendages bearing rounded tip, beginning form setiger 45-55 (Fig. 16G, H).

Neurosetae homogomph spinigers and heterogomph falcigers in dorsal fascicle and heterogomph spinigers and heterogomph falcigers in ventral fascicle (Fig. 16I, J).

Pygidium with many wrinkles and 2 anal cirri.

Remarks. The new species of the present study has a diagnostic feature such as the markedly elongate and broader dorsal notopodial ligules on the posterior setigers, and this commonly observed in the species of genus *Pseudonereis, Alitta* Kinberg, 1865, and *Nectoneanthes* Imajima, 1972 (Imajima, 1972; Bakken, 2005, 2007; Sato, 2013; Villalobos-Guerrero and Carrera-Parra, 2015). Among them, the new species is assigned to *Pseudonereis* because the presetal notopodial lobes of the new species are rudimentary, which is known as the characteristic feature of *Pseudonereis*, while those of *Alitta* and *Nectoneanthes* are well developed at least on the anterior parapodia (Imajima, 1972; Bakken, 2005, 2007; Sato *et al.* 2013).

The new species can be generally distinguished from its relatives by the morphologies of setal composition and paragnaths on the area VI of proboscis as follows: the new species has the notopodial homogomph falcigers on the posterior setigers, while the most species of *Pseudonereis* have only notopodial homogomph spinigers in the all setigers; the area VI possesses only conical paragnaths only in the new species, but that in the most species of *Pseudonereis* possesses the bar-shaped paragnaths (Imajima, 1972; Bakken, 2007; Villalobos-Guerrero and Tovar-Hernández, 2013).

Therefore, the new species of the present study is closely related to *P. anomala* Gravier, 1900 and *P. mutisetosa* Hartmann-Schröder, 1992 in the presence of the notopodial homogomph falcigers on the posterior setigers, the absence of paragnath on the area V, and the presence of conical paragnaths on the area VI (Bakken, 2007). However, the new species is easily distinguishable from its congeners, *P. anomala* and *P. mutisetosa,* by the following morphological features: the homogomph falcigers in neuropodial dorsal fascicle are absent in the new species, while those of *P. mutisetosa* present; the new species has the conical paragnaths on the area II-IV of proboscis, but *P. anomala* has the p-bars; the new species has the large conical paragnaths as well as minute paragnaths scattered among large conical paragnaths on the area VII-VIII, while *P. anomala* and *P. mutisetosa* have not minute paragnaths (Bakken, 2007).

Additionally, the new species slightly differs from *Pseudonereis* species in the arrangements of paragnaths on the area II-IV as follows: the paragnaths on area II-IV are arranged in the compact clusters as comb-like rows in *Pseudonereis* species, but those of new species are loosely arranged in rows relatively (Imajima, 1972; Bakken, 2005, 2007; Villalobos-Guerrero and Tovar-Hernández, 2013).

Table 2. Comparison of morphological characteristics among the congeneric species of *Pseudonereis* sp. nov. 1 and 2.

Species	Number and shpae of paragnath on proboscis							Location of dorsal cirri on posterior parapodia	Dorsal notopodial ligules on posterior parapodia	Setae	
	Area I	Area II	Area III	Area IV	Area V	Area VI	Area VII-VIII			Notopodial homogomph falcigers	Neuropodial homogomph falcigers
P. anomala	1-3 (cone)	11-31(p-bar)	30-72 (p-bar)	20-52 (p-bar and cone)	absent	3-15 (cone)	10-24 (cone)	subterminal	elongte and broader	present	absent
P. gallapagensis	1 (cone)	17-20 (p-bar)	51-68 (p-bar)	38-57 (p-bar and cone)	1 (cone)	1 (shield-shaped bar)	17-20	terminal	elongte and broader	absent	absent
P. mutisetosa	2 (cone)	17-18 (cone)	20 (cone)	29-33 (cone)	absent	4 (cone)	8 (cone)	subterminal	broader	present	present
P. palpata	2 (cone)	39-40 (cone)	109 (cone)	108-120 (cone)	1 (cone)	1-2 (bar and cone)	19 (cone)	terminal	elongte and broader	absent	absent
P. variegate	1-2 (cone)	13-34 (p-bar)	59-76 (p-bar)	63-87 (p-bar)	1 (cone)	1 (shield-shaped bar)	18-21 (large cone and p-bar)	subterminal, and terminal in last few setigers	elongte and broader	absent	absent
P. sp. nov. 1	1 (cone)	11-16 (cone)	33-36 (cone)	42-52 (cone)	1 (cone)	1 (smooth bar)	39-42 (large cone)	subterminal	elongte and broader	absent	absent
P. sp. nov. 2	3-4 (cone)	21-25 (cone)	36-38 (cone)	34-38 (cone)	absent	3-4 (cone)	46-68 (large cone), and numerous minute paragnath additionally	subterminal	elongte and broader	present	absent

Consequently, the author suggests that the new species is discriminated from its congeners by the morphologies of setal composition and paragnaths on the area II-IV, VI, and VII-VIII of proboscis.

Genus *Simplisetia* Hartmann-Schröder, 1985

Only chitinous paragnaths present on proboscis. Paragnaths conical, present on maxillary ring only, and absent on oral ring. Posterior parapodia with large and stout simple falciger.

Type species. *Simplisetia aequisetis* (Augener, 1913).

51. *Simplisetia erythraeensis* (Fauvel, 1918) 붉은집참갯지렁이

Ceratonereis erythraeensis Fauvel, 1918: 505, fig. 2; Russell, 1962: 5; Imajima and Hartman, 1964: 140; Day, 1967: 327, figs. 14.10o-t; Imajima, 1972: 61, fig. 12a-p; Paik, 1977: 165, fig. 13a-h; 1982: 785, pl. 12a-c; 1989: 301, fig. 68.

Simplisetia erythraeensis: Khlebovich, 1996; 121.

Material examined. 5 specimens, Daegok-ri, Sinji-myeon, Wando-gun, Jeollanam-do (126°48′46″E, 34°20′07″N), 12 April 2011, Choi HK; 6 specimens, Haeun-ri, Hyeongyeong-myeon, Muan-gun, Jeollanam-do (126°25′40″E, 35°03′33″N), 27 Feb 2012, Choi HK; 5 specimens, Namdong-ri, Imhoe-myeon, Jindo-gun, Jeollanam-do (126°09′10″E, 34°21′35″N), 09 Apr 2013, Choi HK; 4 specimens, Janggyeong-ri, Yeongheung-myeon, Ongjin-gun, Incheon-si (126°26′40″E, 37°16′15″N), 17 Jul 2012, Choi HK; 1 specimen, Ganggye-ri, Imhoe-myeon, Jindo-gun, Jeollanam-do (126°15′16″E, 34°23′30″N), 09 Apr 2013, Choi HK; 12 specimens, Deoksin-ri, Seolcheon-myeon, Namhae-gun, Gyeongsangnam-do (127°56′55″E, 34°55′27″N), 12 May 2014, Choi HK; 21 specimens, Dadae-ri, Nambu-myeon, Geoje-si, Gyeongsangnam-do (128°39′25″E, 34°43′44″N), 22 Mar 2014, Choi HK.

Diagnosis. Prostomium with 2 antennae and 2 pairs of eyespots. Peristomial cirri 4 pairs, and longest ones reaching to segment 7. Proboscis with paragnaths on maxillary rings only; paragnaths minute and elongate cones. Notosetae all homogomph spinigers. Neurosetae hetero- and homogomph spinigers as well as heterogomph falcigers on anterior and posterior neuropodia. Simple falcigers large and stout, present on neuropodia.

Distribution. Red Sea, South west Africa, Madagascar, Mozambique, Swan River, Western Australia, Pacific Ocean, Okinawa Island, Yellow Sea, Japan, Korea.

Genus *Tylorrhynchus* Grube, 1869 실참갯지렁이속

Proboscidial papillae present on maxillary ring, and paragnath absent. Anterior notopodia with dorsal cirri bearing large cirrophores. Neuropodia with single ventral cirrus and notopodia without accessory ligules.

Type species. *Tylorrhynchus heterochaetus* (Quatrefages, 1866).

52. *Tylorrhynchus heterochaetus* (Qustrefages, 1865) 실참갯지렁이

Nereis heterocheta Quatrefages, 1865: 552.

Chinonereis edestus Chamberlin, 1924: 81.

Ceratocephale osawai Izuka, 1903: 1, pls. 1-2; 1912: 179.

Tylorrhynchus heterochaetus: Imajima and Hartman, 1964: 154; Paik, 1972: 128, fig. 1a-g; 1982: 782, pl. 10n-p; 1989: 285, fig. 61.

Material examined. 1 specimen, Nongju-ri, Haeryong-myeon, Suncheon-si, Jeollanam-do (127°29′03″E, 34°51′49″N), 25 Jun 2013, Choi HK.

Diagnosis. Prostomium with 2 antennae and biarticulated palps. Peristomium with 4 pairs of cirri. Proboscis with soft papillae only on maxillary ring. Parapodia biramous; anterior notopodia with thick dorsal cirri and well developed cirrophores. Notosetae homogomph spinigers. Neurosetae homo- and heterogomph spinigers as well as heterogomph falcigers.

Distribution. China, Yellow Sea, Java, Japan, Korea.

Family Nephtyidae Grube, 1850 백금갯지렁이과

Prostomium flattened, pentagonal-shaped, and with 4 reduced antennae. Parapodia biramous with well separated rami. Interamal cirri usually present on parapodia. Notosetae and neurosetae simple capillary.

Type genus. *Nephtys* Cuvier, 1817

Key to the genera of Nephtyidae Grube, 1850 from Korea

1. Interamal cirri rudimentary or absent; postacicular lamellae rudimentary ······························· *Micronephtys*
 - Interamal cirri well developed ··················· 2
2. Parapodia with involute interamal cirri ··················· 3
 - Parapodia with recurved interamal cirri ··················· *Nephtys*
3. Probocidial papillae present ··················· *Aglaophamus*
 - Probocidial papillae absent ··················· *Inermonephtys*

Genus *Micronephtys* Friedrich, 1939 꼬마백금갯지렁이속

Body small sized. Proboscis with 14 rows of papillae, and proximal region smooth. Interramal cirri reduced or absent. Postacicular lamellae rudimentary. Neuropodial superior lobes absent. Branchiae usually absent. Lyrate setae present.

Type species. *Micronephtys minuta* (Théel, 1879).

53. *Micronephthys sphaerocirrata orientails* Lee and Jae, 1983 꼬마백금갯지렁이

Nephthys (Micronephthys) sphaerocirrata: Day, 1967: 347, fig. 15. 3A - D; Gibbs 1971: 155.

Micronephthys sphaerocirrata orientails Lee and Jae, 1983: 20, fig. 2, pl. 1a-f; Imajima and Takeda, 1985: 63, fig. 3a-h; Paik, 1989: 350, fig. 93.

Material examined. 3 specimens, Woljeong-ri, Namyang-myeon, Goheung-gun, Jeollanam-do (127°21′57″E, 34°44′65″N), 30 Apr 2013, Choi HK; 4 specimens, Ganggye-ri, Imhoe-myeon, Jindo-gun, Jeollanam-do (126°15′16″E, 34°23′30″N), 09 Apr 2013, Choi HK; 1 specimen, Yongjeong-ri, Sangha-myeon, Gochang-gun, Jeollabuk-do (126°32′29″E, 35°28′08″N), 04 May 2015, Choi HK.

Diagnosis. Body small. Prostomium quadrangular, longer than broad, and with 2 pairs of antennae. Proboscis with 14-22 rows of papillae. Interramal cirri reduced and absent. Parapodial biramous, with poorly developed lobes. Seate consisting of 3 types, barred setae, long and spinulose setae, and lyrate setae.

Distribution. Atlantic Ocean, southern Spain, Indian Ocean, New Caledonia, Pacific

Ocean, Thailand, Japan, Korea.

Genus *Nephtys* Cuvier, 1917 백금갯지렁이속

Proboscis usually with rows of 5-7 subterminal papillae. Acicular lobes conical, rounded or bilobed. parapodial lamellae well-developed. Neuropodial superior lobes absent. Lyrate setae absent.

Type species. *Nephtys hombergii* Lamarck, 1818.

Key to the species of *Nephtys* Cuvier, 1917 from Korea

1. Interramal cirri small and foliaceous ········· 2
 - Interramal cirri large and sickle-shaped ········· 4
2. Posterior parapodia without interramal cirri ········· *N. oligobranchia*
 - Posterior parapodia with interramal cirri ········· 3
3. Preacicular lobe well developed and rounded ········· *N. polybranchia*
 - Preacicular lobe low ········· *N. neopolybranchia*
4. Proboscis with mid-dorsal papilla ········· 5
 - Proboscis without mid-dorsal papilla ········· 7
5. Interramal cirri beginning before setiger 8; proboscis with 22 bifid terminal papillae ········· 6
 - Interramal cirri beginning from setiger 9; proboscis with 20 rows of terminal papillae ········· *N. chemulpoensis*
6. Neuropodial postacicular lamellae well developed than acicular lobes ········· *N. longosetosa*
 - Neuropodial postacicular lamellae as large as acicular lobes ········· *N. ciliata*
7. Proboscis with rough proximal surface ········· *N. ceaca*
 - Proboscis with smooth proximal surface ········· *N. californiensis*

54. *Nephtys caeca* (Fabricius, 1780) 북방백금갯지렁이

Nereis caeca Fabricius, 1780: 304.

Nephtys caeca: Moore, 1908: 341; 1911: 243; Izuka, 1912: 213; Southern, 1914: 82; Fauvel, 1923: 365, fig. 142a-k; Berkely and Berkely, 1948: 54, fig. 80-81;

Hartman, 1950: 95; Okuda and Yamada, 1954: 186, fig. 4; Imajima, 1961: 88, fig. 4; 1963: 354; Pettibone, 1963: 203, fig. 51b; Fauchald, 1963: 11, fig. 10. 3D; Imajima and Hartman, 1964: 156; Paik, 1973b: 124, pl. 1 fig. B-D; 1982: 791, pl. 15j; 1989: 353, fig. 96; Banse abd Hobson, 1974: 73; Lee and Jae, 1983: 24, fig. 2; Ravara *et al.*, 2010: 34, figs. 12-13.

Material examined. 2 specimens, Haksan-ri, Byeollyang-myeon, Suncheon-si, Jeollanam-do (127°29′03″E, 34°50′50″N), 28 Nov 2011, Choi HK; 2 specimens, Nongju-ri, Haeryong-myeon, Suncheon-si, Jeollanam-do (127°29′03″E, 34°51′49″N), 17 Jun 2012, Choi HK.

Diagnosis. Prostomium rectangular, with small nuchal organ. Proboscis with 22 bifid terninal papillae and 22 subterminal rows bearing 5-6 papillae in each row. Mid-dorsal papilla absent. Proximal surface on proboscis rough. Interamal cirri large and sickle-shaped, present from setiger 4, and continue to posterior end. Notopodial and neuropodial postacicular lamellae expanded beyond acicular lobes. Seate consisting of 2 types, barred and spinulose setae.

Distribution. North Atlantic Ocean, Greenland, Arctic Sea, Bering Sea, Pacific Ocean, California, China, Japan, Korea.

55. *Nephtys californiensis* Hartman, 1938

Nephtys californiensis Hartman, 1938d: 150, fig. 64A-I; 1950: 103; Imajima and Takeda, 1987: 68, fig. 13; Hilbig, 1994: 334, fig. 13. 7; Jung and Hong, 1997: 379, figs. 6-7.

Material examined. 4 specimens, Daehang-ri, Byeonsan-myeon, Buan-gun Jeollabuk-do (126°35′21″E, 35°41′51″N), 13 Aug 2014, Choi HK.

Diagnosis. Prostomium sub-rectangular, with 2 pairs of antennae. Nuchal organ posteriorly present on postomium. Proboscis with 20 bifid terminal papillae and 22 subterminal rows bearing 3-8 papillae in each row. Mid-dorsal papilla absent. Proximal surface on proboscis smooth. Interamal cirri large and sickle-shaped, beginning from setiger 3, and continue to posterior end. Postacicular lamellae as large as acicular lobes in median parapodia. Seate barred and spinulose setae.

Distribution. Northern and southern California, Gulf of Mexico, China, Japan, Korea.

56. *Nephtys ciliata* (Müller, 1776) 털보백금갯지렁이

Nephtys borealis Örsted, 1843a: 3.

Nephtys ciliata: Moore, 1903: 433; 1910: 341; McIntosh, 1908: 23; Izuka, 1912: 215; Southern, 1914: 83; Fauvel, 1923: 371, fig. 145a-b; Hartman, 1944: 339, pl. 47, fig. 10; 1950; 95; Berkeley and Berkely, 1948: 55, fig. 82; Imajima 1961: 91; Pettibone, 1963: 202, fig. 51c; Imajima and Hartman, 1964: 157; Banse and Hobson, 1974: 75; Paik, 1975: 415, pl. 6, fig. 47; 1982: 791, pl. 15L; Lee and Jae, 1983: 24, fig. z; Ravara *et al.*, 2003: 37, figs. 13-14.

Material examined. 2 specimens, Woljeong-ri, Namyang-myeon, Goheung-gun, Jeollanam-do (127°21′57″E, 34°44′65″N), 30 Apr 2013, Choi HK; 1 specimen, Daepo-ri, Beolgyo-eup, Boseong-gun, Jeollanam-do (127°23′16″E, 34°47′16″N), 30 Apr 2013, Choi HK; 5 specimens, Sang-ri, Samsan-myeon, Ganghwa-gun, Incheon-si (126°18′22″E, 37°44′21″N), 04 Jul 2012, Choi HK; 1 specimen, Gwan-ri, Iwon-myeon, Taean-gun, Chungcheongnam-do (126°14′19″E, 36°53′05″N), 23 May 2012, Choi HK; 2 specimens, Maeeum-ri, Samsan-myeon, Ganghwa-gun, Incheon-si (126°19′28″E, 37°39′07″N), 04 Jul 2012, Choi HK; 6 specimens, Nongju-ri, Haeryong-myeon, Suncheon-si, Jeollanam-do (127°29′03″E, 34°51′49″N), 28 Feb 2012, Choi HK; 1 specimen, Yongjeong-ri, Sangha-myeon, Gochang-gun, Jeollabuk-do (126°32′29″E, 35°28′08″N), 04 May 2015, Choi HK; 4 specimens, Dongho-ri, Haeri-myeon, Gochang-gun, Jeollabuk-do (126°31′34″E, 35°30′29″N), 04 May 2015, Choi HK.

Diagnosis. Prostomium with 2 pairs of antennae and nuchal organ. Proboscis with 22 terninal papillae and 22 subterminal rows bearing 4-7 papillae in each row. Mid-dorsal papilla present. Proximal surface on proboscis smooth. Interramal cirri large and sickle-shaped, present from setiger 3, and continue to posterior end. Neuropodial postacicular lamellae as large as acicular lobes. Setae consisting of 2 types, barred and spinulose setae.

Distribution. Mediterranean Sea, North Atlantic Ocean, North Sea, Iceland, Scandinavia, Scotland, Arctic shore, Denmark, France, Bering Sea, Alaska, Canada, Pacific Ocean, Sourthern California, China, Japan, Korea.

57. *Nephtys longosetosa* Oersted, 1843 긴털백금갯지렁이

Nephtys longosetosa Örsted, 1843a: 195, fig. 75-76; McIntosh, 1908: 29; Southern, 1914: 83; Fauvel, 1923: 367, fig. 143g-h; Berkeley and Berkeley, 1948: 52, fig. 76; Imajima, 1961: 87, fig. 3; Pettibone, 1963: 204, fig. 47; Fauchald, 1963: 8, figs. 1c, 3f; Imajima and Hartman, 1964: 157; Paik, 1973b: 125, pl. 1E-F; 1982: 791, pl. 15K; 1989: 354, Fig. 97; Banse and Hobson, 1974: 73; Lee and Jae, 1983: 24, Fig. 2; Imajima and Takeda 1987: 60, figs. 10A-I, 14; Ravara *et al.*, 2003: 57, figs. 13, 22.

Material examined. 1 specimen, Sin-ri, Sinji-myeon, Wando-gun, Jeollanam-do (126°48′46″E, 34°20′07″N), 26 Dec 2011, Choi HK; 1 specimen, Gwan-ri, Iwon-myeon, Taean-gun, Chungcheongnam-do (126°14′19″E, 36°53′05″N), 23 May 2012, Choi HK; 1 specimen, Dongmak-ri, Hwado-myeon, Ganghwa-gun, Incheon-si (126°25′32″E, 37°34′59″N), 05 Jul 2012, Choi HK.

Diagnosis. Antennae and nuchal organ present on prostomium. Proboscis with 22 terminal papillae and 22 subterminal rows bearing 4-7 papillae in each row. Mid-dorsal papilla present. Proximal surface on proboscis smooth. Interramal cirri large and sickle-shaped, present from setiger 3, and continue to posterior end. Neuropodial postacicular lamellae well developed than acicular lobes. Setae consisting of 2 types, barred and spinulose setae.

Distribution. Korea, Arctic Ocean, Atlantic Ocean, Mediterranean Sea, Pacific Ocean, Panama, Japan, Yellow Sea, Bering Sea, Okhotsk Sea, from Alaska to California, Iceland, Faroes, Norway to France, Hudson Bay.

58. *Nephtys oligobranchia* Southern, 1921 광엽백금갯지렁이

Nephtys oligobranchia Southern, 1921: 610, pl. 24, figs. 12A-C; Lee and Jae, 1983; 23, pl. 2e-h, fig. 2; Paik, 1989: 352, fig. 95.

Material examined. 7 specimens, Daepo-ri, Beolgyo-eup, Boseong-gun, Jeollanam-do (127°23′16″E, 34°47′16″N), 30 Apr 2013, Choi HK; 1 specimen, Namdong-ri, Imhoe-myeon, Jindo-gun, Jeollanam-do (126°09′10″E, 34°21′35″N), 09 April 2013, Choi HK.

Diagnosis. Prostomium with 2 pairs of antennae and nuchal organ. Proboscis with 22 terminal papillae and 22 subterminal rows bearing 6-9 papillae in each row. Mid-dorsal papilla present. Proximal surface on proboscis smooth. Interramal cirri small and foliaceous, present from setigers 5-8, gradually reduced from setiger 15, and absent in posterior parapodia. Setae consisting of 2 types, barred and spinulose setae.

Distribution. Indian Ocean, Yellow Sea, Korea.

59. *Nephtys polybranchia* Southern, 1921 남방백금갯지렁이

Nephtys polybranchia Southern, 1921: 607, pl. 24, fig. 2A-G, fig. 2a-b; Imajima and Hartman, 1964: 158; Paik, 1975: 415, pl. 6, fig. 48; 1982: 791, pl. 15h-i; 1989: 351, fig. 94; Lee and Jae, 1983: 24, fig. 2: Ravara *et al.* 2010: 25, fig. 8.

Material examined. 4 specimens, Woljeong-ri, Namyang-myeon, Goheung-gun, Jeollanam-do (127°21′57″E, 34°44′65″N), 30 Apr 2013, Choi HK; 3 specimens, Haeun-ri, Hyeongyeong-myeon, Muan-gun, Jeollanam-do (126°25′40″E, 35°03′33″N), 19 Dec 2011, Choi HK; 2 specimens, Noil-ri, Gwayeok-myeon, Goheung-gun, Jeollanam-do (127°16′50″E, 34°40′04″N), 30 Apr 2013, Choi HK; 1 specimen, Na-ri, Gunnae-myeon, Jindo-gun, Jeollanam-do (126°12′52″E, 34°33′35″N), 09 Apr 2013, Choi HK; 1 specimen, Gwan-ri, Iwon-myeon, Taean-gun, Chungcheongnam-do (126°14′19″E, 36°53′05″N), 23 May 2012, Choi HK; 3 specimens, Deoksin-ri, Seolcheon-myeon, Namhae-gun, Gyeongsangnam-do (127°56′55″E, 34°55′27″N), 12 May 2014, Choi HK; 4 specimens, Simdong-ri, Jisan-myeon, Jindo-gun, Jeollanam-do (126°09′22″E, 34°22′33″N), 02 May 2015.

Diagnosis. Antennae 2 pairs. Eyespots 1 pairs. Nuchal organ present. Proboscis with 22 terminal papillae and 22 subterminal rows bearing 6-7 papillae in each row. Mid-dorsal papilla absent. Preacicular lobe well developed and rounded. Interramal cirri small and foliaceous, present from setiger 5, and continue to posterior end. Setae consisting of 2 types, barred and spinulose setae.

Distribution: Indian Ocean, Pacific Ocean, Japan, Korea.

Family Polynoidae Malmgren, 1867 비늘갯지렁이과

Body flattened. Prostomium with 1-3 antennae. Dorsal surface covered with overlapping elytra; elytra and dorsal cirri alternate regularly at least on anterior parapodia. Parapodia with simple setae only.

Type genus. *Polynoe* Lamarck, 1818.

Key to the genera of Polynoidae Malmgren, 1867 from Korea

1. Prostomium with median antennae ······ 2
   - Prostomium without median antennae ······ *Iphione*
2. Lateral antennae attached distally on prostomium ······ 3
   - Lateral antennae attached ventrally on prostomium ······ 9
3. Elytrae 12 pairs ······ 4
   - Elytrae more than 12 pairs ······ 6
4. Branchial filaments present on elytrophores ······ *Euphione*
   - Branchial filaments absent ······ 5
5. Notosetae entire distally ······ *Lepidonotus*
   - Notosetae trifurcate distally ······ *Hermenia*
6. Elytrae 18 pairs ······ *Halosydna*
   - Elytrae more than 21 pairs ······ 7
7. Notosetae present ······ 8
   - Notosetae absent ······ *Perolepis*
8. Parapodia with series of long papillae distally ······ *Halosydnopsis*
   - Parapodia without papillae ······ *Lepidasthenia*
9. Elytrae 12 pairs ······ *Polynoella*
   - Elytrae 15 pairs ······ 10
10. Notosetae clearly slender than neurosetae ······ *Gattyana*
    - Notosetae usually as thick as or slightly thicker than neurosetae ······ 11
11. Neurosetae with semilunar pockets ······ *Paradyte*
    - Neurosetae without semilunar pockets ······ 12
12. Neurosetae all unidentate ······ *Eunoe*
    - Neurosetae unidentate and bidentate ······ 13

13. Elytrae partially covered on dorsum posteriorly .... *Lagisca*
- Elytrae completely covered on dorsum .... *Harmothoe*

Genus *Euphione* McIntosh, 1885 아가미비늘갯지렁이속

Lateral antennae attached distally on prostomium. Elytrae consisting of 12 pairs. Branchial filaments present on elytrophores. Notopodia with capillary setae. Neuropodia with unidentate setae; neurosetae thicker than notosetae, and with fine serrations.

Type species. *Euphione elisabethae* McIntosh, 1885.

60. *Euphione chitoniformis* (Moore, 1903) 아가미비늘갯지렁이

Lepidonotus chitoniformis Moore, 1903: 405, pl. 23, figs. 10-11.

Lepidontus branchiferus Moore, 1903: 409, pl. 23, fig. 7-9.

Polynoe chitoniformis: Izuka, 1912: 19.

Polynoe branchifera: Izuka, 1912: 22.

Euphione chitoniformis: Hartman, 1938a: 115; Imajima and Hartman, 1964: 20; Rho and Lee, 1982: 37, pl. 1, figs. 5-7; Paik, 1982: 764, pl. 4o-p; 1989: 369; Jae *et al.*, 1987: 5.

Material examined. 1 specimen, Unseo-dong, Jung-gu, Incheon-si (126°29′16″E, 37°24′08″N), 23 Jul 2008, Choi HK; 2 specimens, Docheong-ri, Cheongsan-myeon, Wando-gun, Jeollanam-do (126°53′31″E, 34°10′19″N), 03 Feb 2007, Choi HK.

Diagnosis. Prostomium with 3 antennae. Dorsal papillae present on dorsum. Elytrae 12 pairs, reniform and imbricated. Elytrophores with branchial filaments. Notosetae capillary. Neurosetae thick and unidentate.

Distribution. Pacific Ocean, Japan, Korea.

Genus *Halosydna* Kinberg, 1855 미륵비늘갯지렁이속

Lateral antennae attached distally on prostomium. Elytrae 18 pairs. Branchial filaments absent. Notosetae with pointed and serrated tips. Neurosetae uni- or bidentate, with many large teeth.

Type species. *Halosydna patagonica* Kinberg, 1855.

61. *Halosydna brevisetosa* Kinberg, 1855 짧은미륵비늘갯지렁이

Halosydna brevisetosa Kinberg, 1855: 385: Hartman, 1939: 34; Berkeley and Berkeley, 1948: 18; Pettibone, 1953: 17, pl. 3, figs. 20, pl. 4, figs. 25-33, pl. 5, figs. 34-42; Imajima and Hartman, 1964: 20; Imajima, 1970: 115; Imajima and Gamo, 1970: 4, figs. 6-7; Banse and Hobson, 1974: 28; Rho and Song, 1974: 75, figs. 1-7; 1975: 100; 1979: 61; Paik, 1975: 410, pl. 1, figs. 1-4; 1979b: 46; 1980: 36, table 1, fig. A, fig. 1a-b; 1982: 762, pl. 3a-e; 1989: 377, figs. 113-114; Jae *et al.*, 1987: 7; Salazar-Silva, 2013: 1180, fig. 1.

Lepidonotus (Hylosydna) vexillarius Moore, 1903: 415, pl. 23, figs. 13-15.

Polynoe vexillatia: Izuka, 1912: 27, pl. 1, fig. 2, pl. 3, figs. 12-14.

Halosydna nebulosa: Okuda and Yamada, 1954: 181.

Halosydna johnson: Hartman, 1939: 34; 1938: 65, fig. 1-4.

Material examined. 2 specimens, Jinsan-ri, Soan-myeon, Wando-gun, Jeollanam-do (126°40′49″E, 34°06′52″N) 04 Feb 2007, Choi HK; 2 specimens, Yeonpyeong-ri, Udo-myeon, Jeju-si, Jeju-do (126°58′50″E, 33°29′23″N), 24 Jun 2014, Choi HK; 2 specimens, Maejuk-ri, Hansan-myeon, Tongyeong-si, Gyeongsangnam-do (128°37′45″E, 34°40′50″N), 27 Aug 2014, Choi HK; 1 specimen, Daepo-dong, Sokcho-si, Gangwon-do (128°38′18″E, 38°10′27″N), 15 Sep 2014, Choi HK.; 1 specimen, Guman-ri, Nam-gu, Homigot-myeon, Pohang-si, Gyeongsangbuk-do (129°34′31″E, 36°04′35″N), 19 May 2015, Choi HK.

Diagnosis. Antennae present on prostomium. Elytrae 18 pairs, with fringed margin; surface with numerous microtubercles and macrotubercles. Anterior elytrae with large and hony-like tubercles. Notosetae much slender than neurosetae, with pointed and serrated tips. Neurosetae unidentate or bidentate, and serrated.

Distribution. Alaska, California Coast, Caribbean Sea, Mexico, Panama, Puerto Rico, Yellow Sea, Japan, Korea.

Genus *Harmothoe* Kinberg, 1855 눈비늘갯지렁이속

Lateral antennae attached ventrally on prostomium. Dorsum completely covered with 15 pairs of elytrae. Notosetae usually as thick as or slightly thicker than neurosetae. Neurosetae both unidentate and bidentate.

Type species. *Harmothoe spinosa* Kinberg, 1855.

Key to the species of *Harmothoe* Kinberg, 1855 from Korea

1. Elytrae with macrotubercles; elytral margin fringed ························ 2
 - Elytrae without macrotubercles; elytral margin smooth ············ *H. forcipata*
2. Macrotubercles of elytrae multipronged; neurosetae with secondary tooth remote from tip ·· *H. hirsuta*
 - Macrotubercles of elytrae simple; neurosetae with secondary tooth close to tip ··· ·· *H. imbricata*

62. *Harmothoe forcipata* (Marenzeller, 1902) 짝눈비늘갯지렁이

Harmothoe (Evarne) forcipata: Okuda and Yamada, 1954: 179, fig. 2.

Harmothoe forcipata: Imajima and Hartman, 1964: 35; Paik, 1982: 764, pl. 4k-m; Jae *et al.*, 1985: 69, pl. 2i-l.

Material examined. 1 specimen, Punghwa-ri, Sanyang-eup, Tongyeong-si, Gyeongsangnam-do (128°24′34″E, 34°48′04″N), 21 Mar 2014, Choi HK

Diagnosis. Prostomium with well developed cephalic peaks and 3 antennae. Prostomial eyespots located behind prostomial peaks; anterior eyespots larger than posterior ones. Elytrae 15 pairs, subcircular shaped, and covered with numerous and spindle-like tubercles. Notosetae thicker than neurosetae, distally pointed, and with rows of spines. Neurosetae bidentate with broad subdistal part and unidentate with simple acute tip.

Distribution. South California, Japan, Korea.

63. *Harmothoe imbricata* (Linnaeus, 1767) 염눈비늘갯지렁이

Aphrodita imbricata Linnaeus, 1767: 1084.

Polynoe (Harmothoe) imbricata: Marenzeller, 1879: 117, pl. 2, fig. 1.

Harmothoe imbricata: Moore, 1903: 402; Izuka, 1912: 43 pl. 5, fig. 1-4, pl. 6, fig. 1; Fauvel, 1923: 55, fig. 18f-l; Berkeley and Berkeley, 1948: 11, fig. 9; Pettibone, 1963: fig. 7a-d; Imajima and Hartman, 1964: 35; Bans and Hobson, 1974: 29; Paik, 1982: 764, pl. 4g-j; 1989: 393, fig. 126; Jae *et al.* 1985: 68, pl. 2E-H; Ruff, 1995: 132, fig. 3. 11A-E; Imajima, 1997: 29, fig. 14a-l.

Material examined. 1 specimen, Deoksin-ri, Seolcheon-myeon, Namhae-gun, Gyeongsangnam-do (127°56′55″E, 34°55′27″N), 12 May 2014, Choi HK.

Diagnosis. Prostomium with 3 antennae. Prostomial eyespots located on prostomial peaks ventrally. Elytrae 15 pairs, covered with numerous and spindle-like tubercles. Notosetae thicker than neurosetae, distally pointed, and with rows of spines. Neurosetae bidentate with broad subdistal part and unidentate with simple acute tip.

Distribution. Cosmopolitan.

Genus *Lagisca* Malmgren, 1866 열대꼬리비늘갯지렁이속

Lateral antennae attached ventrally on prostomium. Body long, with 15 pairs of elytrae. Branchial filaments absent. Notosetae as thick as neurosetae. Neurosetae unidentate and bidentate. Last 8-10 segments exposed.

Type species. *Euphione elisabethae* McIntosh, 1885.

64. *Lagisca waahli* (Kinberg, 1856) 열대꼬리비늘갯지렁이

Antinoe waahli Kinberg, 1856: 385.

Lagisca waahli: Lee *et al.* 1985: 71, pl. 3G-K; Paik, 1989: 385, fig. 120.

Material examined. 1 specimen, Songseok-ri. Haeje-myeon, Muan-gun, Jeollanam-do (126°19′33″E, 35°08′12″N), 09 Apr 2013, Choi HK.

Diagnosis. Prostomium with well developed cephalic peaks. Prostomial eyespots located on prostomial peaks ventrally. Elytrae 15 pairs, with numerous tubercles on surface and smooth margin; last 9 segments not covered by elytrae. Notosetae thicker than neurosetae, distally pointed, and with rows of spines. Neurosetae bidentae with broad subdistal part and unidentate with simple acute tip.

Distribution. South Africa, Australia, New zealand, Thahiti, Malay, Philippine, Korea.

Genus *Lepidasthenia* Malmgren, 1867 긴비늘갯지렁이속

Body long, with elytrae more than 21 pairs. Lateral antennae attached distally on prostomium. Notosetae with blunt tip. Neurosetae thicker than notosetae, with uni- or bidentate.

Type species. *Lepidasthenia elegans* (Grube, 1840).

Key to the species of *Lepidasthenia* Malmgren, 1867 from Korea

1. Neurosetae bidentae only ········· *L. maculata*
 – Neurosetae both unidentate and bidentate ········· *L. izukai*

65. *Lepidasthenia izukai* Imajima and Hartman, 1964 이즈카긴비늘갯지렁이

Polynoe longissima: Izuka, 1912: 34, pi. 1, fig. 1; pi. 4, figs. 1-5.

Lepidasthenia longissima: Uschakov, 1955: 129, fig. 21A-E.

Lepidasthenia izukai Imajima and Hartman, 1964: 22; Rho and Song, 1974: 78, figs. 17-19; Paik, 1978: 368, pl. 1, figs. 1-4; 1982: 762, pl. 3f-j; 1989: 381, fig. 117; Jae *et al.*, 1987: 8-9.

Material examined. 16 specimens, Siran-dong, Sacheon-si, Gyeongsangnam-do (128°10′46″E, 34°52′48″N), 14 May 2014, Choi HK.

Diagnosis. Body with broad transverse brown band on exposed dorsum. Prostomium with 3 antennae. Elytrae 46 pairs, and not fringed. Notosetae blunt and fewer. Neurosetae both unidentate and bidentate.

Distribution. China, Japan, Korea.

Genus *Lepidonotus* Leach, 1816 예쁜이비늘갯지렁이속

Body with 12 pairs of elytrae. Lateral antennae attached distally on prostomium. Notosetae tapering distally, slender than neurosetae. Branchial filaments absent. Neurosetae unidentate, with small teeth arranged in rows.

Type species. *Lepidonotus clava* (Montagu, 1808).

Key to the species of *Lepidonotus* Leach, 1816 from Korea

1. Elytrae with smooth surface ········· *L. helotypus*
 – Elytrae with tuberculated surface ········· 2
2. Elytral tubercles both small and large cone centrally ········· *L. dentatus*

– Elytral tubercles small only 3
3. Dorsal cirri relatively short, with long ceratophore .... *L. elongatus*
– Dorsal cirri relatively long, with normal ceratophore 4
4. Anterior and posterior eyespots close to each other .... *L. tenuisetosus*
– Anterior and posterior eyespots distinctly separated from each other ....
.... *L. squamatus*

66. *Lepidonotus dentatus* Okuda and Yamada, 1954 이예쁜이비늘갯지렁이

Lepidonotus dentatus Okuda and Yamada, 1954: 177, fig. 1; Imajima and Hartman, 1964: 24; Rho and Song, 1975: 99; pl. 1, fig. 6, pl. 5, figs. 4-7; Paik, 1979b: 57, fig. 3f-j; 1982: 761, pl. 2e-g; 1989: 372, fig. 108.

Material examined. 1 specimen, Songseok-ri. Haeje-myeon, Muan-gun, Jeollanam-do (126°19′33″E, 35°08′12″N), 12 Feb 2013, Choi HK; 1 specimen, Deugam-ri, Yaksan-myeon, Wando-gun, Jeollanam-do (126°58′24″E, 34°20′49″N), 25 Aug 2006, Choi HK; 1 specimen, Ibam-ri, Nam-gu, Donghae-myeon, Pohang-si, Gyeongsangbuk-do (129°35′23″E, 35°57′21″N), 19 May 2015, Choi HK.

Diagnosis. Body with small spots on dorsum. Prostomium with median antenna and lateral antennae. Elytrae 12 pairs, reniform, without fringes, and with tuberculated surface; elytral tubercles small ones covered on surface and large cone on central region. Notosetae slender, tapering with whorls of spines. Neurosetae unidentate, with rows of teeth.

Distribution. Yellow Sea, Japan, Korea.

67. *Lepidonotus elongatus* Marenzeller, 1902 긴예쁜이비늘갯지렁이

Lepidonotus elongatus Marenzeller, 1902: 571, pl. 1, fig. 5; Imajima and Hartman, 1964: 24; Imajima and Gamo, 1970: 2, fig. 5; Rho and Song, 1974: 76, figs. 8-11; Paik, 1976: 233; 1979: 47, fig. 47; 1989: 373, fig. 109.

Material examined. 1 specimen, Sangju-ri, Sangju-myeon, Namhae-gun, Gyeongsangnam-do (128°06′40″E, 34°40′34″N), 15 Mar 2014, Choi HK; 1 specimen, Geumgap-ri, Uisin-myeon, Jindo-gun, Jeollanam-do (126°19′24″E, 34°2

2′59″N), 02 May 2015, Choi HK; 6 specimens, Simdong-ri, Jisan-myeon, Jindo-gun, Jeollanam-do (126°09′22″E, 34°22′33″N), 02 May 2015; 3 specimens, Siran-dong, Sacheon-si, Gyeongsangnam-do (128°10′46″E, 34°52′48″N), 14 May 2014, Choi HK.

Diagnosis. Prostomium with 3 antennae. Elytrae 12 pairs, subcircular-shaped, fringed with clavate papillae, and with small cylindrical tubercles on surface. Dorsal cirri short, with well developed ceratophores; ceratophores extending to ends of neurosetae.

Distribution. Japan, Korea.

68. *Lepidonotus helotypus* (Grube, 1877) 송곳예쁜이비늘갯지렁이

Lepidonotus gymnonotus: Izuka, 1912: 8, pl. 3, figs. 1-4.

Polynoe ijimai Izuka, 1912: 11, pl. 3, figs. 5-6.

Lepidonotus helotypus: Hartman, 1938a: 109; Okuda and Yamada, 1954: 177; Imajima and Hartman, 1964: 25; Imajima and Gamo, 1970: 2, fig. 4; Rho and Song, 1974: 77, figs. 12-16; 1975: 98; 1976: 61; Paik, 1975: 411, pl. 1, fig. 5; 1979b: 47, fig. 3a-b; 1982: 761, pl. 1, pl. 2a-b; 1989: 371, fig. 107; Jae *et al.*, 1987: 2-3. pl. 1A-D.

Material examined. 1 specimen, Jinha-ri, Seosaeng-myeon, Ulju-gun, Ulsan-si, Gyeongsangbuk-do (129°20′16″E, 35°22′19″N), 18 May 2012, Choi HK; 1 specimen, Gwandang-ri, Ungcheon-eup, Boryeong-si, Chungcheongnam-do (126°37′50″E, 36°14′08″N), 18 Sep 2008, Choi HK.

Diagnosis. Segments with transverse band on dorsum. Prostomium with 3 antennae. Elytrae 12 pairs, with smooth surface. Notosetae slender, tapering with whorls of spines. Neurosetae unidentate, with rows of teeth.

Distribution. Bering Sea, Okhotsk sea, East China Sea, Yellow Sea, Japan, Kurile Island, Korea.

Genus *Paradyte* Pettibone, 1969 주머니비늘갯지렁이속

Body with 15 pairs of elytrae. Lateral antennae attached ventrally on prostomium. Notosetae usually as thick as or slightly thicker than neurosetae.

Neurosetae with bifid tips and semilunar pockets.

Type species. *Paradyte crinoidicola* (Potts, 1910).

69. *Paradyte crinoidicola* (Potts, 1910) 나리주머니비늘갯지렁이

Polynoe crinoidicola Potts, 1910: 337, pl. 18, fig. 10, pl. 21, figs. 39-41.

Scalisetous longicirrus: Imajima and Hartman, 1964: 38; Day, 1967: 58, fig. 17a-f; Paik, 1976: 233, figs. 7-10; 1982: 764, pl. 4a-d; 1984: 141.

Paradyte crinoidicola: Pettibone, 1969: 13, fig. 7; Jae *et al.*, 1985: 72; Paik, 1989: 386, fig. 121; Barnich *et al.*, 2004: 312.

Material examined. 1 specimen, Woosan-ri, Byeollyang-myeon, Suncheon-si, Jeollanam-do (127°27′08″E, 34°51′36″N), 26 Mar 2013, Choi HK; 1 specimen, Haeun-ri, Hyeongyeong-myeon, Muan-gun, Jeollanam-do (126°25′40″E, 35°03′33″N), 23 Aug 2013, Choi HK.

Diagnosis. Prostomium with 3 antennae. Elytrae 15 pairs. Notosetae thicker than neurosetae, with entire tip. Neurosetae with semilunar pockets; tip bifid on supracicular position and entire on subacicular position.

Distribution. North Atlantic Ocean, Red Sea, Mozambique, Ceylon, Indian Ocean, Japan, Korea.

Family Chrysopetalidae Ehlers, 1864 등가시갯지렁이과

Body flattened. Prostomium with 3 antennae. Dorsal surface covered with golden paleae. Neurosetae composite.

Type genus. *Chrysopetalum* Ehlers, 1864.

Key to the genera of Chrysopetalidae Ehlers, 1864 from Korea

1. Prostomium without caruncle ········· *Bhawania*
- Prostomium with conspicuous caruncle covered peristomium ········· *Chrysopetalum*

Genus *Chrysopetalum* Ehlers, 1864 황금비늘갯지렁이속

Dorsum completely covered with golden paleae. Caruncle present. First segment with paired, similar ventral cirri.

Type species. *Chrysopetalum debile* (Grube, 1855).

70. *Chrysopetalum occidentale* Johnson, 1897 황금비늘갯지렁이

Chrysopetalum occidentale Johnson, 1897: 161, pl. 5, figs. 15-16, pl. 6, fig. 17-19; Hartman, 1961: 56; Imajima and Hartman, 1964: 47, pl. 9, figs. a-g; Imajima and Gamo, 1970: 4, figs. 8-10; Paik, 1982: 767, pl. 6a-e; 1989: 404, fig. 133; Rho and Lee, 1982: 38, pl. 1, figs. 8-9; Imajima, 2003: 5.

Material examined. 1 specimen, Dumi-ri, Yokji-myeon, Tongyeong-si, Gyeongsangnam-do (128°06′02″E, 34°40′08″N), May, 09, 2010, Choi HK; 1 specimen, Daejin-dong, Donghae-si, Gangwon-do (129°11′25″E, 37°33′50″N), 16 Sep 2014, Choi HK; 1 specimen, Minam-ri, Sanyang-eup, Tongyeong-si, Gyeongsangnam-do (128°26′39″E, 34°45′03″N), 21 Mar 2014, Choi HK; 4 specimens, Dueok-ri, Hansan-myeon, Tongyeong-si, Gyeongsangnam-do (128°29′39″E, 34°47′15″N), 28 Aug 14, Choi HK.

Diagnosis. Body entirely covered by gold-colored paleae. Prostomium with 2 pairs of brown eyes and 3 antennae; lateral antennae attached on frontal margin of the prostomium. Caruncle present, globular lobe, and covering peristomium. First parapodia with pair of biarticulate cirri. Neurosetae heterogomph spinigers

Distribution. Siberian Arctic Ocean, Australia, Southern California to Western Mexico, Japan, Korea.

Order Eunicida Fauchald, 1977 털갯지렁이목

This order is represented by 5 families in Korea, and 7 families are known in the world. They are characterized by throat region composed of various components such as maxillae, mandibles, and carriers.

Key to the families of Eunicida Fauchald, 1977 from Korea

1. Prostomium without antennae or palps; parapodia without dorsal or ventral cirri ·· 2
 - Prostomium with 1-7 antennae and 2 palps; parapodia with dorsal and ventral cirri ·· 3

2. Parapodia with hooded hooks; maxillary carriers short and broad ··· Lumbrineridae
 - Parapodia without hooded hooks; maxillary carriers long and slender ··· Oenonidae
3. First segment without parapodia and setae ······························ Onuphidae
 - First 2 segment without parapodia and setae ······························ 4
4. Prostomium with 2 antennae and palps ······························ Dorvilleidae
 - Prostomium with 1-5 occipital antennae and 2 palps ······························ Eunicidae

Family Onuphidae Kinberg, 1865 집갯지렁이과

Prostomium with 7 antennae. Palps short and globular. First segment without parapodia and setae. Maxillary carriers short. Parapodia with dorsal and ventral cirri.

Type genus. *Onuphis* Audouin and Milne Edwards, 1833.

Key to the genera of Onuphidae Kinberg, 1865 from Korea

1. Lower limbate setae present; subacicular hooks located on median position in fascicle ······························ *Nothria*
 - Lower limbate setae absent; subacicular hooks located on ventral position in fascicle ······························ 2
2. Branchiae with filaments arranged in spiral ······························ *Diopatra*
 - Branchiae with filaments arranged in pectinate or simple ······························ 3
3. Pseudocompound hooks on modified parapodia with long and pointed hooks ······························ *Paradiopatra*
 - Pseudocompound hooks on modified parapodia with short and blunt hoods ······························ *Onuphis*

Genus *Diopatra* Audouin and Milne Edwards, 1833 집갯지렁이속

Prostomial antennae short and conical. Prostomial cirri present. Branchial filaments arranged in spiral. Dorsal cirri digitate. Lower limbate setae absent. Subacicular hooks located on ventral position in fascicle.

Type species. *Diopatra amboinensis* Audouin and Milne-Edwards, 1833.

71. ***Diopatra sugokai*** **Izuka, 1907 털보집갯지렁이**

Diopatra bilobata: Rho and Lee, 1982: 39, pl. 2, figs. 3-9; Paik, 1989: 414, fig. 138.

Diopatra sugokai Izuka, 1907: 139, figs. 6; Imajima and Hartman, 1964: 242; Rho and Song, 1974: 8, figs. 31-36; 1975: 102; 1976: 63; Paik, 1975: 416, pl. 6, fig. 51; 1982: 796, pl. 16o-p; 1989: 413, fig. 138; Paxton, 1998: 45, fig. 2K-I, fig. 9, fig. 10, fig. 14, table 1; Imajima, 1999: 56.

Material examined. 1 specimen, Songseok-ri. Haeje-myeon, Muan-gun Jeollanam-do (126°19′33″E, 35°08′12″N), 9 Apr 2013, Choi HK; 1 specimen, Dongho-ri, Haeri-myeon, Gochang-gun, Jeollabuk-do (126°31′34″E, 35°30′29″N), 04 May 2015, Choi HK; 1 specimen, Gomso-ri, Jinseo-myeon, Buan-gun, Jeollabuk-do (35°35′11″N, 126°36′55″E), 14 Aug 2014, Choi HK.

Diagnosis. Prostomium with median and lateral antennae; ceratophores with 8-9 rings. Nuchal groove rounded. Modified parapodia on setigers 1-5 with 1-2 upper simple setae, bidentate. Following setigers with pectinate and limbate setae. Lower limbate setae absent. Subacicular hooks located on ventral position in fascicle. Branchiae with filaments arranged in spiral.

Distribution. Indo-Pacific region, Malaysia, Thailand, Indonesia, Taiwan, China, Japan, Korea.

Genus *Onuphis* Audouin and Milne Edwards, 1833 수염집갯지렁이속

Prostomial antennae short and conical. Prostomial cirri present. Branchial filaments arranged in pectinate form. Lower limbate setae absent. Subacicular hooks located on ventral position in fascicle. Pseudocompound hooks on modified parapodia with short and blunt hoods.

Type species. *Onuphis eremita* Audouin and Milne-Edwards, 1833.

72. ***Onuphis shirikishinaiensis*** **(Imajima, 1960) 실집갯지렁이**

Nothria shirikishinaiensis Imajima, 1960: 55, figs. 1-14; Imajima and Hartman, 1964: 245; Paik, 1973b: 126, pl. 2, figs. D-G; 1982: 797, pl. 17a-b; 1989: 416, fig. 140

Onuphis shirikishinaiensis: Fauchald, 1982: 53, fig. 14d.

Material examined. 1 specimen, Nongju-ri, Haeryong-myeon, Suncheon-si, Jeollanam-do (127°29′03″E, 34°51′49″N), 26 Nov 2012, Choi HK.

Diagnosis. Prostomium with ceratophores bearing more than 8 rings and occipital antennae; outer lateral antennae distinctly longer than others. pseudocompounded hooks both bi- and tridentate, with short and blunt hoods, and present from setiger 7. Lower limbate setae absent. Subacicular hooks located on venral position in fascicle. Branchiae simple, present from setiger 1.

Distribution. Japan, Korea.

Family Eunicidae Savigny, 1818 털갯지렁이과

Prostomium with 1-5 occipital antennae and pair of ventral palps; ventral palps short and globular. Maxillary carriers short and broad. First 2 segments without parapodia and setae. Setae including composite falcigers and spinigers, limbate and pectinate setae, and subacicular hook.

Type genus. *Eunice* Cuvier, 1817.

Key to the genera of Eunicidae Savigny, 1818 from Korea

1. Occipital antennae 5 ········· 2
 - Occipital antennae 3 ········· *Lysidice*
2. Peristomial cirri present ········· 3
 - Peristomial cirri absent ········· *Marphysa*
3. Subacicular hooks absent ········· *Palola*
 - Subacicular hooks present ········· 4
4. Prostomium with regularly articulated antennae; lateral black dot present between posterior parapodia ········· *Leodice*
 - Prostomium with irregularly articulated or smooth antennae; lateral black dot absent ········· *Eunice*

Genus *Eunice* Cuvier, 1817 두수염털갯지렁이속

Mid-body with branchiae. Prostomium with 5 antennae; antennae irregularly articulated or smooth antennae. Peristomial cirri present. Posterior parapodia without lateral black dot. Subacicular hooks present.

Type species. *Eunice aphroditois* (Pallas, 1788).

Key to the species of *Eunice* Cuvier, 1817 from Korea

1. Subacicular hooks light yellow or translucent ·· 2
 – Subacicular hooks dark honey-colored to black ·· 3
2. Ceratostyle on antennae articulated ·· *E. indica*
 – Ceratostyle on antennae smooth ·· *E. mucronata*
3. Dorsal cirri and antennae short and oval-shaped ·· *E. ovalifera*
 – Dorsal cirri and antennae long and elongate ·· 4
4. Branchiae present to posterior end ·· 5
 – Branchiae terminating before posterior end ·· *E. tibiana*
5. Ceratostyle on antennae articulated ·· *E. northioidea*
 – Ceratostyle on antennae smooth ·· *E. aphroditois*

73. *Eunice northioidea* Moore, 1903 염주털갯지렁이

Eunice northioidea Moore, 1903: 433, pl. 25, figs. 36-38; Imajima and Hartman, 1964: 253; Miura, 1986: 280, figs. 9-10; Paik, 1984b: 152; 1989, 431, fig. 151; Fauchald, 1992: 240, Fig. 80g-m.

Material examined. 1 specimen, Sagye-ri, Andeok-myeon, Seogwipo-si, Jeju-do (126°21 ′ 58 ″ E, 33°12 ′ 19 ″ N), 12 Oct 2008, Choi HK.

Diagnosis. Prostomium shorter and narrower than peristomium, retracted within preistomium, with pairs of eyespots. Prostomial antennae long and strongly articulated. Peristomial cirri long, slender, and articulated. Branchiae beginning from segment 4, with 1-4 filaments, long and slender. Subacicular hooks dark honey-colored to black. Setae bidentate composite falcigers with rounded hood, simple capillary, and pectinate.

Distribution. Japan, Korea.

Genus *Leodice* Lamarck, 1818

Mid-body with branchiae. Prostomium with regularly articulated antennae. Lateral black dot present between posterior parapodia. Peristomial cirri present.

Subacicular hooks present.

Type species. *Leodice antennata* Lamarck, 1818.

74. *Leodice antennata* Lamarck, 1818 고리털갯지렁이

Eunice antennata: Imajima and Hartman, 1964: 255; Rho and Song, 1975: 103, pl. 2, fig. 13, pl. 6, figs. 4-6; Paik, 1989: 427, fig. 147.

Leodice antennata: Zanol *et al.*, 2014: 90, figs. 1-2.

Material examined. 2 specimens, Yuseo-ri, Saengil-myeon, Wando-gun, Jeollanam-do (127°02′34″E, 34°18′36″N), 09 Aug 2006, Choi HK.

Diagnosis. Prostomium with 5 antennae; antennae styles regularly articulated. Peristomial cirri present on posterior peristomial ring. Lateral black dot present between posterior parapodia. Compound tridentate chaetae present only in median to posterior parapodia. Aciculae and subacicular hook present; acicula light or dark. Subacicular hooks light or dark, bi- or tridentate.

Distribution. Cosmopolitan.

Genus *Lysidice* Lamarck, 1818 솜털갯지렁이속

Body without branchiae. Prostomium with 3 antennae. Tentacular cirri absent. parapodia with limbate setae, pectinate setae, composite facigers, and subacicular hooks.

Type species. *Lysidice ninetta* Audouin and Milne-Edwards, 1833.

75. *Lysidice collaris* Grube, 1870 노란솜털갯지렁이

Lysidice collaris Grube, 1870: 495; Fauvel, 1917: 236, fig. 24; 1919: Day, 1967: 402, fig. 17. 8a-f; Imajima and Hartman, 1964: 258; Paik, 1975a: 417, pl. 7, figs. 53-56; 1982: 797, pl. 17g-j; 1989: 422, fig. 144.

Material examined. 3 specimens, Yeonpyeong-ri, Udo-myeon, Jeju-si, Jeju-do (127°00′12″E, 33°29′19″N), 24 Jun 2014, Choi HK; 1 specimen, Yanga-ri, Sangju-myeon, Namhae-gun, Gyeongsangnam-do (127°59′10″E, 34°42′36″N), 15 Mar 2014, Choi HK; 1 specimen, Guman-ri, Nam-gu, Homigot-myeon, Pohang-si, Gyeongsangbuk-do (129°34′31″E, 36°04′35″N), 19 May 2015, Choi HK.

Diagnosis. Body dark red with numerous yellow spots. Prostomium bilobed, with 3 antennae. Anterior dorsal cirri longer than posterior ones. Parapodia with hooded and bidentate composite falcigers, and capillary setae.

Distribution. North Atlantic Ocean, Red Sea, Madagascar, Mozambique, South Africa, Indo-Pacific Area, Caribbean Sea, Japan, Korea.

Genus *Marphysa* Quatrefages, 1865 바위털갯지렁이속

Prostomium bilobed or not divided, with 5 antennae. Peristomial cirri absent. Branchiae present. Setae limbate setae, pectinate setae, composite facigers and spinigers, and subacicular hooks.

Type species. *Marphysa sanguinea* (Montagu, 1815).

Key to the species of *Marphysa* Quatrefages, 1865 from Korea

1. Prostomium bilobed, with eyespots ·· *M. sanguinea*
 \- Prostomium undivided, without eyespots ·· *M. tamurai*

76. *Marphysa sanguinea* (Montagu, 1815) 바위털갯지렁이

Nereis sanguinea Montagu, 1815: 20, fig. 1.

Marphysa iwamushi Izuka, 1907: 141, fig. 5; 1912: 131, pl. 1, fig. 8, pl. 14, figs. 11-16; Okuda, 1933: 247, pl. 13, fig. a-e.

Marphysa sanguinea: Southern, 1914: 87-88; Fauvel. 1953: 245, fig. 123; Okuda and Yamada, 1954: 188; Hartman, 1961: 84; Imajima and Hartman, 1964: 259; Paik, 1975: 417, pl. 7, fig. 57-64; 1978: 372, pl. 5, fig. 9, pl. 6, fig. 1; 1979b: 55, fig. E, fig. 8 a-i; 1982: 798, pl. 17k-o; 1989: 424, fig. 145; Rho and Song, 1975: 103; Hutchings *et al.* 2012: 278, figs. 1-3.

Material examined. 1 specimen, Gwandang-ri, Ungcheon-eup, Boryeong-si, Chungcheongnam-do (126°31′50″E, 36°14′32″N), 18 Sep 2008, Choi HK; 1 specimen, Haeun-ri, Hyeongyeong-myeon, Muan-gun, Jeollanam-do (126°25′40″E, 35°03′33″N), 05 Apr 2011, Choi HK; 3 specimens, Hyangho-ri, Jumunjin-eup, Gangneung-si, Gangwon-do (126°21′58″E, 33°12′19″N), 15 Sep 2014, Choi HK; 2 specimens, Ibam-ri, Nam-gu, Donghae-myeon, Pohang-si, Gyeongsangbuk-do

(129°35′23″E, 35°57′21″N), 19 May 2015, Choi HK.

Diagnosis. Body cylindrical anteriorly, becoming dorsoventally flattened posteriorly. Prostomium bilobed, with 5 antennae. Peristomium consisting of 2 rings, without peristomial cirri. Branchiae present from setigers 13-27, with 1-6 branchial filaments. Setae limbate capillary with hirsute blades and pectinate setae on dorsal position, and compound spinigers and bifid subacicular hooks on ventral position.

Distribution. Cosmopolitan.

77. *Marphysa tamurai* Okuda, 1934 민머리털갯지렁이

Marphysa tamurai Okuda, 1934b: 521, fig. 1; Imajima and Hartman, 1964: 260; Paik, 1975a: 418, pl. 8, figs. 65-66; 1989: 426, fig. 146.

Material examined. 1 specimen, Yongho-ri, Hansan-myeon, Tongyeong-si, Gyeongsangnam-do (128°35′04″E, 34°43′21″N), 02 May 2014, Choi HK.

Diagnosis. Prostomium bluntly conical, undivided, and without eyespots. Peristomium longer than prostomium. Branchiae beginning from segment 42, and minute papilla initially. Dorsal cirri on anterior parapodia digitiform and thick basally. Ventral cirri on anterior parapodia thick and cylindrical; cirri of branchial segments inflated and smooth. Parapodial presetal lobe conical-shaped in anterior parapodia and compressed in posterior parapodia. Setae including narrowly winged capillary, pectinate ones, and composite spinigers.

Distribution. Japan, Korea.

Family Lumbrineridae Malmgren, 1867 송곳갯지렁이과

Body cylindrical and elongate. Prostomium without appendage, sometimes with 1-3 nuchal papilla. Maxillary carriers short and broad. First 2 segments without parapodia and setae. Parapodia without dorsal and ventral cirri. Neurosetae consisting of limbate setae and hooded hooks.

Type genus. *Lumbrineris* Blainville, 1828.

Key to the genera of Lumbrineridae Malmgren, 1867 from Korea

1. Anterior parapodia with palmate branchiae ························ *Ninoe*

– Branchiae absent ········· *Lumbrineris*

Genus *Lumbrineris* Blainille, 1828 송곳갯지렁이속

Prostomium globular or conical. Branchiae absent. Dorsal cirri indistinct. Composite hooded hooks present or absent, if present, with multidentate tips.

Type species. *Lumbrineris latreilli* Audouin and Milne-Edwards, 1834.

Key to the species of *Lumbrineris* Blainille, 1828 from Korea

1. Prostomium with nuchal antennae in prostomial pocket; postsetal lobes well developed in antero-median parapodia ········· *L. abyssalis*
 – Prostomium without nuchal antennae ········· 2
2. Prostomium globular ········· *L. inflata*
 – Prostomium conical ········· 3
3. Composite hooded hooks present ········· 4
 – Composite hooded hooks absent ········· 6
4. Postsetal lobes on posterior parapodia elongate ········· *L. cruzensis*
 – Postsetal lobes on posterior parapodia short and rounded ········· 5
5. Composite hooded hooks with relatively short appendage; acicula black ········· *L. japonica*
 – Composite hooded hooks with markedly long appendage; acicula yellow ········· *L. latreilli*
6. Hooded hooks beginning on setiger 1 ········· 7
 – Hooded hooks beginning on posterior to setiger 7 ········· 8
7. Postsetal lobes on posterior parapodia markedly elongate ········· *L. longifolia*
 – Postsetal lobes on posterior parapodia normal and erect ········· *L. nipponica*
8. Posterior parapodia with both markedly elongate pre- and postsetal lobes; hooded hooks beginning on setigers 7-14 ········· *L. bifurcate*
 – Posterior parapodia with both normal pre- and postsetal lobes; hooded hooks beginning on setigers 30-45 ········· *L. heteropoda*

78. *Lumbrineris heteropoda* (Marenzeller, 1879) 긴다리송곳갯지렁이

Lumbriconeris heteropoda Marenzeller, 1879: 138, pl. 5, fig. 4; pl. 6, fig. 1; Moore, 1903: 454; Izuka, 1912: 141, pl. 14, fig.19.

Lumbrineris heteropoda: Moore, 1908: 346; Imajima and Hartman, 1964: 262; Uschakov, 1965: 242, fig. 79; Imajima and Higuchi, 1975: 28, fig. 11a-m; Paik, 1973b: 127; pl. 2, figs. H-K; 1982: 800, pl. 18u-v; 1989: 438, fig. 157.

Material examined. 3 specimens, Gomso-ri, Jinseo-myeon, Buan-gun, Jeollabuk-do (126°38′28″E, 35°35′04″N), 14 Aug 2014, Choi HK.

Diagnosis. Prostomium conical, with nuchal organs. First 2 asetigerous segments slightly shorter than following segments. Posterior parapodia with projected postsetal lobes upwardly and obtusely conical presetal lobes. Setae simple hooded hooks and limbate ones; hooded hooks present from setiger 30-48, with about 8 small teeth on tip.

Distribution. Red Sea, Southern Sakhalin, Yellow sea, Japan, Korea.

79. *Lumbrineris japonica* (Marenzeller, 1879) 참송곳갯지렁이

Lumbriconereis japonica Marenzeller, 1879: 137, pl. 5, fig. 3; Izuka, 1912: 139, pl. 14, figs. 17-18.

Lumbrineris latreilli japonica Marenzeller, 1879: 137, pl. 5, fig. 3; Hartman, 1944c: 159.

Lumbriconereis latreilli: Fauvel, 1953: 266, fig. 134m-r; Hartman, 1944c: 158.

Lumbrineris japonica: Imajima and Hartman, 1964: 263; Banse and Hobson, 1974: 88; Imajima and Higuchi, 1975: 30, fig. 12a-n; Paik, 1975a: 418, pl. 18, figs. 67-48; 1978: 372, pl. 4, figs. 2-3; 1982: 799, pl. 18l-p; 1989: 145, fig. 155; Hilbig and Brigitte, 1995: 296, fig. 11. 7.

Material examined. 3 specimens, Hyangho-ri, Jumunjin-eup, Gangneung-si, Gangwon-do (126°21′58″E, 33°12′19″N), 15 Sep 2014, Choi HK.

Diagnosis. Prostomium bluntly conical. Nuchal organs present. Parapodia with blunt and short presetal lobes, and subtrianglar-shpaed postsetal lobes. Setae composite and simple hooded hooks, and limbate ones; composite hooded hooks with relatively short appendage, present from setiger 10-33, and thereafter replaced by simple hooded hooks. Acicula black.

Distribution. Indo-Pacific areas, Southern California to Mexico, Yellow Sea, Japan, Korea.

80. *Lumbrineris latreilli* Audouin and Milne-Edwards, 1834 긴가시송곳갯지렁이

Lumbrineris latreilli Audouin and Milne Edwards, 1834: 168, pl. 38, figs. 13-15; Hartman, 1944c: 158, pl. 9, figs. 213-216; Pettibone, 1963: 258, fig. 67a-c; Day, 1967: 438, fig. 17. 16p-t; Imajima and Higuchi, 1975: 32, fig. 13a-m; Kim and Paik, 1993: 50, fig. 2j-q; Hilbig, 1995: 298, fig. 11. 8; Jirkov, 2001: 264.

Lumbriconereis latreilli: Fauvel, 1919: 391; 1923: 431, fig. 171m-r; Okuda and Yamada, 1954: 189.

Lumbrinereis latreilli: Berkeley and Berkeley, 1948: 98, fig. 156.

Material examined. 11 specimens, Gusan-ri, Giseong-myeon, Uljin-gun, Gyeongsangbuk-do (126°38′28″E, 35°35′04″N), 17 Sep 2014, Choi HK; 3 specimens, Janggil-ri, Nam-gu, Guryongpo-eup, Pohang-si, Gyeongsangbuk-do (129°35′05′′E, 35°56′17′′N), 19 May 2015,

Diagnosis. Prostomium conical, longer than broad. Posterior presetal lobes rounded and posterior postsetal lobes projected upwardly. Setae composite and simple hooded hooks, and limbate ones; composite hooded hooks with relatively long appendage, continue to setiger 18-20, and thereafter replaced by simple hooded hooks. Acicula yellow.

Distribution. North Atlantic Ocean North Sea Mediterranean Sea, France Red Sea, Persian Gulf, Mozambique, South Africa, Indian Ocean Caribbean Sea,, Belize, Colombia Cuba, Gulf of Mexico, Canada, Peru, Galapagos Island, Japan, Korea.

81. *Lumbrineris longifolia* Imajima and Higuchi, 1975 긴자락송곳갯지렁이

Lumbrineris longifolia Imajima and Higuchi, 1975: 24, fig. 9a-k; Kim and Paik, 1993: 50, fig. 3a-g.

Material examined. 2 specimens, Yuseo-ri, Saengil-myeon, Wando-gun, Jeollanam-do (127°02′34″E, 34°18′36″N), 09 Aug 2006, Choi HK; 2 specimens, Gusu-ri, Baeksu-eup, Yeonggwang-gun, Jeollanam-do (126°26′20″E, 35°21′21″

N), 20 Apr 2015, Choi HK.

Diagnosis. Prostomium depressed conical. First 2 asetigerous segments present. Posterior parapodia with markedly elongate postsetal lobes, obliquely erect. Parapodia with simple hooded hooks and limbate setae, and composite hooded hooks absent; hooded hooks present from setiger 1, unidentate with about 7 small teeth; posterior parapodia without limbate setae.

Distribution. Japan, Korea.

82. *Lumbrineris nipponica* Imajima and Higuchi, 1975. 짧은다리송곳갯지렁이

Lumbrineris brevicirra: Berkeley and Berkeley, 1948: 100; fig. 158.

Lumbrineris impatiens: Okuda and Yamada, 1954: 189; Imajima and Hartman, 1964: 263.

Lumbrineris nipponica Imajima and Higuchi, 1975: 22, fig. 8a-m.

Lumbrineris brevicirra: Lee, 1976: 62, fig. 7h-k; Paik, 1982: 800, pl. 18q-t; 1984: 158; Rho and Lee, 1982: 39, pl. 3, figs. 4-5.

Lumbrineris nipponica: Paik, 1989: 437, fig. 156.

Material examined. 1 specimen, Nongju-ri, Haeryong-myeon, Suncheon-si, Jeollanam-do (127°29′03″E, 34°51′49″N), 25 Jun 2013, Choi HK; 3 specimens, Hamdeok-ri, Jocheon-eup, Jeju-si, Jeju-do (126°42′38″E, 33°31′43″N), 23 Jun 2014, Choi HK; 10 specimens, Docheong-ri, Byeonsan-myeon, Buan-gun, Jeollabuk-do (126°29′40″E, 35°34′56″N), 14 Aug 2014, Choi HK; 8 specimens, Yeonji-ri, Uljin-eup, Uljin-gun, Gyeongsangbuk-do (129°27′13″E, 36°59′15″N), 24 Jun 2014, Choi HK; 6 specimens, Yeonpyeong-ri, Udo-myeon, Jeju-si, Jeju-do (127°00′12″E, 33°29′19″N), 24 Jun 2014, Choi HK; 3 specimens, Gyema-ri, Hongnong-eup, Yeonggwang-gun, Jeollanam-do (126°25′50″E, 35°23′34″N), 20 Apr 2015, Choi HK; 4 specimens, Danghang-ri, Changseon-myeon, Namhae-gun, Gyeongsangnam-do (128°28′24″E, 34°47′33″N), 31 Jul 14, Choi HK..

Diagnosis. Prostomium short and conical. Peristomial segments 2 ring. Postsetal lobes obliquely upward. Parapodia with hooded hooks and limbate setae, and composite hooded hooks absent; hooded hooks present from setiger 1, bidentate with 2-4 small teeth between 2 main teeth on median and posterior setigers.

Distribution. Cosmopolitan.

Family Dorvilleidae Chamberlin, 1919 구슬수염갯지렁이과

Prostomium with 2 antennae and palps. Maxillae composed of 1-2 small jaws and paired carriers. Mandible present. First 2 segments without parapodia and setae. Setae including simple and composite hooks, and furcate and limbate setae.

Type genus. *Dorvillea* Parfitt, 1866.

Genus *Schistomeringos* Jumars, 1974 구슬수염갯지렁이속

Prostomium with distinct antennae and palps; antennae articulated. Notopodia with acicula. Furcate setae present.

Type species. *Schistomeringos rudolphi* (Delle Chiaje, 1828).

83. *Schistomeringos matsushimaensis* (Okuda and Yamada, 1954) 구슬수염갯지렁이

Staurocephalus matsushimaensis Okuda and Yamada, 1954: 189, fig. 6

Dorvillea matsushimaensis: Pettibone, 1961: 181; Imajima and Hartman, 1964: 269; Lee, 1976: 62, fig. 7D-G; Paik, 1982: 800, pl. 19a-d; 1989: 439, fig. 158.

Schistomeringos matsushimaensis Jumars, 1974: 132.

Material examined. 1 specimen, Yeongun-ri, Sanyang-eup, Tongyeong-si, Gyeongsangnam-do (128°28′24″E, 34°47′33″N), 28 Aug 2014, Choi HK; 2 specimens, Gungchon-ri, Geundeok-myeon, Samcheok-si, Gangwon-do (129°26′28″E, 37°16′17″N), 19 Sep 2014, Choi HK; 1 specimen, Jeorim-ri, Sanyang-eup, Tongyeong-si, Gyeongsangnam-do (128°27′10″E, 34°44′40″N), 24 Mar 2014, Choi HK; 1 specimen, Geumgap-ri, Uisin-myeon, Jindo-gun, Jeollanam-do (126°19′24″E, 34°22′59″N), 02 May 2015, Choi HK.

Diagnosis. Prostomium conical with 2 antennae and 2 palps; antennae articulated, and extending beyond palps. Dorsal cirri club-shaped with cirrophore longer than style. Ventral cirri cylindrical and shorter than parapodia. Dorsal setae 2 types: minute and denticulated capillary setae, and thick setae bearing tip with 2 teeth. Ventral setae bidentate composite; furcate setae present.

Distribution. Japan, Korea.

Family Oenonidae Kinberg, 1865 홍점갯지렁이과

Body cylindrical and elongate. Prostomium without appendage. Maxillary carriers long and slender. First 2 segments without parapodia and setae. Parapodia without dorsal and ventral cirri. Neurosetae consisting of limbate setae and sometimes acicular spines.

Type genus. *Arabella* Grube, 1850.

Key to the genera of Oenonidae Kinberg, 1865 from Korea

1. All setae limbate capillary ································ *Arabella*

 – Setae both limbate capillary and acicular spines on median and posterior parapodia ································ *Drilonereis*

Genus *Arabella* Gube, 1850 홍점갯지렁이 속

Mandible present. Maxillae present, consisting of 5 pairs of apparatus. Parapodia without acicular spines. All setae limbate capillary.

Type species. *Arabella iricolor* (Montagu, 1804).

84. *Arabella monroi* Colbath, 1989 (Fig. 18)

Arabella monroi Colbath, 1989: 292, figs. 3e, 4a, b.

Material examined. 5 specimens, Namae-ri, Hyeonnam-myeon, Yangyang-gun, Gangwon-do (128°51′06″E, 37°55′46″N), 15 Sep 2014, Choi HK; 3 specimens, Oryu 1-ri, Gampo-eup, Gyeongju-si, Gyeongsangbuk-do (129°32′21″E, 35°48′13″N), 19 May 2015, Choi HK; 6 specimens, Jinha-ri, Seosaeng-myeon, Ulju-gun, Ulsan-si, Gyeongsangbuk-do (129°20′16″E, 35°22′19″N), 19 May 2015, Choi HK; 17 Sep 2014, Choi HK.

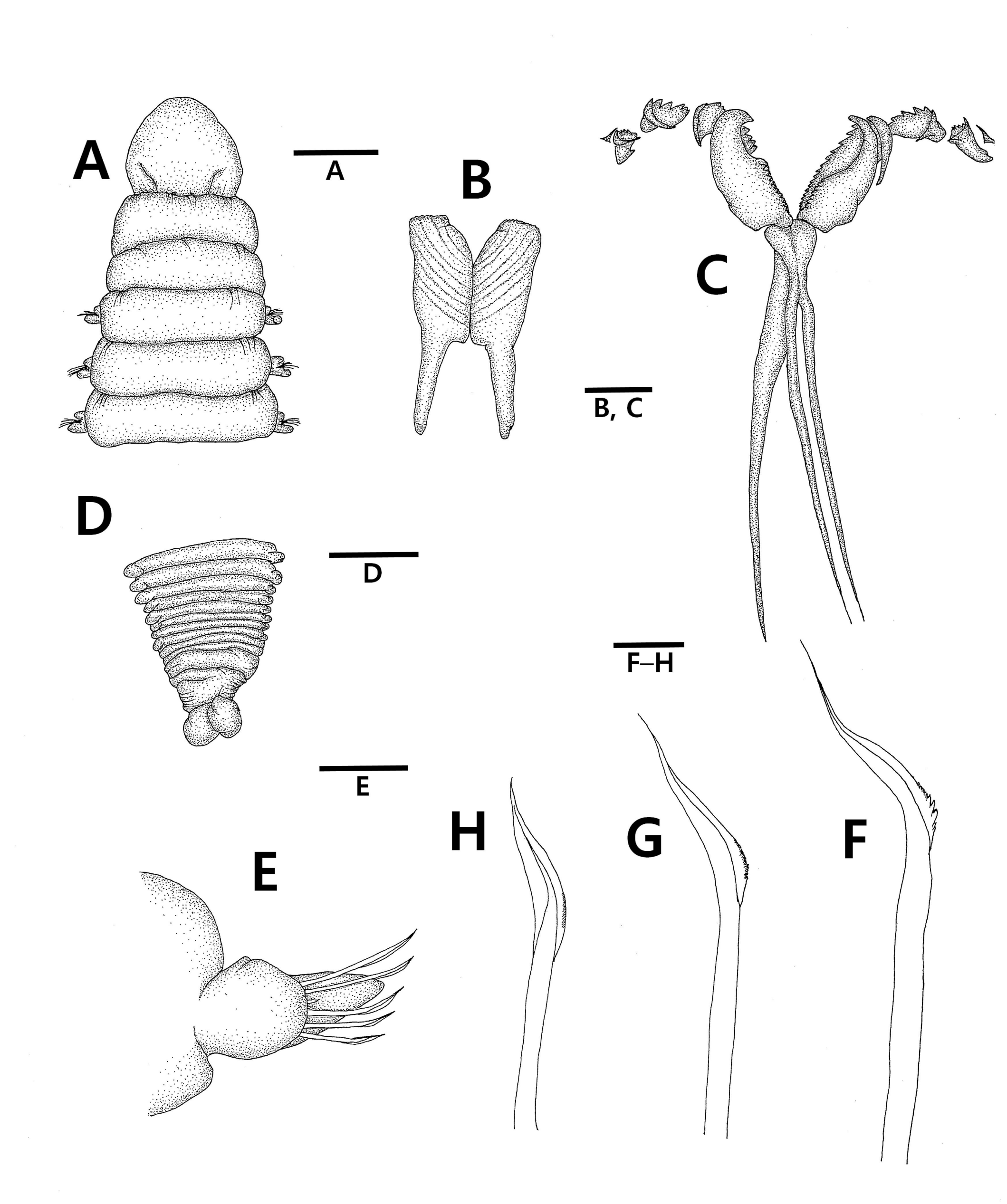

Fig. 18. *Arabella monroi* Colbath, 1989. A, anterior dorsal view B, ventral view of mandibles C, dorsal view of maxillae; D, ventral view of pygidium; E, anterior view of parapodium; F, supra-acicular seta; G, sub-acicular seta; H, modified ventral seta. Scale bars: A=1.0 mm, B, C=0.5 mm, D=0.5 mm, E=0.2 mm, F–H=0.05 mm.

Description. Body cylindrical-shaped, about 6.0-7.0 mm long with about 290 segments and width 0.8-1.0 mm. Body color reddish brown with iridescent cuticle.

Prostomium sub-conical shaped and rounded distally; 2 pairs of eyespots arranged on dorsal side of base. (Fig. 18A).

Peristomium slightly wider than prostomium, without parapodium (Fig. 18A).

Mandibles H-shaped, with short ligament. Maxillary supports with long and slender paired pieces; unpaired support pieces wider than paired supports, tapering distally (Fig. 18B).

Maxillae I (MI) asymmetrical, with 6-8 basal teeth; MI left with robust falcate and MI right with gracile falcate. Maxillae II (MII) asymmetrical; MII left with 7 to 8 teeth and MII right much longer than left, with 10 teeth and large tooth additionally on anterior margin. Maxillae III-V (MIII-V) symmetrical; MIII and MIV large, rounded, horny plate with heavily sclerotized cutting edge bearing 6-11 teeth; MV single, with pointed tooth and small base (Fig. 18C).

Parapodia with rounded presetal lobe and conical postsetal lobe; postsetal lobe twice as long as presetal lobe; notopodium with small papilla (Fig. 18E).

Setae geniculate, with serrated blade; supra-acicular setae longer than others, with finely serrated blade; sub-acicular setae more sloped than supra-acicular setae, with coarsely serrated blade; modified ventral setae with shaft tapering abruptly to distal end and finely serrated blade; aciculae dark-yellow, slightly protrudent, and composed of 2 per parapodium (Fig. 18F-H).

Pygidium without anal cirri, but with 2 rounded and swollen lateral lobes (Fig. 18D).

Remarks. The morphology of maxillae is a significant character for distinguishing species in the genus *Arabella* (Colbath, 1989; Hilbig, 1995; Steiner and Amaral, 2009). Korean materials of the present study have the asymmetrical maxillary apparatus as follows: MI left has robust and falcate protrusion, but MI right has gracile falcate protrusion; MII left are short and extending posteriorly to the falcate region of MI, while MII right are long, extending posteriorly to the base of MI. These characteristics resemble those of *A. iricolor* (Montagu, 1804) known as a cosmopolitan species (Fauvel 1923; Orensanz 1974; Colbath, 1989; Hilbig, 1995;

Steiner and Amaral, 2009). However, Korean materials of the present study differ from *A. iricolor* by the following characteristics: the parapodia have the modified ventral seta in Korean materials, while those of *A. iricolor* have not the modified ventral seta; the pygidium possesses two lateral lobes in Korean materials, but that of *A. iricolor* bears two anal cirri (Fauvel 1923; Orensanz 1974; Colbath, 1989; Hilbig, 1995; Steiner and Amaral, 2009).

According to Steiner and Amaral (2009), *Arabella* species bearing the modified ventral setae are six species, *A. aracaensis* Steiner and Amaral, 2009, *A. atlantica* Crossland, 1924, *A. multidentata* (Ehlers, 1887), *A. novecrinita* (Crossland, 1924), *A. monroi* Colbath, 1989, and *A. panamensis* Colbath, 1989. Korean materials of the present study also have the modified ventral setae, however, they differs from *A. atlantica* and *A. multidentata* by the morphologies of maxillae as follows: the maxillae of Korean materials possess the asymmetrical apparatus, while those of *A. atlantica* possess the symmetrical apparatus; Korean materials have both falcate and robust MI left and right, but *A. multidentata* has bifid and robust MI left (Crossland, 1924; Colbath, 1989; Steiner and Amaral, 2009). Korean materials also are distinguished from *A. aracaensis, A. maculosa,* and *A. panamensis* by the pygidium composed of two lateral lobes (Verrill, 1900; Colbath, 1989; Steiner and Amaral, 2009).

On the other hands, the original description of *A. monroi* suggested that the maxillae possess the asymmetrical apparatus, MI left is falcate robust, the modified ventral setae have the shaft tapering abruptly to distal guard, and the pygidium is composed of two lateral lobes (Colbath, 1989). In this respect, our Korean materials of the present study are agreed well with the original description of *A. monroi* (Colbath, 1989). But, Korean materials of the present study has a minor difference such as the modified ventral setae on parapodia have the shaft without ridge, while those of *A. monroi* have the shaft bearing two ridges (Colbath, 1989).

Distribution. Pacific Ocean, Galapagos Islands, Korea.

Genus *Drilonereis* Claparède, 1870 바늘갯지렁이속

Mandible present or absent. Maxillae consisting of 5 apparatus; maxilla I distally falcate. Setae both limbate capillary and acicular spines on median and posterior parapodia.

Type species. *Drilonereis filum* (Claparède, 1868).

85. *Drilonereis filum* (Claparède, 1868) 날씬바늘갯지렁이

Lumbriconereis filum Claparède, 1868: 454, pl. 9, fig. 1.

Drilonereis filum: Fauvel, 1919: 389; Fauvel, 1923: 435, fig. 174; Hartman, 1944c: 180; Paik, 1997: 528, fig. 2.

Material examined. 3 specimens, Yeongun-ri, Sanyang-eup, Tongyeong-si, Gyeongsangnam-do (128°28′24″E, 34°47′33″N), 24 Mar 2014, Choi HK; 6 specimens, Dueok-ri, Hansan-myeon, Tongyeong-si, Gyeongsangnam-do (128°29′39″E, 34°47′15″N), 20 May 14, Choi HK; 1 specimen, Jeogu-ri, Nambu-myeon, Geoje-si, Gyeongsangnam-do (128°37′45″E, 34°43′19″N), 20 May 14, Choi HK.

Diagnosis. Prostomium spatulate. Eyespots absent. Peristomium consisting of 2 rings. Postsetal lobes digitate and short on posterior parapodia. Setae limbate capillaries and acicular spines in most setigers. Mandible present. Maxillae I with smooth base.

Distribution. North Sea, Atlantic Ocean, Ireland, Mediterranean Sea, Japan, Korea.

Subclass Canalipalpata Rouse and Fauchald, 1997

Key to the orders of Canalipalpata Rouse and Fauchald, 1997 from Korea

1. Prostomium and peristomium fused ········ Sabellida
 - Prostomium and peristomium not fused ········ 2
2. Grooved palps single pair; nuchal organ extending backward ········ Spionida
 - Grooved palps multiple or single pair; nuchal organ not extending or absent ········ Terebellida

Order Spionida Grube, 1850 얼굴갯지렁이목

This order is represented by four families in Korea, and six families are known in the world. This taxon is characterized by having a pair of grooved palps on peristomium and nuchal organ extending backward.

Key to the families of Spionida Grube, 1850 from Korea

1. Anterior end with pair of papillose palps; branchiae absent ………………… Megalonidae
 - Anterior end without papillose palp; branchiae usually present ……………………………… 2
2. Body consisting of 2-3 regions ……………………………………………………………………… 3
 - Body without distinct region ……………………………………………………………………… Spionidae
3. Body divided into 3 regions …………………………………………………………………… Chaetopteridae
 - Body divided into 2 regions ……………………………………………………………… Poecilochaetidae

Family Spionidae Grube, 1850 얼굴갯지렁이과

Anterior end with pair of grooved palps on dorsal side. Prostomium rounded or incised or with frontal horn. All setae simple. Hooded hooks present on posterior setigers.

Type genus. *Spio* Fabricius, 1785.

Key to the genera of Spionidae Grube, 1850 from Korea

1. Branchiae absent; 1-2 large curved neropodial hooks present on setiger 1 ………… ……………………………………………………………………………………………… *Spiophanes*
 - Branchiae present; large neropodial hooks absent on setiger 1 ……………………………… 2
2. Setiger 5 modified ……………………………………………………………………………………… 7
 - Setiger 5 not modified ………………………………………………………………………………… 3
3. Prostomium pointed; branchiae fused to dorsal lamellae at least basally ……………… ……………………………………………………………………………………………… *Scolelepis*
 - Prostomium broadly rounded or incised, or with lateral or frontal horns; branchiae free ……………………………………………………………………………………… 4
4. Branchiae concentrated in anterior setigers, and absent in posterior setigers; hooded hooks present on both noto- and neuropodia ………………………………………… 5
 - Branchiae present over most of body; hooded hooks present on neuropodia ……… 6
5. Branchiae present from setiger 1 …………………………………………………… *Paraprionospio*
 - Branchiae present from setiger 2 or 3 ……………………………………………… *Prionospio*

6. Interparapodial pouches present ········· *Laonice*
 - Interparapodial pouches absent ········· *Spio*
7. Branchiae beginning on setiger 2 ········· 8
 - Branchiae beginning on setigers 6-12 ········· 9
8. Setiger 5 with 1 type of modified spines, simple and falcate ········· *Boccardiella*
 - Setiger 5 with 2 type of modified spines, simple and falcate ones and ones with expanded end bearing cusps or bristles ········· *Boccardia*
9. Modified spines on setiger 5 arranged in U-shaped series; setiger 5 moderately modified ········· *Pseudopolydora*
 - Modified spines on setiger 5 arranged in straight line or slightly curved; setiger 5 greatly modified ········· *Polydora*

Genus *Boccardiella* Blake and Kudenov, 1978

Setiger 5 modified. Neropodial hooks absent on setiger 1. Branchiae present, and beginning on setiger 2. Setiger 5 with 1 type of modified spines in single row, simple falcate spines.

Type species. *Boccardiella hamata* (Webster, 1879).

86. *Boccardiella hamata* (Webster, 1879) 유령얼굴갯지렁이

Polydora hamata Webster, 1879: 251.

Polydora (Boccardia) uncata: Okuda, 1937: 238, fig. 16-17.

Boccardia uncata: Imajima and Hartman, 1964: 281; Paik, 1982: 805, pl. 20b; 1989: 455, fig. 166.

Boccardiella hamata: Blake and Kudenov, 1978: 264.

Material examined. 2 specimens, Gwan-ri, Iwon-myeon, Taean-gun, Chungcheongnam-do (126°14′19″E, 36°53′05″N), 23 May 2012, Choi HK; 1 specimens, Yeonpyeong-ri, Udo-myeon, Jeju-si, Jeju-do (126°58′50″E, 33°29′23″N), 24 Jun 2014, Choi HK; 1 specimens, Punghwa-ri, Sanyang-eup, Tongyeong-si, Gyeongsangnam-do (128°24′34″E, 34°48′04″N), 25 Mar 2014, Choi HK.

Diagnosis. Prostomium with shallow notch anteriorly and caruncle posteriorly.

Setiger 5 strongly modified with capillary notosetae and 1 type of modified spines in single row. Branchiae present from setiger 2, and absent on setiger 5. Bidentate hooded hooks present from setiger 7. Posterior notopodia with single thick and recurved hooks accompanied by capillary setae.

Distribution. West Canada, California, Japan, Korea.

Genus *Laonice* Malmgren, 1867 납작얼굴갯지렁이

Prostomium rounded anteriorly. Setiger 5 not modified. Branchiae not fused to dorsal lamellae basally, beginning from setiger 2, and present over most of body. Interparapodial pouches present. Hooded hooks present on neuropodia only.

Type species. *Laonice cirrata* (Sars, 1851).

87. *Laonice cirrata* (Sars, 1851) 납작얼굴갯지렁이

Nerine cirrata Sars, 1851: 207.

Laonice cirrata: Fauvel, 1927: 38, fig. 12a-c; Okuda, 1937: 222; Imajima and Hartman, 1964: 281; Paik, 1982: 807, pl. 20m-n; 1989: 464, fig. 174; Blake, 1996c: 111, fig. 4. 6.

Material examined. 1 specimen, Yeongun-ri, Sanyang-eup, Tongyeong-si, Gyeongsangnam-do (128°28′24″E, 34°47′33″N), 28 Aug 2014, Choi HK.

Diagnosis. Prostomium entire, rounded anteriorly, and without frontal horn. Peristomium reduced. Postsetal lamellae well developed. Branchiae present from setigers 2-35, apinnate, and separated from notopodial lamellae. Interparapodial pouches beginning on setiger 7. Notosetae capillary. Neuropodial hooks from setiger 14 bidentate.

Distribution. Cosmopolitan.

Genus *Paraprionospio* Caullery, 1914

Prostomium broadly rounded or incised, or with lateral or frontal horns. Setiger 5 not modified. Branchiae not fused to dorsal lamellae basally, beginning from setiger 1, and concentrated in anterior setigers. Hooded hooks present on both noto- and neuropodia.

Type species. *Paraprionospio pinnata* (Ehlers, 1901).

Key to the species of *Paraprionospio* Caullery, 1914 from Korea

1. Setiger 8 with bilobed flap ventrally ············ *P. cordifolia*
 – Setiger 8 without bilobed flap ············ 2
2. Setiger 3 with filaments on dorsum; branchial lamellae flabellate ············ *P. patiens*
 – Setiger 3 without filaments on dorsum; branchial lamellae bifoliate ············ *P. coora*

88. *Paraprionospio coora* Wilson, 1990

Paraprionospio coora Wilson, 1990: 266, figs. 75-83; Yokoyama, 2007: 264, fig. 8; Yokoyama *et al.*, 2009: 134, figs. 2-3; Yokoyama and Choi, 2010: 56, fig. 2; Martínez and Adarraga, 2013: 271, fig. 2.

Material examined. 3 specimens, Dueok-ri, Hansan-myeon, Tongyeong-si, Gyeongsangnam-do (128°29′39″E, 34°47′15″N), 28 Aug 14, Choi HK.

Diagnosis. Eyespots 2 pairs on prostomium. Peristomium with pigment patch on lateral side and small papilla on posterior margin. Branchiae 3 pairs, present on setigers 1-3, and with bifoliate lamellar plates; first branchial shaft with 2-6 conic processes. Neuropodial hooded hooks with 2-3 pairs of teeth above main fang, beginning from setiger 9. Notopodial hooded hooks with 3 pairs of teeth above main fang present from setigers 30-38. Ventral bilobed flap on setiger 8 absent.

Distrbution. Mediterranean Sea, Australia, Yellow Sea, East China Sea, Japan, Korea.

Genus *Prionospio* Malmgren, 1867 예쁜얼굴갯지렁이속

Prostomium blunt anteriorly. Setiger 5 not modified. Branchiae more than 3 pairs, beginning from setiger 2 or 3, and concentrated in anterior setigers. Hooded hooks present on both noto- and neuropodia.

Type species. *Prionospio steenstrupi* Malmgren, 1867.

Key to the species of *Prionospio* Malmgren, 1867 from Korea

1. Branchiae apinnate only ············ 2

– Branchiae either pinnate or both apinnate and pinnate ········· 3
2. Branchiae 4 pairs ········· *P. (Minuspio) japonica*
– Branchiae more than 4 pairs ········· *P. (M.) multibranchiata*
3. Branchiae pinnate only ········· *P. (Aquilaspio) krusadensis*
– Branchiae both apinnate and pinnate ········· 4
4. Only first pair of branchiae pinnate ········· *P. (Prionospio) saccifera*
– Both first and fourth pairs of branchiae pinnate ········· 5
5. Interparapodial pouches present ········· *P. (P.) bocki*
– Interparapodial pouches absent ········· 6
6. Caruncle extending to base of setiger 1 ········· *P. (P.) membranacea*
– Caruncle extending to base of setiger 2 ········· *P. (P.) paradisea*

89. *Prionospio (Aquilaspio) krusadensis* Fauvel, 1929 깃예쁜얼굴갯지렁이

Prionospio aucklandica Augener, 1923: 69.

Prionospio krusadensis: Imajima and Hartman, 1964: 284; Paik, 1982: 807, pl. 20i-J; 1984b: 152; 1989: 462, fig. 172.

Prionospio (Aquilaspio) krusadensis: Imajima, 1990: 5, Fig. 3a-n

Material examined. 2 specimens, Deoksin-ri, Seolcheon-myeon, Namhae-gun, Gyeongsangnam-do (127°56′55″E, 34°55′27″N), 12 May 2014, Choi HK; 11 specimens, Minam-ri, Sanyang-eup, Tongyeong-si, Gyeongsangnam-do (128°26′39″E, 34°45′03″N), 21 Mar 2014, Choi HK.

Diagnosis. Prostomium spindle-shaped, bluntly rounded anteriorly, with narrow caruncle extending to setiger 1. Branchiae 3 pairs, all pinnate, and present from setiger 2. Notopodial setae on setiger 1 absent. Notopodial postsetal lamellae largest. Setae sheathed capillary and hooded hooks.

Distribution. Mediterranean Sea. Indian, New Zealand, Japan, Korea.

90. *Prionospio (Minuspio) multibranchiata* Berkeley, 1927

Prionospio multibranchiata Berkeley, 1927: 414, pl. 1, fig. 1.

Minuspio cirrifera: Foster, 1971: 108, figs. 262-275.

Prionospio (Minuspio) multibranchiata: Maciolek, 1985: 365, fig. 15; Imajima, 1990:

71, fig. 8a-e, 9a-h; Jung *et al.*, 1998: 218, fig. 2.

Material examined. 5 specimens, Haeun-ri, Hyeongyeong-myeon, Muan-gun, Jeollanam-do (126°25′40″E, 35°03′33″N), 19 Dec 2011, Choi HK.

Diagnosis. Prostomium subtriangular, broadly rounded anteriorly, with narrow caruncle extending to setiger 1. Branchiae 9-11 pairs, all apinnate, and present from setiger 2. Notopodial lamellae largest in branchial region, and extending across dorsum to form low dorsal crests on post-branchial setigers 11-13. Setae sheathed capillary and hooded hooks.

Distribution. Vancouver Island, Gulf of Mexico, Florida, Japan, Korea.

91. *Prionospio membranacea* Imajima, 1990

Prionospio membranacea Imajima, 1990: 128, figs. 14-15; Jung *et al.*, 1998: 223, fig. 5

Material examined. 4 specimens, Yeongun-ri, Sanyang-eup, Tongyeong-si, Gyeongsangnam-do (128°28′24″E, 34°47′33″N), 24 Mar 2014, Choi HK; 3 specimens, Danghang-ri, Changseon-myeon, Namhae-gun, Gyeongsangnam-do (128°28′24″E, 34°47′33″N), 31 Jul 14, Choi HK.

Diagnosis. Prostomium truncate anteriorly, with narrow caruncle extending to setiger 1. Branchiae present on setigers 2-5; first and fourth pairs pinnate and elongate, and second and third pairs apinnate. Notopodial lamellae foliaceous, largest in branchial region; notopodial lamellae on setiger 7 connected by high membranous dorsal crest. Setae sheathed capillary and hooded hooks with 5-6 pairs of small teeth above main fang.

Distribution. Japan, Korea.

92. *Prionospio japonicus* Okuda, 1935 매끈예쁜얼굴갯지렁이

Prionospio japonicus Okuda, 1935: 241. fig. 1; 1937: 242, fig. 19; Imajima and Hartman, 1964: 284; Paik, 1975: 419; 1982: 807, pl. 20k-l; 1989: 463, fig. 173.

Material examined. 1 specimen, Haeun-ri, Hyeongyeong-myeon, Muan-gun, Jeollanam-do (126°25′40″E, 35°03′33″N), 19 Dec 2011, Choi HK; 13 specimens, Namdong-ri, Imhoe-myeon, Jindo-gun, Jeollanam-do (126°09′10″E, 34°21′35″N), 09 Apr 2013, Choi HK; 2 specimens, Noil-ri, Gwayeok-myeon, Goheung-gun, Jeollanam-do (127°16′50″E, 34°40′04″N), 30 Apr 2013, Choi HK; 3 specimens, Na-ri, Gunnae-myeon, Jindo-gun, Jeollanam-do (126°12′52″E, 34°33′35″N), 09 Apr 2013, Choi HK; 2 specimens, Maeeum-ri, Samsan-myeon, Ganghwa-gun, Incheon-si (126°19′28″E, 37°39′07″N), 04 Jul 2012, Choi HK; 5 specimens, Gomso-ri, Jinseo-myeon, Buan-gun, Jeollabuk-do (126°38′28″E, 35°35′04″N), 14 Aug 2014, Choi HK.

Diagnosis. Prostomium bluntly triangular, with small median peak. Caruncle reaching to setiger 1. Eyespost 2 pairs. Palps slender, and extending to setiger 6-8. Branchiae 4 pairs, all apinnate, and present on setigers 2-5; longest branchiae first pairs. Notopodial lamellae largest in setigers 2-6; lamellae on post-branchial setigers becoming smaller. Setae striated capillary and hooded hooks.

Distribution. Japan, Korea.

Genus *Scolelepis* Blainville, 1828

Prostomium pointed, sometimes blunt. Setiger 5 not modified. Branchiae fused to dorsal lamallae at least basally, beginning from setiger 2. Setae all capillary on anterior setigers and both hooded hooks and capillaries in posterior setigers.

Type species. *Scolelepis (Scolelepis) squamata* (Muller, 1806).

Key to the species of *Scolelepis* Blainville, 1828 from Korea

1. Hooks bidentate with straight shaft ······································ *S.* (*Scolelepis*) *kudenovi*
 – Hooks multidentate with curved shaft ······················ *S.* (*Parascolelepis*) *yamaguchii*

93. *Scolelepis* (*Scolelepis*) *kudenovi* Hartmann-Schröder, 1981 (Fig. 19)

Scolelepis (*Scolelepis*) *kudenovi*: Imajima, 1992: 17, figs. 11-12.

Material examined. 5 specimens, Gyema-ri, Hongnong-eup, Yeonggwang-gun, Jeollanam-do (126°26′14″E, 35°23′27″N), 02 Apr 15, Choi HK.

Description. Body slender, about 8.0 mm long in incomplete specimens and width about 1.0 mm at anterior region including parapodia.

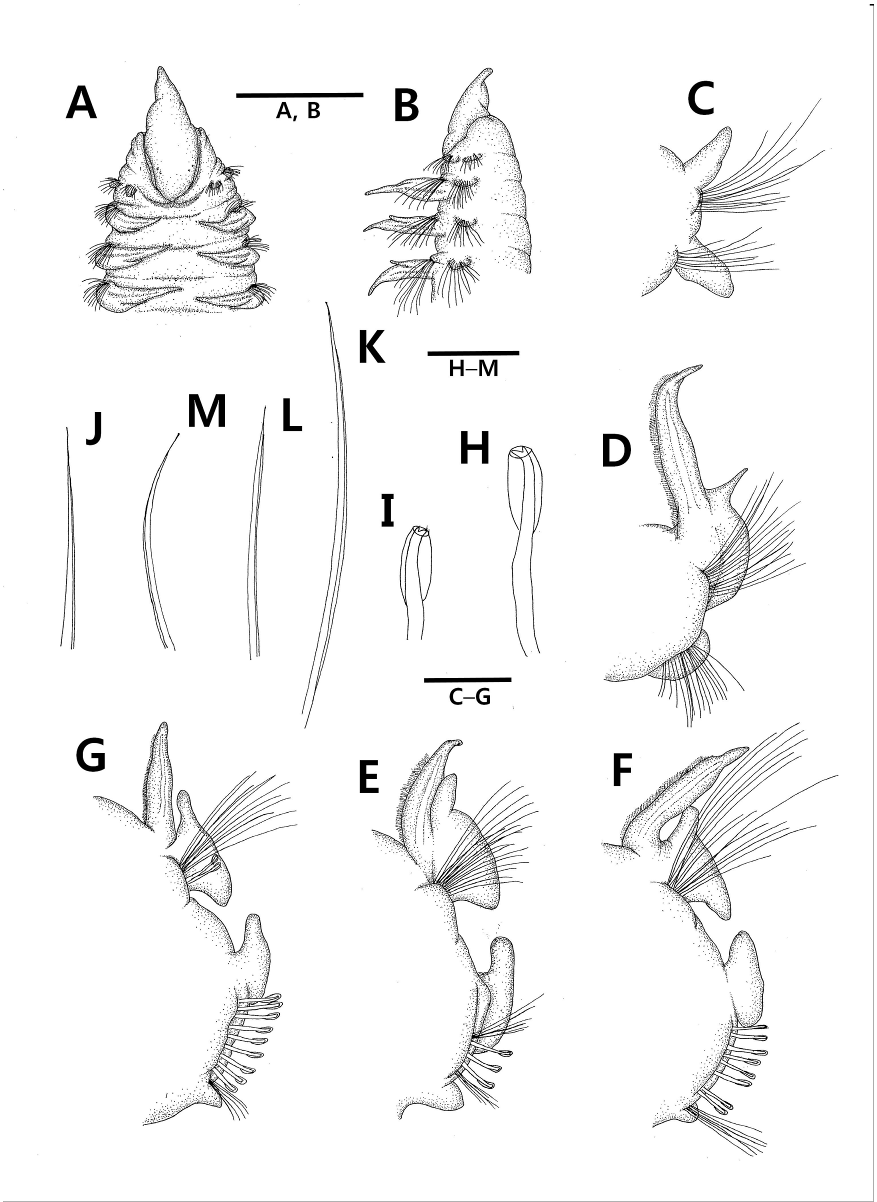

Fig. 19. *Scolelepis (Scolelepis) kudenovi* Hartmann-Schröder, 1981. A, dorsal view of anterior end; B, lateral view of anterior end; C, anterior view of first setiger; D, anterior view of setiger 12; E, anterior view of setiger 42; F, anterior view of setiger 58; G, anterior view of posterior setiger; H, notopodial hooded hook; I, neuropodial hooded hook; J, neuropodial capillary seta of setiger 12; K, notopodial seta in posterior row of setiger 42; L, neuropodial seta in anterior row of setiger 42; M, neuropodial companion seta of posterior setiger. Scale bars: A, B=0.5 mm, C-G=0.2 mm, H-M=0.05 mm.

Prostomium conical-shaped, elongated and tapered anteriorly, and extending to setiger 1 with distinct protuberance posteriorly; 2 pair of eyespots arranged in transverse row. Occipital tentacle absent. Palps paired, reaching to about setigers 10-23. Peristomium distinct from setiger 1, forming lateral wings on each sides (Fig. 19A, B).

First setiger without branchiae, but with conical-shaped notopodial and neuropodial presetal lamallae; notopodial lamellae slightly longer than neuropodial ones (Fig. 19C).

Branchiae elongate and tapered with pointed tip, present from setiger 2, and continued until posterior end (Fig. 19D-G).

Notopodial postsetal lamellae on anterior and median setigers partially fused to branchiae; pointed tips of lamellae separated from branchiae. Notopodial postsetal lamellae on posterior setigers almost separated from branchiae. becoming gradually smaller, and elongate ventrally. Notopodial presetal lobes low and rounded. Neuropodial postsetal lamellae low and rounded, divided into interramal and ventral lamellae from median and posterior setigers; interramal lamellae low and rounded, with elongate tips dorsally, and ventral lamellae increasing transverse length (Fig. 19D-G).

Anterior setigers with limbate capillary only, arranged in 2 transverse rows. Notopodial hooded hooks bidentate with open hoods, composed of 2-4 hooks per fascicle, present on posterior setigers. Notopodial capillary setae slender, present on posterior setigers. Neuropodial hooded hooks bidentate with open hoods, composed of 5-12 hooks per fascicle, and present from setigers 30-33. Neuropodial capillary setae slender, present on setigers bearing neuropodial hooded hooks. (Fig. 19H-M).

Remarks. The present species, *Scolelepis (Scolelepis) kudenovi* Hartmann-Schröder, 1981 originally described from Australia, was first reported from East Asia by Imajima (1992) based on the distinctive features as follows: the prostomium is elongated and tapered anteriorly; the occipital tentacle is absent; the branchiae on the anterior setigers are almost fused to the notopodial postsetal lamellae; the notopodial and neuropodial hooded hooks are bidentate only; the notopodial hooded hooks are present on the posterior setigers (Imajima, 1992). In this respect, Korean materials of *Scolelepis* are generally agreed well with Imajima's materials of *S. (S.) kudenovi*. However, there are some minor differences as follows: the setigers 2-4 of *S. (S.) kudenov* have the mammiform neuropodial postsetal lamellae with narrow tips, while those of Korean materials have the simply rounded ones (Imajima, 1992).

Among *Scolelepis* species, *S. (S.) kudenovi* resembles *S. (S.) daphoinos* Zhou, Ji and Li, 2009, originally described from Chinese waters, in having bidentate notopodial and neuropodial hooded hooks (Imajima, 1992; Zhou *et al*., 2006). However, these two species are distinguishable from each other by the following characteristics: the distinct reddish pigment patches are absent in *S. (S.) kudenovi,* while those of Chinese species are present on the dorsum of anterior body and on the posterior part of the prostomium; the palps are extending to about the setigers 10-23 in *S. (S.) kudenovi*, while those of Chinese species are reaching to the setiger 3 (Imajima, 1992; Zhou *et al*., 2006).

Distribution. Yellow Sea, Korea.

Family Poecilochaetidae Hannerz, 1956 사천왕갯지렁이과

Body long and slender. Prostomium small with frontal antenna. Eyespots usually present. Cephalic cage with long setae arising from first parapodium. Ventral facial tubercle on upper lip of mouth projecting anteriorly, along with parapodial lobes and cephalic cage.

Type genus. *Poecilochaetus* Claparède in Ehlers, 1875

Genus *Poecilochaetus* Claparède in Ehlers, 1875 사천왕갯지렁이속

Prostomium small, rounded, and with 2 pairs of eyespots. Nuchal organ tentaculiform. Grooved palps present. First parapodium with elongate postsetal lobes and long setae forming cephalic cage. Setiger 1-3 with thick and curved spines on neuropodia. Branchiae present. Posterior parapodia modified, with notopodial spines.

Type species. *Poecilochaetus fulgoris* Claparède in Ehlers, 1875

94. *Poecilochaetus johnsoni* Hartman, 1939 사천왕갯지렁이

Poecilochaetus johnsoni Hartman, 1939: 164, figs. 14-24; Paik, 1982: 842, pl. 29a-e; 1989: 469, fig. 178; Blake, 1996d: 228, fig. 5. 1.

Material examined. 2 specimens, Dueok-ri, Hansan-myeon, Tongyeong-si, Gyeongsangnam-do (128°29′39″E, 34°47′15″N), 28 Aug 14, Choi HK.

Diagnosis. Prostomium subsperical with 2 pairs of eyespots. Nuchal organ well developed. First parapodium enlarged, and extending forward bearing short finger-like dorsal tentacular cirrus and long ventral tentacular cirrus. Setae including 4 types: smooth and slender capillaries, spinous setae, plumose setae, and stout spines.

Distribution. central and southern California, North Carolina, Florida, Gulf of Mexico, Korea.

Family Magelonidae Cunningham and Ramage, 1888 양손갯지렁이과

Prostomium flattened. Anterior end with pair of papillose adhesive palps. Branchiae absent. Abdomen with well developed parapodial lamellae. Hooded hooks present.

Type genus. *Magelona* Müller, 1858.

Genus *Magelona* Muller, 1858 양손갯지렁이속

Prostomium flattened, with frontal horns. Palps present. Setae capillaries and hooded bi- or multidentate hooks.

Type species. *Magelona papillicornis* Muller, 1858.

95. *Magelona japonica* Okuda, 1937 양손갯지렁이

Magelona japonica Okuda, 1937: 247, figs. 23-24; Imajima and Hartman, 1964: 290; Tampi and Rangarajan, 1964: 113; Paik, 1975: 420; 1982: 809, pl. 21e; 1989: 417, fig. 179.

Material examined. 22 specimens, Nongju-ri, Haeryong-myeon, Suncheon-si, Jeollanam-do (127°30′29″E, 34°50′34″N), 29 Jul 2011, Choi HK; 14 specimens, Haeun-ri, Hyeongyeong-myeon, Muan-gun, Jeollanam-do (126°25′40″E, 35°03′33″N), 19 Dec 2011, Choi HK; 15 specimens, Yeomho-ri, Hansan-myeon, Tongyeong-si, Gyeongsangnam-do (126°30′58″E, 34°47′32″N), 20 May 2014, Choi HK..

Diagnosis. Prostomium with distinct frontal horn and cephalic ridges. Palps long, extending to segments 15-23, and covered with crowded papillae subdistally. Dorsal and ventral postsetal lobes subequal in length on posterior regions. Setae winged capillary; setiger 9 with setae slender, distally pointed and narrowly limbate. Uncinigerous hooks tridentate with 2 small above main fang.

Distribution. Western Canada, Japan, Korea.

Order Terebellida Malmgren, 1867 유령갯지렁이목

This order is represented by seven families in Korea, and 10 families are known in the world. They are characterized by numerous tentacles or palps with furrows or single pair of palps with longitudinal grooves and simple or branched branchiae.

Key to the families of Terebellida Malmgren, 1867 from Korea

1. Body short; posterior end with chitinized shield ······ Sternaspidae
 - Body elongate; posterior end without chitinized shield ······ 2
2. Anterior end modified by buccal tentacles ······ 3
 - Anterior end not modified ······ Cirratulidae
3. Multiarticulate compound setae present ······ Flabelligeridae
 - Multiarticulate compound setae absent ······ 4
4. Paleae arranged in distinct single row ······ Pectinariidae
 - Paleae usually absent or if present as fascicles of heavy spines ······ 5
5. Tentacles retractile into mouth; branchiae simple, arranged in 1 transverse row ······ Ampharetidae
 - Tentacles non-retractile; branchiae absent or simple or branched, present on 1-3 segments ······ 6
6. Upper lip large; uncini with long and acicular shafts on thoracic segments ······ Trichobranchidae
 - Upper lip usually small; uncini with avicular or pectinate on thoracic segments ······ Terebellidae

Family Cirratulidae Carus, 1863 실타래갯지렁이과

Prostomium conical or rounded without appendage. Anterior end with single pair of long and grooved tentacles or numerous grooved tentacles.

Type genus. *Cirratulus* Lamarck, 1818.

Key to the genera of Cirratulidae Carus, 1863 from Korea

1. Anterior end with single pair of long and grooved dorsal tentacles 2
 - Anterior end with 2 groups or series of numerous tentacular filaments 3
2. Setae all smooth capillary, and modified setae absent .... *Aphelochaeta*
 - Setae including smooth capillary, and modified setae present as acicular spines .... *Chaetozone*
3. First branchiae on same setiger as tentacular filaments; tentacular filaments arising from single segments .... *Cirratulus*
 - First branchiae arising from anterior segment to tentacular filaments; tentacular filaments arising from more than 2 segments 4
4. Branchiae close to notopodia in anterior setigers, shifting toward mid-dorsum of body in median setigers .... *Timarete*
 - Branchiae remaining just dorsal to notopodium throughout, not becomimg more mid-dorsal in median setigers .... *Cirriformia*

Genus *Aphelochaeta* Blake, 1991

Prostomium conical. Anterior end with single pair of long and grooved tentacles on dorsal side. Setae all smooth capillary, and modified acicular spines absent.

Type species. *Aphelochaeta monilaris* (Hartman, 1960).

96. *Aphelochaeta monilaris* (Hartman, 1960) (Fig. 20)

Tharyx monilaris Hartman, 1960: 127, pl. 12, figs. 1-2.

Aphelochaeta monilaris: Blake, 1991: 28; 1996e: 333, fig. 8.28.

Material examined. 7 specimens, Yeongun-ri, Sanyang-eup, Tongyeong-si, Gyeongsangnam-do (128°28′24″E, 34°47′33″N), 28 Aug 14, Choi HK; 9 specimens, Dueok-ri, Hansan-myeon, Tongyeong-si, Gyeongsangnam-do (128°29′39″E, 34°47′15″N), 28 Aug 14, Choi HK; 6 specimens, Danghang-ri, Changseon-myeon, Namhae-gun, Gyeongsangnam-do (128°28′24″E, 34°47′33″N), 31 Jul 14, Choi HK.

Description. Body slender, about 18 mm long and width about 0.5 mm, and consist of 3 distinct regions; thoracic region composed of 10-20 setigers and expanded laterally; mid-region longer than other regions, with non-moniliform segments; posterior region expanded laterally and composed of 10-15 segments (Fig. 20A-C).

Prostomium pointed and conical shaped. Eyespots absent. Peristomium elongate, with single pair of grooved dorsal tentacles arising between peristomium and first setiger (Fig. 20A, B).

Setae simple capillary with smooth edge; thoracic setigers with 8-14 setae per fascicle, and following setigers with fewer setae than ones on thoracic setigers (Fig. 20D).

Pygidium with simple lobe (Fig. 20C).

Methyl green staining patterns present on thoracic segment and prostomium; ventral side of thoracic segments with transverse stripes extending laterally to parapodial edge and scattered small spots over thorax; prostomium staining at tip (Fig. 20B).

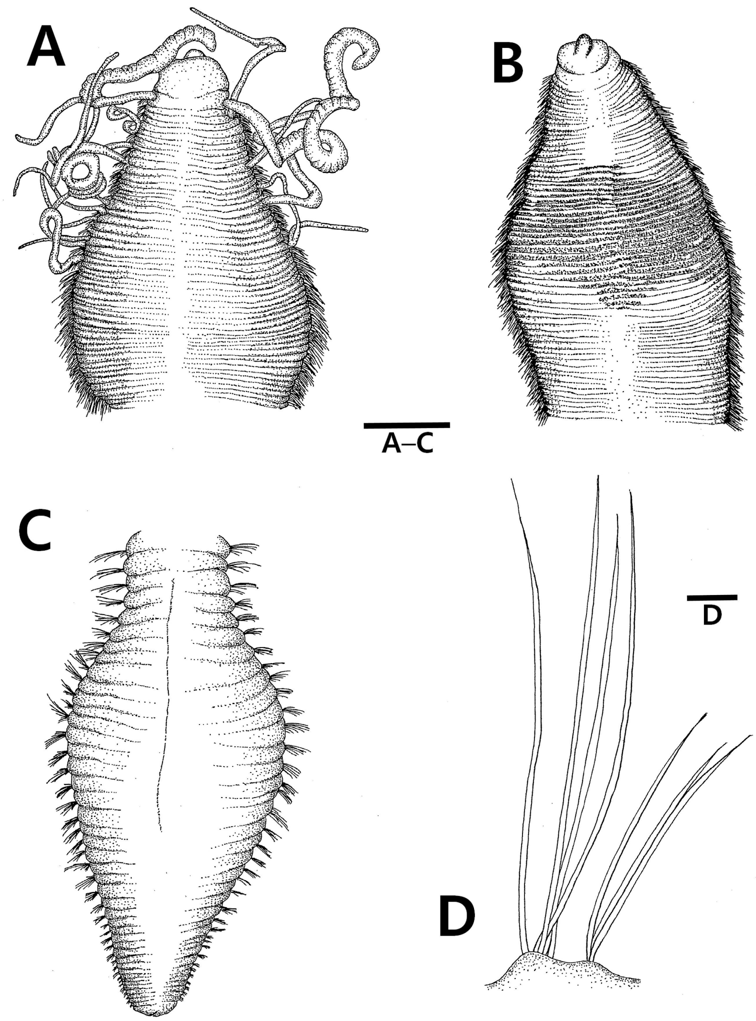

Fig. 20. *Aphelochaeta monilaris* (Hartman, 1960). A, dorsal view of anterior end; B, ventral view of anterior end (omitted tentacles and branchiae); C, dorsal view of posterior end; D, parapodium of mid-body. Scale bars: A-C=0.5 mm, D=0.05 mm.

Remarks. *Aphelochaeta monilaris* (Hartman, 1960) was first described by Hartman (1960) as a species of genus *Tharyx* Webster and Benedict, 1887. However, Blake (1991) established the genus *Aphelochaeta* Blake, 1991 based on 10 cirratulid species including this present species, reported as *Tharyx* species, and suggested the diagnostic characteristic of the genus such as the simple and non-denticulate capillary setae (Blake, 1991e). *A. monilaris* is distinguished from it congeners by the following characteristics: the body is expanded laterally in anterior and posterior regions; the methyl green pattern shows transverse ventral bands extending to the parapodial edge on thoracic segments (Blake, 1991, 1996e).

In this respect, Korean materials of the present study agree well with the descriptions of *A. monilaris* (Blake, 1991, 1996e). Blake (1996e) mentioned that *A. monilaris* has moniliform segments in the mid-body, and those are best expressed in sexually mature materials. However, Korean materials show non-moniliform segments in the mid-body, and they are considered as the atokous materials.

Aphelochaeta monilaris resembles *A. williamsae*, originally reported from Santa Maria Basin in California, in having expanded anterior and posterior end (Blake, 1996e). However, these two species differ from each other by the methyl green pattern such that the ventral bands of thoracic segments are thick and extending to the lateral side on the anterior edge of notopodia in *A. monilaris*, whlie those of *A. williamsae* are narrow and not extending to the lateral side (Blake, 1996e).

The species belonging to the genus *Aphelochaeta.* is first reported from Korean waters.

Distribution. Eastern Pacific Ocean, Korea.

Genus *Chaetozone* Malmgren, 1867 바퀴실타래갯지렁이속

Prostomium conical or blunt anteriorly. Anterior end with single pair of long and grooved dorsal tentacles. Setae including smooth capillary and acicular spines.

Type species. *Chaetozone setosa* Malmgren, 1867.

Key to the species of *Chaetozone* Malmgren, 1867 from Korea

1. Prostomium and peristomium fused, forming large cordate head; anterior

parapodia with whip-like setae ··· *C. spinosa*
– Prostomium and peristomium not fused; anterior parapodia without whip-like setae ··· *C. setosa*

97. *Chaetozone setosa* Malmgren, 1867 솜털바퀴실타래갯지렁이

Chaetozone setosa Malmgren, 1867: 96; Southern, 1914: 119; Fauvel, 1927: 101, fig. 35; Hartman, 1961: 109; Hartman and Fauchald, 1971: 110; Fauchald, 1972: 203; Paik, 1984b: 150; 1989; 481, fig. 185; Blake, 1996e: 274, fig. 8.1; 2015: 504, fig. 1.

Material examined. 2 specimens, Haeun-ri, Hyeongyeong-myeon, Muan-gun, Jeollanam-do (126°25′40″E, 35°03′33″N), 09 Jun 2013, Choi HK.

Diagnosis. Prostomium long, narrow, and pointed anteriorly. Peristomium with large anterior inflated buccal region followed by 2 annulations. Dorsal tentacles inserted on peristomium. Lateral branchiae occurred on every segment except last several posterior segments. Setae capillary and spines. Long whiplike setae absent. Spines beginning on about setigers 20-30.

Distribution. Atlantic Ocean, Northern Europe, Mediterranean Sea, Bering Sea, Arctic Ocean, Arctic Seas of Russia, Okhotsk Sea, Korea.

98. *Chaetozone spinosa* Moore, 1903 긴털바퀴실타래갯지렁이

Chaetozone spinosa Moore, 1903: 468-470, pl. 26, figs. 73-74; Fauvel, 1927: 101, fig. 35; Berkeley and Berkeley, 1941: 45; Hartman, 1961: 109; Imajima and Hartman, 1964: 297; Pettibone, 1967: 13; Paik, 1984: 150; 1989: 471, fig. 179; Blake, 1996e: 300, figs. 8.13, 8. 14.

Material examined. 2 specimens, Namdong-ri, Imhoe-myeon, Jindo-gun, Jeollanam-do (126°09′10″E, 34°21′35″N), 09 Apr 2013, Choi HK; 1 specimen, Songseok-ri, Haeje-myeon, Muan-gun, Jeollanam-do (126°19′33″E, 35°08′12″N), 16 Oct 2012, Choi HK.

Diagnosis. Prostomium and peristomium indistinguishable, forming large cordate head. Dorsal tentacles inserted medially, between first segment and head. Lateral branchiae occurred on every segment except last 10 posterior segments. Anterior neuropodia with capillaries, short limbate and long whiplike setae. Stiff spines beginning on far posterior setigers.

Distribution. Southern California, Japan, Korea.

Genus *Cirratulus* Lamarck, 1801 가는실타래갯지렁이속

Anterior end with transverse series of numerous tentacular filaments arising from single segments. First branchiae on same setiger as tentacular filaments. Setae including smooth capillary and acicular spines.

Type species. *Cirratulus cirratus* (Müller, 1776).

99. *Cirratulus cirratus* (Müller, 1776) 가는실타래갯지렁이

Lumbricus cirratus Müller, 1776: 215.

Cirratulus cirratus: Southern, 1914: 110; Hartman, 1944: 263; Imajima and Hartman, 1964: 298; Paik, 1976: 238, figs. 30-31; 1979b: 59; 1982: 811, pl. 21h-i; 1989: 484, fig. 187.

Material examined. 3 specimens, Ganggye-ri, Imhoe-myeon, Jindo-gun, Jeollanam-do (126°15′16″E, 34°23′30″N), 09 Apr 2013, Choi HK; Yeonpyeong-ri, Udo-myeon, Jeju-si, Jeju-do (126°58′31″E, 33°29′42″N), 24 Jun 2014, Choi HK.

Diagnosis. Prostomium bluntly conical. Branchiae first present from setiger 1. Grooved tentacles arising in 2 groups from dorsum; their bases of attachment visible on single anterior segment. Setae capillary and acicular spine.

Distribution. Cosmopolitan.

Genus *Cirriformia* Hartman, 1936 명주실타래갯지렁이속

Anterior end with transverse series of numerous tentacular filaments arising from more then 2 segments. Branchiae beginning from anterior segment to tentacular filaments, remaining just dorsal to notopodium throughout. Setae including smooth capillary and acicular spines.

Type species. *Cirriformia tentaculata* (Montagu, 1808).

Key to the species of *Cirriformia* Hartman, 1936 from Korea

1. Notopodia and neuropodia with acicular spines ······································ *C. tentaculata*
 - Notopodia and neuropodia without acicular spines ···························· *C. chrysoderma*

100. *Cirriformia chrysoderma* (Claparede, 1869) 메끈명주실타래갯지렁이

Cirratulus chrysoderma Claparède, 1869: 122.

Cirriformia chrysoderma; Imajima and Hartman, 1964: 298; Paik, 1989: 487, fig. 190.

Material examined. 1 specimen, Namdong-ri, Imhoe-myeon, Jindo-gun, Jeollanam-do (126°09′10″E, 34°21′35″N), 09 Apr 2013, Choi HK.

Diagnosis. Prostomium triangular and lacking eyespots. Dorsal tentacles present from setigers 2-4; dorsal tentacles arising in 2 groups from 2-3 anterior segments. Branchiae occurred from setiger 1, close to notopodia in anterior setigers, and shifting toward mid-dorsum of body in median setigers. Setae capillary only.

Distribution. Italy, Indian Ocean, Japan, Korea.

101. *Cirriformia tentaculata* (Montagu), 1808 명주실타래갯지렁이

Terebclla tentaculata Montagu, 1808: 110, pl. 4, fig. 2.

Cirratulus comosus Marenzeller, 1879: 147, pl. 6, fig. 7.

Cirratulus tentaculata: McIntosh, 1911: 151; Southern, 1914: 107.

Audouinia comosa: Okuda and Yamada, 1954: 191.

Cirratulus pallidus: Treadwell, 1931: 1, figs. 1-3.

Cirriformia tentaculata: Hartman, 1956: 292; Imajima and Hartman, 1964: 299; Day, 1967: 515, fig. 20.4h-i; Paik, 1975: 421; 1978: 373, pl. 6, fig. 6; 1982: 811, pl. 21j; 1984b: 149; 1989: 486, fig. 189.

Material examined. 1 specimen, Haeun-ri, Hyeongyeong-myeon, Muan-gun, Jeollanam-do (126°25′40″E, 35°03′33″N), 11 Apr 2012, Choi HK; 9 specimens, Docheong-ri, Byeonsan-myeon, Buan-gun, Jeollabuk-do (126°29′40″E, 35°34′56″N), 14 Aug 2014, Choi HK; 1 specimen, Dadae-ri, Nambu-myeon, Geoje-si, Gyeongsangnam-do (128°39′25″E, 34°43′44″N), 22 Mar 2014, Choi HK; 1 specimen, Gusu-ri, Baeksu-eup, Yeonggwang-gun, Jeollanam-do (126°26′20″E, 35°21′21″N), 20 Apr 2015, Choi HK; 3 specimens, Sapsido-ri, Ocheon-myeon, Boryeong-si, Chungcheongnam-do (126°22′11″E, 35°23′48″N), 24 May 2015, Choi HK; 3 specimens, Daegok-ri, Sinji-myeon, Wando-gun, Jeollanam-do (126°48′46″E, 34°20′07″N), 02 Jul 2015, Choi HK.

Diagnosis. Prostomium bluntly rounded and lacking eyespots. Dorsal tentacles arising in 2 groups from segments 5-6. Branchiae occurred from setiger 1, close to notopodia in anterior setigers, and shifting toward mid-dorsum of body in median setigers. Setae capillary and acicular spines.

Distribution. Cosmopolitan.

Genus *Timarete* Kinberg, 1866 모듬실타래갯지렁이속

Anterior end with transverse series of numerous tentacular filaments arising from more then 2 segments. Branchiae beginning from anterior segment to tentacular filaments, close to notopodia in anterior setigers. Setae including smooth capillary and acicular spines.

Type species. *Timarete fecunda* Kinberg, 1866.

102. *Timarete antarcticus* (Monro, 1930) 모듬실타래갯지렁이

Cirratulus antarcticus Monro, 1930: 155, fig. 59.

Cirratulus chrysoderma: Okuda and Yamada, 1954: 191.

Timarete antarctica: Imajima and Hartman, 1964: 300; Paik, 1984: 149; 1989: 483.

Material examined. 1 specimen, Bunmae-ri, Aphae-myeon, Shinan-gun, Jeollanam-do (126°17′34″E, 34°51′10″N), 06 Apr 2012, Choi HK.

Diagnosis. Prostomium wider than long, without eyespots. Grooved tentacles arising in 2 groups from dorsum; their bases of attachment visible on segments 4, 5 and 6. First branchiae arising from segment anterior to tentacular filaments. All setae slender and capillary.

Distribution. Antarctic and subantantarctic region, Japan, Korea.

Family Flabelligeridae Saint-Joseph, 1894 더덕갯지렁이과

Body cylindrical or fusiform. Body surface usually covered with numerous papillae. Multiarticulate compound setae present. Cephalic cage present or absent.

Type genus. *Flabelligera* Sars, 1829.

Key to the genera of Flabelligeridae Saint-Joseph, 1894 from Korea

1. Cephalic cage absent or poorly developed; postcephalic neurosetae long, pointed, and crossbarred .... *Brada*
   - Cephalic cage well developed; postcephalic neurosetae short and curved falcigers 2
2. Body with filiform caudal portion; setigers 3-5 with multiarticulate transitional neurosetae .... *Daylithos*
   - Body without filiform caudal portion; setigers 3-5 without multiarticulate transitional neurosetae .... *Pherusa*

Genus *Brada* Stimpson, 1854 황금더덕갯지렁이속

Body short and fusiform. Cephalic cage absent or poorly developed. Postcephalic neurosetae long, pointed, and crossbarred. Branchial filaments present on short branchial membrane.

Type species. *Brada granola* Stimpson, 1854.

103. *Brada villosa* (Rathke, 1843) 황금더덕갯지렁이

Siphonostoma villosum Rathke, 1843: 215, pl. 11, figs. 11-12.

Brada pilosa Moore, 1906: 222, pl. 10; Pettbone, 1954: 290.

Brada villosa: Fauvel, 1927: 121, fig. 43e-l; Uschakov, 1955: 310; Imajima and Hartman, 1964: 302; Paik, 1979a: 35, pl. 1, figs. c-d; 1982: 812, pl. 22a-b; 1989: 489, fig. 191; Blake, 2000a: 5, fig. 1.1.

Material examined. 1 specimen, Songho-ri, Jisan-myeon, Jindo-gun, Jeollanam-do (126°10′30″E, 34°22′41″N), 02 May 2015, Choi HK.

Diagnosis. Body short and expanded anteriorly, and characteristically rough and hirsute; body surface with slightly clavate papillae. Cephalic cage absent. First segment with longest notosetae. Noto- and neurosetae crossbarred capillary. Branchial filaments in 2 lateral group numerous and filiform. Nephridial papillae present ventrally on setiger 5.

Distribution. North Atlantic Ocean, Arctic Sea, Mediterranean Sea, Pacific Ocean, Southern California, Japan, Korea.

Genus *Pherusa* Oken, 1807 더덕갯지렁이속

Body inflated anteriorly, without filiform caudal portion. Cephalic cage well developed. Postcephalic neurosetae short and curved falcigers. Nurosetae usually uni- or bidentae hooks.

Type species. *Pherusa plumosa* (Muller, 1776).

104. *Pherusa plumosa* (Müller, 1776) 깃더덕갯지렁이

Stylarioides plumosa: Southern, 1914: 137.

Pherusa plumosa: Imajima and Hartman, 1964: 303; Rho and Song, 1975: 104, pl. 1, fig. 1, pl. 4, figs. 11-12; Paik, 1982: 812, pl. 11c; 1989: 492, fig. 192.

Material examined. 2 specimens, Jeorim-ri, Sanyang-eup, Tongyeong-si, Gyeongsangnam-do (128°27′10″E, 34°44′40″N), 24 Mar 2014, Choi HK.

Diagnosis. Body cylindrical, without filiform caudal portion; body surface with minute papillae regularly distributed over the surface and covered with sand or mud. Oral apparatus with pair of longitudinally grooved palps and 4 pairs of tentacles. cephalic cage formed by long setae, present on first 3 segments. Sigmoid neuropodial hooks first present on setiger 4.

Distribution. Cosmopolitan.

Family Sternaspidae Carus, 1863 오뚜기갯지렁이과

Body short. Proboscis unarmed. Parapodia reduced. Posterior end with chitinized shield. Anus surrounded by filamentous branchiae.

Type genus. *Sternaspis* Otto, 1821.

Genus *Sternaspis* Otto, 1821 오뚜기갯지렁이속

Body peanut-shaped. Introvert hooks tapering falcate. Pre-shield region consisting of 7 segments. Ventro-caudal shield stiff, with radial ribs and concentric lines. Branchiae arranged in discrete branchial plates.

Type species. *Sternaspis thalassemoides* Otto, 1821.

105. *Sternaspis* sp. nov. (Figs. 21, 22)

Type materials. Holotype: complete specimen (8.5 mm long, 3.0 mm width), Yongjung-ri, Hyeongyeong-myeon, Muan-gun, Jeollanam-do (126°24′39″E, 35°04′21″N), 9 Apr. 2013, Choi HK. Paratypes: complete specimen (8.0 mm long, 3.3 mm width); complete specimen (9.0 mm long, 3.5 mm width), collection details of paratypes same as holotype.

Additional materials. Korea, 5 specimens, Gomso-ri, Jinseo-myeon, Buan-gun, Jeollabuk-do (126°36′55′′E, 35°35′11′′N), 14 Aug 2014, Choi HK.

Description. Holotype complete (Figs. 21, 22A - D). Body about 8.5 mm long with approximately 28 segments, maximum width about 3.0 mm, and grey white in alcohol, peanut-shaped; introvert exposed, subglobular shaped, following tapered until segment inserted genital papillae; segmental constriction well developed, appearing between segment 7 and 8; abdomen more thicker than introvert; body surface with densely covered minute and loosely and irregularly arranged filamentous papillae; minute papillae well developed in surface of introvert and filamentous papillae more visible in abdominal segments (Figs. 21, 22D).

Prostomium small, oval shaped, and without eyespot. Peristomium slightly flattened and rounded, with smooth surface, and located at anterior of mouth. Mouth oval shaped, very retractile (Fig. 21A).

Introvert setigers with 8 - 10 long and 3 - 5 short spines arranged in semi-circular rows at each sides; spines generally bronze color, and long spines thick, with slightly curved tips and short spines with pointed tips (Figs. 21, 22C).

Genital papillae short, paired, and present from intersegmental furrow between segment 7 and 8 (Fig. 21A).

Pre-shield region consisted of 7 segments on abdomen and 11 segments on dorsal side. Branchial plate and numerous branchiae present on dorsal side of abdomen posteriorly (Fig. 21A, B).

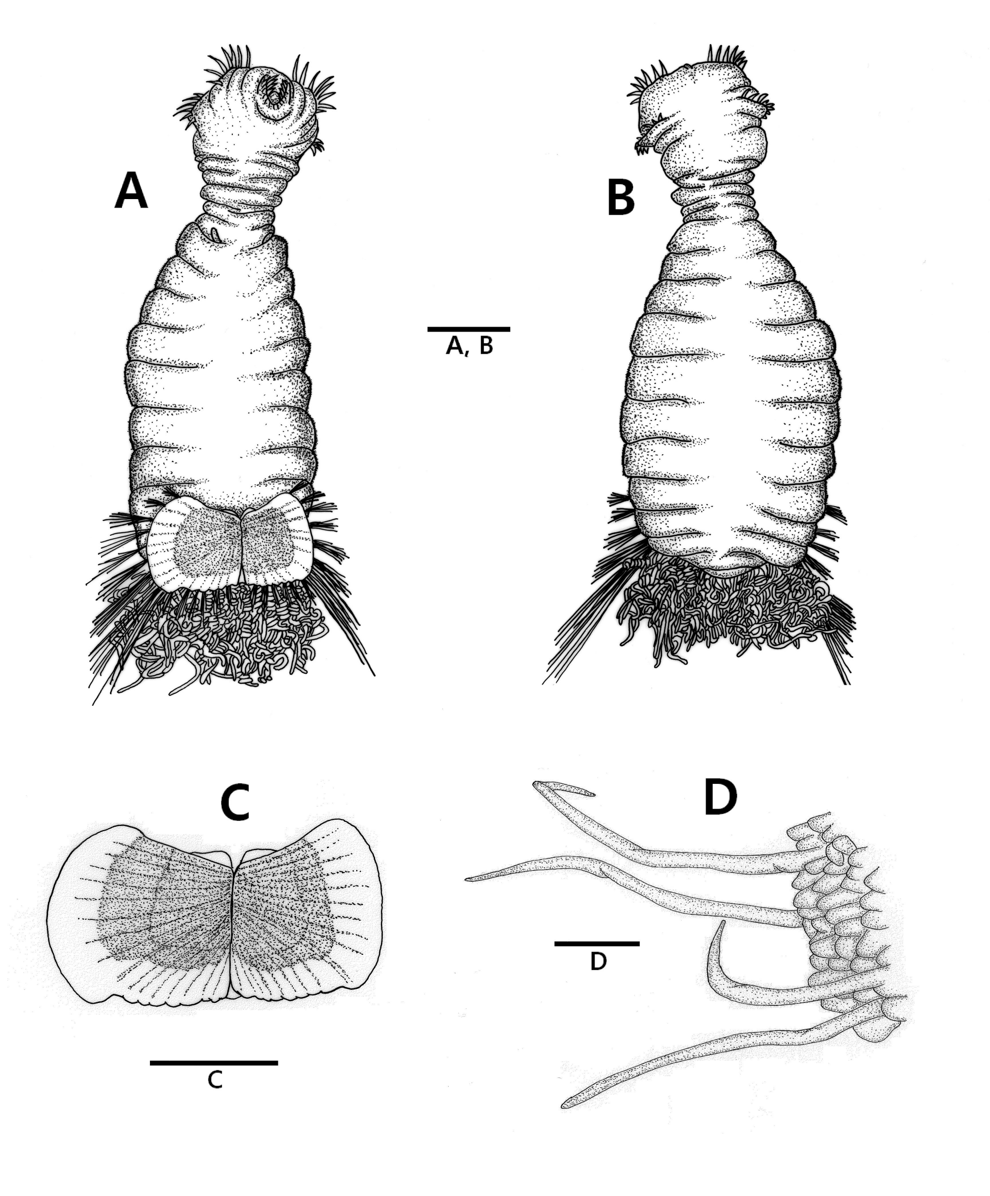

Fig. 21. *Sternaspis* sp. nov., holotype (A–D). A, ventral view; B, dorsal view; C, ventro-caudal shield; D, papillae of body surface. Scale bars: A–C= 1.0 mm, D=0.025 mm.

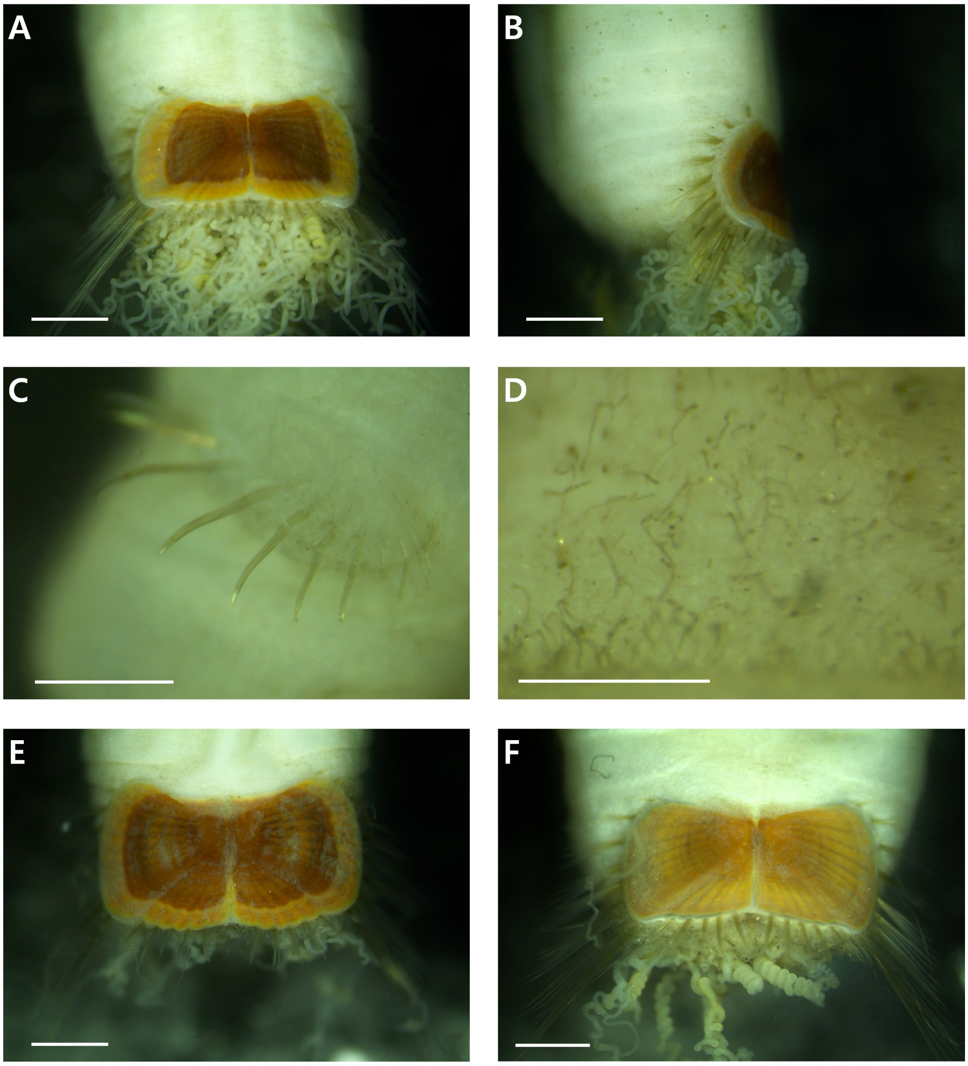

Fig. 22. *Sternaspis* sp. nov., holotype (A–D). A, ventro-caudal shield; B, same, larteral view; C, introvert hooks; D, papillae of body surface; E, paratype, ventro-caudal shield; F, additional material, ventro-caudal shield. Scale bars: A, B, E, F=1.0 mm, C=0.5 mm, D=0.25 mm.

Ventro-caudal shield consisted of 2 equal plates; ribs and concentric lines distinct; central suture extended throughout shield; anterior margin of shield rounded; anterior depression shallow; anterior keels not exposed; lateral margins rounded, slightly extended posteriorly; fan with truncate and crenulated posterior margin, barely projected beyond posterior corners; median notch absent or very shallow; posterior corner distinct (Figs. 21A, 22A).

Marginal setae of shield composed of 10 fascicles of long capillary setae in each lateral side and 5-6 fascicle of short capillary setae in posterior margin; setae of fascicle composed of about 7-9, slender, smooth, and with pointed tips. Peg setae long, emerged from cuticle (Figs. 21A, 22A, B).

Branchiae numerous and coiled, from branchial plate located in rear of shield (Figs. 21, 22A).

Variation. Author could find out that variations were appeared in development of lateral margin and pigmentation pattern of the shield. Some specimens (Fig. 22E) show barely projected posterior corners due to the lateral margins of the shield are very slightly expanded posteriorly, whereas the holotype (Fig. 22A) has distinct posterior corners because these are well expanded posteriorly. Thus, some specimens (Fig. 22E) were appeared as more slightly projected posterior fan margin than the level of posterior corners. The type materials (Figs. 22A, E) indicated widely dark reddish area from central region of the shield, but the additional materials (Fig. 22F) had the pigmentation pattern composed of 3 to 5 concentric bands.

Remarks. In Korean waters, the materials of *Sternaspis* have been regarded as *S. scutata* because the previous literatures of East Asia did not consider the various characters on the ventro-caudal shield (Okuda, 1936; Takahashi, 1938; Imajima, 1961; Imajima and Hartman 1964; Paik 1982, 1989). However, the new species of the present study is distinguishable from *S. scutata* by the differences on the ventro-caudal shield as follows: the new species has rounded anterior margins, while *S. scutata* has truncate ones; the new species possesses shallow anterior keels, but *S. scutata* possesses deep ones; the lateral margins of the new species are rounded, while those of *S. scutata* are straight; the fan of new species is crenulated and barely projected beyond posterior corners, but that of *S. scutata* is smooth and markedly projected beyond posterior corners; the distinct posterior corners are appeared in the new species, but indistinct ones are appeared in *S. scutata* (Sendall and Salazar-Vallejo 2013).

Sternaspis sp. nov. is closely related to *S. costata* Marenzeller, 1879 from Japanese waters in the most characteristics appeared on the ventro-caudal shield (Sendall and Salazar-Vallejo 2013). However, the new species of the present study is distinguished from *S. costata* by the following characteristics: the new species has indistinct median notch in the fan, while *S. costata* has markedly median notch; the new species possesses rounded posterior corners, but those of *S. costata* are angular; the new species bears truncate and crenulated fan margin, but *S. costata* bears smooth one (Sendall and Salazar-Vallejo 2013).

On the other hands, the new species resembles *S. costata, S. islandica* Malmgren, 1867, *S. spinosa* Sluiter, 1882, and *S. thorsoni* Sendall and Salazar-Vallejo, 2013 in having filamentous papillae on the body surface (Sendall and Salazar-Vallejo 2013). However, the filamentous papillae of these species are arranged in one or two transverse rows of clusters, while those of the new species are evenly distributed. This characteristic of the new species is also found in *S. thorsoni*, but *S. thorsoni* can be distinguished from the new species by the present study by relatively abundant introvert hooks and the characteristics on the ventro-caudal shield such as angular anterior margins, deep anterior depression, and not projected fan margin.

Table 3. Comparison of morphological characteristics among congeneric species of *Sternaspis* sp. nov. (CL: concentric line; AM: anterior margin; AD: anterior depression; AK: anterior keels; LM: lateral margin; MN: median notch of fan; PC: posterior corners).

Species	Papillae of body surface	Introvert hooks	Ventro-caudal shield										Lateral shield setae	Posterior shield setae
			CL	Ribs	Suture	AM	AD	AK	LM	Fan margin	MN	PC		
S. costata	filamentous, 2 rows of clusters	10 long and 5 short	present	present	extended throughout shield	rounded	shallow	not exposed	rounded, expanded posteriorly	smooth, barely projected beyond posterior corners	deep	distinct, angular	10 in oval pattern	5 in roughly linear pattern
S. islandica	minute and filamentous, single rows of clusters	6 - 14	present	present	extended throughout shield	rounded	shallow	not exposed	rounded, expanded posteriorly	truncate and smooth, barely projected beyond posterior corners, with two shallow lateral notches	deep	distinct	10 in oval pattern	6 in oval pattern
S. piotrowskiae	mostly eroded	20 - 22	present	present	indistinct	rounded	deep	exposed (well developed)	rounded, medially expanded, slightly reduced posteriorly	truncate and barely crenulated, slightly projected beyond posterior corners	very shallow (indistinct)	distinct	10 in oval pattern	7 in curved pattern
S. rietschi	unknown	6 - 10 long and at least 5 short	present	poorly developed	probably indistinct	rounded	shallow	probably not exposed	rounded, medially expanded and reduced posteriorly	truncate and crenulated, straight	very shallow (indistinct)	indistinct	10, unknown pattern	5, unknown pattern
S. scutata	minute, evenly distributed	10	present	present	restricted to anterior region	truncate, straight	deep	not exposed	straight, not expanded medially	smooth, markedly projected beyond posterior corners	shallow (distinct)	indistinct	10 in oval pattern	6, an arc
S. spinosa	cuticular and filamentous, single rows of clusters	10	present	poorly developed	extended throughout shield	angular	deep	exposed	rounded, expanded posteriorly	truncate and crenulated, straight	absent	indistinct	10 in curved pattern	5 in oval pattern

Table 3 (continued.)

Species	Papillae of body surface	Introvert hooks	Ventro-caudal shield										Lateral shield setae	Posterior shield setae
			CL	Ribs	Suture	AM	AD	AK	LM	Fan margin	MN	PC		
S. thalassemoides	minute or smooth, evenly distributed	more than 12 - 14	present	present	restricted to anterior region	rounded	deep	not exposed	straight, slightly expanding posteriorly	truncate and crenulated, straight	very shallow (indistinct)	distinct	10 in oval pattern	6 in oval pattern
S. thorsoni	minute and filamentous, evenly distributed	16 - 20	present	present	restricted to anterior region	angular	deep	not exposed	curved, slightly expanding posteriorly	truncate and crenulated, straight	very shallow (indistinct)	distinct	10 in oval pattern	7 in curved pattern
Sternaspis. sp. nov.	minute and filamentous, evenly distributed	8 - 10 long and 3 - 5 short	present	present	extended throughout shield	rounded	shallow	not exposed	rounded, expanded posteriorly	truncate and crenulated, barely projected beyond posterior corners	very shallow (indistinct)	distinct, rounded	10 in oval pattern	5 in roughly linear pattern

Family Pectinariidae Quatrefages, 1866 빗갯지렁이과

Body separated into 3 region, thorax, abdomen. and scaphe. prostomium reduced. Anterior end with paleae present in single row. Caudal region short and flattened. Setae notopodial capillary and pectinate uncini.

Type genus. *Pectinaria* Lamarck, 1818.

Key to the genera of Pectinariidae Quatrefages, 1866 from Korea

1. Dorsal opeccular rime smooth ·· 2
 – Dorsal opeccular rime cirrate ·· *Amphictene*
2. Biramous setigers 13; teeth on uncini arranged in 1 vertical row ·········· *Cistenides*
 – Biramous setigers 12; teeth on uncini arranged in more than 2 vertical row ·· *Lagis*

Genus *Lagis* Malmgren, 1866 잎빗갯지렁이

Cephalic veil cirrate, laterally attached. Dorsal opercular rim smooth. Setigers 1-3 with notopodia only, and setigers 4-15 with both noto- and neuropodia. Scaphe distinctly separated from abdomen. Teeth on uncini arranged in more than 2 vertical row.

Type species. *Lagis koreni* Malmgren, 1866.

106. *Lagis* sp. nov. (Fig. 23-25)

Type materials. Holotype: complete specimen (24.5 mm long, 4.0 mm width), Haeun-ri, Hyeongyeong-myeon, Muan-gun, Jeollanam-do (126°25′40″E, 35°03′33″N), 19 Dec 2011. Paratypes: complete specimen (15.0 mm long, 3.0 mm width); complete specimen (17.0 mm long, 2.5 mm width); complete specimen (18.0 mm long, 3.5 mm width), collection details are same as holotype.

Additional materials. 9 specimens, Deoksin-ri, Seolcheon-myeon, Namhae-gun, Gyeongsangnam-do (127°52′16″E, 34°55′50″N), 9 Apr. 2014; 11 specimens, Unseo-dong, Jung-gu, Incheon-si (126°29′16″E, 37°24′08″N), 23 Jul 2008; 5 specimens, Haksan-ri, Byeollyang-myeon, Suncheon-si, Jeollanam-do (127°29′03″E, 34°50′50″N), 24 May 2013; 3 specimens, Noil-ri, Gwayeok-myeon, Goheung-gun, Jeollanam-do (127°16′50″E, 34°40′04″N), 30 Apr. 2013.

Description. Holotype (Figs. 23-25). Body short and conical shaped; pale white in alcohol.

Cephalic veil semi-circular with 14 cirri along free margin, partially fused to operculum. Peristomial palps numerous, short, and oval-shaped with groove (Figs. 23A-C, 24).

Opercular surface with many wrinkles and row of 13 paleae on each side; paleae stout, greenish golden color, gradually tapering, with pointed or coiled tip. Opercular margin smooth, slightly raised (Figs. 23A, B, 24).

Tentacular cirri attached on anterior edges of segments 1 and 2 in each side; cirri on segment 2 arise from connecting ridge. Anterior margin of connecting ridge on segment 2 slightly lobed (Figs. 23A, B, 24).

Branchiae paired on each side, pectoral fin in shape, and present on segments 3–4; branchiae on segment 3 larger than ones on segment 4 (Figs. 23A, B, 24). Ventral median shields present on segments 2–5, with glandular margins (Figs. 23C, 24B).

Notopodia and notosetae present on setigers 1-16; notosetae short and recurved with bordered serration as well as long and straight with fine serration (Fig. 25A, B).

Neuropodia and uncini present on setigers 4-15, with wedged uncinigerous tori; uncini with 3–4 vertical rows, each row composed of 7-8 major and 4-5 minute teeth (Fig. 25C, D).

Scaphe robust, oval-shaped, consisted of 5 segments, slightly longer than board, and distinctly separated from abdomen; lateral margin crenulated, rolled dorsally and posterior edge lobed (Fig. 25D, E).

Scaphal hooks slender, short, and 14 pairs, with pointed and curved tip (Fig. 23F).

Scaphal anal flap wider than long, with 20 short fringes along free margin and median anal cirrus on dorsal surface (Fig. 23G).

Tube long conical in shape, composed of sand grains, with yellowish color.

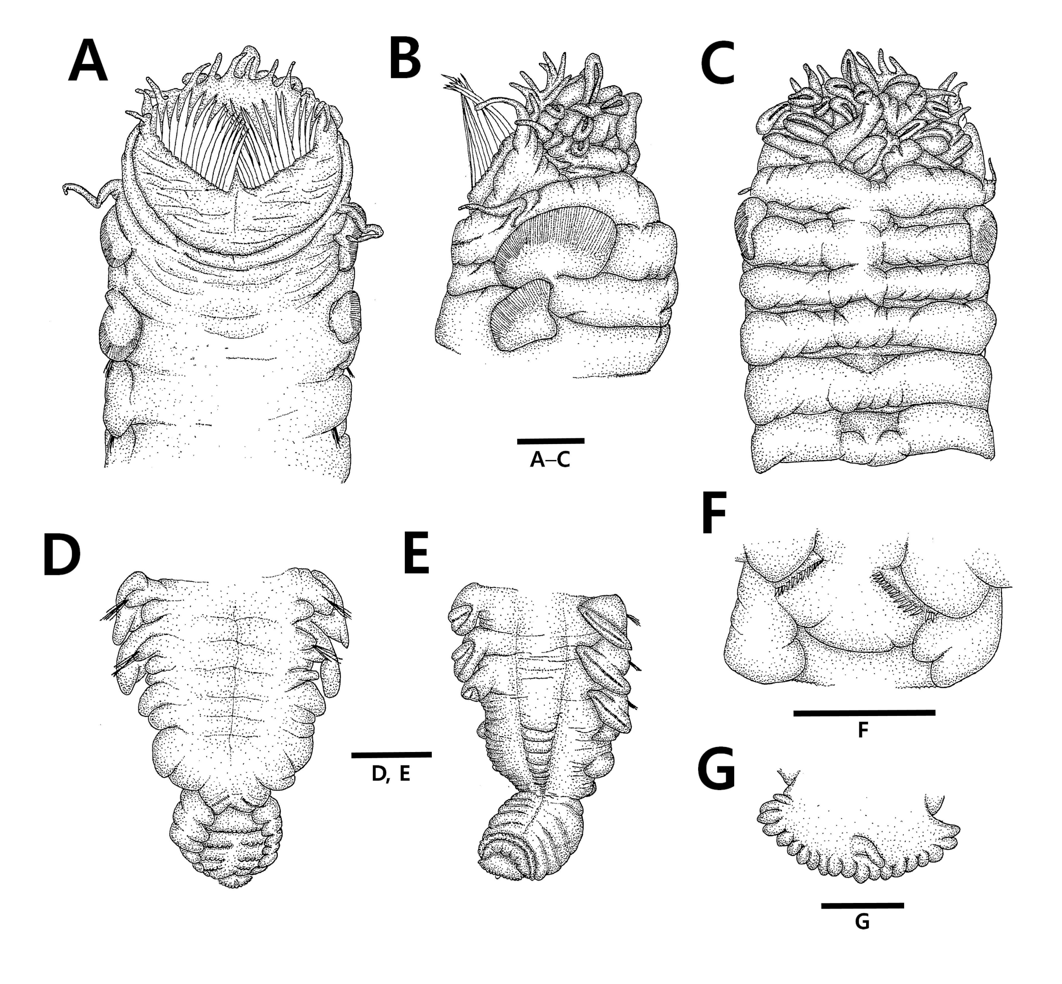

Fig. 23. *Lagis* sp. nov., holotype (A – G). A, anterior end, dorsal view; B, anterior end, lateral view; C, anterior end, ventral view; D, posterior end, dorsal view E, posterior end, ventral view F, arrangement of scaphal hooks; G, dorsal view of scaphal anal flap. Scale bars: A–E=1.0 mm, F, G=0.5 mm.

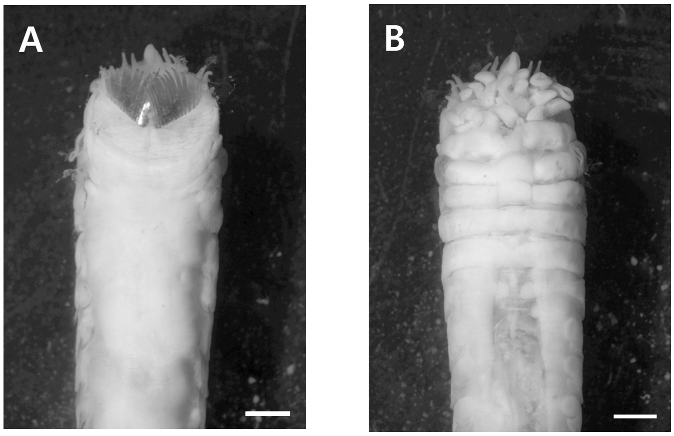

Fig. 24. *Lagis* sp. nov., holotype (A–B). A, anterior end, dorsal view; B, anterior end, ventral view. Scale bars: A–B=1.0 mm.

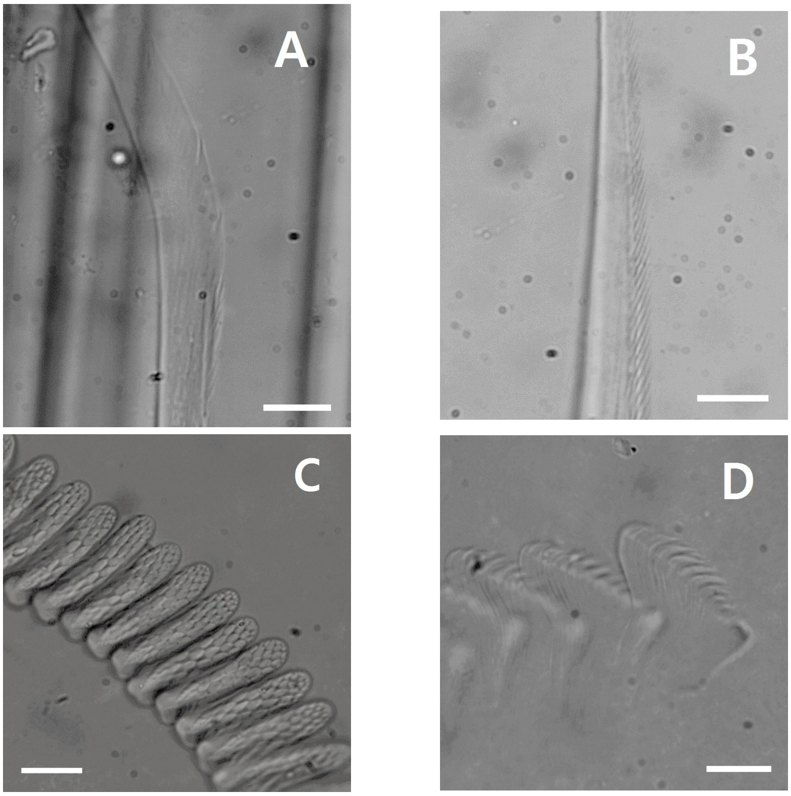

Fig. 25. *Lagis* sp. nov., paratype (A–B). A, short and recurved notosetae with bordered serration; B, long and straight notosetae with fine serration C, frontal view of abdominal uncini; D, lateral view of abdominal uncini. Scale bars: A-D=0.01 mm.

Variations. The materials of this new species represent variables in the following characters: the cirri on cephalic veil are 14-20; the paleae are 12-15 within a row; the scphal hooks are 10-14 pairs; the fringes on scphal anal flap are 18 - 21. Once, Hartmann-Schröder (1959) and Kitamori (1965) did not recognize variations, and considered that the differences of number in each character mentioned above were significant features for distinguishing the species or subspecies. However, the opinions of them are not accepted currently (Hutching and Peart 2002; Sun and Qiu 2012; Nishi *et al.* 2014). These variables are commonly found in the pectinariid species (Hutching and Peart 2002).

Remarks. *Lagis* sp. nov. can be distinguished from other *Lagis* species by the morphology of scaphal anal flap as follows: the new species has well-developed scaphal anal flap, while *L. australis* has poorly developed one; the scaphal anal flap of the new species possesses a dorsal anal cirrus, but that of *L. hupferi* is lacking; scaphal anal flap of the new species has fringed margin, but those of *L. australis, L. hupferi, L. koreni, L. koreni cirrata, L. neapolitana, L. pseudokoreni,* and *L. tenera* have smooth or crenulate margins (Malmgren, 1865; Ehlers, 1904; Fauvel 1927; Hartmann-Schröder, 1959; Day 1955, 1963, 1967; Hutching and Peart 2002). *Lagis* sp. nov. is closely related to *L. bocki* originally described from Japanese waters in that the scaphal anal flap has a margin with 18 - 24 fringes (18-21 fringes in the new species) and dorsal anal cirrus (Hessel 1917; Imajima and Hartman 1964; Nishi *et al.* 2014). However, it differs from *L. bocki* in the morphologies of scaphe and scaphal hooks as follows: the scaphe of new species is robust and has lobed posterior edge but that of *L. bocki* is flattened dorsally and has smooth posterior edge; the scaphal hooks of new species are 10 - 14 pairs and the shape of them is slender and short, while those of *L. bocki* are 2 - 4 pairs and the shape is stout and elongated (Hessel 1917; Imajima and Hartman 1964; Nishi *et al.* 2014).

Hutching and Peart (2002) and Sun and Qiu (2012) suggested that the variations of *Lagis* species caused confusion in identification of *Lagis* species. However, this new species and two previously described species, *L. abranchiata* and *L. crenulatus,* show a remarkable characteristic that they have relatively larger number of scaphal hooks as follows: the scaphe hooks of new species, *L. abranchiata,* and *L. crenulatus* are 10–14, 10–12, and 8 - 14 pairs respectively, while those of other *Lagis* species are 2–8 pairs (Malmgren 1866; Ehlers 1904; Fauvel 1927; Hartmann-Schröder 1959; Imajima and Hartman 1964; Day 1955, 1963, 1967; Hutching and Peart 2002; Nishi *et al.* 2014). Among these three species, *Lagis* sp. nov. of the present study differs from other two species by the presence of thoracic branchiae (Fauvel 1932; Hutching and Peart 2002; Sun and Qiu 2012).

Although the morphology of notosetae has been regarded as a minor character in many previous reports (Malmgren 1865; Ehlers 1904; Fauvel 1927, 1932; Hartmann-Schröder 1959; Day 1955, 1963, 1967; Hutching and Peart 2002), we could find that three *Lagis* species described from Asian region, *Lagis* sp. nov. from Korea, *L. bocki* from Japan, and *L. crenulatus* from Hong Kong, are grouped by commonly having both of the two types of notosetae, short and recurved with bordered serration as well as long and straight with fine serration (Sun and Qiu 2012; Nishi *et al.* 2014). While, *L. australis* and *L. hupferi* have the notosetae with fine serration only, *L. abranchiata, L. koreni,* and *L. koreni cirrata* possess the notosetae with narrow or board wing additionally, *L. neapolitana* has the notosetae with denticulate serration only, and *L. tenera* and *L. pseudokoreni* bears the smooth notosetae (Malmgren 1865; Ehlers 1904; Fauvel 1927, 1932; Hartmann-Schröder 1959; Day 1955, 1963, 1967; Hutching and Peart 2002) (Table I-4). However, the taxonomic validity of this character on *Lagis* species is still in need of more detailed study, because many previous reports of *Lagis* provided poor descriptions and figures on the morphology of notosetae (Malmgren 1865; Ehlers 1904; Fauvel 1927, 1932; Hartmann-Schröder 1959; Day 1955, 1963, 1967; Hutching and Peart 2002).

Table 4. Comparison of morphological characteristics among *Lagis* species.

Species	Body size, length, width (mm)	Opercular rim	Ventral ridge on segment 2	Branchiae	Rows of teeth on uncini	Teeth within a vertical row (major, minor)	Scaphe	Anal flap	Dorsal anal cirrus	Scaphal hooks, number of pair	Notosetae
L. koreni	14.0-50.0, 5.0-9.0	smooth	smooth	present	3-4	6, 5-6	long oval-shaped, with lateral margin lobed with bearing distinct papillae	longer than wide, with slightly crenulate margin	short and slender	2-7	long recurved with distinctly serrated tip,and short straight with narrow wing
L. neapolitana	12.0-32.0, 5.0-9.0	smooth	smooth	present	2-3	7-9, 3-4	oval-shaped, with lateral margin bearing distinct lobes	sub-triangular, with smooth margin	short and slender	4-8	with denticulate serrations
L. australis	6.0-11.0, 3.0	smooth	smooth	present	3	4-5	oval-shaped, with lateral margin bearing distinct lobes	poorly developed	short and slender	8	short recurved, and long straight with fine serrations
L. bocki	10.0-27.0, 3.0-5.0	smooth	smooth	present	3-4	7-8, 6-7	long oval-shaped and flattened dorsally, with crenulate lateral margin recurved ventrally	longer than wide, with 18-24 fringes	short and slender	2-4	short and recurved with bordered serrations, and long and straight with fine serrations
L. abranchiata	11.0-17.0, 3.0	smooth	smooth	absent	4-5	6-8	shortly stout, with lateral margin bearing short ovate knobs	sub-triangular, with smooth margin	short and slender	10-12	straight, and with narrow wing
L. hupferi	13.0-20.0	highly smooth	smooth	present	3	5-6	widely oval-shaped, with crenulate or lobed lateral margins	semi-circular, with crenulate margin	absent	7	with fine serrations
L. pseudokoreni	16.0, 4.0	smooth	smooth	present	2-3	6-8	long oval-shaped, with lateral margin lateral margin crenulated with bearing distinct papillae	triangular, with smooth margin	short and slender	5	smooth, and with denticulate serrations
L. tenera	2.5	smooth	smooth	probably present	3-4	7, 3	long oval-shaped, with lateral margin bearing hump-like lobes	semi-circular, with smooth margin	largely digitate-form	3	smooth

Table. 4. (continued.)

Species	Body size, length, width (mm)	Opercular rim	Ventral ridge on segment 2	Branchiae	Rows of teeth on uncini	Teeth within a vertical row (major, minor)	Scaphe	Anal flap	Dorsal anal cirrus	Scaphal hooks, number of pair	Notosetae
L. crenulatus	12.0, 2.5	highly smooth	smooth	absent	4	7-8, 5-6	bluntly conical-shaped, with crenulate lateral margin recurved ventrally	wider than long, with smooth margin	absent	8-14	short and recurved with bordered serrations, and long and straight with fine serrations
Lagis sp. nov.	24.5-17.0,	smooth	smooth	present	3-4	7-8, 4-5	robust and oval-shaped, with crenulate lateral margin and lobed posterior edged	wider than long, with 18-20 fringes	short and slender	10-14	short and recurved with bordered serrations, and long and straight with fine serrations

Family Ampharetidae Malmgren, 1866 사슴갯지렁이과

Body with biramous anterior region and subbiramius posterior region. Branchiae 2-4 pairs, arranged in 1 row on 1 anterior segment. Notosetae capillary on thorax. Uncini present on thorax and abdomen.

Type genus. *Ampharete* Malmgren, 1866.

Key to the genera of Ampharetidae Malmgren, 1867 from Korea

1. First some neuropodial setigers with fine acicular setae ······ *Melinna*
 - First some neuropodial setigers without fine acicular setae ······ 2
2. Paleae present on segment 3 ······ 3
 - Paleae absent ······ 4
3. Buccal tentacle papillose ······ *Ampharete*
 - Buccal tentacle smooth ······ *Amphicteis*
4. Thorax with 11 uncinigerous setigers ······ *Amage*
 - Thorax with 14 uncinigerous setigers ······ *Amphisamytha*

Genus *Ampharete* Malmgren, 1866 작은사슴갯지렁이속

Branchiae 4 pairs, and smooth. Buccal tentacle papillose. Paleae present on segment 3. Thorax with 12 uncinial setigers.

Type species. *Ampharete acutifrons* (Grube, 1860).

107. *Ampharete arctica* Malmgren, 1866 작은사슴갯지렁이

Ampharete arctica Malmgren, 1866: 364, pl. 26, fig. 77; Moore, 1908: 348; Imajima and Hartman, 1964: 331; Paik, 1979a: 278, pl. 1, fig. 6; 1982: 827, pl. 26f; 1984: 144; 1989: 563, fig. 235.

Ampharete brevibranchiata Treadwell, 1926: 6, figs. 11-14.

Material examined. 1 specimen, Unseo-dong, Jung-gu, Incheon-si (126°29′16″E, 37°24′08″N), 23 Jul 2008, Choi HK.

Diagnosis. Prostomium trilobate, without eyespots. Tentacles club-shaped and pinnate. Branchiae 4 pairs. Paleae 9-16 pairs. Notosetae bordered capillary and slender, shorter ones. Uncinial tori beginning from setiger 3. Uncini with 6-8 large teeth.

Distribution. Atlantic Ocean, Spitabergen, Arctic Sea, Pacific Ocean, Japan, Korea.

Genus *Amphicteis* Grube, 1850 큰사슴갯지렁이속

Branchiae 4 pairs, and smooth. Buccal tentacle smooth. Paleae present on segment 3. Thorax with 14 uncinial setigers.

Type species. *Amphitrite gunneri* Sars, 1835.

108. *Amphicteis gunneri* (Sars, 1835) 큰사슴갯지렁이

Amphicteis japonica McIntosh, 1885: 431, pl. 27a, figs. 3-5; Moore, 1903: 478.

Amphicteis gunneri: Hessle, 1917: 117; Okuda, 1938: 101; Takahashi, 1938: 212, fig. 14; Imajima and Hartman, 1964: 331; Day, 1967: Paik, 1979c: 278, pl. 1, fig. c; 1982: 827, pl. 26g; 1989: 564, fig. 236.

Material examined. 12 specimens, Daegok-ri, Sinji-myeon, Wando-gun, Jeollanam-do (126°48′46″E, 34°20′07″N), 26 Mar 2010, Choi HK; 2 specimens, Jeorim-ri, Tongyeong-si, Sanyang-eup, Gyeongsangnam-do (128°27′10″E, 34°44′40″N), 20 May 2014, Choi HK; Gyeongsangnam-do, Tongyeong-si, Hansan-myeon, Dueok-ri (128°29′39″E, 34°47′15″N), 28 Aug 14, Choi HK.

Diagnosis. Prostomium with 3 lobes and numerous eyespots basally. Thorax with 17 setigers. Branchiae 4 pairs; first and second pairs of branchiae located on setiger 2. Paleae smooth and tapering distally. Uncininial neuropodia beginning from setger 4; uncini with 2 vertical series of 4 or 5 teeth.

Distribution. Cosmopolitan.

Family Terebellidae Malmgren, 1867 유령갯지렁이과

Body divided into 2 region, anterior biramous and posterior uniramous region. Prostomium simple fold. Branchiae usually present on 1-3 segments. Uncini avicular or pectinate.

Type genus. *Terebella* Linnaeus, 1767.

Key to the genera of Terebellidae Malmgren, 1867 from Korea

1. Proboscis present, and with papillae ··· *Artacama*
   - Proboscis absent ··· 2
2. Uncini arranged in 2 rows present on thoracic setigers ··· 4
   - Uncini arranged in 2 rows absent, and arranged in single row on all thoracic setigers ··· 3
3. Branchiae absent ··· *Polycirrus*
   - Branchiae present ··· *Thelepus*
4. Notosetae with serrated tips ··· 5
   - Notosetae with smooth tips ··· 6
5. Branchiae 3 pairs, and sessile ··· *Amphitrite*
   - Branchiae 2 or 3 pairs, and branched ··· *Terebella*
6. Uncini with long-handled shafts on anterior thoracic setigers ··· *Pista*
   - All uncini with short-handled shafts ··· 7
7. Lateral lobes well developed on anterior setigers ··· *Loimia*
   - Lateral lobes reduced or absent ··· *Nicolea*

Genus *Amphitrite* Müller, 1771 꽃유령갯지렁이속

Branchiae 3 pairs, sessile type, present from segment 2. Nephridial papillae on segment 3 and 6. Lateral lobes absent. Notosetae with serrated tips. Uncini arranged in 2 rows present on thoracic setigers.

Type species. *Amphitrite cirrata* Muller, 1771.

109. *Amphitrite edwardsii* (Quatrefages, 1866) 에드워드유령갯지렁이

Terebella edwardsii Quatrefages, 1866: 354, pl. 19, fig. 1.

Amphitrite edwardsii: Fauvel, 1927: 245, fig. 4a-i; Imajima and Hartman, 1964: 335; Paik, 1982: 832; 1989: 576, fig. 243; Rho and Lee, 1982: 40, pl. 4, figs. 3, 4.

Material examined. 2 specimens, Chubong-ri, Hansan-myeon, Tongyeong-si, Gyeongsangnam-do (128°35′28″E, 34°44′08″N), 27 Aug 2014, Choi HK.

Diagnosis. Lateral lobe well developed on 2-3 segments, and segment 4 with small lobes. Uncinigerous segments 7-16 with uncini arranged in double rows. Uncinus with 4-6 rows of teeth above the main fang. Notosetae bordered capillaries.

Nephridial papillae present on segments 3-11.

Distribution. Korea, Westerm Europe, Falkand Island, Japan.

Genus *Loimia* Malmgren, 1865 괴물유령갯지렁이속

Lateral lobes well developed on anterior thoracic segment. Branchiae 3 pairs, branched. Thorax composed of 17 setigers. Notosetae with smooth tips. Uncini pectinate form, with all short-handled shafts.

Type species. *Loimia medusa* (Savigny, 1818).

110. *Loimia medusa* (Savigny, 1818) 괴물유령갯지렁이

Terebella medusa Savigny, 1818:

Loimia medusa: Okuda, 1938: 102; Imajima and Hartman, 1964: 339; Day, 1967: 743; Paik, 1978: 374, pl. 6, fig. 8; 1982: 831, pl. 27; 1989: 573, fig. 241; Hilbig, 2000: 258, fig. 9.11.

Material examined. 4 specimens, Gomso-ri, Jinseo-myeon, Buan-gun, Jeollabuk-do (126°38′28″E, 35°35′04″N), 14 Aug 2014, Choi HK; 3 specimens, Haksan-ri, Byeollyang-myeon, Suncheon-si, Jeollanam-do (127°29′03″E, 34°50′50″N), 24 May 2013.

Diagnosis. Thoracic region consisting of 19 segments, and with 17 setigers; first setiger present from segment 3. segment 3 with well developed lateral lobes. Branchiae arborescent, attached on segments 2-4. Notosetae bordered capillary. Thoracic uncini beginning from setiger 2, arranged in single row, but posterior thoracic uncini arranged in double rows. Abdominal uncini arranged in single row.

Distribution. Cosmopolitan.

Genus *Pista* Malmgren, 1866 총채유령갯지렁이

Lateral lobes present on anterior thoracic segment. Branchiae 1-3 pairs, stalked and branched. Notopodia beginning from segment 4, composed of 17 pairs. Notosetae with smooth tips. Uncini with long-handled shafts present on thoracic setigers, and those of posterior thoracic setigers arranged in 2 rows.

Type species. *Pista cristata* (Müller, 1776).

Key to the species of *Pista* Malmgren, 1866 from Korea

1. Posterior thoracic segments with uncini bearing long handled shafts and additional short handled shafts or lacking shafts .... *P. shizugawaensis*
- Posterior thoracic segments with uncini bearing long handled shafts only 2
2. Lateral lobes on peristomium well developed; branchiae arborescent, with short stalk .... *P. faciata*
- Lateral lobes on peristomium very short branchiae with filaments arranged in spiral at distal tips and long stalk .... *P. cristata*

111. *Pista cristata* (Müller, 1776) 총체유령갯지렁이

Amphitrite cristata Müller, 1776: 216.

Pista cristata: Malmgren, 1865: 382; Moore, 1903: 473; Southern, 1914: 123; Uschakov, 1955: 386; Imajima and Hartman, 1964: 342; Paik, 1982: 831; 1989: 574, fig. 242; Sui, 2013: 101, figs. 4.14-4.15.

Material examined. 7 specimens, Daegok-ri, Sinji-myeon, Wando-gun, Jeollanam-do (126°48′46″E, 34°20′07″N), 26 Mar 2010, Choi HK.

Diagnosis. Prostomium compact. Lateral lobes present on anterior setigers; lateral lobes on segment 4 thin and narrow flaps. Branchiae 2 pairs, and with long stalk and filaments arranged in a spiral at distal tip. Thorax with setigers 17. Notosetae bordly winged capillary. Uncini arranged in 2 rows present from segments 11-20. All thoracic uncini with long-handled shafts.

Distribution. Cosmopolitan.

112. *Pista shizugawaensis* Nishi and Tanaka, 2006 넓은총체유령갯지렁이 (Fig. 26, 27)

Pista shizugawaensis Nishi and Tanaka, 2006: 141, figs. 2-4; Choi *et al.* 2015: 154, figs. 1-2.

Material examined. 2 specimens, Daecheon-ri, Aphae-eup, Shinan-gun, Jeollanam-do (34°51′56″N, 126°21′53″E), 19 Dec 2011, Choi HK.

Description. Body about 10 cm long; thoracic width about 4.0 mm at 6th setiger;

abdominal width about 1.0 mm. Eyespots absent. Buccal tentacles numerous, arose from thickened glandular margin. Prostomium compact with anteriorly projecting tongue, with convoluted glandular margins. Peristomium thickened, with 2 large lateral lobes; lateral lobes distally rounded, extended anteriorly and ventrally, fused mid-ventrally (Fig. 26A - C).

Branchiae 2 pairs, composed of large ones on 2nd segment and small ones on 3rd segment; each branchia with stout, long annulated stalk and plume-shaped head bearing tufts composed of many dichotomously branched filaments; filaments arranged in irregular spiral (Fig. 26A).

Lateral lobes attached from 2nd to 6th segments; 2nd segment with flattened ventro-lateral lobes, fused mid-ventrally, and formed single small lobe; 3rd segment with wide and rounded semi-rectangular lateral lobes, more lateral in position than those on 2nd segment, and lobes divided into dorsal and ventral parts but connected across ventral part by very narrow ridge; 4th segment with thin narrow lateral lobes, reached to ventral pad, completely divided into dorsal and ventral parts; 5th and 6th segments with reduced lateral lobes composed of 2 pairs, located more ventrally than those on 2nd to 4th segments; lateral lobes positioned between neuropodial uncini and ventral pad; lobes on 6th segment slightly smaller than those on 5th segment (Fig. 26A - C).

Ventral pads conspicuous on thoracic setigers, eventually disappeared on abdominal setgers (Fig. 26B, C).

Nephridial papillae very small, present on 6th and 7th segments, inserted below notopodia (Fig. 26A).

Notopodia globular shaped, consisted of 17 pairs from 4th segment (Fig. 26A, B); notosetae broadly or narrowly winged capillary, each with different length (Fig. 27A, B).

Neuropodia beginning from 5th segment (2nd setiger) and continued to pygidium; thoracic neuropodia long, flattened rectangular shaped, and abdominal neuropodia reduced (Fig. 26A).

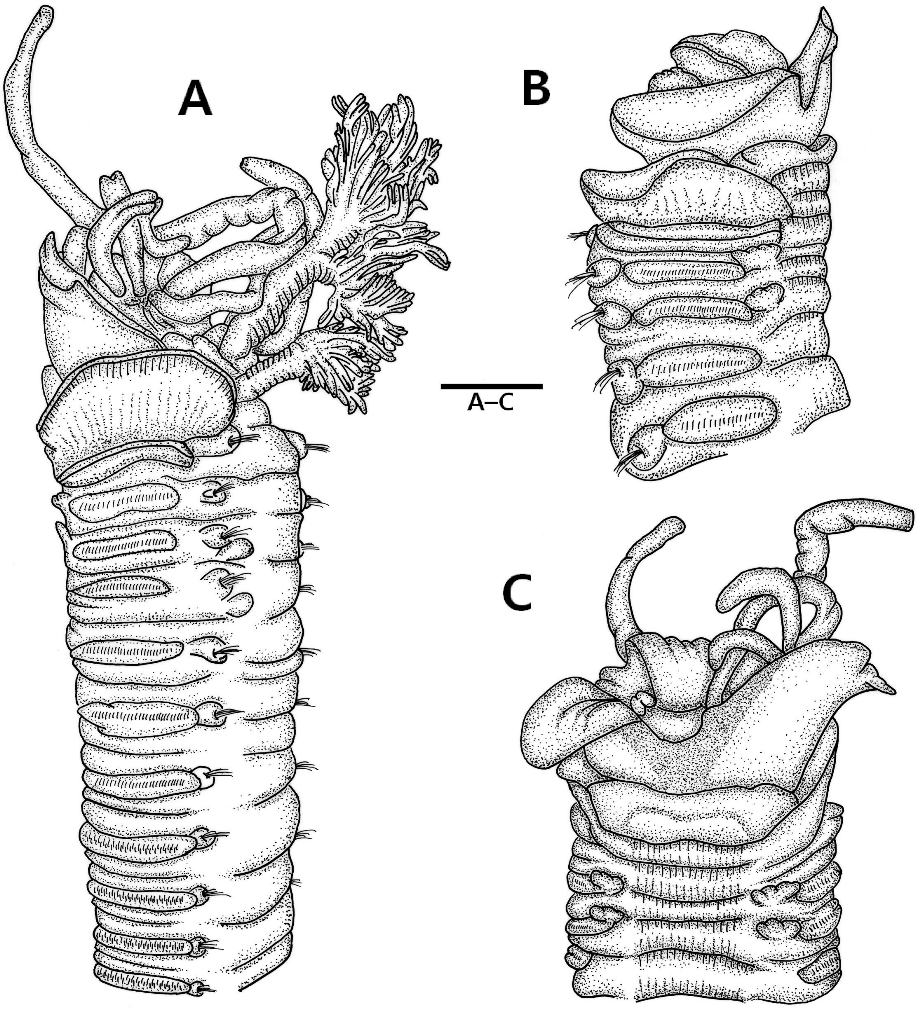

Fig. 26. *Pista shizugawaensis* Nishi and Tanaka, 2006. A, dorso-lateral view (branchiae on the opposite lateral side are omitted) B, ventro-lateral view(tentacles are omitted) C, ventral view. Scale bars: A－C=1.0 mm.

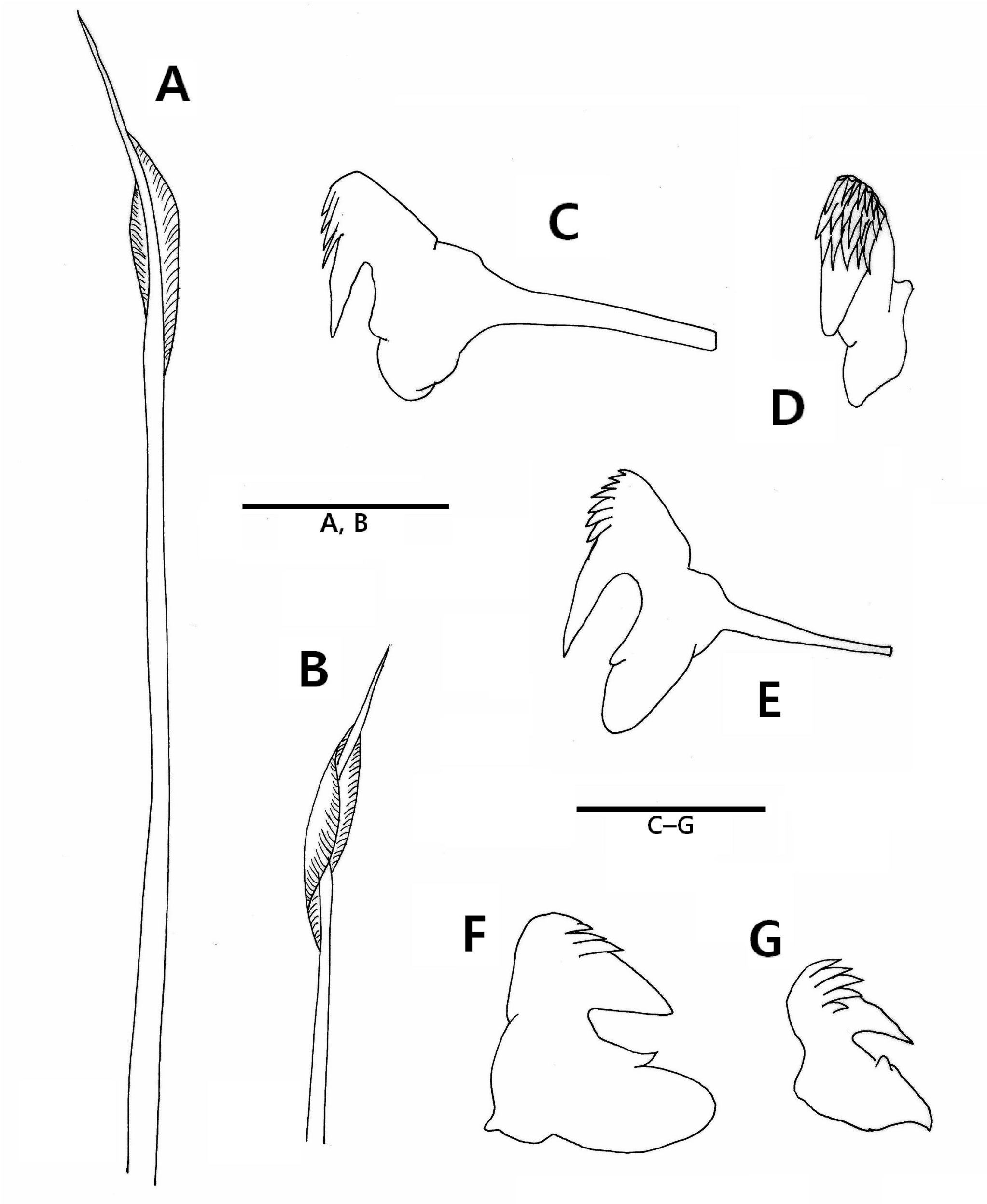

Fig. 27. *Pista shizugawaensis* Nishi and Tanaka, 2006. A, notosetae with long shaft from 7th segment; B, notosetae with short lengths from 7th segment; C, uncini, thoracic uncinus arranged in single row; D, crested head of thoracic uncinus; E, thoracic uncinus on 11th segment arranged in double rows; F, thoracic uncinus on 18th segment arranged in double rows; G, abdominal uncini. Scale bars: A-B=0.2 mm, C-G=0.05 mm.

Uncini (neurosetae) well chitinised, arranged in single rows from 5th to 10th thoracic segments (2nd to 7th setigers) and subsequently arranged in double rows until last thoracic segment (17th setiger), and then arranged in single rows on abdominal segments (Fig. 26A); thoracic uncini arranged in single rows possessing long handled shafts and hook-shaped crested head, with dental formula MF (main fang): 4 - 5, 5 - 6, 6, α (difficult to count) (Fig. 27C, D); thoracic uncini arranged in double rows bearing similar crested head to those in single rows, with long-handled shafts from 11th to 20th segments (8th to 17th setigers) and with additional short-handled shafts or lacking shafts from 18th to 20th segments (15th to 17th setigers) (Fig. 27E, F); abdominal uncini arranged in single rows without shaft, with crested head smaller than thoracic ones (Fig. 27G).

Remarks. *Pista shizugawaensis* was first described from Shizugawa Bay, Japan by Nishi and Tanaka (2006). The original description of this species suggested the following several distinguishable characteristics: two pairs of reduced lateral lobes are located on the 5th and 6th segments; two pairs of branchiae on the 2nd and 3rd segments have tufts composed of many dichotomously branched filaments; the nephridial papillae are present on the 6th and 7th segments; the uncini on the thoracic segments possess long-handled shafts and additional short-handled shafts or lacking shafts appearing in the uncini on the posterior ones; the notosetae are broadly or narrowly winged capillary (Nishi and Tanaka, 2006). In this respect, our Korean materials of *P. shizugawaensis* generally agree well with the original description of Japanese materials (Nishi and Tanaka, 2006), however, there are some minor differences: the lateral lobes on the 3th segment are sub-rectangular shaped in Korean materials, while those in Japanese materials are semi-circular shaped; the dental formula of Korean materials is MF: 4 - 5, 5 - 6, 6, α in the uncini arranged in single rows, but that of Japanese materials is MF: 5 - 6, 5 - 6, 6, 7, α, α (Nishi and Tanaka, 2006).

Pista shizugawaensis is closely related to *P. cristata* and *P. fasciata* reported from Korean waters in which the two paired branchiae are located on the 2nd and 3rd segments, the thoracic segments consist of 17 setigers, the uncini are arranged in double rows from the 11th to 20th segments, the long-handled shafts are present on the uncini of thoracic segments, and the nephridial papillae are found from 6th and 7th segments. However, *P. shizugawaensis* of the present study shows the following different characteristics compared to those of these two species: *P. shizugawaensis* has reduced lateral lobes on the 5th and 6th segments, but both *P. cristata* and *P. fasciata* have not; *P. shizugawaensis* possesses branchiae bearing a long stalk and many dichotomously branched filaments, while branchiae of *P. cristata* have a long stalk and the filaments arranged in a spiral at the distal tip, and those of *P. fasciata* are arborescent and bear a short stalk; *P. shizugawaensis* has notosetae composed of broadly or narrowly winged capillary setae, but both *P. cristata* and *P. fasciata* have those of broadly winged capillary only; *P. shizugawaensis* has short-handled shafts or lacking shafts that appear additionally in the uncini on the posterior thoracic segments, while *P. cristata* and *P. fasciata* do not possess them. On the other hand, *P. cristata* has very short lateral lobes on the prostomium and well developed lateral lobes from the 2nd to 4th segments, while *P. fasciata* possesses well developed lateral lobes on the prostomium and poorly developed lateral lobes from the 2nd to 4th segments (Müller, 1776; Grube, 1870; Marenzellar 1884; Imajima and Hartman, 1964; Day, 1967; Paik, 1982; Kim and Paik, 1993; Nishi and Tanaka, 2006; Nogueira *et al.*, 2011; Sui, 2013)

Discussion. Banse (1980) pointed out that *P. brevibranchiata* Moore, 1923 was characterized by the presence of lateral lobes on the 5th and 6th segments. At this point, Leontovich and Jirkov (2011) considered that *P. shizugawaensis* was a synonym of *P. brevibranchiata* based on the opinion given by Banse (1980). However, *P. shizugawaensis* differs from *P. brevibranchiata* referred by Leontovich and Jirkov (2011) in terms of the detailed shape of notosetae. *P. shizugawaensis* has broadly or narrowly winged capillary notosetae, while *P. brevibranchiata* shows capillary notosetae bearing only small denticles on the surface. Also, *P. shizugawaensis* has short-handled shafts or lacking shafts that appear additionally in the uncini on the posterior thoracic segments, but *P. brevibranchiata* has only long handled shafts (Leontovich and Jirkov, 2011). The shape of uncini on the thoracic segments is known to be an important character in *Pista* taxonomy (Dos

Santos *et al.*, 2010; Nogueira *et al.*, 2011). Therefore, author considers that *P. shizugawaensis* is a completely distinct species from *P. brevibranchiata*, and the synonym of *P. brevibranchiata* as referred by Leontovich and Jirkov (2011) needs to be emended.

Pista fasciata sensu Marenzellar, 1884, which was described by Imajima and Hartman (1964) from Japanese waters, was also regarded as a synonym of *P. brevibranchiata* by Leontovich and Jirkov (2011) because Japanese specimens studied by Imajima and Hartman (1964) possess lateral lobes on the 5th and 6th segments as pointed out by Banse (1980). The authors could also find out the presence of lateral lobes on the 5th and 6th segments in the report of *P. fasciata* described by Marenzellar (1884). However, *P. fasciata* sensu Marenzellar, 1884 differs from *P. brevibranchiata* described by Leontovich and Jirkov (2011) and *P. shizugawaensis* of the present study by the presence of the notosetae with large teeth arranged in one side of the tip (Marenzellar, 1884).

Except for the species mentioned above, we found that other *Pista* species also show a similar feature. Six *Pista* species reported from the Caribbean Sea and the Atlantic coast of South America have lateral lobes on the 5th and 6th segments (Londoño-Mesa, 2009; Dos Santos *et al.*, 2010; Nogueira *et al.*, 2011): *P. alonsae* Santos *et al.*, 2010, *P. cetrata* (Ehlers, 1887), *P. corrientis* McIntosh, 1885, *P. nonatoi* Nogueira *et al.*, 2011, and *P. palmata* (Verrill, 1873). In spite of being poorly described, *Pista sinusa* Hutchings and Glasby, 1988 reported from Australia also shows a similar feature based on the figure (Hutchings and Glasby, 1988). However, *P. shizugawaensis* differs from these species by the presence of uncini bearing short-handled shafts or lacking shafts in the posterior thoracic segments (Hutchings and Glasby, 1988; Nishi and Tanaka, 2006; Dos Santos *et al.*, 2010; Nogueira *et al.*, 2011). Among them, only *P. cetrata* has uncini bearing short-handled shafts or lacking shafts, but *P. shizugawaensis* can be distinguished from *P. cetrata* by the presence of thin and narrow lateral lobes on the 4th segment because *P. cetrata* bears triangular and large lateral lobes (Londoño-Mesa, 2009).

Conclusively, the presence of reduced lateral lobes on the 5th and 6th segments, which was described as a key characteristic feature in the original description by Nishi and Tanaka (2006), is not a valid characteristic of *P. shizugawaensis* because it is shared by several *Pista* species. Author suggests that the useful characteristics of *P. shizugawaensis* that help to distinguish it from its congeners are the morphologies of notosetae, uncini, and other lateral lobes besides those on the 5th and 6th segments.

Distribution. Japan, Korea.

Genus *Terebella* Linnaeus, 1767 고목유령갯지렁이속

Branchiae 2 or 3 pairs, branched, and present from segment 2. Nephridial papillae on segment 3 and 6. Lateral lobes absent. Notosetae beginning from segment 4, with serrated tips. Uncini arranged in 2 rows present on posterior thoracic setigers.

Type species. *Terebella lapidaria* Linnaeus, 1767.

113. *Terebella ehrenbergi* Grube, 1870 고목유령갯지렁이

Leprea ehrenbergi Marenzeller, 1884: 201, pl. 1., fig. 3.

Terebella ehrenbergi Grube, 1870: 511; Hessle, 1917: 188; Okuda, 1938: 102; Imajima and Hartman, 1964: 346; Paik, 1975: 422, pl. 8, fig. 76; 1980: 38; 1982: 832; 1984: 146; 1989: 579, fig. 246.

Material examined. 1 specimen, Bunmae-ri, Aphae-myeon, Shinan-gun, Jeollanam-do (126°17′34″E, 34°51′10″N), 06 Apr 2012, Choi HK; 1 specimen, Haeun-ri, Hyeongyeong-myeon, Muan-gun, Jeollanam-do (126°25′40″E, 35°03′33″N), 28 Jun 2012, Choi HK; 2 specimens, Jeonchon-ri, Gampo-eup, Gyeongju-si, Gyeongsangbuk-do (129°34′38″E, 35°46′25″N), 18 May 2015, Choi HK; 2 specimens, Yuseo-ri, Saengil-myeon, Wando-gun, Jeollanam-do (127°04′33″E, 34°18′08″N), 23 Jul 2007, Choi HK.

Diagnosis. Branchiae 3 pairs on segments 2-4. Lateral lobes lacking. Eyespots present. Notosetae beginning from segment 4; last 40 segments without notosetae. Uncini in single rows on segments 5-10, and in double rows on last 25 segments; uncinus with 3-5 large teeth above main fang, and 2 or 3 rows of smaller teeth.

Distribution. Indo-Pacific regions, Red Sea, France, Mediterranean Sea, Mozambique, North Atlantic Ocean, Japan, Korea.

Genus *Thelepus* Leuckart, 1849 비유령갯지렁이속

Branchiae sessile and filiform, present on segments 2-4. Notosetae beginning from segment 3, with smooth tips. Uncini arranged in single row on all thoracic setigers.

Type species. *Thelepus cincinnatus* (Fabricius, 1780).

Key to the species of *Thelepus* Leuckart, 1849 from Korea

1. Branchiae present on segments 3-4 ········· *T. cincinnatus*
 - Branchiae present on segments 2-4 ········· 2
2. Eyespots present on peristomium ········· 3
 - Eyespots absent ········· *T. setosus*
3. Branchial filaments long and coiled ········· *T. japonicus*
 - Branchial filaments short and digitiform ········· *T. toyamaensis*

114. *Thelepus japonicus* Marenzeller, 1884 긴싸리비유령갯지렁이

Thelepus japonicus Marenzeller, 1884: 208, pl. 2, fig. 4; Imajima and Hartman, 1964: 350; Paik, 1982: 830; 1989: 572, fig. 240; Rho and Lee, 1982: 40, pl. 4, fig. 1.

Thelepus plagiostoma Hessle, 1917: 214.

Material examined. 2 specimens, Yanga-ri, Sangju-myeon, Namhae-gun, Gyeongsangnam-do (127°59′10″E, 34°42′36″N), 15 Mar 2014, Choi HK; 4 specimens, Guman-ri, Homigot-myeon, Nam-gu, Pohang-si, Gyeongsangbuk-do (129°34′31″E, 36°04′35″N), 19 May 2015, Choi HK; 3 specimens, Maejuk-ri, Hansan-myeon, Tongyeong-si, Gyeongsangnam-do (128°37′45″E, 34°40′50″N), 27 Aug 2014, Choi HK; 7 specimens, Siran-dong, Sacheon-si, Gyeongsangnam-do (128°10′46″E, 34°52′48″N), 14 May 2014, Choi HK.

Diagnosis. Tentacular filaments with deep groove. Peristomial ring with numerous eyespots. Branchiae 3 pairs on segments 2-4; branchial filaments long and coiled. Notopodia present from segment 3. Uncini beginning from setiger 3, and arranged in single row; thoracic uncini with 1 or 2 teeth above main fang in lateral view. Nephridial papillae present on segments 4-7.

Distribution. Japan, Korea.

115. *Thelepus setosus* (Quatrefages, 1866) 마당비유령갯지렁이

Phenacia setosa Quatrefages, 1866: 376.

Thelepus setosus: Southern, 1914: 124; Okuda and Yamada, 1954: 196; Imajima and Hartman, 1964: 351; Day, 1967: 729, fig. 36.6a; Rho and Song, 1975: 105, pl. 1, fig. 7, pl. 4, figs. 3-4; Paik, 1982: 830, pl. 26i; 1989: 569, fig. 238; Hilbig, 2000: 246, fig. 9.5.

Material examined. 1 specimens, Jinsan-ri, Soan-myeon, Wando-gun, Jeollanam-do (126°40′49″E, 34°06′52″N), 24 Aug 2006, Choi HK.

Diagnosis. Peristomial ring without eyespots. Branchiae 3 pairs, present on segments 2-4; branchial filaments arranged in transverse series. Notopodia present from segment 3. Uncini beginning from setiger 3, and arranged in single row; uncini with main fang, 2 teeth in tandem, and median tooth above main fang. Nephridial papillae present on segments 4-7.

Distribution. Cosmopolitan.

116. *Thelepus toyamaensis* Okuda, 1936 짧은싸리비유령갯지렁이

Thelepus toyamaensis Imajima and Hartman, 1964: 351; Paik, 1975a: 422, pl. 8, fig. 76; 1982: 830; 1989: 571, fig. 239.

Material examined. 3 specimens, Yuseo-ri, Saengil-myeon, Wando-gun, Jeollanam-do (127°04′33″E, 34°18′08″N), 23 Jul 2007, Choi HK.

Diagnosis. Peristomial ring with numerous eyespots. Ventral shields well developed. Branchiae thick and short, attached on segments 2-4, and arranged in transverse row on each segment. Notosetae beginning from segment 5. Uncini present from segment 3, arranged in single row; uncinus with 2 or 3 teeth above main fang.

Distribution. Japan, Korea.

Family Trichobranchidae Malmgren, 1866 조름털갯지렁이과

Body divided into 2 region, anterior biramous and posterior uniramous region. Prostomium large hood over mouth. Branchiae 1-4 pairs. Uncini with long and acicular shafts on thoracic segments.

Type genus. *Trichobranchus* Malmgren, 1866.

Key to the genera of Trichobranchidae Malmgren, 1866 from Korea

1. Branchia single, with 4 lobes bearing flat branchial lamallae ················ *Terebellides*
 - Branchiae more than 1 pair ··· 2
2. Branchiae 3 pairs; thorax with 15 setigers ·· *Trichobranchus*
 - Branchiae 4 pairs; thorax with 16 setigers ·· *Octobranchus*

Genus *Trichobranchus* Malmgren, 1866

Thorax with 15 setigers. Branchiae simple, 3 pairs. Notosetae beginning from segment 6. Uncini present on all thoracic setigers.

Type species. *Trichobranchus glacialis* Malmgren, 1866.

117. *Trichobranchus glacialis* Malmgren, 1866 여섯조름털갯지렁이

Trichobranchus glacialis Malmgren, 1866: 395; Southern, 1914: 129; Fauvel, 1927: 288, fig. 100; Uschakov, 1955: 381, fig. 142; Paik, 1984b: 147; 1989: 584, fig. 249.

Material examined. 2 specimens, Yeongun-ri, Sanyang-eup, Tongyeong-si, Gyeongsangnam-do (128°28′24″E, 34°47′33″N), 28 Aug 2014, Choi HK.

Diagnosis. Prostomium compact, fused to free frontal edge of peristomium. Peristomium forming lips; upper lip hidden. Branchiae 3 pairs and filamentous. Thrax with 15 setigers. Notopodia beginning from segment 6. Notosetae smooth tipped. Neuropodia from segments 5 or 6, and present to posterior end. Thoracic neurosetae avicular with long shafts.

Distribution. Atantic Ocea, Mediterranean Sea, Bering Sea, Okhotsk Sea, Japan, Korea.

Order Sabellida Malmgren, 1867 꽃갯지렁이목

This order is represented by four families in Korea, and six families are known in the world. They are characterized by the fusion of the prostomium and peristomium, and frontal tentacular crown.

Key to the families of Sabellida Malmgren, 1867 from Korea

1. Anterior end with small collar with ventral incision ·········· Oweniidae
 – Anterior end with tentacular crown ·········· 2
2. Anterior end with paleae arranged in 2-3 rows ·········· Sabellariidae
 – Anterior end without paleae ·········· 3
3. Radioles in tentacular crown not modified into operculum ·········· Sabellidae
 – Radiole in tentacular crown modified into operculum ·········· Serpulidae

Family Oweniidae Rioja, 1917 싸리버섯갯지렁이과

Body cylindrical. Prostomium fused to anterior segments, sometimes produced in lobes or as fold membrane. Notosetae capillary. Neurosetae bi- or tridentate hooks.
Type genus. *Owenia* Delle Chiaje, 1844.

Key to the genera of Oweniidae Rioja, 1917 from Korea

1. Prostomium produced anteriorly into low tentacular crown ·········· *Owenia*
 – Prostomium rounded ·········· *Myriowenia*

Genus *Owenia* Delle Chiaje, 1844 싸리버섯갯지렁이속

Prostomium with low tentacular crown bearing flattened lobes. First 3 setigers without neurosetae.
Type species. *Owenia fusiformis* Delle Chiaje, 1841.

118. *Owenia fusiformis* Delle Chiaje, 1844 싸리버섯갯지렁이

Owenia fusiformis Delle Chiaje, 1844: 31; Southern, 1914: 106; Fauvel, 1927: 203, fig. 71a-f; Imjima and Hartman, 1964: 322; Tempi and Rangarajan, 1964: 116; Day, 1967: 649, fig. 31.1e-j; Paik, 1982: 823, pl. 25a; 1989: 547, fig. 255; Jirkov, 2001: 425.

Material examined. 2 specimens, Songseok-ri, Haeje-myeon, Muan-gun, Jeollanam-do (126°19′33″E, 35°08′12″N), 16 Oct 2012, Choi HK; 2 specimens, Dongho-ri, Haeri-myeon, Gochang-gun, Jeollabuk-do (126°31′34″E, 35°30′29″N), 03 May 2015, Choi HK.

Diagnosis. Prostomium with low tentacular crown. Dorsal setae spinous. Neuropodial uncini bidentate. First 3 setigers without neurosetae. Tube fusiform and membranous.

Distribution. Cosmopolitan.

Family Sabellidae Malmgren, 1867 꽃갯지렁이과

Body divided into thorax and abdomen. Prostomum reduced, fused to peristomium. Anterior end with crown of bipinnate radioles. Uncini crested or with teeth in several rows.

Type genus. *Sabella* Linnaeus, 1767.

Key to the genera of Sabellidae Malmgren, 1867 from Korea

1. Abdomen with uncinial cinctures around body .... *Myxicola*
 \- Abdomen with uncinial tori 2
2. Thoracic uncini with acicular shafts; companion setae absent 3
 \- Thoracic uncini with avicular shafts; companion setae present 4
3. Modified posterior end present .... *Euchone*
 \- Modified posterior end absent .... *Chone*
4. Thoracic neropodial companion setae present 5
 \- Thoracic neropodial companion setae absent 6
5. Radioles with external stylodes .... *Branchiomma*
 \- Radioles without external stylodes .... *Sabellastarte*
6. Thoracic setae including spatulate notosetae .... *Pseudopotamilla*
 \- Thoracic setae not including spatulate notosetae .... *Sabella*

Genus *Chone* Krøyer, 1856 빗꽃갯지렁이속

Radioles more than 5, with distinct webbing between radioli. Collar well developed. Thoracic uncini with acicular shafts; companion setae absent. Abdominal uncini with short, quadrangular base and crested tip. Modified posterior end absent.

Type species. *Chone infundibuliformis* Kroyer, 1856

119. *Chone teres* Bush, 1904 빗꽃갯지렁이

Chone teres Bush, 1904: 215, pl. 30, fig. 1, pl. 27, figs. 16-23; Imajima and Hartman, 1964: 365; Paik, 1982: 835; 1989: 600, fig. 657.

Material examined. 2 specimens, Maejuk-ri, Hansan-myeon, Tongyeong-si, Gyeongsangnam-do (128°37′45″E, 34°40′50″N), 27 Aug 2014, Choi HK

Diagnosis. Thorax with 8 setigerous segments. First setiger with notosetal fascicles composed of 2 rows of short and longer, narrowly limbate setae. Thoracic segments with notosetae of 3 types: limbate capillary, spatulate setae, and bayonet-shaped setae. Thoracic uncini with thick hooks and small teeth above main fang. Abdominal neuropodia with limbate capillaries and uncini with 5 to 6 rows of teeth.

Distribution. Alaska, northern Japan, Korea.

Genus *Pseudopotamilla* Bush, 1904, 안점꽃갯지렁이속

Radioles with eyes, not branched. Thoracic uncini with avicular shafts. Companion setae present on notopodia. Thoracic setae including spatulate notosetae. Abdomen with uncinial tori.

Type species. *Pseudopotamilla reniformis* (Bruguière, 1789).

Key to the species of Sabellidae Malmgren, 1867 from Korea

1. Tentacular crown with deep and V-shaped notch basally on dorsal side .... *P. occelata*
- Tentacular crown without notch .... *P. myriops*

120. *Pseudopotamilla occelata* Moore, 1905 안점꽃갯지렁이

Pseudopotamilla occelata Moore, 1905: 559, pl. 37, figs. 8-15; 1908: 360.

Potamilla myriops: Okuda, 1934: 233. fig. 1-2.

Pseudopotamilla occelata: Hartman, 1938b: 26, pl. 2, fig. 6; 1944: 281; Imajima and Hartman, 1964: 361; Rho and Song, 1974: 81, fig. 44-49; Paik, 1982: 836; 1984: 143; 1989: 589, fig. 250.

Material examined. 6 specimens, Gungchon-ri, Geundeok-myeon, Samcheok-si, Gangwon-do (129°26′28″E, 37°16′17″N), 19 Sep 2014, Choi HK.

Diagnosis. Radioles 35-50 pairs, with 4-12 eyespots in single rows on each radiole. Tentacular base distinct with deep and V-shaped notch on dorsal side. Thorax with 8 setigers. Collar setae slender and limbate. Thoracic notopodia with narrowly limbate setae and spatulate setae. Abdomen with avicular uncini on notopodia and limbate capillary setae on neuropodia.

Distribution. Alaska to Northern California, Japan, Korea.

Genus *Sabellastarte* Krøyer, 1856 꽃갯지렁이속

Radioles spiralled, with eyes, and without external stylodes. Collar widely separated dorsally. Thoracic neuropodial companion setae present. Thoracic uncini with avicular shafts.

Type species. *Sabellastarte spectabilis* (Grube, 1878).

Key to the species of *Sabellastarte* Krøyer, 1856 from Korea

1. Ventral gland shields with pair of minute spot ········· *S. spectabilis*
 \- Ventral gland shields without spot ········· *S. zebuensis*

121. *Sabellastarte spectabilis* (Grube, 1878) 납색꽃갯지렁이

Sabella spectabilis Grube, 1878b: 253, pl. 14, fig. 4.

Laonome japonica Marenzeller, 1884: 212, pl. 3, fig. 4

Sabellastarte indica: Okuda, 1938: 103; Takahashi, 1941: 109; Okuda and Yamada, 1954: 196.

Sabellastarte japonica: Imajima and Hartman, 1964: 364; Rho and Song, 1974: 82, fig. 1; 1975: 105; Paik, 1975a: 423, pl. 9, figs. 79-84; 1989: 593, fig. 253.

Sabellastarte spectabilis: Phyllis and Andrew, 2003: 2274, fig. 2.

Material examined. 5 specimens, Daepo-dong, Sokcho-si, Gangwon-do (128°38′1

8″E, 38°10′27″N), 15 Sep 2014, Choi HK.

Diagnosis. Tentacular radioles spiralled with eyespots, and without external stylodes. Collar well developed, lobed, and separated dorsally. Thorax with 8 setigers. Pigment spots present on dorsal and ventral side. thoracic notosetae limbate capillary and neurosetae avicular uncini. Spatulate and companion setae absent.

Distribution. England, Red Sea, Indian Ocean, Australia, New Zealand, China, Korea.

Family Serpulidae Rafinesque, 1815 석회관갯지렁이과

Body symmetrical, with more than 4 thoracic setigers and thoracic membrane. Anterior end with crown of bipinnate radioles; 1 radioli modified into operculum. Tube calcareous, irregularly twisted or straight.

Type genus. *Serpula* Linnaeus, 1767.

Key to the genera of Serpulidae Rafinesque, 1815 from Korea

1. Body symmetrical; thorax with more than 3 setigers ············ 2
 - Body asymmetrical; thorax with 3 setigers ············ *Neodexiospira*
2. Operculum present ············ 3
 - Operculum absent ············ 6
3. Collar setae absent ············ *Ditrupa*
 - Collar setae present ············ 4
4. Opercular peduncle with well developed membranous distal wings ·· *Spirobranchus*
 - Opercular peduncle without well developed distal wings ············ 5
5. Operculum 2 tiered, with proximal funnel of fused radii and distal verticil of spines ············ *Hydroides*
 - Operculum simple funnel made of fused radii ············ *Serpula*
6. Radioles 4 pairs; collar setae limbate capillary and geniculate ············ *Salmacina*
 - Radioles 30-45 pairs; collar setae capillary ············ *Protula*

Genus *Hydroides* Gunnerus, 1768 우산석회관갯지렁이속

Radiolar eyes absent. Collar setae present. Opercular peduncle without well developed distal wings. Operculum 2 tiered, with proximal funnel of fused radii and distal verticil of spines. Thorax consisting of 7 setigers.

Type species. *Hydroides norvegica* Gunnerus, 1768.

Key to the species of *Hydroides* Gunnerus, 1768 from Korea

1. Superior opercular crown with dissimilar spines .... *H. albiceps*
 – Superior opercular crown with similar spines in size and shape 2
2. Inner surface on superior opercular crown with accessory spinules .... *H. ezoensis*
 – Inner surface on superior opercular crown without accessory spinules .... *H. uncinatus*

122. *Hydroides ezoensis* Okuda, 1934 우산석회관갯지렁이

Hydroides diplochone: Zachs, 1933: 135.

Hydroides ezoensis Okuda, 1934: 239; Imajima and Hartman, 1964: 369; Paik, 1975: 423, pl. 9, fig. 88; 1979b: 57, fig. 10d-g; 1980: 38, table. 1, figs. G-I; 1982: 840, pl. 28h-j; 1989: 616, fig. 267; Imajima, 1976: 236, fig. 2a-o; 1978: 54; Sun et al., 2015: 34, fig. 9.

Material examined. 2 specimens, Hamdeok-ri, Jocheon-eup, Jeju-si, Jeju-do (126°42′38″E, 33°31′43″N), 23 Jun 2014, Choi HK; 2 specimens, Guman-ri, Homigot-myeon, Nam-gu, Pohang-si, Gyeongsangbuk-do (129°34′31″E, 36°04′35″N), 19 May 2015, Choi HK; 3 specimens, Yanga-ri, Sangju-myeon, Namhae-gun, Gyeongsangnam-do (127°59′10″E, 34°42′36″N), 15 Mar 2014, Choi HK.

Diagnosis. Thorax with 7 setigers. Radioles 11-21 pairs with numerous pinnules. Collar low, with entire edge. Superior opercular crown with 20-23 verticil spines, each spines with 6-8 accessory spinules in row on inner surface. Inferior operculum with 23-60 crenulations. Collar setae slender capillary and bayonet-shaped with 2 short basal processes. Thoracic uncini with pointed fang and 5-6 teeth.

Distribution. Southern United Kingdom, Australia, South China, Japan, Korea.

123. *Hydroides uncinatus* (Philippi, 1844) 갈고리석회관갯지렁이

Hydroides uncinatus: Fauvel, 1927: 357, fig. 122a-h; Okuda, 1937: 63, fig. 10; Uschakov, 1955: 427; Day, 1967: 805, fig. 38h-i; Rho and Lee, 1982: 41, figs. 10-11; Paik, 1989: 616, fig. 266.

Eupomatus uncinatus Imajima and Hartman, 1964: 368.

Material examined. 6 specimens, Punghwa-ri, Sanyang-eup, Tongyeong-si, Gyeongsangnam-do (128°24′34″E, 34°48′04″N), 21 Mar 2014, Choi HK; 1 specimen, Yanga-ri, Sangju-myeon, Namhae-gun, Gyeongsangnam-do (127°59′10″E, 34°42′36″N), 15 Mar 2014, Choi HK.

Diagnosis. Radioles 14-17 pairs. Inferior operculum with circlet consisting of about 30 pointed spines. Superior opercular crown with 16 long and simple spines. Collar setae slender capillary and bayonet-shaped with 2 short basal processes.

Distribution. Cosmopolitan.

Genus *Spirobranchus* Blainville, 1818 큰조름석회관갯지렁이속

Operculum calcareous. Opercular peduncle with well developed membranous distal wings. Radioles arranged in circle or spiral. Collar setae present or absent. Thorax consisting of 7 setigers.

Type species. *Spirobranchus giganteus* (Pallas, 1766).

124. *Spirobranchus kraussii* (Baird, 1865) 굵은석회관갯지렁이

Placostegus cariniferus kraussii Baird, 1865: 14.

Pomatoleios kraussii: Day, 1967: 800, fig. 38. 3d-f; Imajima and Hartmna, 1964: 372; Paik, 1975a: 424; 1982: 839, pl. 28g; 1989: 609, fig. 261.

Spirobranchus kraussii: Pillai, 2009: 168, fig. 49E-G.

Material examined. 1 specimen, Hamdeok-ri, Jocheon-eup, Jeju-si, Jeju-do (126°42′38″E, 33°31′43″N), 23 Jun 2014, Choi HK; 2 specimens, Guman-ri, Homigot-myeon, Nam-gu, Pohang-si, Gyeongsangbuk-do (129°34′31″E, 36°04′35″N), 19 May 2015, Choi HK; 8 specimens, Punghwa-ri, Sanyang-eup, Tongyeong-si, Gyeongsangnam-do (128°24′34″E, 34°48′04″N), 21 Mar 2014, Choi HK.; 15 specimens, Sangju-ri, Sangju-myeon, Namhae-gun, Gyeongsangnam-do (128°06′40″E, 34°40′34″N), 15 Mar 2014, Choi HK

Diagnosis. Operculum calcareous, without processes; opercular plate circular, flat and concave centrally. Radioles arranged in circle on each side, and inter-radiolar membranes present. Collar setae present on juveniles and absent in adults. Abdomial setae with long shafts and blades bearing tapering process.

Distribution. Korea, Gulf of Mexico, South Africa, Philippines, Indian Ocean, Madagascar, Mediterranean Sea, Mozambique, North Atlantic Ocean, Austrailia, Japan.

Subclass Scolecida Rouse and Fauchald, 1997

In Korean waters, eight families are recorded in this taxon. The species belonging to this taxon are characterized by absence of palps and head appendage.

Key to the families of Scolecida Rouse and Fauchald, 1997 from Korea

1. Multidentate hooks present on posterior setigers ··· 2
  - Multidentate hooks absent ··· 4
2. Hooded hooks present ··· Capitellidae
  - Hooded hooks absent ··· 3
3. Each segments elongate with joints; branchiae usually absent ··· Maldanidae
  - Each segments not elongate; branchiae present ··· Arenicolidae
4. Single filiform tentacle present on 1 anterior setiger ··· Cossuridae
  - Single filiform tentacle absent ··· 5
5. Ventral groove usually present; all setae simple capillaries ··· Opheliidae
  - Ventral groove absent; setae various ··· 6
6. Prostomium with T-shaped frontal horns ··· Scalibregmatidae
  - Prostomium without T-shaped frontal horn ··· 7
7. Parapodia with internal acicula; branchiae continuing to posterior end ··· Orbiniidae
  - Parapodia without internal acicula; branchiae absent on posterior end ··· Paraonidae

Family Orbiniidae Hartman, 1942 갓모갯지렁이과

Parapodia with internal acicula and well developed lobes. Branchiae present, continuing to posterior end. Setae including crenulated or camerated capillary and sometimes lyrate setae. Neuropodial uncini modified.

Type genus. *Orbinia* Quatrefages, 1865.

Key to the genera of Orbiniidae Hartman, 1942 from Korea

1. Prostomium rounded or truncate ······ *Naineris*
 – Prostomium pointed distally ······ 2
2. Thoracic parapodia with all slender and pointed setae ······ *Haploscoloplos*
 – Thoracic parapodia with setae of another kind ······ 3
3. Thorax with neuropodia of 2 abruptly different kinds ······ *Phylo*
 – Thorax with neuropodia not abruptly different ······ *Scoloplos*

Genus *Haploscoloplos* 갓모갯지렁이속

Prostomium pointed distally. Thoracic parapodia with all slender and pointed setae. Noto- and neurosetae crenulated capillaries, and sometimes furcate setae.

Type species. *Haploscoloplos cylindrifer* (Ehlers, 1905).

125. *Haploscoloplos elongatus* (Johnson, 1901) 갓모갯지렁이

Haploscoloplos elongatus: Imajima and Hartman, 1964: 274; Paik, 1975: 419, pl. 8, fig. 69; 1979b: 55, table. 2, fig. A; 1982: 802, pl. 19j-k; 1984b: 154; 1989: 447, fig. 161.

Material examined. 1 specimen, Namdong-ri, Imhoe-myeon, Jindo-gun, Jeollanam-do (126°09′10″E, 34°21′35″N), 09 Apr 2013, Choi HK; 1 specimen, Ganggye-ri, Imhoe-myeon, Jindo-gun, Jeollanam-do (126°15′16″E, 34°23′30″N), 09 Apr 2013, Choi HK; 2 specimens, Na-ri, Gunnae-myeon, Jindo-gun, Jeollanam-do (126°12′52″E, 34°33′35″N), 09 Apr 2013, Choi HK; 4 specimens, Cheongsan-ri, Wonbuk-myeon, Taean-gun, Chungcheongnam-do (126°20′38″E, 36°47′53″N), 23 Jun 2012, Choi HK.

Diagnosis. Prostomium acutely pointed. Branchiae first observed from segments 14-18; first 2-3 pairs of branchiae very small as minute papilla, and following ones digitiform. Thorax with about 15 setigers; neuropodial and notopodial postsetal lobes short and subtrianglar-shaped. Abdomen with well developed notopodial postsetal lobes, asymmetrical and foliceous. Thoracic setae slender and pointed distally.

Distribution. Alaska to California, Western Mexico, Japan, Korea.

Genus *Naineris* Blainville, 1828 모자갯지렁이속

Prostomium rounded or truncate. Branchiae beginning from segments 2-23. Notosetae including furcate setae on abdomen. Neurosetae blunt uncini and pointed subuluncini in thorax.

Type species. *Naineris quadricuspida* (Fabricius, 1780).

126. *Naineris dendritica* (Kinberg, 1867) (Fig. 28)

Naineris nannobranchia Chamberlin, 1919: 260, pl. 2, fig. 10, pl. 3, fig. 1

Naineris laevigata: Berkeley and Berkeley, 1941: 41.

Naineris dendritica: Hartman, 1957: 299, pl. 36, figs. 1-3, pl. 37, figs. 1-7; Blake, 1996a: 19, fig. 1.7.

Material examined. 14 specimens, Ibam-ri, Donghae-myeon, Nam-gu, Pohang-si, Gyeongsangbuk-do (129°35′23″E, 35°57′21″N), 19 May 2015, Choi HK; 4 specimens, Gungchon-ri, Geundeok-myeon, Samcheok-si, Gangwon-do (129°26′28″E, 37°16′17″N), 16 Sep 2014, Choi HK; 11 specimens, Hyangho-ri, Jumunjin-eup, Gangneung-si, Gangwon-do (126°21′58″E, 33°12′19″N), 15 Sep 2014, Choi HK; 6 specimens, Daepo-dong, Sokcho-si, Gangwon-do (128°38′18″E, 38°10′27″N), 15 Sep 2014, Choi HK.

Description. Body about 55.0-75.0 mm long and width about 5.0 mm; thoracic region expanded and flattened dorsoventrally; abdominal region more slender and crowded than thoracic region; pygidium with 2 lobes (Fig. 28A).

Prostomium rounded anteriorly, without eyespots. Nuchal organs invisible. Proboscis numerous branched (Fig. 28A).

Peristomium narrow unannulate, but biannulate ventrally in some small specimens (Fig. 28A).

Thorax with about 21-26 segments; transition between thorax and abdomen distinct (Fig. 28A).

Branchiae paired, narrowly long, and present from 8 to last setiger on dorsal side; initial branchiae reduced, sub-globular shaped; complete branchiae present from about setiger 25 (Fig. 28A-C).

Parapodia biramous; thoracic region with notopodia bearing long and sub-triangular postsetal lobes and neuropodia simple ridges bearing projected lamellae dorsally; abdominal region with notopodia bearing more slender lobes than thoracic ones and neuropodia bearing subtriangular-shaped presetal lobes and more thicker and longer postsetal lobes than thoracic ones (Fig. 28B, C).

Thoracic notosetae camerated capillarise; abdominal notosetae slender capillary. Thoracic neurosetae 2 or 3 rows of heavy spines grading from blunt uncini to pointed subuluncini; abdominal neurosetae capillary and few prostruding acicular spines (Fig. 28D-I).

Remarks. The peristomium of *Naineris* species has been described as having a single ring (Fauchald, 1977; Blake, 1996a). However, Blake (1996a) suggested that the small materials of *Naineris* species have two peristomial rings instead of one, and the author is able to observe this feature in some Korean materials of the present study of small size. The peristomium with two rings had been regarded as one of the diagnostic feature of other taxa (Fauchald, 1977), but Blake (1996a) concluded that the materials bearing two peristomial rings might actually be juveniles of the species belonging to *Naineris*. Therefore, small Korean materials can be also considered as *Naineris* species.

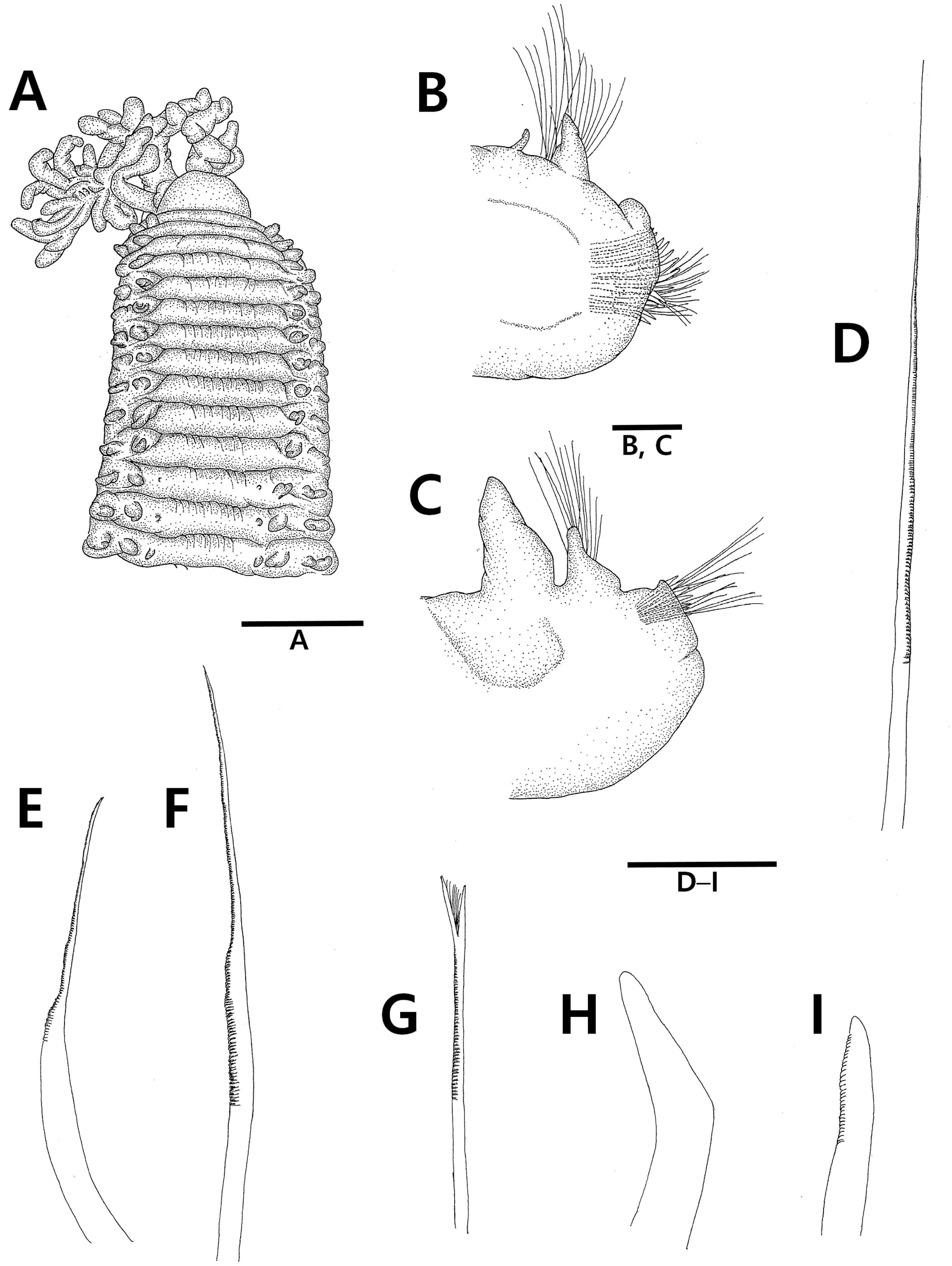

Fig. 28. *Naineris dendritica* (Kinberg, 1867). A, anterior dorsal view (omitted setae) B, anterior view of thoracic parapodium; C, anterior view of abdominal parapodium; D, thoracic notopodial seta; E, F, thoracic neuropodial subuluncini G, abdominal notopodial; G, abdominal notopodial furcate seta; H, I, thoracic neuropodial uncini. Scale bars: A=1.0 mm, B, C=0.2 mm, D–I=0.05 mm.

Naineris dendritica of the present study is closely related to *N. laevigats* known as a cosmopolitan species, but these species differ in the detail of the thoracic neuropodia and setae as follows: the thoracic neuropodial lobes of *N. dendritica* possess superior edge which is slightly enlarged so as to resemble a small papilla, while those of *N. laevigats* have foliaceous and more projected lobes; the thoracic uncini on the inferior position of *N. dendritica* have ridges, but those of *N. laevigats* are smooth (Hartman, 1957; Blake, 1996a). In this respect, Korean materials of the present study agree well with the previous descriptions of *N. dendritica* (Hartman, 1957; Blake, 1996a). However, Korean materials show a minor difference as follows: the branchiae are beginning from about setiger 11-12 in the Korean materials, while those of the previous descriptions of *N. dendritica* are beginning from setigers 8-12 or rarely from setiger 7 (Hartman, 1957; Blake, 1996a).

Distribution. Alaska to southern California, Gulf of Mexico, Florida, Korea.

Genus *Phylo* Kinberg, 1866 고깔갯지렁이속

Prostomium pointed distally. Thoracic neurosetae crenulated capillaries, heavy hooks and heavy spear-shaped setae.

Type species. *Phylo felix* Kinberg, 1866.

Key to the species of *Phylo* Kinberg, 1866 from Korea

1. Parapodial interramal cirri present; 23 subpodial papillae on segments 12-21 ····· ································ *P. felix asaticus*
- Parapodial interramal cirri absent; 2-4 subpodial papillae on segments 14-16 and 9 ones on segments 6-8 ································ *P. fimbriatus*

127. *Phylo felix asiaticus* Wu, 1962 아시아고깔갯지렁이

Phylo felix asiaticus Wu, 1962: 422, pl. 1, figs. H-N, pl. 2, fig. A; Imajima and Hartman, 1964: 275; Paik, 1982: 803, pl. 191-n; 1989: 448, fig. 162.

Material examined. 2 specimens, Daegok-ri, Sinji-myeon, Wando-gun, Jeollanam-do (126°48′46″E, 34°20′07″N), 02 Jul 2015, Choi HK.

Diagnosis. Prostomium conical-shaped. Branchiae first present from setiger 5. Neuropodial postsetal lobes fringed with 12-16 papillae. Subpodial papillae from setiger 12, and 23 subpodial papillae on segments 12-21. Thoracic neurosetae long capillary setae, uncini, and subuluncini. Parapodial interramal cirrus rudimentary. Abdominal notosetae capillary and furcate setae.

Distribution. China, Japan, Korea.

Genus *Scoloplos* Blainville, 1828 삼각모자갯지렁이속

Prostomium pointed distally. Thoracic neurosetae blunt hooks and crenulated capillaries. Abdomenial notosetae crenulated capillaries, furcate setae, and spines.

Type species. *Scoloplos armiger* (Muller, 1776).

128. *Scoloplos armiger* (Müller, 1776) 삼각모자갯지렁이

Lumbricus armiger Müller, 1776: 215.

Scoloplos armiger: McIntosh, 1910: 510, pl. 56, fig. 7; Fauvel, 1927: 20, fig. 6k-q; Imajima and Hartman, 1964: 277; Paik, 1987: 803, pl. 19r-t; 1989: 450, fig. 164

Scoloplos (Scoloplos) armiger: Blake, 1996a: 17, fig. 1.6

Material examined. 1 specimen, Bunmae-ri, Aphae-myeon, Shinan-gun, Jeollanam-do (126°17′34″E, 34°51′10″N), 06 Apr 2012, Choi HK; 5 specimens, Gwan-ri, Iwon-myeon, Taean-gun, Chungcheongnam-do (126°14′19″E, 36°53′05″N), 23 May 2012, Choi HK; 1 specimens Hamdeok-ri, Jocheon-eup, Jeju-si, Jeju-do (126°42′38″E, 33°31′43″N), 23 Jun 2014, Choi HK; 5 specimens, Danghang-ri, Changseon-myeon, Namhae-gun, Gyeongsangnam-do (128°28′24″E, 34°47′33″N), 31 Jul 14, Choi HK.

Diagnosis. Prostomium acutely pointed. Branchiae first observed on setiger 12, continue to end of body; branchiae on mediam setigers with subdistal asymmetrical enlargement and smooth tip. Abdomen with prolonged setal lobes. Thoracic setae pointed capillary. Abdominal setae pointed and furcate.

Distribution. Cosmopolitan.

Family Paraonidae Cerruti, 1909 별난가시갯지렁이과

Prostomium usually with median antenna. Parapodia without internal acicula, and parapodial lobes reduced. Branchiae present, limited to anterior segments. Setae smooth or faintly striated, and lyrate setae usually present.

Type genus. *Paraonis* Cerruti, 1909.

Key to the genera of Paraonidae Cerruti, 1909 from Korea

1. Notopodial modified setae present ··· *Cirrophorus*
 – Notopodial modified setae absent ··· *Aricidea*

Genus *Aricidea* Webster, 1879 긴코별난가시갯지렁이속

Prostomium conical, with median antenna. Prebranchial segments 3. Parapodia biramous, with digitiform postsetal notopodial lobes. Setae including simple capillary and modified neurosetae on postbranchial segments.

Type species. *Aricidea fragilis* Webster, 1879.

Key to the species of *Aricidea* Webster, 1879 from Korea

1. Modified setae absent ··· *A.* (*Aricidea*) *pacifica*
 – Modified setae present ··· 2
2. Antenna articulated ··· *A.* (*Aricidea*) *wassi*
 – Antenna smooth ··· *A.* (*Acesta*) *assimilis*

129. *Aricidea* (*Aricidea*) *pacifica* Hartman, 1944 태평양별난가시갯지렁이

Aricidea pacifica Hartman, 1944: 316, pl. 27, fig. 8, 9.

Aricidea (*Aedicira*) *pacifica:* Fauchald and Hancock, 1981: 7; Blake, 1996b: 47, fig. 2. 9; Jung *et al.*, 1996: 318, fig. 5.

Material examined. 4 specimens, Gomso-ri, Jinseo-myeon, Buan-gun, Jeollabuk-do (126°38′28″E, 35°35′04″N), 14 Aug 2014, Choi HK.

Diagnosis. Prostomium truncate, with short lateral horns. Median antenna slender, cirriform, and reaching to setiger 4. Branchiae beginning on setiger 4, present until about setigers 29-60; anterior branchiae thick, and posterior ones tapering to thin as thread-like. Setae all capillary. Modified setae absent.

Distribution. California, China, Yellow Sea, Japan, Korea.

130. *Aricidea (Acesta) assimilis* Tebble, 1959 솜털별난가시갯지렁이

Aricidea assimilis: Day, 1961: 482.

Aricidea (Acesta) assimilis: Jung *et al.*, 1996: 320, fig 7.

Material examined. 1 specimen, Haeun-ri, Hyeongyeong-myeon, Muan-gun, Jeollanam-do (126°25′40″E, 35°03′33″N), 08 Apr 2013, Choi HK.

Diagnosis. Prostomium conical and triangular. Median antenna elongate, smooth, and extending to setiger 3. Branchiae beginning on setiger 4, present until about setigers 20-38; anterior branchiae slender and tapered distally. Modified setae acicular, with narrow sheath along convex side and numerous fine bristles arounded apex.

Distribution. North Atlantic Ocean, Yellow Sea, Korea.

Family Opheliidae Malmgren, 1867 요정갯지렁이과

Body convex. Prostomium blunt or conical, without appendage. Ventral groov usually present. Parapodial lobes reduced. All setae capillary. Uncinial hook absent.

Type genus. *Ophelia* Savigny, 1822.

Key to the genera of Opheliidae Malmgren, 1867 from Korea

1. Body elongate and generally streamlined, with distinct ventral groove extending along body 2
 - Body large and thick, without ventral groove .... *Travisia*
2. Lateral eyespots present 3
 - Lateral eyespots absent .... *Ophelina*
3. Branchiae present; anal funnel with long and unpaired cirrus .... *Armandia*
 - Branchiae absent; anal funnel with small papillae .... *Polyophthalmus*

Genus *Armandia* Filippi, 1861 보석요정갯지렁이속

Body with ventral groove extending to nearly posterior end. Lateral eyespots and branchiae present. Anal funnel with long and unpaired cirrus.

Type species. *Armandia cirrhosa* Filippi, 1861.

Key to the species of *Armandia* Filippi, 1861 from Korea

1. Anal funnel fringed 2
 – Anal funnel not fringed .... *A. simodaensis*
2. Abranchiaete setigers on posterior region 1 or 2 anal funnel bearing 8 - 11 papillae .... *A. amakusaensis*
 – Abranchiaete setigers on posterior region more than 2 anal funnel bearing 14 - 18 papillae .... *A. lenceolata*

131. *Armandia amakusaensis* Saito, Tamaki and Imajima, 2000 아가미보석요정갯지렁이 (Fig. 29)

Armandia amakusaensis Saito *et al.*, 2000: 2032, fig. 3; Choi *et al.*, 2015: 99, fig. 2.

Material examined. 8 specimens, Gwan-ri, Iwon-myeon, Taean-gun, Chungcheongnam-do (36°53′05″N, 126°14′19″E), 23 May 2012, Choi HK; 11 specimens, Docheong-ri, Byeonsan-myeon, Buan-gun, Jeollabuk-do (35°35′24′′N, 126°28′51′′E), 14 Aug 2014, Choi HK; 10 specimens, Ganggye-ri, Imhoe-myeon, Jindo-gun, Jeollanam-do (34°23′30″N, 126°15′16″E), 09 Apr 2013, Choi HK; 12 specimens, Gyema-ri, Hongnong-eup, Yeonggwang-gun, Jeollanam-do (126°25′50″E, 35°23′34″N), 20 Apr 2015, Choi HK.

Description. Body about 6.0 to 7.0 mm long with about 29 segments, slender and convex dorsally, and tapering anterior and posterior end; width 0.8 to 1.0 mm; surface smooth and faintly annulated; ventral groove from setiger 2 to last segment.

Prostomium conical shaped, with ball-shaped palpode distally; 2 or 3 subepidermal eyespots on dorsal side; nuchal organs visible on base of prostomium (Fig. 29A, C).

Branchiae filament-shaped, present on setigers from setiger 2 to second or third from last setiger (Fig. 29A, B).

Lateral eyespots beginning from setiger 7, composed of 11 pairs; anterior eyespots slightly larger than posterior ones (Fig. 29A).

Anal funnel with V-shaped incision on both dorsal and ventral sides, fringed with 8 to 10 short cirri and long unpaired cirrus originated mid-ventrally from inside of anal funnel; ventral length slightly shorter than dorsal length (Fig. 29D).

Parapodia biramous, with presetal lobes and ventral cirrus; presetal lobes semi-circular shaped, with minute projection (Fig. 29E).

Notosetae and neurosetae simple capillary in bundles; notosetae longer than neurosetae (Fig. 29E).

Remarks. *Armandia amakusaensis* was originally described from western Kyushu in Japan by Saito *et al.* (2000). They indicated that *A. amakusaensis* resembled *A. leptocirris* and *A. intermedia* in the total number of setigers, the number of branchiae on the setigers, the distribution of lateral eyespots, and the number of anal funnel papaillae (Saito *et al.* 2000). However, *A. amakusaensis* is distinguished from these species by the following characteristics: *A. amakusaensis* and *A. intermedia* possess the lateral eyespots beginning from the setiger 7, while *A. leptocirris* has the lateral eyespots beginning from the setiger 5; the branchiae are present on the setigers from the setiger 2 to the second or third from the last setiger in *A. amakusaensis*, while those of *A. leptocirris* are present on the setigers from the setiger 2 to the last setiger and those of *A. intermedia* are present on the setigers from the setiger 2 to the fourth from the last setiger (Saito *et al.* 2000).

Korean materials of the present study show several characteristics which are generally agreed well with the original description of *A. amakusaensis* as follows: the prostomium has two or three subdermal eyespots; total number of setigers are 29 (27 - 34 in the original description of *A. amakusaensis*); the branchiae are present on the setigers from the setiger 2 to the second or third from the last setiger; the lateral eyespots beginning from the setiger 7 are composed of 11 pairs; the anal funnel has 8 - 11 short cirri and a long cirrus. However, *A. amakusaensis* of the present study has a minor difference such that its long cirrus on anal funnel is smooth, while that of Japanese materials has constrictions at intervals (Saito *et al.* 2000).

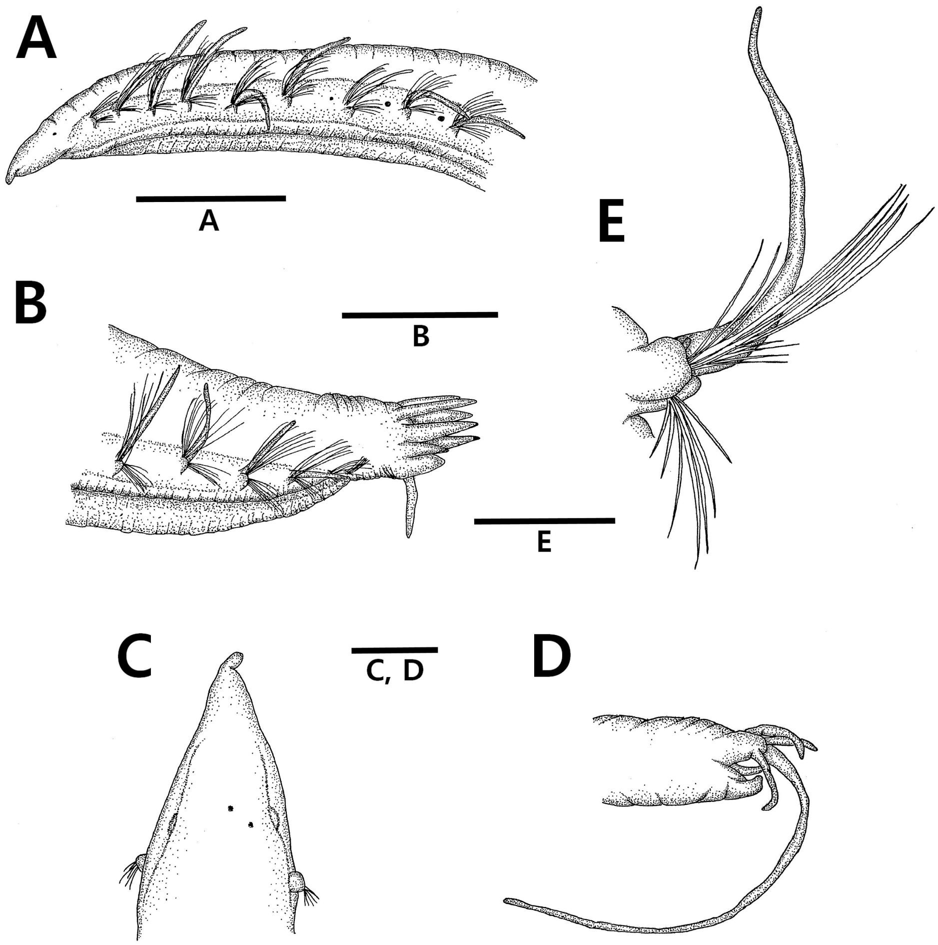

Fig. 29. *Armandia amakusaensis* Saito, Tamaki and Imajima, 2000. A, lateral view of anterior end; B, lateral view of posterior end including anal funnel (omitted long cirrus); C, dorsal view of anterior end; D, dorsal view of posterior end; E, anterior view of parapodium. Scale bars: A=1.0 mm, B=0.5 mm, C–E=0.2 mm.

Armandia amakusaensis resembles *A. lenceolata* previously reported by Paik (1989) from Korean waters in which the anal funnel is fringed, the lateral eyespots are composed of 11 pairs, and the body has about 29 setigers. However, these species are clearly distinguishable from each other by the following characteristics: *A. amakusaensis* has two or three subepidermal eyespots on the prostomium, while *A. lenceolata* has the prostomium without eyespots; *A. amakusaensis* possesses one or two abranchiate setigers posteriorly, while *A. lenceolata* has more than two; the anal funnel bears 8 - 11 short cirri in *A. amakusaensis*, while that of *A. lenceolata* has 14 - 18 short cirri (Willey 1905; Imajima and Hartman 1964; Paik 1989).

Distribution. Japan, Korea.

132. *Armandia lanceolata* Willey, 1905 침보석요정갯지렁이

Armandia lanceolata Willey, 1905: 288, pl. 5, fig. 120; Imajima and Hartman, 1964: 306.; Tampi and Rangarajan, 1964: 115; Paik, 1975: 422; 1982: 815; 1989: 502-503, fig. 199.

Material examined. 10 specimens, Ganggye-ri, Imhoe-myeon, Jindo-gun, Jeollanam-do (126°15′16″E, 34°23′30″N), 09 Apr 2013, Choi HK; 1 specimen, Na-ri, Gunnae-myeon, Jindo-gun, Jeollanam-do (126°12′52″E, 34°33′35″N), 09 Apr 2013, Choi HK; 8 specimens, Gwan-ri, Iwon-myeon, Taean-gun, Chungcheongnam-do (126°14′19″E, 36°53′05″N), 23 May 2012, Choi HK; 7 specimens, Punghwa-ri, Sanyang-eup, Tongyeong-si, Gyeongsangnam-do (128°24′34″E, 34°48′04″N), 25 Mar 2014, Choi HK; 2 specimens, Minam-ri, Sanyang-eup, Tongyeong-si, Gyeongsangnam-do (128°26′39″E, 34°45′03″N), 21 Mar 2014, Choi HK.

Diagnosis. Prostomium conical shaped, with ball-shaped palpode distally. Abranchiaete setigers on posterior region 3-4. Lateral eyespots beginning from setiger 7. Anal funnel finged with 14-18 papillae and long unpaired cirrus. Notosetae and neurosetae simple capillary.

Distribution. Indo Pacific Ocean, Japan, Korea.

133. *Armandia simodaensis* Takahashi, 1938 둥근보석요정갯지렁이

Armandia simodaensis Takahashi, 1938: 152, 3 figs; Imajima and Hartman, 1964: 306; Paik, 1982: 815; 1989: 503.

Material examined. 4 specimens, Uhak-ri, Nam-myeon, Yeosu-si, Jeollanam-do (127°57′06″E, 34°28′55″N), 07 May 2012, Choi HK; 2 specimens, Dueok-ri, Hansan-myeon, Tongyeong-si, Gyeongsangnam-do (128°29′39″E, 34°47′15″N), 28 Aug 14, Choi HK.

Diagnosis. Prostomium conical shaped. Nuchal organs distinct. Branchiae present on setigers from setiger 2 to second from last setiger. Lateral eyespots present from setiger 7 to 16. Anal funnel not fringed, funnel-shaped membrane, longest mid-ventrally.

Distribution. Japan, Korea.

Genus *Ophelina* Örsted, 1843 매끈요정갯지렁이속

Body with ventral groove extending to nearly posterior end. Lateral eyespots absent. Branchiae present on most setigers. Anal funnel open ventrally, with thin cirri.

Type species. *Ophelina acuminata* Orsted, 1843.

134. *Ophelina acuminata* Örsted, 1843 매끈요정갯지렁이

Ammotrypane aulogaster Rathke, 1843: 188; Southern, 1914: 131; Imajima and Hartman, 1964: 305; Hartman and Fauchald, 1971: 129; Lee, 1976: 67, fig. 9. 1; Paik, 1982: 816, pl. 23g-j; 1989: 504, fig. 201.

Ammotrypane gracile McIntosh, 1885: 357, pl. 43, figs. 9-12.

Ophelina acuminata Örsted, 1843a: 46; Blake, 2000c: 158, fig. 7. 5.

Material examined. 2 specimens, Janggil-ri, Guryongpo-eup, Nam-gu, Pohang-si, Gyeongsangbuk-do (129°35′05′′E, 35°56′17′′N), 19 May 2015, Choi HK.

Diagnosis. Body sub-cylindrical with mid-ventral groove continuing to posterior end. Prostomium conical shaped. Branchiae present from setiger 2 to posterior end. Lateral eyespots absent. Parapodia biramous, with capillary setae. Anal funnel open ventrally, with 8-20 pairs of thin cirri; mid-ventral base of anal funnel with long median cirrus and 2 short lateral cirri.

Distribution. Cosmopolitan.

Genus *Polyophthalmus* Quatrefages, 1850 무늬요정갯지렁이속

Body with ventral groove extending to nearly posterior end. Lateral eyespots present or absent. Branchiae absent. Anal funnel with small papillae.

Type species. *Polyophthalmus picta* (Dujardin, 1839).

Key to the species of *Polyophthalmus* Quatrefages, 1850 from Korea

1. Prostomium with brain bearing dark pigment-spots; lateral eyespots distinct .... *P. qingdaoensis*

– Prostomium without brain; lateral eyespots faintly small .... *P. pictus* (Dujardin, 1839)

135. *Polyopthalmus pictus* (Dujardin, 1839) 무늬요정갯지렁이

Nais picta Dujardin, 1839: 293, pl. 7, fig. 9.

Polyopthalmus pictus: Southern, 1914: 133; Fauvel, 1927: 137, fig. 48l-n; Imajima and Hartman, 1964: 309; Day, 1967: 579, fig. 25.2k-m; Paik, 1982: 815; 1989: 500, fig. 198.

Material examined. 5 specimens, Noil-ri, Gwayeok-myeon, Goheung-gun, Jeollanam-do (127°16′50″E, 34°40′04″N), 30 Apr 2013, Choi HK; 4 specimen, Dumi-ri, Yokji-myeon, Tongyeong-si, Gyeongsangnam-do (128°06′02″E, 34°40′08″N), 09 May 2010, Choi HK; 1 specimens, Ibam-ri, Donghae-myeon, Nam-gu, Pohang-si, Gyeongsangbuk-do (129°35′23″E, 35°57′21″N), 19 May 2015, Choi HK.

Diagnosis. Prostomium rounded, with 2 or 3 subepidermal eyespots, and without brain. Lateral groove present on both sides, from setiger 3 to 24. Lateral eyespots distinct. Anal funnel with single median notch on dorsal side and 8–10 small papillae. Branchiae absent.

Distribution. Cosmopolitan.

136. *Polyophthalmus qingdaoensis* Purschke, Ding and Müller, 1995 안점무늬

요정갯지렁이 (Fig. 30)

Polyophthalmus qingdaoensis Purschke *et al.*, 1995: 239, fig. 7; Choi *et al.*, 2015: 101, fig. 3.

Material examined. 6 specimens, Yeonpyeong-ri, Udo-myeon, Jeju-si, Jeju-do (33°30′08′′N, 126°56′34′′E), 24 Jun 2014, Choi HK; 2 specimens, Hyangho-ri, Jumunjin-eup, Gangneung-si, Gangwon-do (33°12′19″N, 126°21′58″E), 15 Sep 2014, Choi HK.

Description. Body slender, about 12.0 to 17.0 mm long with 27 setigerous segments and width 0.8 to 1.2 mm; body color brightly white in alcohol; separations of segments indistinct; ventral groove from setiger 2 to last segment.

Prostomium rounded, with 2 or 3 subepidermal eyespots; 4 or 5 dark pigment-spots on prostomial brain; pair of nuchal organ distinct, formed cylindrical projection, and positioned between prostomium and setrger 1 (Fig. 30A).

Lateral groove present on both sides, from setiger 3 to 24; reduced parapodia and lateral eyespots within lateral groove (Fig. 30B).

Dorsum convex, with short and dark pigment-streaks composed of numerous spots appeared on surface in most segments (Fig. 30C).

Lateral eyespots distinct, circular and with heavily dark pigmentation, beginning from setiger 7, and composed of 12 pairs; median eyespots larger than anterior and posterior ones (Fig. 30B).

Anal funnel with single median notch on dorsal side and 8 - 10 small cirri on posterior margin; dorsal papillae smaller than ventral (Fig. 30D).

Parapodia without dorsal and ventral cirri, with only subglobular parapodial lobe and 2 - 5 capillary setae per bundle; setae from parapodial lobe, and grouped into notopodial and neuropodial setae. Branchiae absent (Fig. 30E).

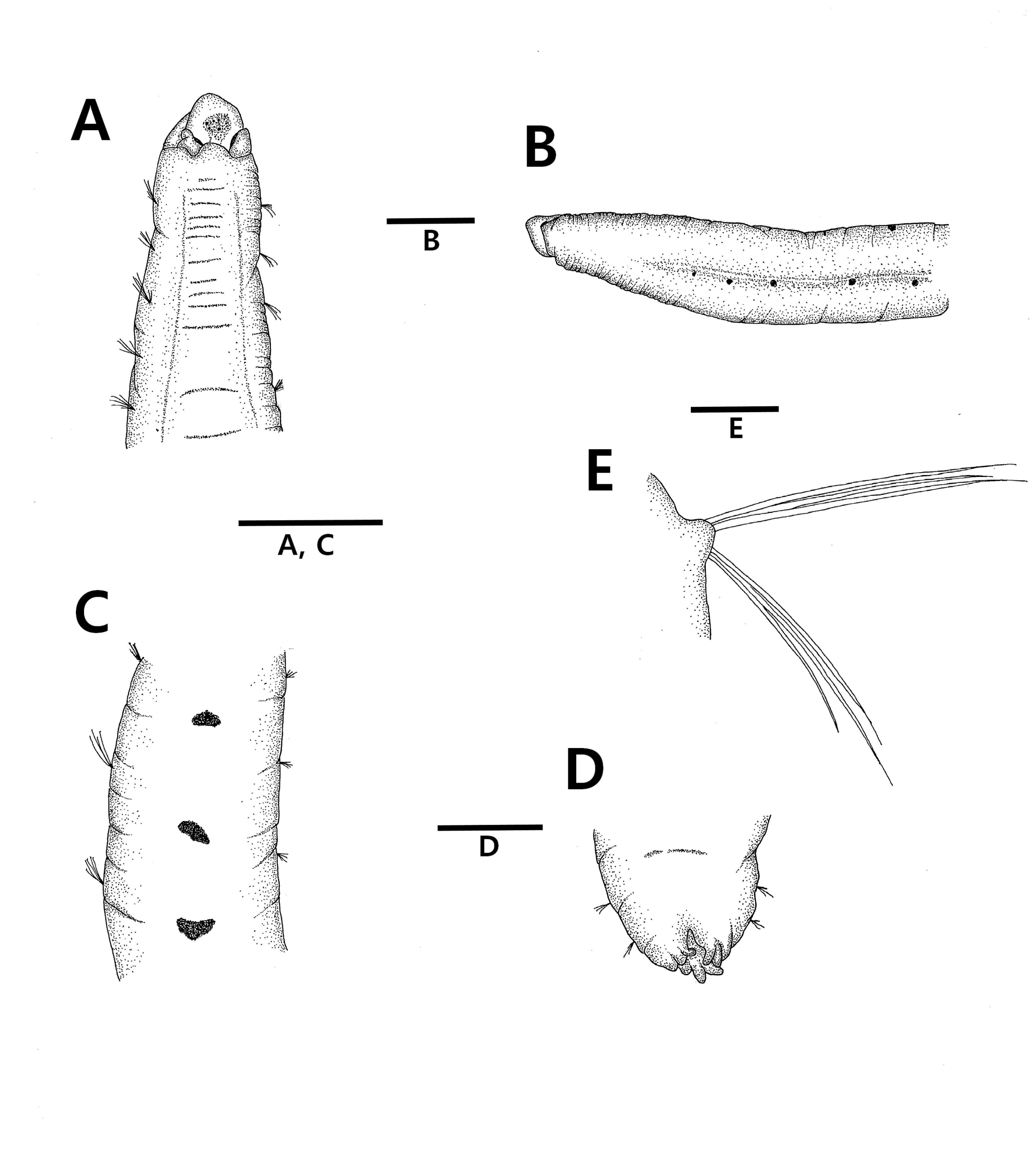

Fig. 30. *Polyophthalmus qingdaoensis* Purschke, Ding and Müller, 1995. A, dorsal view of anterior end B, lateral view of anterior end (omitted setae) C, pigmented streaks on dorsal side of mid-body D, dorsal view of posterior end; E, anterior view of parapodium. Scale bars: A－C=1.0 mm, D=0.05 mm, E=0.025 mm.

Remarks. *Polyophthalmus qingdaoensis*, which was first described by Purschke *et al.* (1995) from Qingdao in China, has a unique feature such as the prostomial brain bearing dark pigment-spots. The authors could find out the presence of this feature from the Korean materials of *Polyophthalmus* species in the present study. They generally agree well with the original description of *P. qingdaoensis* as the following characteristics: the body is slightly translucent and poorly pigmented, and has only short and dark pigment-streaks on the dorsal side; the lateral eyespots beginning from the setiger 7 are composed of 12 pairs (Purschke *et al.* 1995). However, there are some minor differences between Korean materials and Chinese materials of the original description: Korean materials possess the prostomial brain with 4 or 5 pigment-spots, while Chinese materials has the brain with 10 pigment-spots; the anal funnel bears 8 - 10 small cirri in Korean materials, but that in Chinese materials has only 6 small cirri (Purschke *et al.* 1995).

Polyophthalmus qingdaoensis is distinguished from *P. pictus*, which is widely known from East Asia, by the following characteristics: *P. qingdaoensis* has distinct prostomial brain bearing the dark pigment-spots, while *P. pictus* possesses indistinct prostomial brain; *P. qingdaoensis* bears the distinct lateral eyespots, but *P. pictus* has faintly small lateral eyespots; the body possesses only dark pigment-streaks on the dorsal side in *P. qingdaoensis*, whereas that of *P. pictus* bears brown streaks and variable spots (Fauvel 1927; Imajima and Hartman 1964; Day 1967; Imajima and Gamo 1970; Paik 1982, 1989; Purschke *et al.* 1995).

Distribution: China, Korea.

Genus *Travisia* Johnston, 1840 벌레요정갯지렁이속

Body short and grub-like without ventral groove. Branchiae Present. Posterior setigers with epipodial pads. Anal cirri short and thick. Setae smooth. First setiger present before mouth.

Type species. *Travisia forbesii* Johnston, 1840.

Key to the species of *Travisia* Johnston, 1840 from Korea

1. Posterior parapodia with enlarged parapodial lobes; each annulus without large

and bulbous vesicles ·· *T. japonica*

- Posterior parapodia with reduced parapodial lobes; each annulus with large and bulbous vesicles on posterior halves ··· *T. pupa*

137. *Travisia japonica* Fujiwara, 1933 벌레요정갯지렁이

Travisia japonica Fujiwara, 1933: 91, pls. 1, 2, fig. 1-11; Imajima and Hartman, 1964: 309; Paik, 1976: 239, figs. 32-33; 1989: 498, fig. 196.

Material examined. 2 specimens, Yongjung-ri, Hyeongyeong-myeon, Muan-gun, Jeollanam-do (126°24′39″E, 35°04′21″N), 9 Apr 2013, Choi HK.

Diagnosis. Body subfusiform, covered with uniform vesicles; dorsum strongly convex and ventrum lacking ventral groove. Prostomium small and pointed. Parapodia biramous, rudimentary, and with notosetae and neurosetae. Posterior parapodia well developed, consisting of dorsal cirrus, notopodial and neuropodial lobes, and setal fascicles. Pygidium surrounded by 6 cirri.

Distribution. China, Japan, Korea.

138. *Travisia pupa* Moore, 1906 번데기요정갯지렁이

Travisia pupa Moore, 1906: 228, pl. 11, fig. 23; Uschakov, 1955: 301, fig. 120F-G; Paik, 1982: 814, pl. 23d-f; Blake, 2000c: 163, fig. 7.8.

Material examined. 7 specimens, Yeongun-ri, Sanyang-eup, Tongyeong-si, Gyeongsangnam-do (128°28′24″E, 34°47′33″N), 21 Mar 2014, Choi HK; 1 specimens, Dueok-ri, Hansan-myeon, Tongyeong-si, Gyeongsangnam-do (128°29′39″E, 34°47′15″N), 28 Aug 14, Choi HK.

Diagnosis. Body distinctly fusiform, covered with non-uniform vecicles; each annulus with large and bulbous vesicles on posterior halves. Ventral groove absent. Prostomium small and conical-shaped. Parapodial lobes reduced. Setae all smooth capillary. Branchiae simple and cirriform, from setigers 2-25.

Distribution. Alaska, Ohotsk Sea, Japan, Korea.

Family Capitellidae Grube, 1862 버들갯지렁이과

Body divided into thorax and abdomen. Thoracic setae including limbate capillary setae. Abdomen with hooded hooks.

Type genus. *Capitella* Blainville, 1828.

Key to the genera of Capitellidae Grube, 1862 from Korea

1. Thorax without 1st asetigerous segment; branchiae absent ························· *Capitella*
 – Thorax with 1st asetigerous segment; branchiae present ··· 2
2. Thorax with 14 segments ··· *Dasybranchus*
 – Thorax with 12 segments ··· 3
3. Capillary setae present on 5 thoracic setigers only ······························ *Heteromastus*
 – Capillary setae present on all thoracic setigers ··· *Notomastus*

Genus *Capitella* Blainville, 1828 등가시버들갯지렁이속

Thorax consisting of 9 segments without first asetigerous segment. Branchiae absent. Capillary setae present on first 7 thoracic setigers. Genital spines present on 8-9.

Type species. *Capitella capitata* (Fabricius, 1780).

139. *Capitella capitata* (Fabricius, 1780) 등가시버들갯지렁이

Lumbricus capitatus Fabricius, 1780: 279.

Capitella capitata: Southern, 1914: 130; Fauvel, 1927: 154, fig. 55a-h; Imajima and Hartman, 1964: 311, pl. 37, figs. a-g; Paik, 1980: 91, fig. 1 e-g; 1982: 817, pl. 23; 1989: 508, fig. 203; Blake, 2000b: 58, figs. 4.2, 4.3; 2009: 58, figs. 2-5; Dean, 2001: 71, fig. 1-3.

Material examined. 12 specimens, Yongdam-ri, Yeongheung-myeon, Ongjin-gun, Incheon (126°27′46″E, 37°14′17″N), 17 Jul 2012, Choi HK; 5 specimens, Odu-ri, Bureun-myeon, Ganghwa-gun, Incheon (126°31′09″E, 37°40′48″N), 05 Jul 2012, Choi HK; 2 specimans, Sangnae-ri, Haeryong-myeon, Suncheon-si, Jeollanam-do (127°30′25″E, 34°50′14″N), 28 Sep 2012, Choi HK; 2 specimens, Deoksin-ri, Seolcheon-myeon, Namhae-gun, Gyeongsangnam-do (127°56′55″E, 34°55′27″N), 14 Mar 2014, Choi HK; 3 specimens, Dadae-ri, Nambu-myeon, Geoje-si, Gyeongsangnam-do (128°39′25″E, 34°43′44″N), 22 Mar 2014, Choi HK.

Diagnosis. Prostomium conical shaped. Thorax with 9 segments, and asetigerous segment absent. Capillary setae present on setigers 1-4 or 1-7. Genital spines present on setigers 8-9. Branchiae absent.

Distribution. Cosmopolitan.

Genus *Dasybranchus* Grube, 1850 굵은버들갯지렁이속

Thorax with 14 segments including first asetigerous segment. Notopodial branchiae present. Capillary setae present on all thoracic setigers.

Type species. *Dasybranchus caducus* (Grube, 1846).

140. *Dasybranchus caducus* (Grube, 1846) 굵은버들갯지렁이

Dasymallus caducus Grube, 1846: 166, figs. 3-4.

Dasybranchus caducus Grube, 1850: 324; Fauvel, 1927: 147, fig. 52a-h; Day, 1967: 603, fig. 28.3c-h; Imajiam and Hartman, 1964: 312; Paik, 1979a: 36, pl. 1, figs. e-f; 1982: 818, pl. 23n; 1989: 510, fig. 205; Garcia-Garza and Leon-Gonzalez, 2011: 22.

Material examined. 3 specimens, Maeeum-ri, Samsan-myeon, Ganghwa-gun, Incheon (126°19′28″E, 37°39′07″N), 04 Jul 2012, Choi HK; 1 specimen, Daepo-ri, Beolgyo-eup, Boseong-gun, Jeollanam-do (127°23′16″E, 34°47′16″N), 30 Apr 2013, Choi HK; 6 specimens, Punghwa-ri, Sanyang-eup, Tongyeong-si, Gyeongsangnam-do (128°24′34″E, 34°48′04″N), 21 Mar 2014, Choi HK; 3 specimens, Jeorim-ri, Sanyang-eup, Tongyeong-si, Gyeongsangnam-do (128°27′10″E, 34°44′40″N), 20 May 2014, Choi HK; 2 specimens, Jeogu-ri, Nambu-myeon, Geoje-si, Gyeongsangnam-do (128°37′45″E, 34°43′19″N), 20 May 2014, Choi HK

Diagnosis. Thorax with 14 segments composed of first asetigerous peristomium and following 13 setigers. Capillary setae present on all thoracic setigers. Branchiae simple and retractile. Abdominal hooded hooks long handled.

Distribution. Cosmopolitan.

Genus *Heteromastus* Eisig, 1887

Thorax with 12 segments including first asetigerous segment. Branchiae present. Thoracic setigers 1-5 with capillary setae, and setigers 6-11 with hooded hooks.

Type species. *Heteromastus filiformis* (Claparède, 1864).

141. *Heteromastus filiformis* (Claparède, 1864) (Fig. 31)

Capitella filiformis Claparède, 1864: 509, pl.4, fig. 10

Heteromastus filiformis: Fauvel, 1927: 150, fig. 53a - l; Hartman, 1947a: 427, pl. 52, figs. 1 - 4; Uschakov, 1965: 304; Day, 1967: 601, fig, 28.3a - d; Hutchings and Rainer, 1981: 374 - 376; Dean, 2001: 75, figs. 10 - 12; Garcia-Garza and Leon-Gonzalez, 2011: 27.

Material examined. 25 specimens, Daehang-ri, Byeonsan-myeon, Buan-gun, Jeollabuk-do (126°35′02″E, 35°41′44″N), 13 Aug 2014; 14 specimens, Haksan-ri, Byeollyang-myeon, Suncheon-si, Jeollanam-do (127°29′03″E, 34°50′50″N), 24 May 2013.

Description. Body filiform and cylindrical shaped, about 30 to 35 mm long with approximately 130 to 150 segments, width 0.8 to 1.0 mm in thoracic segments and 1.0 mm in abdominal segments.

Prostomium small conical shaped. Proboscis globular shaped with numerous minute papillae on surface. Peristomium slightly longer than setiger 1; single pair of subepidermal eyespots on dorsal surface appearing in only 2 materials (Fig. 31A, B).

Thorax distinct and biannulate, with weak wrinkles on surface, with 12 segments composed of asetigerous peristomium and 11 setigers; thoracic setigers 1 - 5 with narrowly bilimbate capillary setae composed of 4 to 5 per fascicle in noto- and neuropodia; setigers 6 - 11 with long handled hooded hooks composed of 3 to 6 per fascicle. Thoracic hooded hooks with indistinct node on shaft and 5 or 6 teeth in two transverse rows above main fang. Nephridial and genitial pores invisible (Fig. 31A, F, G).

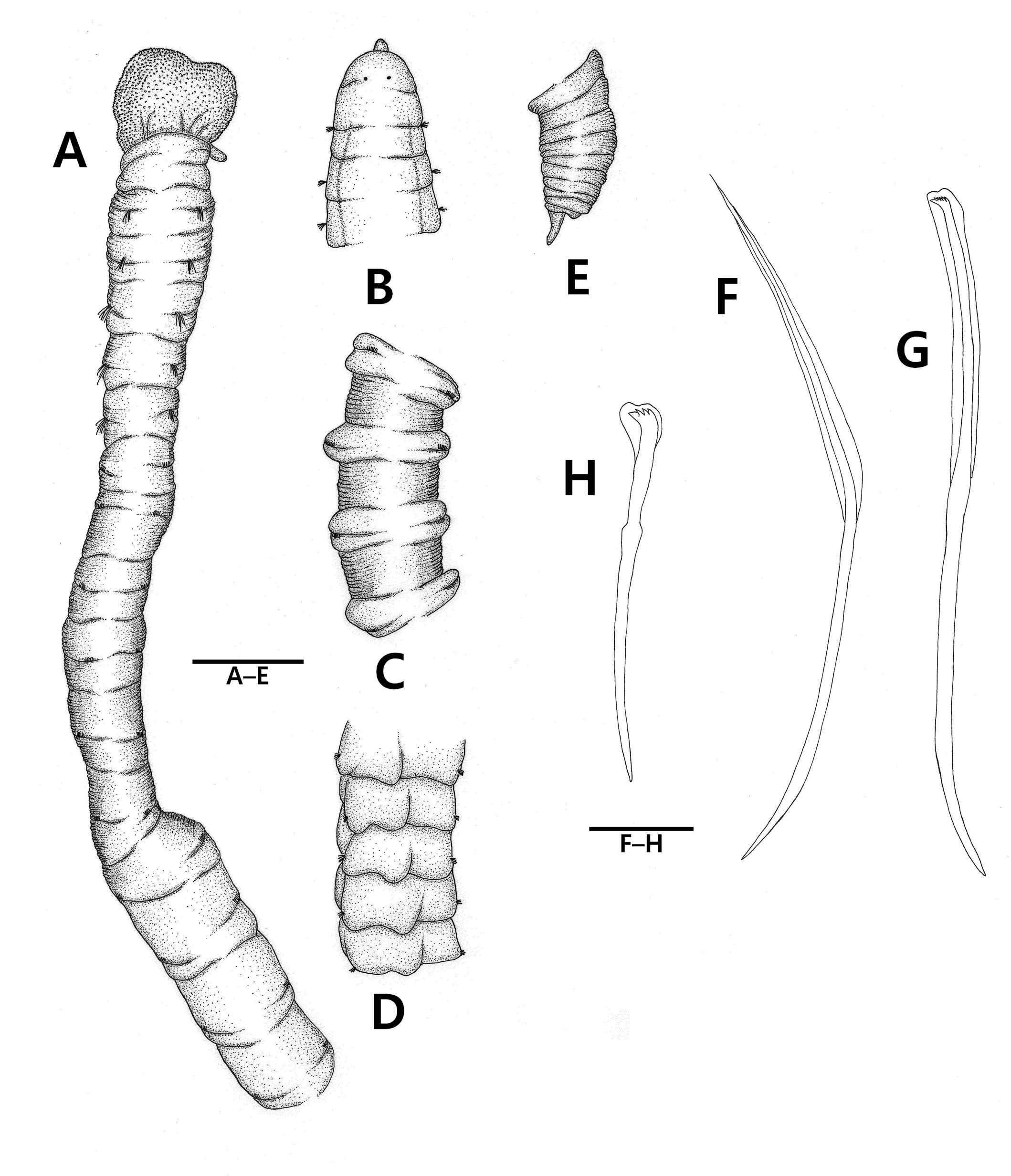

Fig. 31. *Heteromastus filiformis* (Claparède, 1864). A, anterior lateral view including thoracic segments; B, anterior dorsal view of specimens with subepidermal eyespots C, lateral view of posterior abdominal segments; D, lateral view of posterior abdominal segments with branchiae E, pygidium F, notopodial capillary seta G, thoracic notopodial hooded hook; H, abdominal notopodial hooded hook. Scale bars: A-E=0.5 mm, F-H=0.025 mm.

Transition between thorax and abdomen distinct. Abdomen biannulate, smooth on anterior segments but many wrinkle on posterior segments, composed of about 120 to 140 segments; parapodia located at slightly posterior of segment; length between noto- and neuropodia longer than thoracic segments; anterior abdominal segments slightly longer and wider than posterior and gradually tapered toward end; posterior abdominal segments with parapodial lobes projecting posteriorly; abdominal setigers with short handled hooded hooks composed of 4 to 7 per fascicle. Abdominal hooded hooks with distinct node on shaft and 3 or 4 teeth above main fang (Fig. 31A, C, D, H).

Pygidium with single digitate caudal cirrus (Fig. 31E).

Branchiae short, broadly-based, rounded lamellae projecting posteriorly over adjacent segment, and well developed in about 100 to 120 segments (Fig. 31D).

Remarks. Korean materials of the present study show the several characteristics those are generally agreed well with several previous works including the original description of *H. filiformis* as follows: the thoracic hooded hooks have indistinct nodes on the shaft and 5 or 6 teeth above the main fang; the abdominal hooded hooks possess distinct nodes on the shaft and 3 or 4 teeth above the main fang; the branchiae appearing in posterior abdominal segments are broadly-based and rounded lamellae projecting posteriorly (Claparède, 1864; Fauvel, 1927; Hartman, 1947; Day, 1967; Hutchings and Rainer, 1982; Blake, 2000b; Dean, 2001). However, Korean materials of *H. filiformis* have several minor differences in the morphology of teeth on the hooded hooks from some of previous literatures as follows: the abdominal hooded hooks have 11 - 13 teeth above main fang in the description of Hutchings and Rainer (1982), but those of our materials have only 3 - 4 teeth above main fang as described in the most previous works except Hutchings and Rainer (1982); the thoracic hooded hooks have 6 - 7 teeth arranged in a transverse row in the descriptions of Hartman (1947) and Blake (2000b), while those of Korean materials have 5 - 6 teeth arranged in 2 rows (Hartman, 1947; Day, 1967; Hutchings and Rainer, 1982; Blake, 2000b; Dean, 2001). Unfortunately, the real structures of teeth on thoracic and abdominal hooded hooks of type materials are unclear because the original description was very poorly described (Claparède, 1864), and the taxonomic value of this characteristics are still in need of further study.

Heteromastus filiformis is readily differentiated from *H. tohbaiensis* Yabe and Mawatari, 1998, which was recorded from Hokkaido in northern Japan, by following characteristics: the thoracic hooded hooks of *H. filiformis* have indistinct nodes on the shaft, while those of *H. tohbaiensis* have distinct nodes on the shaft; the branchiae on posterior abdominal segments are composed of broadly-based and rounded lamellae projecting posteriorly in *H. filiformis,* but those are absent in *H. tohbaiensis* (Yabe and Mawatari, 1998).

Distribution. Italy, France, Mediterranean Sea, Germany, Atlantic Ocean, Southern Africa, Australia, Costa Rica, Mexico, California, Thailand, Japan, Korea.

Genus *Notomastus* Sars, 1851 가는버들갯지렁이속

Thorax consisting of 12 segment bearing first asetigerous segment. Branchiae present. Capillary setae present on all thoracic setigers.

Type species. *Notomastus latericeus* Sars, 1850.

142. *Notomastus latericeus* Sars, 1851 가는버들갯지렁이

Notomastus latericeus Sars, 1851: 199; Southern, 1914: 130; Chamberlin, 1919: 466; Fauvel, 1927: 143, fig. 49a-h; Okuda and Yamada, 1954: 192, fig. 7; Imajima and Hartman, 1964: 313; Paik, 1978: 373, pl. 6, fig. 7; 1982: 818, pl. 23m; 1984: 55; 1989: 510, fig. 204; 1989: 510, fig. 204.

Material examined. 3 specimens, Namdong-ri, Imhoe-myeon, Jindo-gun, Jeollanam-do (126°09′10″E, 34°21′35″N), 09 Apr 2013, Choi HK; 2 specimens, Daepo-ri, Beolgyo-eup, Boseong-gun, Jeollanam-do (127°23′16″E, 34°47′16″N), 30 Apr 2013, Choi HK; 2 specimens, Nae-ri, Hwado-myeon, Ganghwa-gun, Incheon (126°22′05″E, 37°37′55″N), 05 Jul 2012, Choi HK; 3 specimens, Dongmak-ri, Hwado-myeon, Ganghwa-gun, Incheon (126°25′32″E, 37°34′59″N), 05 Jul 2012, Choi HK; 2 specimens, Yeongun-ri, Sanyang-eup, Tongyeong-si, Gyeongsangnam-do (128°28′24″E, 34°47′33″N), 28 Aug 2014, Choi HK.

Diagnosis. Thorax with 12 segments composed of 1st asetigerous peristomium and following 11 setigers. Capillary setae present on all thoracic setigers. Branchiae

reduced protuberances in anterior abdominal setigers. Hooded hooks long handled.
Distribution. Cosmopolitan.

Family Arenicolidae Johnston, 1846 검은갯지렁이과

Body cylindrical. Prostomium without appendage. Notopodia blunt truncate. Neuropodia elongate. Branchiae present. Notosetae capillary or limbate. Neurosetae rostrate hooks.

Type genus. *Arenicola* Lamarck, 1801.

Key to the genera of Arenicolidae Johnston, 1846 from Korea

1. Neuropodia on branchial segments approached mid-ventrally; oesophageal sacs single pair .... *Arenicola*
– Neuropodia on branchial segments well separated; oesophageal sacs more than single pair .... *Abarenicola*

Genus *Abarenicola* Wells, 1959 큰검은갯지렁이속

Body divided into 3 region, prebranhial, branchial, and asetigerous caudal region. Branchiae beginning from setiger 7. Oesophageal sacs more than single pair.

Type species. *Abarenicola claparedi* (Levinsen, 1884).

143. *Abarenicola pacifica* Healy and Wells, 1959 큰검은갯지렁이

Arenicola claparedii: Okuda, 1946: 161; Okuda and Yamada, 1954: 193.

Abarenicola pacifica Healy and Wells, 1959: 330; Imajima and Hartman, 1964: 314; Paik, 1979b: 36, pl. 1, fig. g-h; 1982: 819, pl. 24b; 1989: 514, fig. 207.

Material examined. 1 specimen, Geumjin-ri, Ganggu-myeon, Yeongdeok-gun, Gyeongsangbuk-do (129°28′04″E, 36°21′38″N), 17 Sep 2014, Choi HK.

Diagnosis. Body cylindrical and slender posteriorly, and consists of 19 setigerous and 1 asetigerous segments. Prostomium trilobed. Nuchal organs V-shaped grooves. Branchiae arborescent, 13 pairs, and present from setigers 5-19. Oesophageal sacs 6 pairs posteriorly. Notosetae capillaries with spinous blades. Neurosetae simple hooks with 5 or 6 small teeth above main fang.

Distribution. Eastern of Russia, Alaska, California, Japan, Korea.

Family Maldanidae Malmgren, 1867 대나무갯지렁이과

Body with elongate segments bearing joints. Pygidial plate usually present. Branchiae absent or sometimes present. Mutidentate hooks without hood.

Type genus. *Maldane* Grube, 1860.

Key to the genera of Maldanidae Malmgren, 1867 from Korea

1. Neurosetae beginning from setiger 5, and arranged in double rows ·········· *Rhodine*
 – Neurosetae beginning from setiger 1-2, and arranged in single rows ···················· 2
2. Cephalic plate indistinct ·· 3
 – Cephalic plate distinct ·· 7
3. Anal plate on pygidium absent, if present flattened ventrally ································ 4
 – Anal plate on pygidium present ··· 6
4. Setiger 4 with deep and encircling collar ································ *Clymenopsis*
 – Setiger 4 without collar ·· 5
5. Pygidium flattened, with dorsal anus ·· *Notoproctus*
 – Pygidium conical, with terminal anus ·· *Lumbriclymene*
6. Anal plate well developed ·· *Nicomache*
 – Anal plate reduced dorsally, and well developed ventrally ·················· *Petaloproctus*
7. Pygidium encircled by anal cirri, and anus present on projecting cones or sunken in funnel ·· 8
 – Pygidium oblique plate without anal cirri, and anus present on anal plate ········· 12
8. Setiger 1 with neurosetae ·· *Maldanella*
 – Setiger 1 without neurosetae ··· 9
9. First 3 or 4 setigers with rostrate uncini similar to those on later setigers ·········· ·· *Axiothella*
 – First 3 or 4 setigers with acicular setae different to those on later setigers ····· 10
10. setiger 4 with deep and encircling collar ·· *Clymenella*
 – setiger 4 without collar ·· 11
11. Anal plate with smooth margin ·· *Microclymene*

– Anal plate with finged margin ································ *Praxillella*

12. Cephalic keel prominent ································ *Maldane*

– Cephalic keel low and broad ································ *Asychis*

Genus *Asychis* Kinberg, 1867 수술대나무갯지렁이속

Cephalic plate distinct. Cephalic rim with lateral incisions. Cephalic keel low and broad. Neurosetae beginning from setiger 2, and arranged in single rows Pygidium oblique plate without anal cirri, and anus present on anal plate.

Type species. *Asychis atlanticus* Kinberg, 1867.

Key to the species of *Asychis* Kinberg, 1867 from Korea

1. Cephalic plate with smooth lateral rim ································ *A. pigmentata*

– Cephalic plate with cirriform or denticulate lobes on lateral rim ································ 2

2. Lobes on cephalic plate cirriform; anal plate dorsal flaring part and undulating ventral part ································ *A. gotoi*

– Lobes on cephalic plate rounded or triangular-shaped ································ 3

3. Anal plate surrounded by greatly expanded rim composed of 2 lobes with smooth margin ································ *A. disparidentata*

– Anal plate surrounded by rounded or triangular lobes ································ *A. biceps*

144. *Asychis biceps* (Sars, 1861) 투구대나무갯지렁이

Asychis biceps: Arwidsson, 1906: 263, pl. 6, figs. 200-207; Imajima and Shiraki, 1982: 77, fig. 37; Paik, 1989: 541, fig. 222.

Material examined. 1 speciman, Songseok-ri, Haeje-myeon, Muan-gun, Jeollanam-do (126°19′33″E, 35°08′12″N), 09 Apr 2013, Choi HK.

Diagnosis. Body with 2 posterior asetigerous segments. Cephalic plate circular in shape, with deep furrows and triangular-shaped lobes on lateral rim. Prostomium broad and rounded with smooth margin. First setiger with limbate capillary setae arranged in 2 rows.. Anal plate surrounded by rounded or triangular lobes.

Distribution. Iceland, Greenland, Scotland, Altlantic Ocean, California, western Mexico, Japan, Korea.

145. *Asychis pigmentata* Imajima and Shiraki, 1982 점박이대나무갯지렁이

Asychis pigmentata Imajima and Shiraki, 1982: 82, fig. 39; Lee and Paik, 1986b: 35, fig. 6A-H; Paik, 1989: 539:, fig. 220.

Material examined. 4 specimens, Dueok-ri, Hansan-myeon, Tongyeong-si, Gyeongsangnam-do (128°29′39″E, 34°47′15″N), 28 Aug 14, Choi HK.

Diagnosis. Body with small pigment spots anteriorly. Cephalic plate sub-triangular in shape, with smooth rim divided by 2 lateral incisions. Cephalic keel indistinct. Peristomial ring distinct. First setiger with notosetae only. Notosetae limbate or bilimbate capillary. Uncini rostrate. Anal palte truncated, with smooth rim.

Distribution. Japan, Korea.

Genus *Maldanella* McIntosh, 1885 둥근대나무갯지렁이속

Cephalic plate distinct. Acicular spines absent. Neurosetae beginning from setiger 1, and arranged in single rows. Pygidium encircled by anal cirri, and anus present on sunken in funnel.

Type species. *Maldanella antarctica* McIntosh, 1885.

146. *Maldanella harai* (Izuka, 1902) 둥근대나무갯지렁이

Clymene harai Izuka, 1902: 111, pl. 3, figs. 9-12.

Axiothea campanulata Moore, 1903: 485, pl. 27, figs. 9-12.

Maldanella harai: Fauvel, 1927: 186, figs. i-n; Imajima and Hartman, 1964: 319; Paik, 1982: 822, pl. 24m-o; 1984b: 157; 1989: 530, fig. 215; Imajima and Shiraki, 1982: 55, fig. 25a-h; Lee and Paik, 1986b: 30.

Material examined. 1 specimen, Songseok-ri, Haeje-myeon, Muan-gun, Jeollanam-do (126°19′33″E, 35°08′12″N), 16 Oct 2012, Choi HK.

Diagnosis. Cephalic plate oval-shaped, with entire rim. Prostomium short and broadly rounded. Nuchal organs less than half of cephalic length. Cephalic keel stretched further back than nuchal organ. Notopodial setae capillary and neropodial setae rostrate uncini from setiger 2. Pygidium encircled by anal cirri, and anus sunken in funnel.

Distribution. North Atlantic Ocean, Indian Ocean, Japan, Korea.

Genus *Microclymene* Arwidsson, 1906 꼬마대나무갯지렁이속

Cephalic plate distinct. Neurosetae beginning from setiger 1. First 3 setigers with acicular spines. Pygidium encircled by anal cirri, and anus present on projecting cones. Anal plate with smooth margin.

Type species. *Microclymene acirrata* Arwidsson, 1907.

147. *Microclymene propecaudata* Lee and Paik, 1986 꼬마대나무갯지렁이

Microclymene propecaudata Lee and Paik, 1986b: 32, fig. 4A-F; Paik, 1989: 535, fig. 218.

Material examined. 3 specimens, Songseok-ri, Haeje-myeon, Muan-gun, Jeollanam-do (126°19′33″E, 35°08′12″N), 16 Oct 2012, Choi HK.

Diagnosis. Cephalic plate sub-circular, with entire rim. Prostomium large and conical in front. Nuchal organs straight and parallel. Anterior setigers 2-4 without collar. First 3 setigers with thick acicular setae with rudimentary tooth on neuropodia. Pygidium with anal cone extending back beyond anal funnel.

Distribution. Korea.

Genus *Nicomache* Malmgren, 1865 큰대나무갯지렁이속

Cephalic plate indistinct. First 3 setigers with acicular spines. Neurosetae rostrate, arranged in single row. Anal plate on pygidium present.

Type species. *Nicomache lumbricalis* (Fabricius, 1780).

Key to the species of *Nicomache* Malmgren, 1865 from Korea

1. Body with 23 setigers and 1 preanal apodous segment ································ *N. minor*
 - Body with 22 setigers and 2 preanal apodous segment ······················ *N. lumbricalis*

148. *Nicomache lumbricalis* (Fabricius, 1780)톱니대나무갯지렁이

Nicomache benthaliana McIntosh, 1885: 400, pl. 46, fig. 8, pl. 24, fig. 21.

Nicomache lumbricalis: Fauvel, 1927: 190, fig. 66a-i; Hartman, 1948: 42; Uschakov, 1955: 336, fig. 124A-D; Day, 1967: 621, fig. 301, i-o; Imajima and Shiraki, 1982: 35, fig. 14a-n; Paik, 1984b: 157, pl. 1, figs. 25-27; Lee and Paik, 1986a: 20, fig. 6A-H.

Material examined. 1 specimen, Dueok-ri, Hansan-myeon, Tongyeong-si, Gyeongsangnam-do (128°29′39″E, 34°47′15″N), 28 Aug 14, Choi HK.

Diagnosis. Body composed of 22 setigers and 2 preanal apodous segments. Cephalic plate indistinct. Prostomium and peristomium compeltely fused. First 3 setigers with acicular spines. Pygidium with cup-like anal funnel.

Distribution. Greenland, North Sea, Kara Sea, Bering Sea, Pacific Ocean of North America, Japan, Korea.

Genus *Praxillella* Verrill, 1881 꼬리대나무갯지렁이속

Cephalic plate distinct. First 3 or 4 setigers with acicular spines. Pygidium encircled by anal cirri, with long midivental cirrus. Anus present on projecting cones.

Type species. *Praxillella praetermissa* (Malmgren, 1865).

Key to the species of *Praxillella* Verrill, 1881 from Korea

1. Body with 3 asetigerous segments posteriorly; first 3 setgers with reduced rostrate uncini on neuropodia ······ *P. affinis*

\- Body with 4 asetigerous segments posteriorly; first 3 setgers with thick distally bent spines on neuropodia ······ *P. pacifica*

149. *Praxillella pacifica* Berkeley, 1929 (Fig. 32)

Praxillella affinis var. *pacifica* Berkeley, 1929: 313; Berkeley and Berkeley, 1952: 49, figs. 97-100.

Praxillella pacifica: Imajima and Shiraki, 1982: 58, fig. 27.

Material examined. 5 specimens, Yeongun-ri, Sanyang-eup, Tongyeong-si, Gyeongsangnam-do (128°28′24″E, 34°47′33″N), 28 Aug 14, Choi HK; 6 specimens, Dueok-ri, Hansan-myeon, Tongyeong-si, Gyeongsangnam-do (128°29′39″E, 34°47′15″N), 28 Aug 14, Choi HK.

Description. Body slender, about 60.5 to 75.0 mm long and width about 1.0 mm, consist of 18 setigers, and with 4 asetigerous segments in posterior region. Anterior setigers relatively shorter than median and posterior setigers (Fig. 32A, B).

Cephalic plate oval shaped, surrounded by membraneous rim; cephalic rim with mid-dorsal cleft in posterior rim and 2 deep incisions in lateral rim. Prostomium rounded protrusion on frontal margin of cephalic plate. Nuchal organs straight and parallel, connected to cephalic keel (Fig. 32A, C).

Neuropodial spines thick and bent almost at right angle, present on first 3 setigers, and 1 or 2 per setiger; setiger 1 with spines more shorter and slender than ones on setigers 2 and 3, with 2 or 3 small teeth on bent neck to shaft; spines on setigers 2 and 3 thick, with 1 or 2 large teeth above main fang, without small teeth on bent neck to shaft. Neuropodial uncini rostrate, present on others except first 3 setigers, and composed of 10-26 per torus; uncini with 5-6 teeth in row, small accessory teeth on main fang, and long gular bristles. Neuropodial setae composed of very thin and limbate capillary and lateral hirsute setae additionally (Fig. 32D-I).

Pygidial funnel with fringed margin bearing 23-24 marginal cirri and 1 long cirrus on mid-dorsal side; anal cone strongly constricted immediately in front of funnel (Fig. 32B).

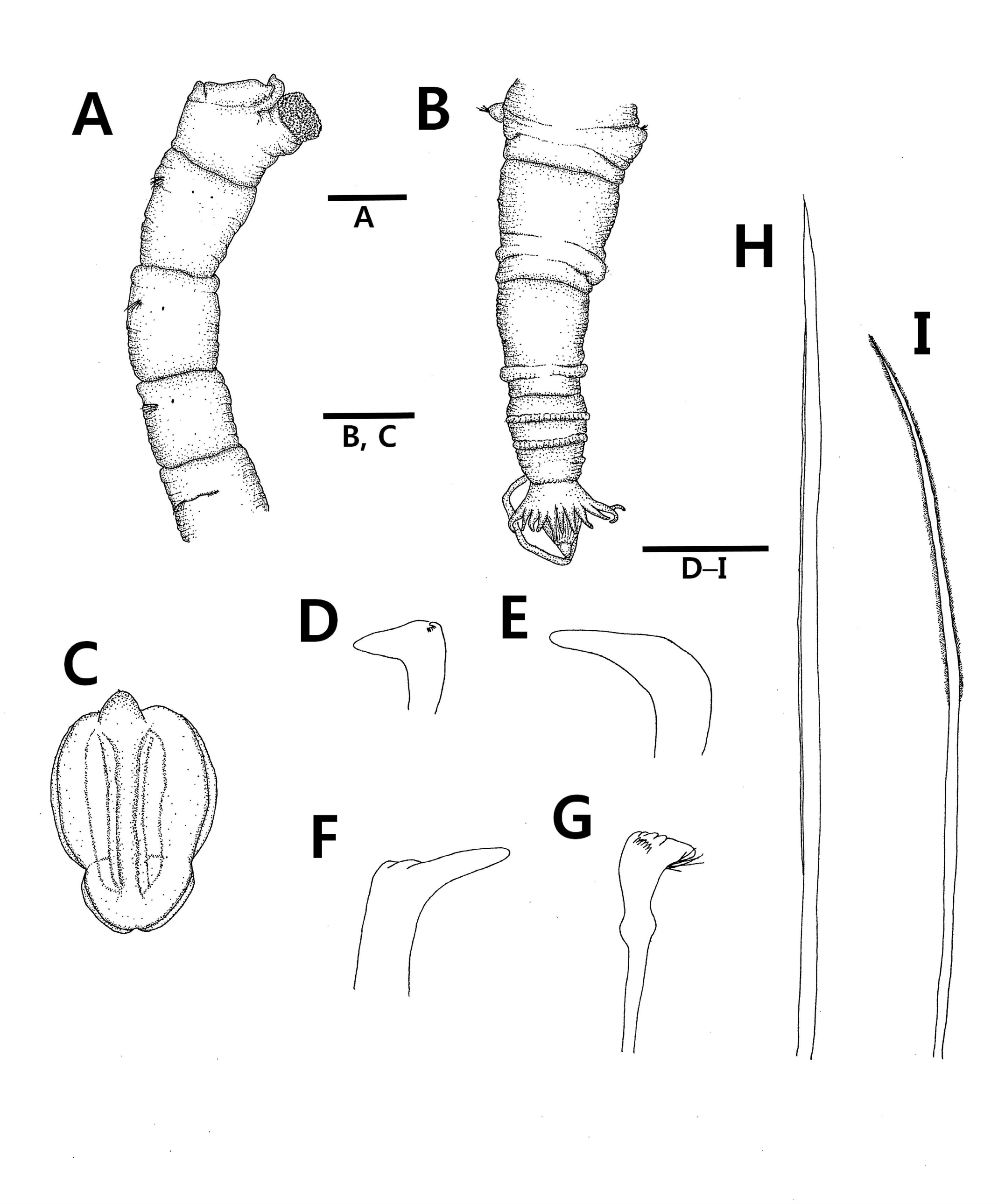

Fig. 32. *Praxillella pacifica* Berkeley, 1929. A, lateral view of anterior end; B, lateral view of posterior end; C, cephalic plate; D, spine on first setiger; E, spine without large tooth on setiger 2; F, spine with 2 large teeth on setiger 3; G, rostrate uncini; H, notopodial capillary seta; I, hirsute seta. Scale bars: A=1.0 mm, B, C=0.5 mm, D–I=0.05 mm.

Remarks. The present species, *Praxillella pacifica* Berkeley, 1929, was originally described from Nanaimo in Canada as the subspecies of *Praxillella affinis* (Sars, 1872). However, Imajima (1982) transferred this subspecies to specific rank because it is distinguishable from *P. affinis* by the following characteristics: *P. pacifica* has four asetigerous segments in the posterior region, while *P. affinis* has three ones; the pygidium of *P. pacifica* has constricted anal cone in front of funnel, but that of *P. affinis* has smooth one; the neuropodial spines of setigers 2 and 3 in *P. pacifica* are thick and almost bent at right angle, and have not small teeth, but those in *P. affinis* are reduced rostrate and have 2-5 small teeth above main fang (Berkeley, 1929; Imajima, 1982). In this respect, Korean materials of the present study generally agree well with Imajima's materials of *P. pacifica* (Imajima, 1982). However, Korean materials of *P. pacifica* have several differences in the morphology of spines on the setigers 2 and 3 as follows: the spines on setigers 2 and 3 have 0-2 large teeth above main fang in Korean materials, while those of *P. pacifica* have not large tooth (Imajima, 1982).

This species also resembles *Praxillella gracilis* (Sars, 1861) from East Asia in having four asetigerous segments in the posterior region and the neuropodial spines, which are thick and bent at right angle on the setigers 2 and 3 (Imjima, 1982). However, they are easily distinguished from each other by the different feature such that the prostomium is bluntly rounded in *P. pacifica,* while that of *P. gracilis* is prolonged forward as a finger-like projection (Imajima, 1982).

Distribution. Southern Caifornia north to western Canada, Japan, Korea.

Genus *Rhodine* Malmgren, 1865 깃대나무갯렁이속

First setigers with notosetae only. Acicular spines absent. Neurosetae beginning from setiger 5, and arranged in double rows. Posterior setigers with encircling collars.

Type species. *Rhodine loveni* Malmgren, 1865.

150. *Rhodine loveni* Malmgren, 1865 깃대나무갯지렁이

Rhodine loveni Malmgren, 1865: 189; Uschakov, 1955: 336, fig. 123; Imajima and

Shiraki, 1982: 32, fig. 13; Lee and Paik, 1986a: 15, fig. 2A-E; 1989: 517, fig. 208.

Material examined. 3 specimens, Songseok-ri, Haeje-myeon, Muan-gun, Jeollanam-do (126°19′33″E, 35°08′12″N), 16 Oct 2012, Choi HK.

Diagnosis. Head with dorsal crest. Prostomium rounded. Chehalic keel high and compressed. Setiger 2 and 3 with collar incised mid-dorsally. Setiger 9 and 10 fused. Ventral glandular shields present on setigers 3-9. First 4 setigers with capillary notosetae only. Neurosetae beginning from setiger 5, and arranged in double rows. Pygidium short and blunt cone with terminal anus and large ventral valve.

Distribution. Arctic Ocean, Atlantic Ocean, Pacific Ocean, Antarctica, Japan, Korea.

3.2. Distribution and ecological information

In this study, the marine polychaetes were examined and identified, which were collected from various habitats at 85 localities in Korean waters during the time periods of August, 2006 to July, 2015. By the present study, 150 polychaete species belonging to 99 genera of 36 families were identified. Among them, four species described as new species, seven species reported as new to Korean fauna. Therefore, the additions of 17 species by the present study bring the total number of species in Korean polychaete fauna to above 300 species.

Polychaete fauna of the present study is constituted of Phyllodocida (46%), Scolecida (19%), Terebellida (15%), Eunicida (10%), Spionida (5%), and Sabellida (5%) in the number of species grouped by order level (Fig. 33). This result is generally similar to that of the monograph of Korean polychaetes reported by Paik (1989), but the proportion of Scolecida in the present study is higher than that in the monograph by Paik (1989). While, the proportions of Sabellida and Spionida in the present study are slightly lower than those in the monograph by Paik (1989) (Fig. 34). In the comparison with the ecological study on polychaete fauna in the western and southern coasts of Korea (Paik *et al.*, 2005), the proportions of Phyllodocida and Euncida in the present study is generally similar to those of Paik *et al.* (2005). However, Spionida and Sabellida in this study represent slightly lower proportions than those of Paik *et al.* (2005), and Terebellida and Scolecida show somewhat higher proportions, respectively.

Distribution of Korean polychaetes in the present study is presented in Table 5. In the respect of the areas from which polychaete species were collected, 101 species among total 150 species occurred from Korea Strait, 73 species from the Yellow Sea, and 34 species from the East Sea (Fig. 35). In the number of species grouped by order level, Phyllodocida shows the highest value in all areas, while Spionida represents the lowest values in the Yellow Sea and Korea Strait, and not observed in the East Sea. Also, Terebellida and Scolecida show relatively higher values in the Yellow Sea and Korea Strait than those in the East Sea (Fig. 35).

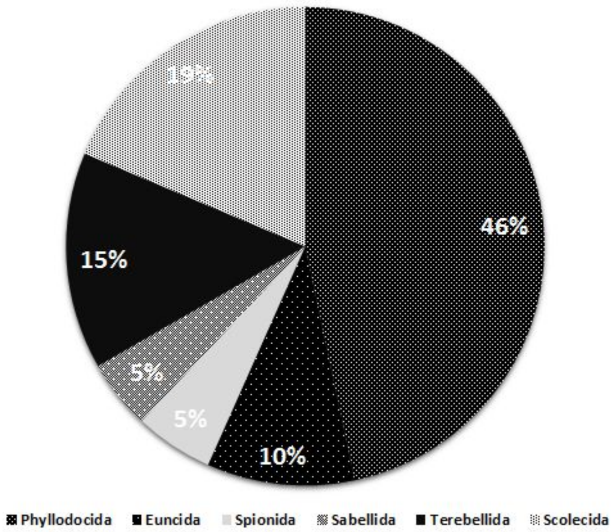

Fig. 33. Component ratio of polychaete orders by the number of species in the present study.

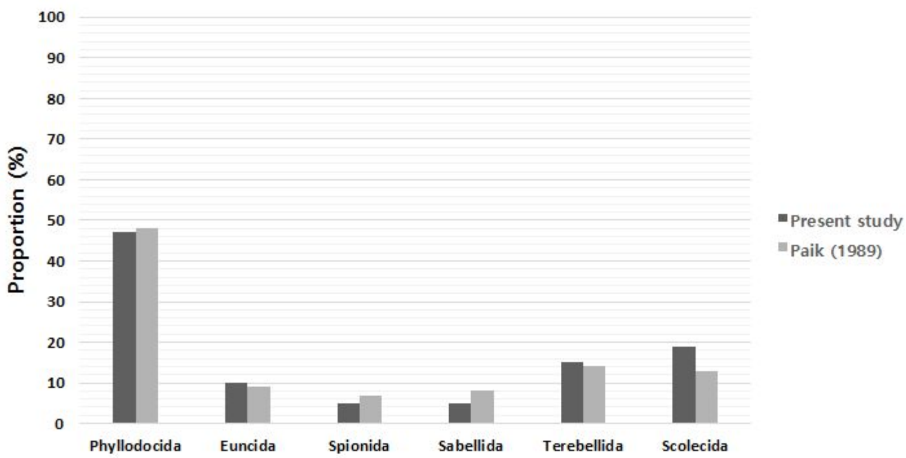

Fig. 34. Comparison of the component ratio of polychaete orders by the number of species between the present study and Paik (1989).

In the comparison of component ratio between three areas in Korean waters, the proportions of Phyllodocida and Scolecida are relatively higher in the Yellow Sea, and Terebellida and Spionida show higher proportions in Korea Strait. In the East Sea, Euncida represents relatively higher proportion (Fig. 36). Among polychaetes of this study, the nereidids are widely distributed from Korean waters and they have the highest proportion in Korea Strait and the lowest proportion in the East Sea. It is slightly different to the result of Paik (1989) in which the nereidids showed the lowest proportion in the Yellow Sea (Paik, 1989). These differences are supposed to be resulted mainly from different number of sampling sites in three regions of the present study and from different surveying activities and localities according to studies.

In Table 5, polychaetes of the present study were categorized to two habitats regions concerning to tidal level and two habitats types of soft and hard bottoms. Among total 150 species of the present study, 127 species were found from intertidal region, 36 species from subtidal region, and 13 species from both regions (Fig. 37). And 112 species were collected from soft bottom, 52 species from hard bottom, and 14 species from both types of bottom (Fig 38).

For the analysis of feeding guild types, polychaete species were categorized into 15 feeding guilds based on Fauchald and Jumars (1979) (Table 6). Categorization of them was also referred by several previous works on the polychaete communities in Korea (Choi and Koh, 1986, 1988, 1989, 1992). Among feeding guild types, CMJ type was most abundant (20%), and it was followed by HMJ (16%), SDT (12%), BMX (12%), and CDJ (9%) (Fig. 7). This result means that carnivores and deposit feeders are abundant in Korean polychaete fauna of the present study. Also, it suggests that the species of motile type are dominant than those of sessile type in the respect of mobility, and the jawed type is dominant among the types based on feeding apparatus (Fig. 39, Table 6).

Table 6. Distribution and ecological information of Korean polychaetes in the present study.

Species	Area			Habitats region		Habitats type		Type of FG
	YS	KS	ES	IZ	SZ	SB	HB	
1. *Eteone longa* (Fabricius, 1780)	+	+		+			+	CMX
2. *Eulalia bilineata* (Johnston, 1840)	+			+			+	CMX
3. *Eulalia viridis* (Linnaeus, 1767)	+	+	+	+		+	+	CMX
4. *Mysta ornata* (Grube, 1879)	+			+			+	CMX
5. *Nereiphylla castanea* (Marenzeller, 1879)		+		+			+	CMX
6. *Nereiphylla hera* Kato and Mawatari, 1999			+	+			+	CMX
7. *Phyllodoce koreana* (Lee and Jae, 1985)		+		+		+		CMX
8. *Phyllodoce maculata* (Linnaeus, 1767)	+			+		+		CMX
9. *Glycera alba* (Müller, 1776)		+		+	+	+		CDJ
10. *Glycera fallax* Quatrefages, 1850	+			+		+		CDJ
11. *Glycera macintoshi* Grube, 1877	+			+		+		CDJ
12. *Glycera nicobarica* Grube, 1868	+	+		+	+	+		CDJ
13. *Glycera onomichiensis* Izuka, 1912	+	+		+		+		CDJ
14. *Glycera tesselata* Grube, 1863	+			+		+		CDJ
15. *Glycera unicornis* Lamarck, 1818	+			+		+		CDJ
16. *Hemipodia yenourensis* (Izuka, 1912)	+			+		+		CDJ
17. *Goniada japonica* Izuka, 1912	+	+		+		+		CDJ
18. *Goniada maculata* Oersted, 1843	+			+		+		CDJ
19. *Glycinde bonhourei* Gravier, 1904	+	+		+		+		CDJ
20. *Micropodarke dubia* (Hessle, 1925)		+		+	+	+		CMJ
21. *Ophiodromus pugettensis* (Johnson, 1901)		+			+	+		CMJ
22. *Ancistrosyllis matsunagaensis* (Kitamori, 1960)		+		+		+		CMJ
23. *Sigambra hanaokai* (Kitamori, 1960)	+	+		+		+		CMJ
24. *Syllis spongiphila* Verrill, 1885			+	+			+	CMJ
25. *Syllis gracilis* Grube, 1840		+		+			+	CMJ
26. *Typosyllis adamanteus kurilensis* Chlebovitsh, 1959		+				+	+	CMJ
27. *Typosyllis fasciata* (Malmgren, 1867)			+	+			+	CMJ
28. *Typosyllis prolifera* Krohn, 1852			+	+			+	CMJ
29. *Alitta virens* (Sars, 1835)	+			+		+		HMJ
30. *Ceratonereis hircinicola* (Eisig, 1870)		+		+		+		HMJ
31. *Hediste japonica* (Izuka, 1908)	+	+		+		+		FDP
32. *Leonnates nipponicus* Imajima, 1972	+			+		+		HMJ
33. *Lycastopsis augeneri* Okuda, 1937			+	+			+	HMJ
34. *Neanthes cautata* (Delle Chiaje), 1828		+			+		+	HMJ
35. *Nectoneanthes oxypoda* (Marenzeller, 1879)	+	+		+		+		HMJ
36. *Nereis heterocirrata* Treadwell, 1931	+		+	+		+	+	HMJ
37. *Nereis multignatha* Imajima and Hartman, 1964		+	+	+			+	HMJ
38. *Nereis neoneanthes* Hartman, 1948			+	+			+	HMJ
39. *Nereis nichollsi* Kott, 1951		+		+		+		HMJ
40. *Nereis pelagica* Linnaeus, 1758	+	+	+	+		+	+	HMJ
41. *Nereis surugaense* Imajima, 1972		+		+		+		HMJ
42. *Paraleonnates uschakovi* Khlebovich and Wu, 1962	+			+		+		HMJ
43. *Perinereis aibuhitensis* (Grube, 1878)	+	+		+		+		HMJ
44. *Perinereis cultrifera* (Grube, 1840)	+	+		+		+	+	HMJ
45. *Perinereis floridana* (Ehlers, 1868)			+	+			+	HMJ
46. *Perinereis mictodonta* (Marenzeller, 1879)	+	+		+		+	+	HMJ

Table 6. (continued.)

Species	Area			Habitats region		Habitats type		Type of FG
	YS	KS	ES	IZ	SZ	SB	HB	
47. *Perinereis wilsoni* Glasby and Hsieh, 2006	+	+		+		+	+	HMJ
48. *Platynereis bicanaliculata* (Baird, 1863)		+	+	+			+	HMJ
49. *Pseudonereis* sp. nov. 1		+		+			+	HMJ
50. *Pseudonereis* sp. nov. 2		+		+			+	HMJ
51. *Simplisetia erythraeensis* (Fauvel, 1918)	+	+		+		+		HMJ
52. *Tylorrhynchus heterochaetus* (Qustrefages, 1865)		+		+		+		HMJ
53. *Micronephthys sphaerocirrata orientails* Lee and Jae, 1983	+	+		+		+		CMJ
54. *Nephtys caeca* (Fabricius, 1780)		+		+		+		CMJ
55. *Nephtys californiensis* Hartman, 1938	+			+		+		CMJ
56. *Nephtys ciliata* (Müller, 1776)	+	+		+		+		CMJ
57. *Nephtys longosetosa* Oersted, 1843	+	+		+		+		CMJ
58. *Nephtys oligobranchia* Southern, 1921		+		+		+		CMJ
59. *Nephtys polybranchia* Southern, 1921	+	+		+		+		CMJ
60. *Euphione chitoniformis* (Moore, 1903)	+	+		+	+	+	+	CMJ
61. *Halosydna brevisetosa* Kinberg, 1855		+	+	+	+		+	CMJ
62. *Harmothoe forcipata* (Marenzeller, 1902)		+		+			+	CMJ
63. *Harmothoe imbricata* (Linnaeus, 1767)		+		+		+		CMJ
64. *Lagisca waahli* (Kinberg, 1856)	+			+			+	CMJ
65. *Lepidasthenia izukai* Imajima and Hartman, 1964		+		+		+		CMJ
66. *Lepidonotus dentatus* Okuda and Yamada, 1954	+	+	+	+			+	CMJ
67. *Lepidonotus elongatus* Marenzeller, 1902		+				+	+	CMJ
68. *Lepidonotus helotypus* (Grube, 1877)	+		+	+			+	CMJ
69. *Paradyte crinoidicola* (Potts, 1910)	+	+		+		+		CMJ
70. *Chrysopetalum occidentale* Johnson, 1897		+	+	+	+	+	+	CMX
71. *Diopatra sugokai* Izuka, 1907	+			+		+		SDJ
72. *Onuphis shirikishinaiensis* (Imajima, 1960)		+		+		+		SDJ
73. *Eunice northioidea* Moore, 1903		+			+		+	CDJ
74. *Leodice antennata* Lamarck, 1818		+			+		+	CDJ
75. *Lysidice collaris* Grube, 1870		+	+	+			+	HMJ
76. *Marphysa sanguinea* (Montagu, 1815)	+		+	+		+	+	–
77. *Marphysa tamurai* Okuda, 1934		+			+	+		–
78. *Lumbrineris heteropoda* (Marenzeller, 1879)	+			+		+		BMJ
79. *Lumbrineris japonica* (Marenzeller, 1879)			+	+		+		BMJ
80. *Lumbrineris latreilli* Audouin and Milne-Edwards, 1834			+	+		+		BMJ
81. *Lumbrineris longifolia* Imjiam and Higuch, 1975	+	+		+	+	+		BMJ
82. *Lumbrineris nipponica* Imajima and Higuchi, 1975	+	+	+	+		+		BMJ
83. *Schistomeringos matsushimaensis* (Okuda and Yamada, 1954)		+	+	+	+	+		CMJ
84. *Arabella monroi* Colbath, 1989			+	+			+	CMJ
85. *Drilonereis filum* (Claparède, 1868)		+			+	+		CMJ
86. *Boccardiella hamata* (Webster, 1879)	+	+		+		+	+	SDT
87. *Laonice cirrata* (Sars, 1851)		+			+	+		SDT
88. *Paraprionospio coora* Wilson, 1990		+			+	+		SDT
89. *Prionospio (Aquilaspio) krusadensis* Fauvel, 1929		+		+		+		SDT
90. *Prionospio (Minuspio) multibranchiata* Berkeley, 1927	+			+		+		SDT
91. *Prionospio membranacea* Imajima, 1990		+			+	+		SDT

Table 6. (continued.)

Species	Area			Habitats region		Habitats type		Type of FG
	YS	KS	ES	IZ	SZ	SB	HB	
92. *Prionospio japonicus* Okuda, 1935	+	+		+		+		SDT
93. *Scolelepis (Scolelepis) kudenovi* Hartmann-Schröder, 1981	+			+		+		SDT
94. *Poecilochaetus johnsoni* Hartman, 1939		+			+	+		SDT
95. *Magelona japonica* Okuda, 1937	+	+		+	+	+		SDT
96. *Aphelochaeta monilaris* (Hartman, 1960)		+		+	+	+		SDT
97. *Chaetozone setosa* Malmgren, 1867	+			+		+		SDT
98. *Chaetozone spinosa* Moore, 1903	+	+		+		+		SDT
99. *Cirratulus cirratus* (Müller, 1776)		+		+		+		SDT
100. *Cirriformia chrysoderma* (Claparede, 1868)		+		+		+		SDT
101. *Cirriformia tentaculata* (Montagu), 1808	+	+		+		+		SDT
102. *Timarete antarcticus* (Monro, 1930)	+			+		+		SDT
103. *Brada villosa* (Rathke, 1843)		+		+		+		SMT
104. *Pherusa plumosa* (Müller, 1776)		+			+	+		SMT
105. *Sternaspis* sp. nov.	+			+		+		BMX
106. *Lagis* sp. nov.	+	+		+		+		BMX
107. *Ampharete arctica* Malmgren, 1866	+				+	+		SST
108. *Amphicteis gunneri* (Sars, 1835)		+		+	+	+		SST
109. *Amphitrite edwardsii* (Quatrefages, 1866)		+			+	+		SST
110. *Loimia medusa* (Savigny, 1818)	+	+		+		+		SST
111. *Pista cristata* (Müller, 1776)		+		+		+		SST
112. *Pista shizugawaensis* Nishi and Tanaka, 2006	+			+		+		SST
113. *Terebella ehrenbergi* Grube, 1870	+	+	+	+	+	+	+	SST
114. *Thelepus japonicus* Marenzeller, 1884		+	+	+	+	+	+	SST
115. *Thelepus setosus* (Quatrefages, 1866)		+		+			+	SST
116. *Thelepus toyamaensis* Okuda, 1936		+		+			+	SST
117. *Trichobranchus glacialis* Malmgren, 1866		+			+	+		SST
118. *Owenia fusiformis* Delle Chiaje, 1844	+			+		+		FDT
119. *Chone teres* Bush, 1904		+			+		+	FST
120. *Pseudopotamilla occelata* Moore, 1905			+	+			+	FST
121. *Sabellastarte spectabilis* (Grube, 1878)			+	+			+	FST
122. *Hydroides ezoensis* Okuda, 1934		+	+	+			+	FST
123. *Hydroides uncinatus* (Philippi, 1844)		+		+			+	FST
124. *Spirobranchus kraussii* (Baird, 1865)		+	+	+			+	FST
125. *Haploscoloplos elongatus* (Johnson, 1901)		+		+		+		BMX
126. *Naineris dendritica* (Kinberg, 1867)			+	+			+	BMX
127. *Phylo felix asiaticus* Wu, 1962		+		+		+		BMX
128. *Scoloplos armiger* (Müller, 1776)	+	+		+		+		BMX
129. *Aricidea (Aricidea) pacifica* Hartman, 1944	+			+		+		HMX
130. *Aricidea (Acesta) assimilis* Tebble, 1959	+			+		+		HMX
131. *Armandia amakusaensis* Saito, Tamaki and Imajima, 2000	+	+		+		+		BMX
132. *Armandia lanceolata* Willey, 1905	+	+		+		+		BMX
133. *Armandia simodaensis* Takahashi, 1938		+			+	+		BMX
134. *Ophelina acuminata* Örsted, 1843			+	+			+	BMX
135. *Polyopthalmus pictus* (Dujardin, 1839)		+	+	+	+	+	+	BMX
136. *Polyophthalmus qingdaoensis* Purschke et al., 1995		+	+	+			+	BMX
138. *Travisia pupa* Moore, 1906		+			+	+		BMX
139. *Capitella capitata* (Fabricius, 1780)	+	+		+		+		BMX
140. *Dasybranchus caducus* (Grube, 1846)	+	+		+	+	+		BMX

Table 6. (continued.)

Species	Area			Habitats region		Habitats type		Type of FG
	YS	KS	ES	IZ	SZ	SB	HB	FG
141. *Heteromastus filiformis* (Claparède, 1864)	+	+		+		+		BMX
142. *Notomastus latericeus* Sars, 1851	+	+		+	+	+		BMX
143. *Abarenicola pacifica* Healy and Wells, 1959			+	+		+		SDX
144. *Asychis biceps* (Sars, 1861)	+			+		+		BSX
145. *Asychis pigmentata* Imajima and Shiraki, 1982		+			+	+		BSX
146. *Maldanella harai* (Izuka, 1902)	+			+		+		BSX
147. *Microclymene propecaudata* Lee and Paik, 1986	+			+		+		BSX
148. *Nicomache lumbricalis* (Fabricius, 1780)		+			+	+		BSX
149. *Praxillella pacifica* Berkeley, 1929		+			+	+		BSX
150. *Rhodine loveni* Malmgren, 1865	+			+		+		BSX

Abbreviations: YS, the Yellow Sea; KS, Korea Strait; ES, the East Sea; IZ, intertidal zone; SZ, subtidal zone; SB, soft bottom; HB, hard bottom; FG, feeding guilds.

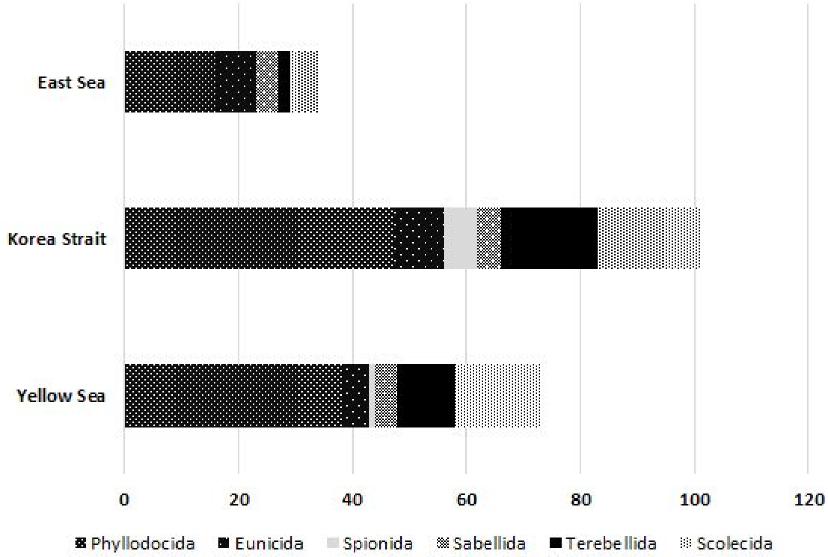

Fig. 35. Number of polychaete species from three areas in Korean waters.

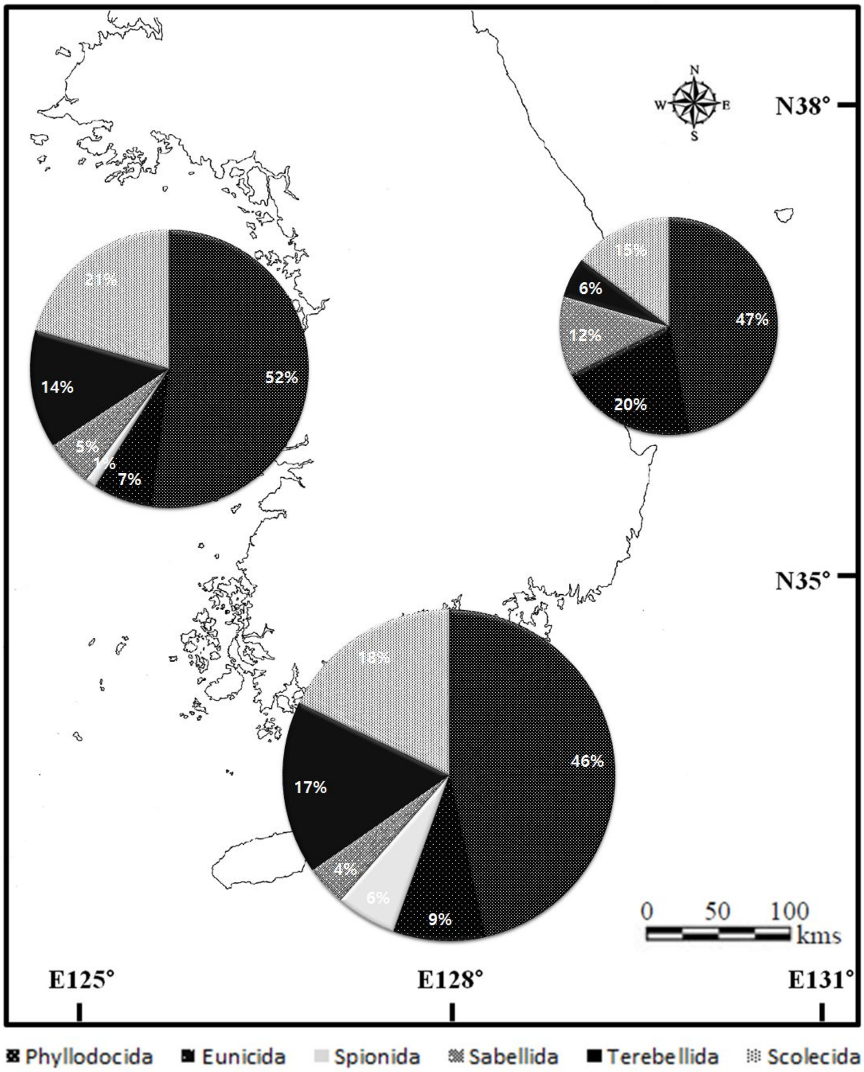

Fig. 36. Composition of polychaete fauna from three areas in Korean waters.

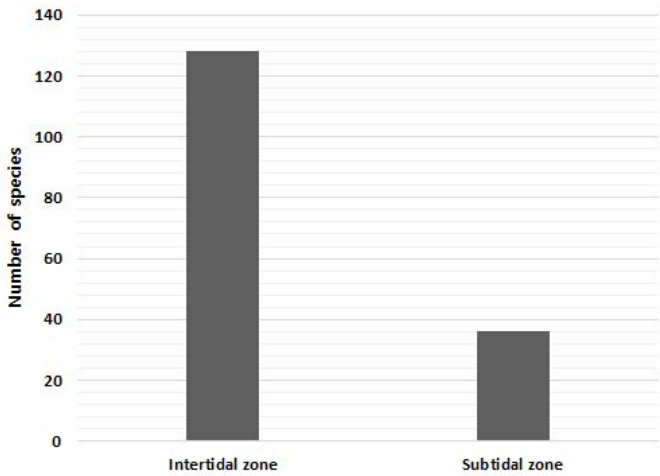

Fig. 37. Number of polychaete species by different habitats regions in the present study.

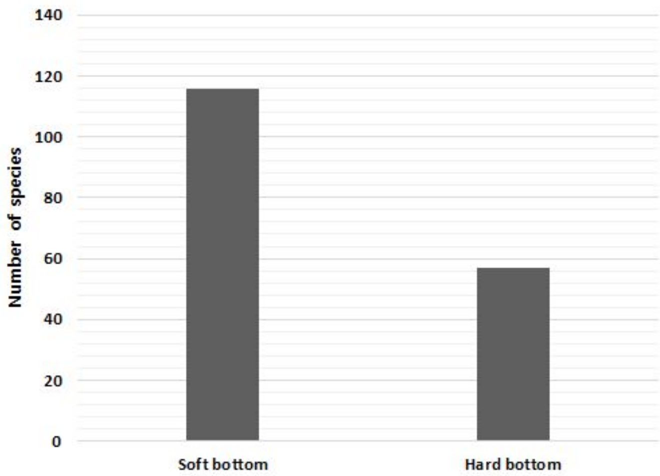

Fig. 38. Number of polychaete species by different habitats types in the present study.

Table 7. Types and characteristics of polychaete feeding guilds in the present study.

Feeding guilds	Characteristics
BMJ	burrowing, motile, jawed
BMX	burrowing, motile, non-jawed
BSX	burrowing, sessile, non-jawed
CDJ	carnivore, discretely motile, jawed
CMJ	carnivore, motile, jawed
CMX	carnivore, motile, non-jawed
FDP	filter-feeding, discretely motile, pumping
FDT	filter-feeding, discretely motile, tentaculate
FST	filter-feeding, sessile, tentaculate
HMJ	herbivore, motile, jawed
HMX	herbivore, motile, non-jawed)
SDJ	surface deposit-feeding, discretely motile, jawed
SDT	surface deposit-feeding, discretely motile, tentaculate
SMT	surface deposit-feeding, motile, tentaculate
SST	surface deposit-feeding, sessile, tentaculate

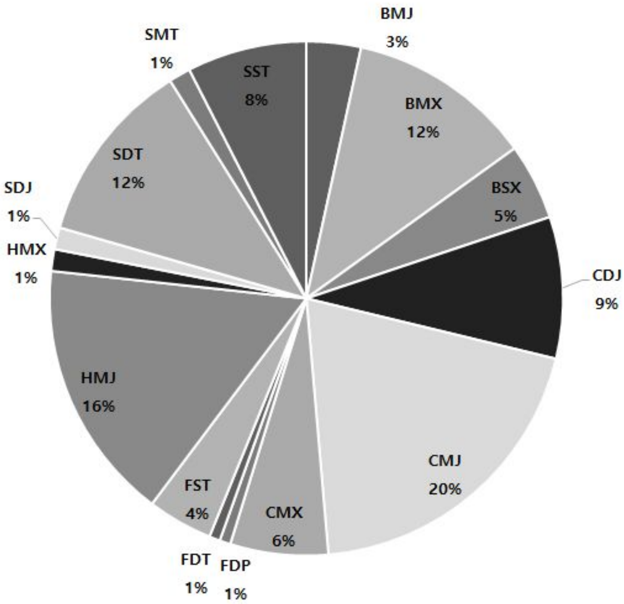

Fig. 39. Component ratio of polychaete species by feeding guilds in the present study.

3.3. An ecological study on the polychaete community and secondary production of *Hediste* population in Suncheon Bay, Korea

3.3.1. Habitat conditions

During the sampling period from January, 2012 to February, 2014, the water temperature varied from 1.22 ℃ on January, 2014 to 35.53 ℃ on July, 2012, with an average value of 15.69±10.09 ℃. The salinity ranged between 11.98 psu on February, 2013 and 31.41 psu on March 2013, and the average of it was 22.44±5.16 psu. The dissolved oxygen measured from 1.37 mg/L on February, 2013 to 13.50 mg/L on November, 2013, and the mean value of dissolved oxygen was 6.73±2.98 mg/L (Fig. 40, Table 7).

3.2.2 Polychaete community structure

Species composition and abundance

During sampling period, total 20 polychaete species belonging to 15 genera and 11 families were identified in the polychaete community (Table 8). The most abundant family in the number of species was the Spionidae of four species, followed by Nephtyidae, Nereididae, and Glyceridae of three species, respectively. While the family of only one species was Polynoidae, Pilargidae, Onuphidae, Magelonidae, Pectinariidae, Terebellidae, and Capitellidae (Fig. 41, Table 8).

Table 7. Seasonal change of temperature, salinity, and dissolved oxygen during the sampling period.

Month/Year	Temperature (℃)	Salinity (psu)	Dissolved oxygen (mg/L)
Jan/2012	1.64	21.81	7.75
Feb	5.19	29.07	9.31
Mar	8.9	27.5	7.24
Apr	16.29	26.0	8.2
May	28.12	26.51	3.36
Jun	27.65	26.71	2.78
Jul	35.53	25.29	8.17
Aug	26.94	24.34	8.55
Sep	25.100	24.300	2.20
Oct	17.21	22.13	2.99
Nov	10.67	31.18	6.78
Dec	3.11	21.47	6.91
Jan/2013	4.85	17.56	6.54
Feb	8.15	11.98	1.37
Mar	11.62	31.41	2.23
Apr	14.71	23.56	9.15
May	22.33	16.68	9.36
Jun	21.34	16.57	4.23
Jul	26.76	18.07	5.27
Aug	26.68	16.11	5.98
Sep	27.08	17.32	6.18
Oct	16.63	24.60	7.86
Nov	7.16	13.51	13.50
Dec	4.70	22.60	9.96
Jan/2014	1.22	23.41	8.95
Feb	8.39	23.70	10.18

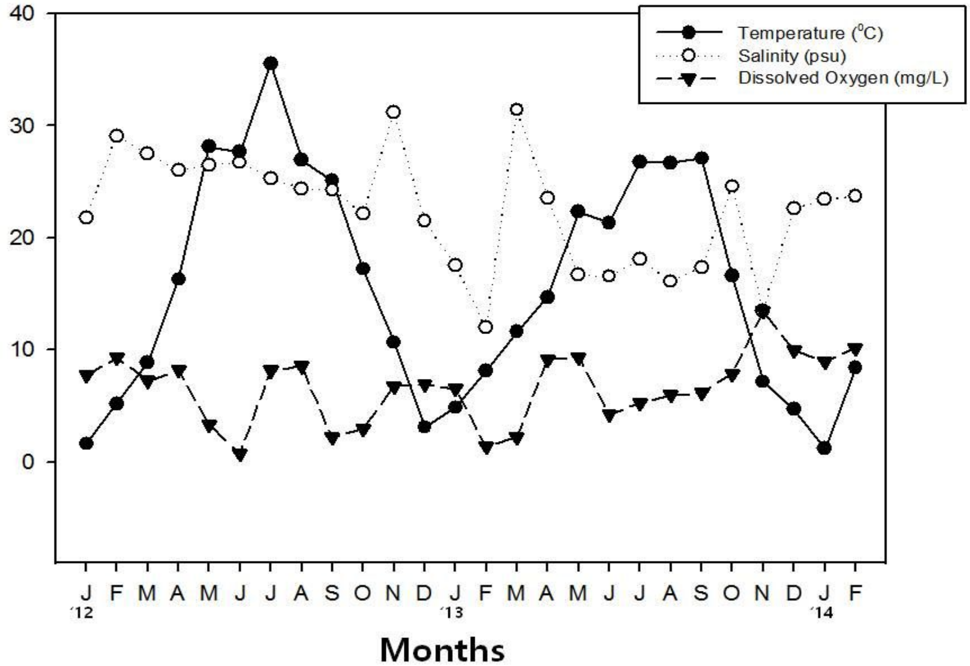

Fig. 40. Seasonal change of temperature, salinity, dissolved oxygen, and pH during the sampling period: solid circles (●), temperature (℃); open circles (○), salinity (psu); solid triangles (▼), dissolved oxygen (mg/L).

Mean density of the individuals occurred was estimated as 1524 ind./m^2 in the present study of polychaete community. In component ratio of the individuals by family level, the families with the higher proportions were Nereididae (39%), Capitellidae (29%), and Pilargidae (14%), followed by other families with relatively lower proportions, Nephtyidae (7%), Magelonidae (5%), Spionidae (2%), Polynoidae (2%), Pectinariidae (0.6%), Terebellidae (0.3%), Glyceridae (0.1%), and Onuphidae (0.02%) (Fig. 42, Table 8).

The three most abundant species accounted for 82.24% of all the species were *Hediste japonica* (39%), *Heteromastus filiformis* (29%), and *Sigambra hanaokai* (14%). Whereas many rare species contributing less than 1% occurred as follows: *Nephtys longosetosa* (0.5%), *Alitta virens* (0.1%), *Nectoneanthes oxypoda* (0.2%), *Glycera nicobarica* (0.03%), *Glycera onomichiensis* (0.05%), *Glycera alba* (0.02%), *Onuphis shirikishinaiensis* (0.02%), *Dipolydora flava* (0.14%), *Boccardiella hamata* (0.03%), *Prionospio pulchra* (0.02%), *Lagis* sp. nov. (0.6%), and *Loimia medusa* (0.3%) (Fig. 43, Table 8).

Feeding guilds

Total eight kinds of feeding guilds, BMX (burrowing, motile, non-jawed), CDJ (carnivorous, discretely motile, jawed), CMJ (carnivorous, motile, jawed), FDP (filter feeding, discretely motile, pumping), HMJ (herbivore, motile, jawed), SDJ (surface deposit-feeding, discretely motile, jawed), SDT (surface deposit-feeding, discretely motile, tentaculate), and SST (surface deposit-feeding, sessile, tentaculate), were emerged in the polychaete community of Suncheon Bay based on the categorization of Fauchld and Jumars (1979). Among them, the feeding guilds of BMX, CMJ, and FDP were abundant in this area, but other types of guilds were contributing less than 5%. In the respect of feeding, the dominances were filter-feeding, carnivore, and burrowing types. Discretely motile and motile types were abundant in the mobility, and pumping, non-jawed, and jawed types were appeared dominantly in the feeding apparatus (Fig. 44).

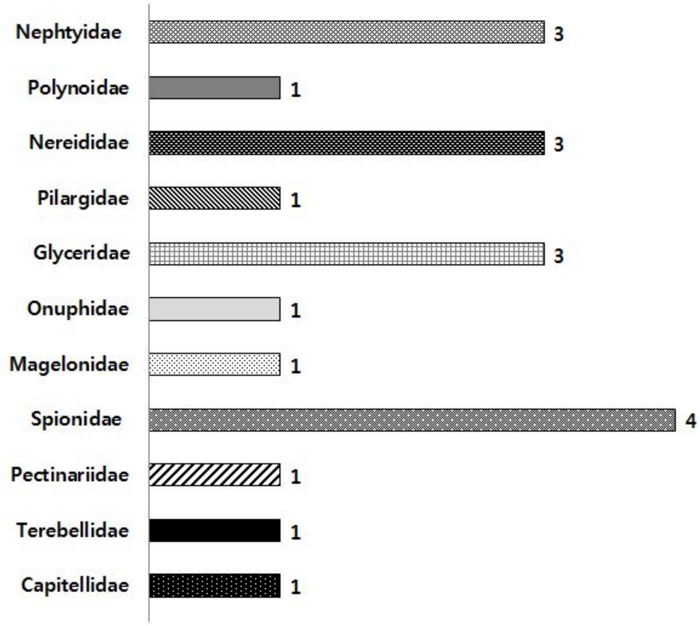

Fig. 41. The species numbers in each family consisted of the intertidal polychaete community.

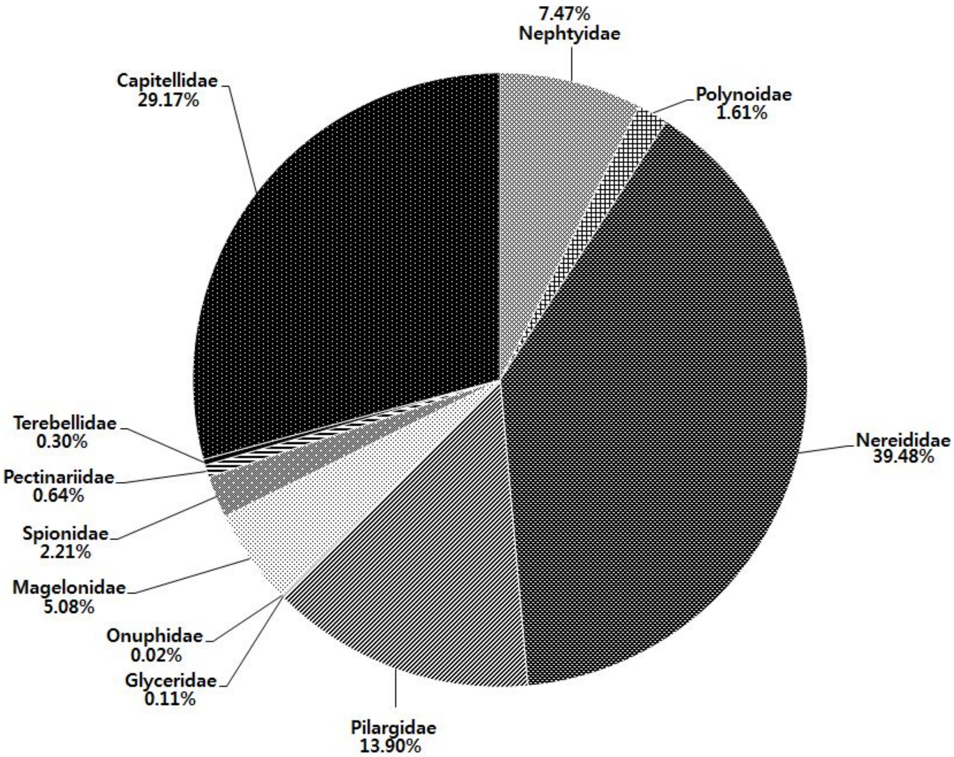

Fig. 42. Percentage composition of each family member in the polychaete community.

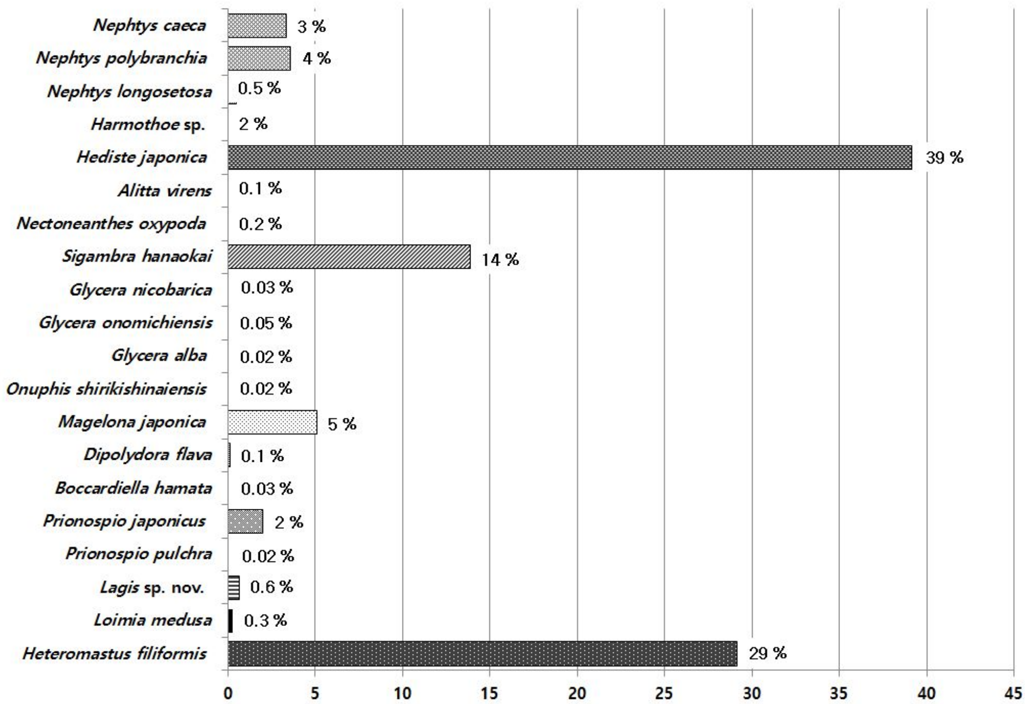

Fig. 43. Component ratio of the individuals by species level in the polychaete community.

Table 8. Species composition and abundance of the polychaete community.

Families	Species	Density (ind./m^2)	Composition (%)
Nephtyidae	*Nephtys caeca*	51	3
	Nephtys polybranchia	55	4
	Nephtys longosetosa	8	0.5
Polynoidae	*Harmothoe* sp.	24	2
Nereididae	*Hediste japonica*	597	39
	Alitta virens	2	0.1
	Nectoneanthes oxypoda	3	0.2
Pilargidae	*Sigambra hanaokai*	212	14
Glyceridae	*Glycera nicobarica*	0.5	0.03
	Glycera onomichiensis	0.8	0.05
	Glycera alba	0.3	0.02
Onuphidae	*Onuphis shirikishinaiensis*	0.3	0.02
Magelonidae	*Magelona japonica*	77	5
Spionidae	*Dipolydora flava*	2	0.1
	Boccardiella hamata	0.5	0.03
	Prionospio japonicus	31	2
	Prionospio pulchra	0.3	0.02
Pectinariidae	*Lagis* sp. nov.	10	0.6
Terebellidae	*Loimia medusa*	5	0.3
Capitellidae	*Heteromastus filiformis*	445	29
Total	20 species	1,524	100

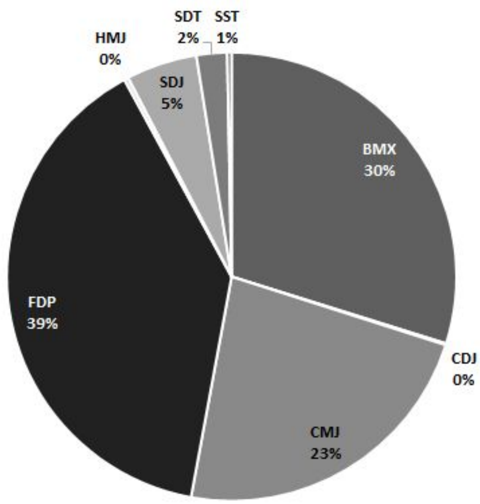

Fig. 44. Component ratio of individuals by feeding guilds in the polychaete community in Suncheon Bay, Korea.

Seasonal variation

During the sampling period, the number of species ranged from five on January, May, August, 2012 and February, 2013 to 12 on November, 2012. More divers species occurred in the spring and fall, while relatively lower number of species were represented in the summer and winter (Fig. 45, Table 10). Seasonal change in faunal density varied from a minimum of 283 inds./m^2 in February, 2014 to a maximum of 5,795 inds./m^2 in April, 2012 (Fig. 45, Table 9).

The relatively higher densities were observed in the spring-summer periods, especially from April to June, 2012, and it was caused by higher density of *H. japonica* in this periods. The relatively lower densities were represented in winter periods by decrease of *H. japonica*, but November, 2012 and February, 2013 showed relatively higher densities because of the high density of capitellid species (Fig. 45, 46, Table 9).

The species belonging to Nereididae, Pilargidae, Magelonidae, and Capitellidae were widely distributed during the sampling period, while the species of Glyceridae, Onuphidae, and Terebellidae showed low occurrence (Fig. 46, 47, Table 9). Also, the nereidid species represented the higher densities and proportions in the spring and summer from April to July, 2012 and April to August, 2013. The capitellid species showed the relatively higher densities and proportions in winter from November, 2012 to February, 2013 and from December, 2013 to February, 2014 (Fig. 46, 47, Table 9).

Dominant species

The seasonal change in the abundance of dominant species in the polychaete community during the sampling period was presented as Fig 48. Top three dominant species in the study area were *H. japonica, H. filiformis,* and *S. hanaokai,* and which accounted for 82% in of total individuals.

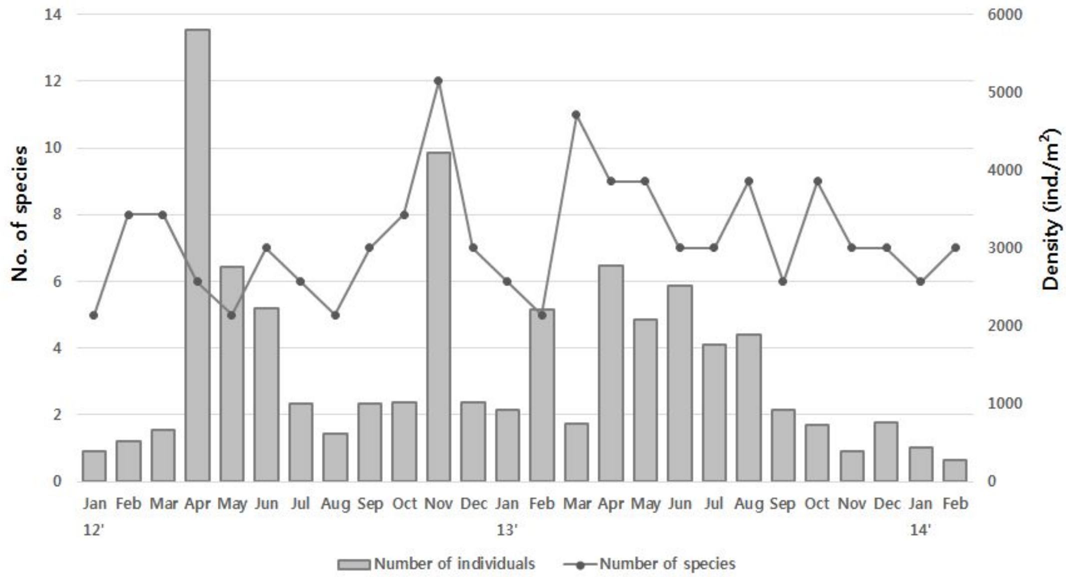

Fig. 45. Seasonal change of the number of species occurred and the density of individuals in the polychaete community during the sampling period.

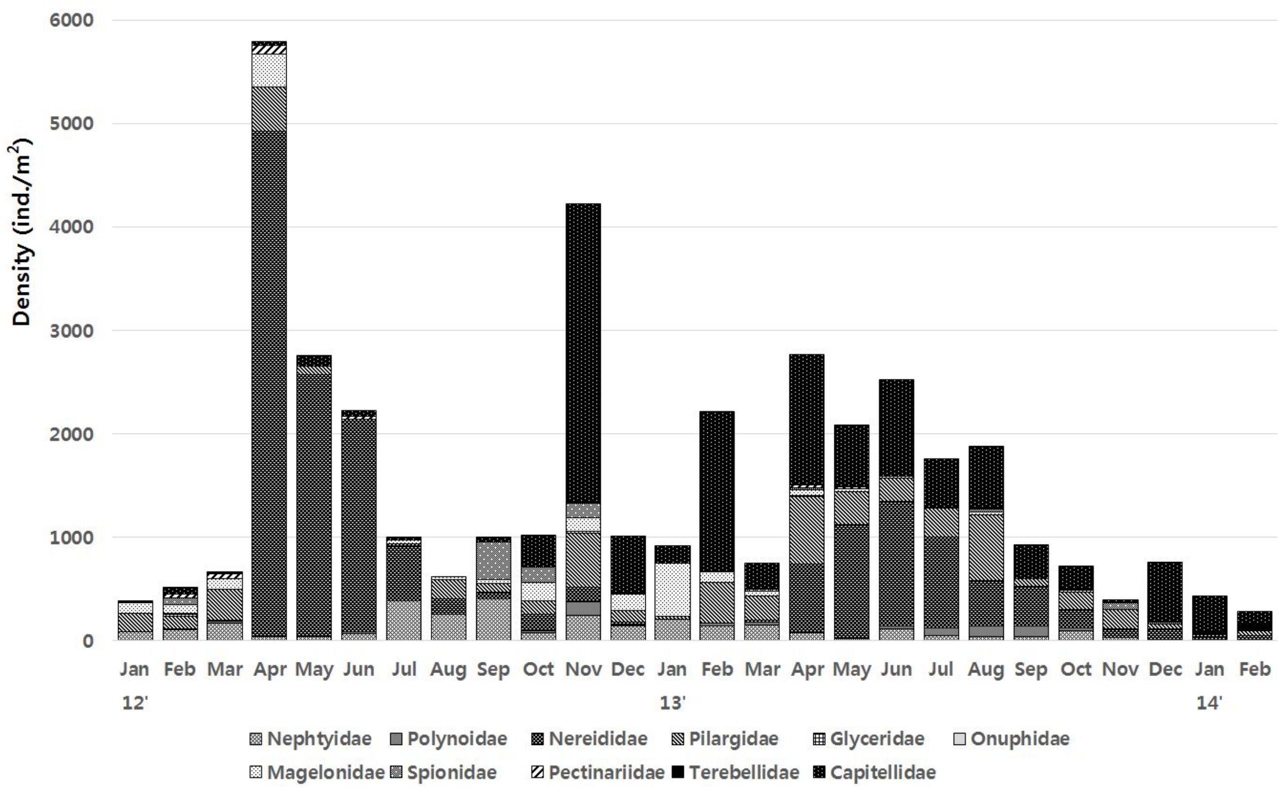

Fig. 46. Seasonal change of the number of individuals occurred by family level in the polychaete community during the sampling period.

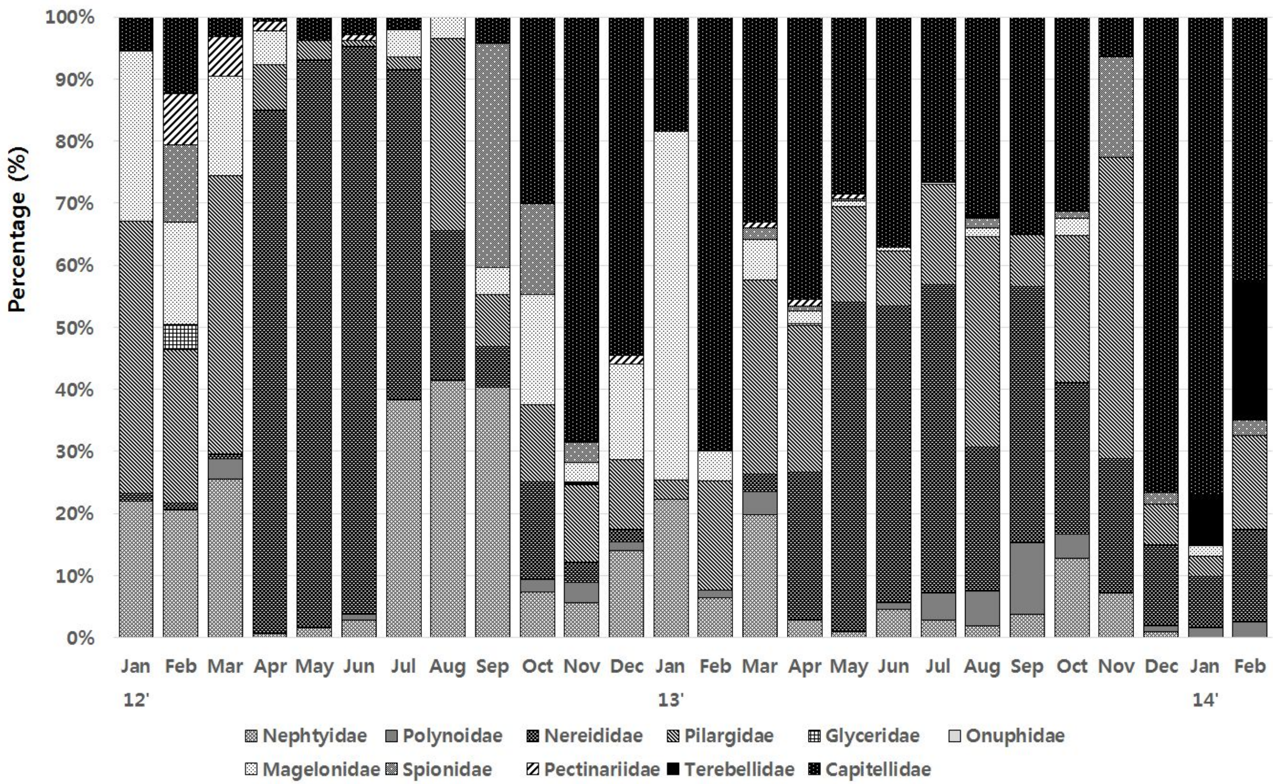

Fig. 47. Monthly changes in the percentage composition of families in the polychaete community during the sampling period.

Table 9. Seasonal change of the number of species occurred and the density (ind./m^2) of polychaetes by family level during the sampling period.

Taxa	No. of individuals																									
	2012												2013												2014	
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb
Nephtyidae	85	106	170	42	42	64	382	255	403	74	240	141	205	141	147	77	21	113	49	35	35	92	28	7		2962
Polynoidae			21			21				21	134	14		28	28			28	78	106	106	28		7	7	7
Nereididae	5	5	5	4883	2526	2038	531	149	64	159	141	21			21	658	1104	1203	871	435	382	177	84	99	35	42
Pilargidae	170	127	297	425	85	21	21	191	85	127	523	113	28	389	233	658	317	226	283	637	77	169	191	49	14	42
Glyceridae		21									14					7										42
Onuphidae											7															
Magelonidae	106	85	106	318			42	21	42	180	127	155	517	106	49	57	21	14	7	28		21			7	
Spionidae		64							361	149	141				14	21	7			28		7	63	14		7
Pectinariidae		42	42	85		21						14			7	28	14									
Terebellidae											14									7					35	64
Capitellidae	21	64	21	42	106	64	21		42	307	2881	552	170	1550	248	1260	595	934	467	601	325	226	25	580	332	120
Total	387	514	662	5,795	2,759	2,229	997	616	997	1,017	4,222	1,010	920	2,214	747	2,766	2,079	2,518	1,755	1,877	925	720	391	756	430	3,286
No. of species	5	8	8	6	5	7	6	5	7	8	12	7	6	5	11	9	9	7	7	9	6	9	7	7	6	7

Among the species, *H. japonica* was the most dominant species, and showed the mean density of 597 ind./m^2. There was a seasonal fluctuation in the density of this species which varied between 5 and 4883 ind./m^2 during the sampling period. In January and February of 2012, its density was very low only to be 5 ind./m^2, but it increased in April, 2012 as 1996 ind./m^2 and then the sudden decline of its density was observed from May to August, 2012. This pattern appeared to be similar to the next year. In January and February, 2013, *H. japonica* was not identified (Fig. 48).

Heteromastus filiformis, which was a second dominant species in the polychaete community, represented the mean density of 445 ind./m^2. Its ranged from 21 ind./m^2 on January, March, and July, 2012 to 2881 ind./m^2 in November, 2012. From January to September, 2012, *H. filiformis* represented the lower densities between 21 and 106 ind./m^2, but it showed a sudden increase in its density up to 2881 ind./m^2 in November, 2012. After then, the density of *H. filiformis* were fluctuated at the intervals of one or two months (Fig. 48).

In case of *S. hanaokai*, the density was ranged from 21.23 ind./m^2 in June and July, 2012 to 658.44 ind./m^2 on April, 2013, and its average value was 211.83 ind./m^2. The density of this species was considered to be not fluctuated according to season. The increases and decreases in the density of *S. hanaokai* were repeated at the intervals of one or two months (Fig. 48).

Ecological indices

The diversity (H′) of the polychaete community was ranged from 1.20 on June, 2012 to 1.98 on February, 2012, and its mean value was 1.59±0.21. It showed relatively higher values in the spring and fall. The lower values were generally appeared in the summer and winter during the sampling periods (Fig. 49, Table 11).

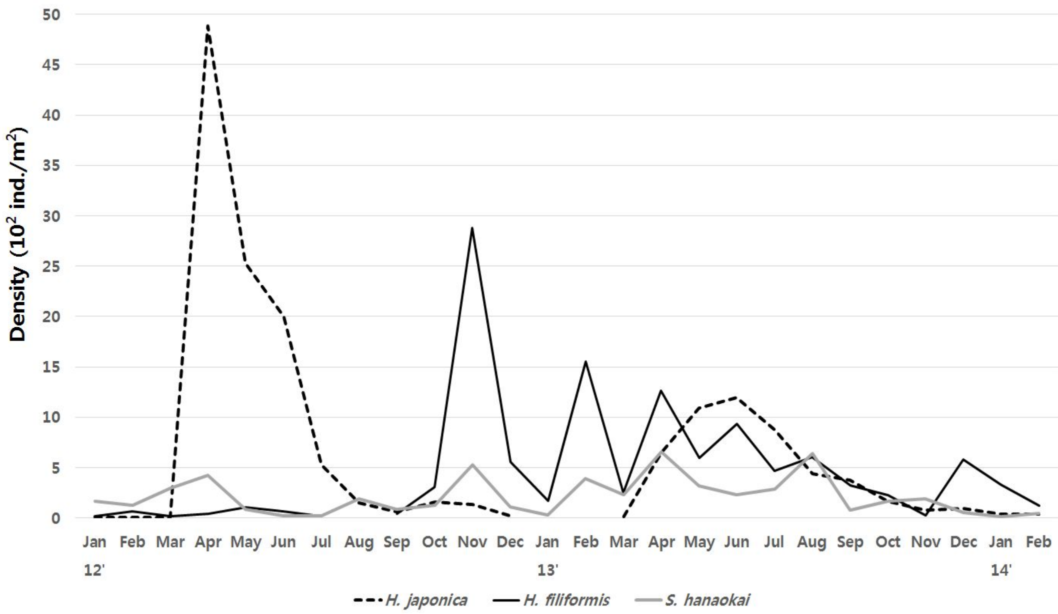

Fig. 48. Seasonal change of the density of dominant species in the polychaete community during the sampling period.

The evenness (J′) varied from 0.62 on June, 2012 to 1.00 on August, 2012, and the mean value of it was 0.82±0.10. The higher values were observed in the spring and summer periods, while the lower values was represented in the winter periods (Fig. 49, Table 10).

In the richness (R) values, the maximum value was 1.51 measured on March, 2013 and the minimum value was 0.50 on May, 2012. The mean value of it was 0.90±0.24. The seasonal change of richness (R) values was similar to that of diversity (H′) (Fig. 49, Table 10).

The values of dominance (D) were ranged from 0.45 on February, 2012 to 0.95 on May, 2012, and the mean value was 0.74±0.13. The higher values of them were observed in the summer and winter periods, and relatively lower values of them were appeared in the fall periods (Fig. 49, Table 10).

Discussions

In this study, total 20 species were identified from the investigation of the polychaete community in Suncheon Bay, Korea. Total number of species occurred was higher than that of the previous study of this region by Hong *et al.* (2011). These studies were restricted to the polychaete communities on intertidal zone in Suncheon Bay. Total number of species occurred was much less than those of the studies from Gwangyang Bay and Yeoja Bay, adjacent regions to the investigating area of the present study, showing the range from 70 to 79 species (Choi and Koh, 1984; Shin and Koh, 1990; Kim *et al.*, 2005) (Table II-5). These studies were performed on the polychaete communities over vast regions including intertidal and subtidal zones. Total number of species of the present study was also similar to those of other studies on the intertidal zone of different regions in Korea, showing 19-27 species (Shin *et al.*, 1989; Lim *et al.* 1997).

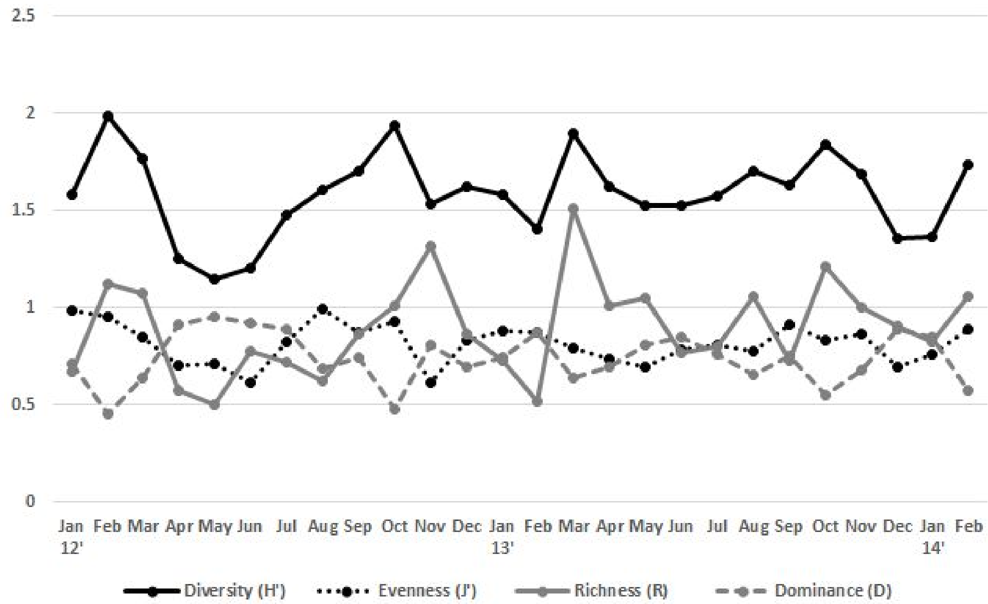

Fig. 49. Seasonal change of the ecological indices of polychaete community during the sampling period.

Table. 10. Seasonal change of the ecological indices of polychaete community during the sampling period.

Index	2012												2013											2014		
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb
Diversity (H′)	1.58	1.98	1.77	1.25	1.15	1.20	1.48	1.60	1.70	1.94	1.53	1.62	1.58	1.40	1.90	1.62	1.53	1.53	1.57	1.70	1.63	1.84	1.69	1.36	1.36	1.73
Evenness (J′)	0.98	0.95	0.85	0.70	0.71	0.62	0.83	1.00	0.87	0.93	0.61	0.83	0.88	0.87	0.79	0.74	0.69	0.78	0.81	0.77	0.91	0.83	0.87	0.70	0.76	0.89
Richness (R)	0.67	1.12	1.08	0.58	0.50	0.78	0.72	0.62	0.87	1.01	1.31	0.87	0.73	0.52	1.51	1.01	1.05	0.77	0.80	1.06	0.73	1.21	1.00	0.90	0.82	1.06
Dominance (D)	0.71	0.45	0.64	0.91	0.95	0.92	0.89	0.69	0.74	0.48	0.81	0.70	0.74	0.87	0.64	0.69	0.81	0.84	0.76	0.66	0.75	0.55	0.68	0.89	0.85	0.57

The mean density of the individuals occurred, 1524.15 ind./m^2, in the present study was much more than those from Gwangyang Bay and Yeoja Bay, measured as 490-520 ind./m^2 and 149 ind./m^2, respectively (Choi and Koh, 1984; Shin and Koh, 1990; Kim *et al.*, 2005) (Table 11). The mean density of the present study also showed very higher value compared to those of other studies from intertidal zone showing 232-379 ind./m^2 (Shin *et al.,* 1989; Lim *et al.* 1997). This higher density of the polychaetes was supposed to be represented by the increase of organic matters (Lim and Hong, 1997).

While, Choi and Koh (1992) suggested the close relationship between feeding strategies and sediment types. In the present study, major feeding guilds of polychaete community were FDP, BMX, and CMJ. According to Choi and Koh (1992), these types of guilds are usually appeared in muddy sand type of sediment. It is well accorded with the sediment type of study area in the present study.

The polychaete community of the present study showed different species composition and number of individuals according to season. It seems to be affected by environmental factors such as temperature, day-length, and tidal or lunar cycles because most polychaetes have a restricted breeding period depending on the combination of these factors (Hanafiah *et al.,* 2006). Especially, the dominant periods of *H. japonica* and *H. filiformis* populations were different from each other. This difference is considered as the result from the competition of the two species (Gillet and Torresani, 2002).

Three species, *Hediste japonica* (39.17%), *Heteromastus filiformis* (29.17%), and *S. hanaokai* (13.90%), were represented as the dominant species in the polychaete community of Suncheon Bay. Among them, *H. filformis* was a subdominant species in the polychaete community of Yeoja Bay (Kim *et al.*, 2005). *Lumbrineris longifolia* Imajima and Higuchi, 1975, which was a major dominant species in Gwangyang Bay, was not observed in the present study. While, *H. japonica*, the most dominant species in the polychaete community of Suncheon Bay, showed very low frequencies in Gwangyang Bay and Yeoja Bay (Choi and Koh, 1984; Shin and Koh, 1990; Kim *et al.*, 2005) (Table 11).

The ecological indices of the polychaete community for diversity (H′), evenness

(J′), richness (R), and dominance (D) were measured as 1.59±0.21, 0.82±0.10, 0.90±0.24, and 0.74±0.13 in mean values, respectively. The diversity and richness of the present study represented lower values than those of Gwangyang Bay and Yeoja Bay, while the dominance of the present study represented higher value than those of Gwangyang Bay and Yeoja Bay (Choi and Koh, 1984; Shin and Koh, 1990; Kim *et al.*, 2005). On the other hands, the evenness of the present study is similar value to those of Gwangyang Bay and Yeoja Bay (Choi and Koh, 1984; Shin and Koh, 1990; Kim *et al.*, 2005) (Table 11).

Table 11. Comparison of the dominant species and ecological indices of polychaete communities studied in Suncheon Bay and adjacent regions.

Region	Number of species	Mean density (ind./m^2)	Dominant species	Ecological indices			
				Diversity (H′)	Evenness (J′)	Richness (R)	Dominance (D)
Gwangyang Bay (Choi, 1984)	70	490	*Lagis bocki* (20.0%) *Lumbrineris longifolia* (15.0%) *Chone teres* (6.6%)	1.9±0.6	0.8±0.1	2.4±1.3	0.6±0.2
Gwangyang Bay (Shin and Koh, 1990)	79	520	*Lumbrinereis longifolia* (28.2%) *Nepthys polybranchia* (16.3%) *Sternaspis scutata* (8.3%)	2.3±0.3	0.8±0.1	3.9±1.3	0.5±0.1
Yeoja Bay (Kim *et al.*, 2005)	72	149	*Sternaspis scutata* (13.6%) *Heteromastus filiformis* (9.8%) Polynoidae indet. (8.3%)	2.0±0.4	0.9±0.1	3.0±0.9	0.5±0.1
Suncheon Bay (present study)	20	1524	*Hediste japonica* (39.17%) *Heteromastus filiformis* (29.17%) *Sigambra hanaokai* (13.90%)	1.59±0.21	0.82±0.10	0.90±0.24	0.74±0.13

3.2.3. Secondary production of *Hediste japonica*

The measurement for the secondary production of a population of *Hediste japonica* was carried out to estimate the importance of its contribution to the intertidal benthic ecosystem because *H. japonica* was the most dominant component of the polychaete community in Sucheon Bay.

Relationship between the length L3 (mm) and biomass (g, body weight)

The relationships between the wet weight (WW, g) with the length L3 (mm) and the dry weight (DW, g) with the length L3 (mm) were compared (Fig. 50, 51). The relationship of fresh weight and length L3 was calculated and the regression equation of it was resulted as $WW = 0.02111L3^{2.5426}$ ($r^2 = 0.86$, $n = 55$, $P < 0.001$). The relationship of dry weight and length L3 was calculated as $DW = 0.00583L3^{2.7572}$ ($r^2 = 0.77$, $n = 55$, $P < 0.001$).

Abundance and biomass

During the sampling period, the population of *H. japonica* was observed from January, 2012 to February, 2014, and showed a mean density of 597.06 ind./m^2. The mean density of the 2012 cohort of *H. japonica* from January to December, 2012 was 873 ind./m^2 with a peak of 4883 ind./m^2 on April. During this period, the 2012 cohort had an increasing period from March to April, and then it showed a sudden reduction of density from May to August. During the period after August, the *Hediste* population was observed with lower densities of less than 160 ind./m^2 until December. From March, 2013 to February, 2014, the mean density of the 2013 cohort of *H. japonica* was 422 ind./m^2, and a maximum density of 1196 ind./m^2 was observed on June, 2013. As with the previous year, the 2013 cohort of *Hediste* population had a increasing period and sudden reduction from March to August, and then the low density less than 100 ind./m^2 was retained until January, 2014 (Fig. 52).

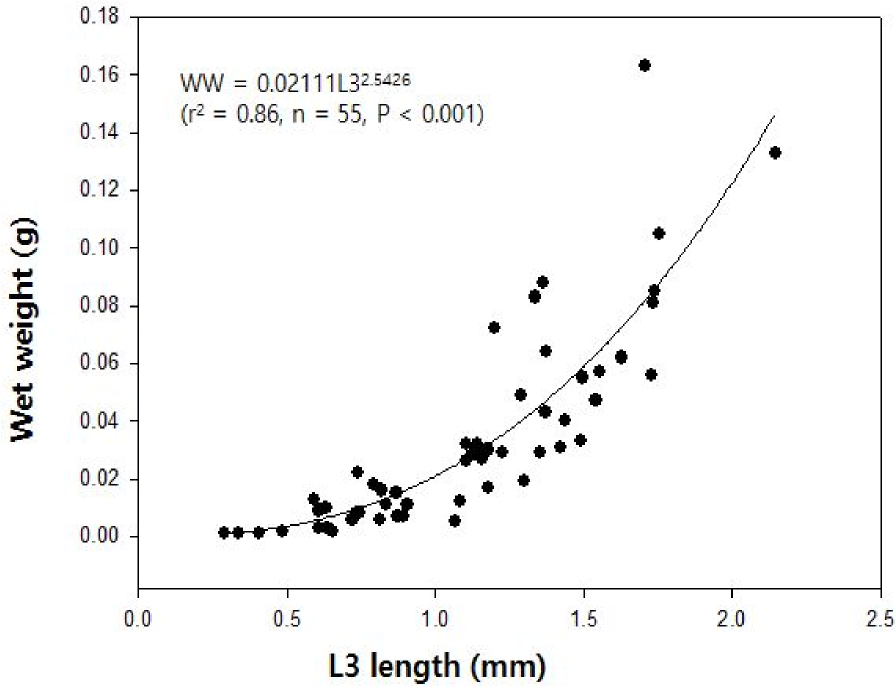

Fig. 50. The relationship between mean wet weight (WW) and mean body length (L3) of *Hediste japonica* from Suncheon Bay, Korea.

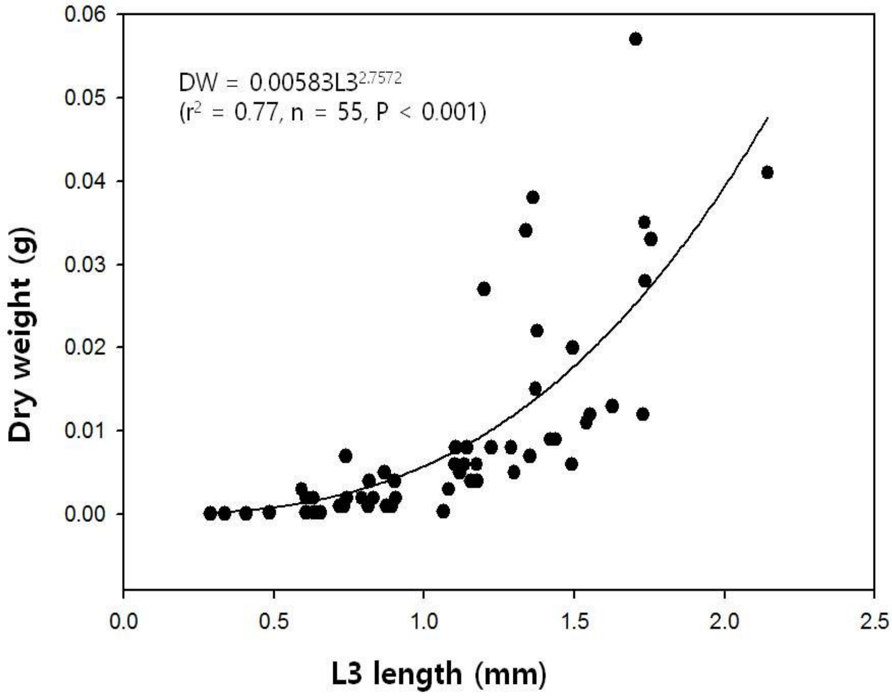

Fig. 51. The relationship between mean dry weight (DW) and mean L3 length (L3) of *Hediste japonica* from Suncheon Bay, Korea.

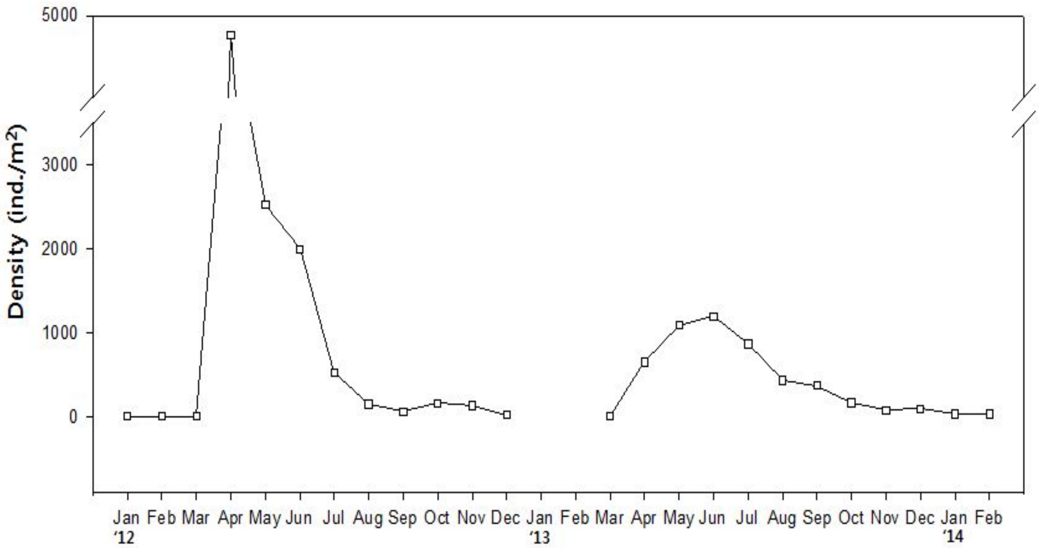

Fig. 52. Seasonal change of the density of *Hediste japonica* during the sampling period.

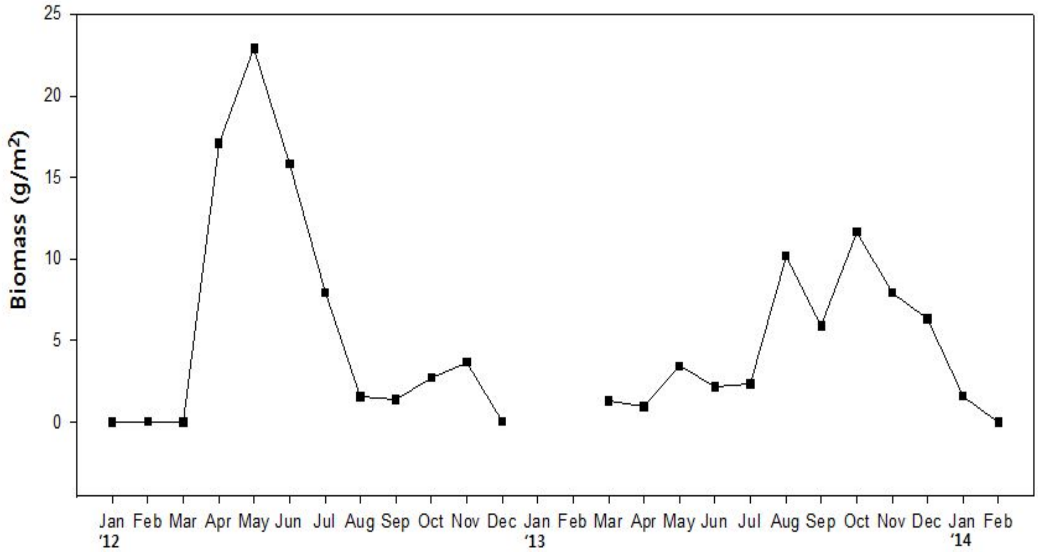

Fig. 53. Seasonal change of the biomass (DW) of *Hediste japonica* during the sampling period.

The mean biomass (DW) of the 2012 cohort ranged from 0.018 g/m^2 on March to 7.93 g/m^2 on July, and the mean value was B=0.87 g/m^2. There was a strong spring peak in density and biomass in the 2012 cohort, but there was a weak peak in density without biomass peak from the 2013 cohort. It seems that there was no normal recruitment in the 2013 cohort of *Hediste* population during the spring season of 2013. From March, 2013 to February, 2014, the biomass of the 2013 cohort ranged from a minimum of 0.007 g/m^2 in February to a maximum of 13.39 g/m^2 in October with the average of 5.26 g/m^2. The seasonal change of biomass showed the higher values from August to October (Fig. 53).

These results also showed the growth pattern of *Hediste* population such as the recruitment of juveniles observed in spring-summer periods and a mass mortality presented in winter periods. The relation between the abundance and biomass was shown in Fig. 54, and this relationship was $Y = 369.05 - 198.79X + 36.41X^2 - 0.99X^3$ ($r = 0.78$, $N = 26$ samples).

Population structure and cohort analysis

The population structure of *H. japonica* was shown in Figs. 55 and 56 by the histograms based on the L3 length frequency distributions. The size frequency histogram was divided into 21 size classes from 0.1 to 2.5 mm in L3 length. Two cohorts, C_1 and C_2, were observed during the sampling period of the present study by the analysis of size frequency histogram, and these cohorts occurred from different periods each other. First cohort C_1 could be maintained over 12 months from January to December, 2012, and only one breeding period was present in this cohort from January to April. It showed a progressive growth in L3 length after a breeding period. In January to February, 2013, the cohorts C_1 disappeared. Second cohort C_2 was beginning from March, 2013 and observed during 12 months until February, 2014. The cohort C_2 also had only one breeding period from March to April, 2013 as the cohorts C_1, and showed a drastic growth in L3 length. Growth curves of two cohorts were represented in Fig. 57.

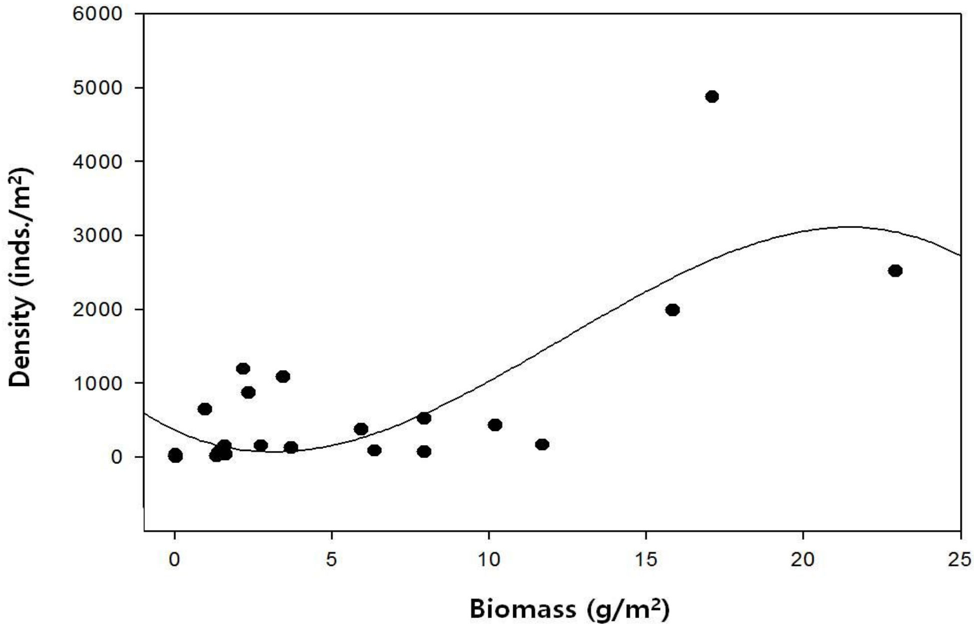

Fig. 54. Relationship between the density and biomass of *Hediste japonica* from Suncheon Bay, Korea.

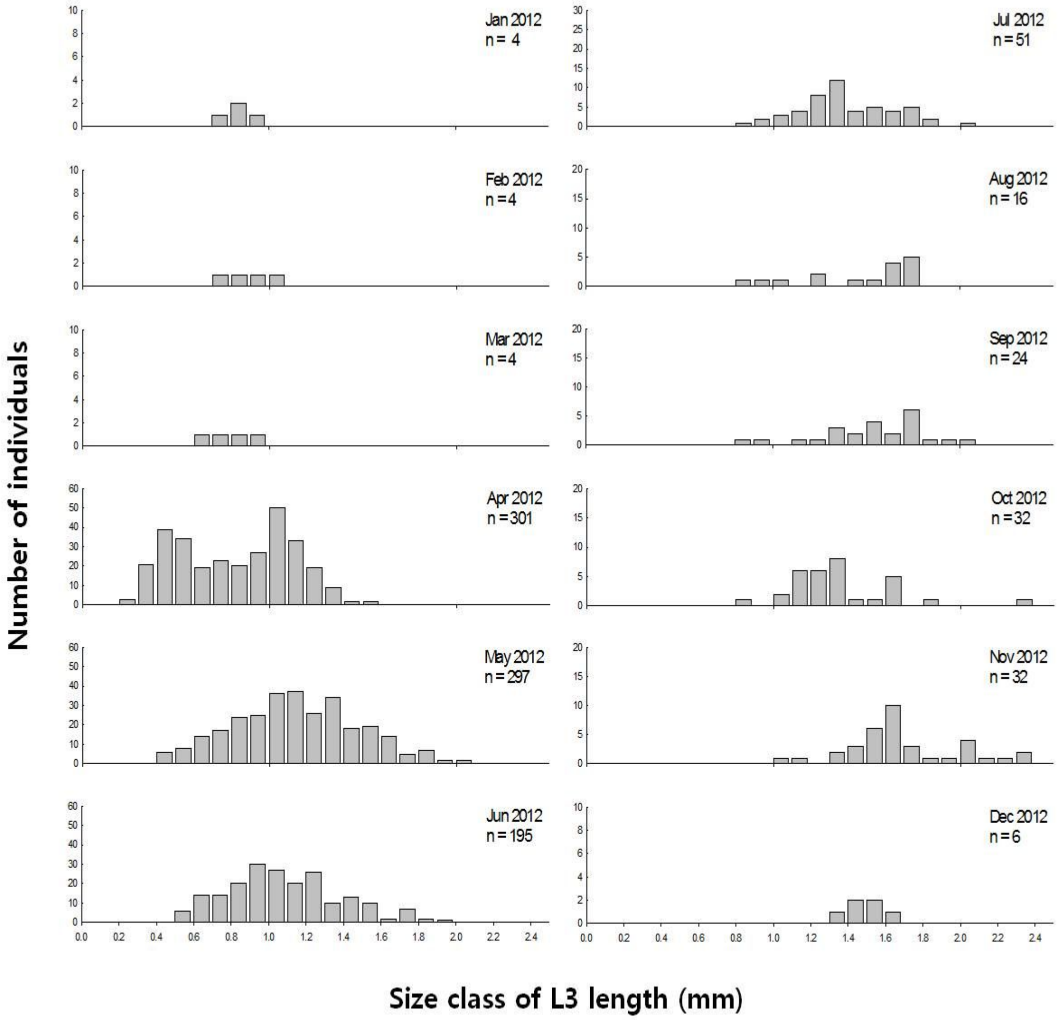

Fig. 55. Size-frequency histogram (L3 length in mm) of *Hediste japonica* from January to December, 2012.

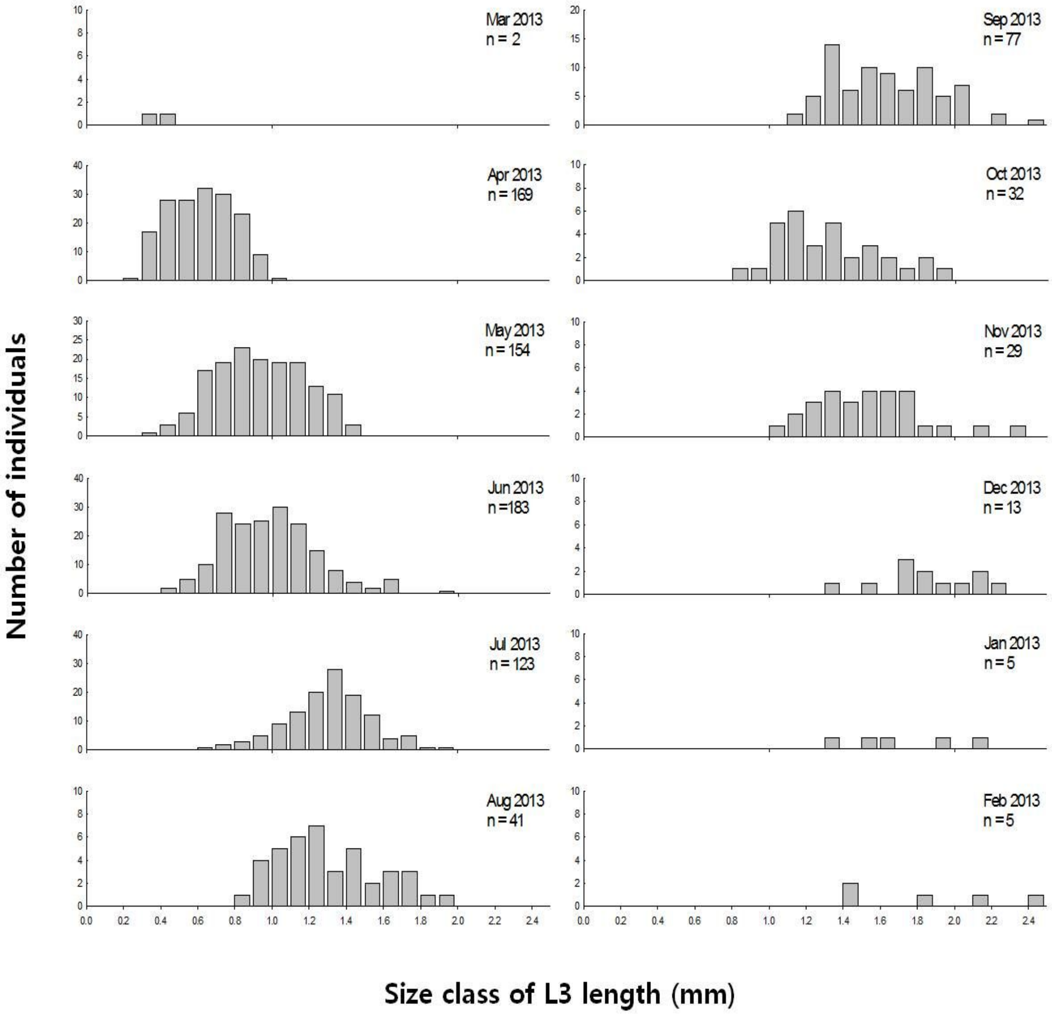

Fig. 56. Size-frequency histogram (L3 length in mm) of *Hediste japonica* from March, 2013 to February, 2014.

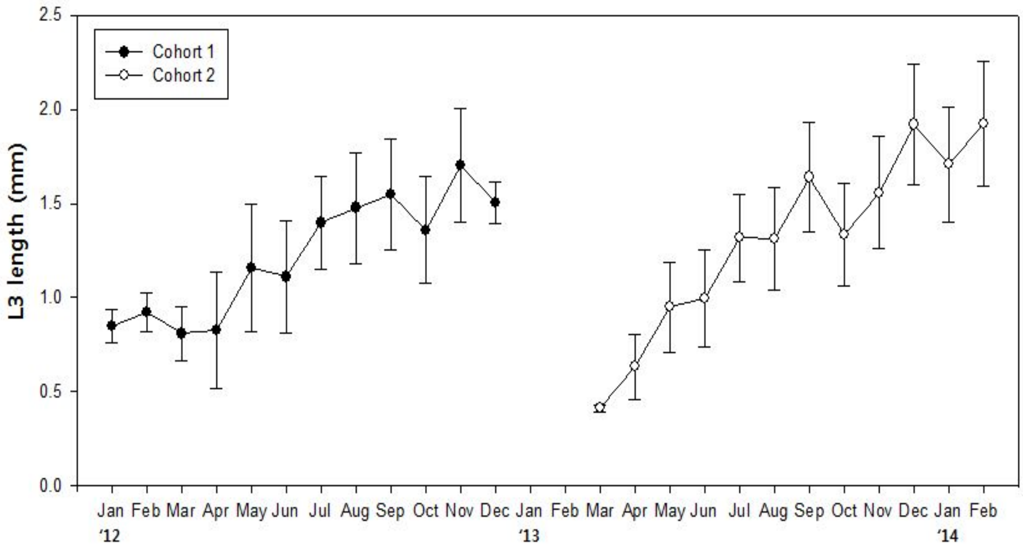

Fig. 57. Growth curves of two cohorts of *Hediste japonica* based on L3 length (mm).

Secondary production

The secondary productions for the population of *H. japonica* by the two cohorts during sampling period were shown in Fig. 58 and Table 12. The annual secondary production (P) of the population from January to December, 2012 was estimated as 31.74469 g/m^2year^{-1} with a mean annual biomass (B) of 6.10201 g/m^2, and the P/B ratio during this period was calculated as 5.20233 $year^{-1}$. P, B, and P/B ratio were also calculated as 15.5097 g/m^2year^{-1}, 4.49263 g/m^2, and 3.45225 $year^{-1}$, respectively, in the population from March, 2013 to February, 2014.

Discussions

In the population of *H. japonica* observed in Suncheon Bay, the density of the individuals occurred represented generally higher values in the breeding periods of spring. After the breeding periods, the density was decreased drastically. This reduction is considered as a result by the predation pressure because it is known that the juveniles of *H. japonica* show incomplete settlement staying near on the surface and it causes frequent exposure from the predators (Qiu and Wu, 1993). The population of *H. japonica* also represented stable change of the density in summer and fall because the individuals show the burrowing pattern increased to 10-30 cm deep by the high temperature and individual growth (Qiu and Wu, 1993; Nagai and Nagai, 1981).

Two cohorts existed in a population of *H. japonica* during sampling period, and each cohort occurred once a year. The 2012 cohort showed higher values than those of second cohort in the annual biomass, secondary production, and P/B ratio, and these differences may be due to the influences that the individual biomass of the 2012 cohort with high water temperature was lower than those of the next cohort. According to Morin and Bourassa (1992), the annual P/B ratio expresses the turnover rate of the biomass in a population, and it is decreasing as the growth of individual biomass and it is increasing as a rise of temperature.

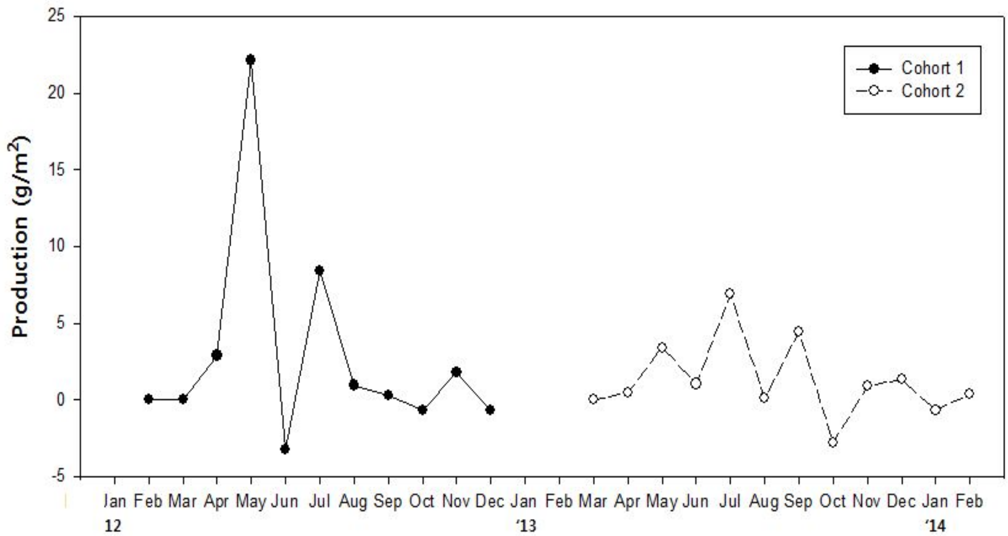

Fig. 58. Changes in the productions of two cohorts of *H. japonica* during the sampling period.

Table 12. Secondary production of the cohorts of the population.

Cohort	Wt (mg)	$Wt_2-Wt_1/2$	Nt	Nt_1+Nt_2	Production (mg for m^2)
Jan '12	3.77	-	5.32	-	-
Feb	4.73	0.48	5.32	10.64	5.11
Mar	3.42	-0.655	5.32	10.64	-6.97
Apr	4.60	0.59	4,882.90	4888.22	2,884.05
May	10.57	2.985	2,526.37	7409.26	22,116.64
Jun	9.13	-0.72	1,995.62	4521.98	-3,255.83
Jul	15.77	3.32	530.75	2526.36	8,387.51
Aug	18.57	1.4	148.61	679.36	951.10
Sep	20.97	1.2	63.72	212.32	254.78
Oct	15.02	-2.975	159.30	223.02	-663.48
Nov	27.06	6.02	134.52	293.82	1,768.80
Dec	18.11	-4.475	21.24	155.76	-697.03
Total C1		**B = 6,102.01 mg/m^2 P/B=5.20**			**31,744.69**
Mar '13	0.51	0.255	14.16	14.16	3.61
Apr	1.93	0.71	651.36	665.52	472.52
May	5.83	1.95	1,090.32	1741.68	3,396.28
Jun	6.73	0.45	1,196.52	2286.84	1,029.08
Jul	13.40	3.335	870.84	2067.36	6,894.65
Aug	13.58	0.09	435.42	1306.26	117.56
Sep	24.56	5.49	375.24	810.66	4,450.52
Oct	14.24	-5.16	169.92	545.16	-2,813.03
Nov	21.47	3.615	77.88	247.8	895.80
Dec	37.41	7.97	92.04	169.92	1,354.26
Jan '14	27.09	-5.16	35.40	127.44	-657.59
Feb	37.43	5.17	35.40	70.8	366.04
Total C2		**B = 4,492.63 mg/m^2 P/B=3.45**			**15,509.7**

The higher P/B ratios also could be a consequence by the factors such as a shorter life span, a high primary productivity of ecosystem, and a high predation pressure which keeps the populations at a young stage (Sprung, 1994).

In northern China, a population of *H. japonica* represented the P/B ratio as 5.7 (Qiu and Wu, 1993), and it is higher than that of the present study ranged from 5.20 to 3.45 (Table 13). However, the populations of *H. japonica* in both countries commonly showed the same population characters of a single cohort and an annual breeding period (Qiu and Wu, 1993).

The populations of *H. diversicolor* (Müller, 1776), known as the congeneric species of *H. japonica*, have been studied in many regions including France (Gillet, 1990; Gillet and Torresani, 2002), Belgium (Heip and Herman, 1979), United Kingdom (Chambers and Milne, 1975; Humphreys, 1985; Nithart, 1998), Spain (Arias and Drake, 1995), and Morocco (Gillet, 1993). The values of P/B ratio in these regions were ranged from 1.1 to 4.9, which is similar to or lower than that of the *H. japonica* population of the present study. From the population studies on nereidid polychaetes, *Nereis falsa* Quatrefages, 1866 from Algeria and *Perinereis cultrifera* (Grube, 1840) from Morocco, the value of P/B ratio was reported as 1.07 and 2.3, respectively (Rouhi *et al.*, 2008; Daas *et al.*, 2011), and these values are much lower than those of the present study. The upper tidal population of *P. aibuhitensis* in the megatidal Kyeonggi Bay, in the Yellow Sea showed a slightly lower P/B ratio of 3.4 than those of the present study (Choi and Lee, 1997). Also, it was reported that the species belonging to other families, Lumbrineridae, Terebellidae, Ampharetidae, Nephthyidae, and Spionidae, had the P/B ratio values ranged from 0.826 to 3.0 (Valderhaug, 1985; Seitz and Schaffner, 1995; Oyeneken, 1986; 1988; Souza and Borzone, 2000), and they are relatively lower than that of the present study (Table 13). Conclusionally, *H. japonica* of the present study represented the highest P/B ratio compared to those of other polychaete species reported from previous studies. The P/B ratios of polychaete species were also generally differed by the geographical regions depending on local temperature regimes (Rouhi *et al.*, 2008).

Table 13. Comparison of the ratio P/B between the secondary production (P) and the biomass (B) in several species of polychaetous annelids.

Family	Species	Localities	Source	P/B ratio
Nereididae	*Hediste japonica*	Korea	Present study	3.45-5.20
		China	Qiu and Wu, 1993	5.7
	Hediste diversicolor	France	Gillet and Torresani, 2002	1.1-3.6
			Gillet, 1990	2.2
		Belgium	Heip and Herman, 1979	2.5
		United Kingdom	Chambers and Milne, 1975	3.0
			Humphreys, 1985	1.1
			Nithart, 1998	1.75
		Spain	Arias and Drake, 1995	4.9
		Morocco	Gillet, 1993	3.9-4.6
	Nereis falsa	Algeria	Daas *et al.*, 2011	1.07
	Perinereis cultrifera	Morocco	Rouhi *et al.*, 2008	2.3
	Perinereis aibuhitensis	Korea	Choi and Lee, 1997	3.4
Lumbrineridae	*Lumbrineris fragilis*	Norway	Valderhaug, 1985	0.826
Terebellidae	*Loimia medusa*	Virginia, U.S.A	Seitz and Schaffner, 1995	3.0
Ampharetidae	*Melinna palmata*	England	Oyeneken, 1988	2.19
Nephthyidae	*Nephthys hombergii*	England	Oyeneken, 1986	1.6-2.9
Spionidae	*Scolelepis squamata*	Brasil	Souza and Borzone, 2000	2.70

3.4. Summary and conclusion

In the taxonomic study on polychaete species from Korean waters, a total of 150 species including four new species and seven species new to Korean fauna were described and the keys to families, genera, and species were also provided. Thus the total species number of Korean polychaete fauna was counted to be about 300, but this is still poorer compared to those from adjacent regions of Japanese and Chinese waters. It is expected that there are many species such as new species or new to Korean fauna still existed awaiting to be discovered from Korean waters, especially on deep sea area.

About half of the polychaete species in the present study were belonged to Phyllodocida, the largest taxon among the orders of polychaetes. In the spatial distribution of polychaete worms, 101 species were collected from the Korea Strait, and it was the most abundant number compared to those from the Yellow Sea and the East Sea. Also, most polychaete species were found from intertidal zone and soft bottom. In the polychaete feeding guilds, the most abundant type was from motile carnivores or herbivores with jaws such as CMJ and HMJ, and followed by SDT, BMX, and CDJ in the present study. This information was provided as the preliminary data for ecological studies on polychaete species.

In the study of polychaete community in Suncheon Bay, a total of 20 species occurred. This species richness was much less than those of the neighboring bays such as Gwangyang Bay and Yeoja Bay, but similar to those of other studies conducted on the intertidal zones from different regions. Mean density of the present study showed a relatively higher value, and it seemed to be correlated with the high content of organic matters in the sampling site of the present study. Major polychaete feeding guilds in Suncheon Bay consisted of FDP, BMX, and CMJ were the common components of polychaete communities in the sediments of muddy sand type. Also, it seemed that the species composition and the number of individuals of polychaete community were usually changed depending on the season by environmental factors such as temperature, day-length, and tidal or lunar cycles. Among the species occurred in the polychaete community, *Hediste japonica*, *Heteromastus filiformis*, and *S. hanaokai* were dominant species, and the values of diversity (H′), evenness (J′), richness (R), and dominance (D) were measured as 1.59±0.21, 0.82±0.10, 0.90±0.24, and 0.74±0.13, respectively.

It was revealed that the population of *Hediste japonica* had two cohorts, the 2012 cohort existed from January to December, 2012 and the 2013 cohort present from March, 2013 to February, 2014, by the analysis of size frequency histogram (L3 length in mm). The annual secondary production (P) of the 2012 cohort was estimated as 31.74 g/m^2year^{-1} with the mean annual biomass (B) of 6.10 g/m^2 and the P/B ratio of 5.20 $year^{-1}$. Those of the 2013 cohort were estimated as 15.51 g/m^2year^{-1}, 4.49 g/m^2, and 3.45 $year^{-1}$, respectively. This difference in the annual secondary production of *Hediste japonica* population was considered to be affected by biological and environmental factors such as the abundance, individual biomass, water temperature, and predation pressure. The P/B ratio of *H. japonica* population of the present study represented highest value among polychaetes from which the P/B ratios have been known. Also, it was supposed that the P/B ratios of polychaete species were generally differed by the geographical regions depending on local temperature regimes.

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5. Appendix

List of collecting stations

Gyeonggi-do (경기도)

1. Sang-ri, Samsan-myeon, Ganghwa-gun, Incheon-si (인천광역시 강화군 삼산면 상리); 2. Maeeum-ri, Samsan-myeon, Ganghwa-gun, Incheon-si (인천광역시 강화군 삼산면 매음리); 3. Nae-ri, Hwado-myeon, Ganghwa-gun, Incheon-si (인천광역시 강화군 화도면 내리); 4. Dongmak-ri, Hwado-myeon, Ganghwa-gun, Incheon-si (인천광역시 강화군 동막리); 5. Donggeom-ri, Gilsang-myeon, Ganghwa-gun, Incheon-si (인천광역시 강화군 길상면 동검리); 6. Odu-ri, Bureun-myeon, Ganghwa-gun, Incheon-si (인천광역시 강화군 불은면 오두리); 7. Unseo-dong, Jung-gu, Incheon-si (인천광역시 중구 운서동); 8. Janggyeong-ri, Yeongheung-myeon, Ongjin-gun, Incheon-si (인천광역시 옹진군 영흥면 장경리); 9. Yongdam-ri, Yeongheung-myeon, Ongjin-gun, Incheon-si (인천광역시 옹진군 영흥면 용담리); 10. Daebu-dong, Danwon-gu, Ansan-si (경기도 안산시 단원구 대부동).

Chungcheongnam-do (충청남도)

11. Gwan-ri, Iwon-myeon, Taean-gun, (충청남도 태안군 이원면 관리); 12. Hwangchon-ri, Wonbuk-myeon, Taean-gun (충청남도 태안군 원북면 황촌리); 13. Cheongsan-ri, Wonbuk-myeon, Taean-gun (충청남도 태안군 원북면 청산리); 14. Ho-ri, Palbong-myeon, Seosan-si (충청남도 서산시 팔봉면 호리); 15. Uihang-ri, Sowon-myeon, Taean-gun (충청남도 태안군 소원면 의항리); 16. Sapsido-ri, Ocheon-myeon, Boryeong-si (충청남도 보령시 옥천면 삽시도리); 17. Gwandang-ri, Ungcheon-eup, Boryeong-si (충청남도 보령시 웅천읍 관당리).

Jeollabuk-do (전라북도)

18. Daehang-ri, Byeonsan-myeon, Buan-gun (전라북도 부안군 변산면 대항리); 19. Docheong-ri, Byeonsan-myeon, Buan-gun (전라북도 부안군 변산면 도청리); 20. Gomso-ri, Jinseo-myeon, Buan-gun (전라북도 부안군 진서면 곰소리); 21. Dongho-ri, Haeri-myeon, Gochang-gun (전라북도 고창군 해리면 동호리); 22. Yongjeong-ri, Sangha-myeon, Gochang-gun (전라북도 고창군 상하면 용정리).

Jeollanam-do (전라남도)

23. Gyema-ri, Hongnong-eup, Yeonggwang-gun (전라남도 영광군 홍농읍 계마리);

24. Gusu-ri, Baeksu-eup, Yeonggwang-gun (전라남도 영광군 백수읍 구수리); 25. Songseok-ri. Haeje-myeon, Muan-gun (전라남도 무안군 해제면 송석리); 26. Haeun-ri, Hyeongyeong-myeon, Muan-gun (전라남도 무안군 현경면 해운리); 27. Piseo-ri, Mangun-myeon, Muan-gun (전라남도 무안군 망운면 피서리); 28. Bunmae-ri, Aphae-eup, Shinangun (전라남도 신안군 압해읍 분매리); 29. Na-ri, Gunnae-myeon, Jindo-gun (전라남도 진도군 군내면 나리); 30. Simdong-ri, Jisan-myeon, Jindo-gun (전라남도 진도군 지산면 심동리); 31. Songho-ri, Jisan-myeon, Jindo-gun (전라남도 진도군 지산면 송호리); 32. Namdong-ri, Imhoe-myeon, Jindo-gun (전라남도 진도군 임회면 남동리); 33. Ganggye-ri, Imhoe-myeon, Jindo-gun (전라남도 진도군 임회면 강계리); 34. Geumgap-ri, Uisin-myeon, Jindo-gun (전라남도 진도군 의신면 금갑리); 35. Jinsan-ri, Soan-myeon, Wando-gun (전라남도 완도군 소안면 진산리); 36. Sin-ri, Sinji-myeon, Wando-gun (전라남도 완도군 신지면 신리); 37. Daegok-ri, Sinji-myeon, Wando-gun (전라남도 완도군 신지면 대곡리); 38. Docheong-ri, Cheongsan-myeon, Wando-gun (전라남도 완도군 청산면 도청리); 39. Deugam-ri, Yaksan-myeon, Wando-gun (전라남도 완도군 약산면 득암리); 40. Yuseo-ri, Saengil-myeon, Wando-gun (전라남도 완도군 생일면 유서리); 41. Noil-ri, Gwayeok-myeon, Goheung-gun (전라남도 고흥군 과역면 노일리); 42. Woljeong-ri, Namyang-myeon, Goheung-gun (전라남도 고흥군 남양면 월정리); 43. Daepo-ri, Beolgyo-eup, Boseong-gun (전라남도 보성군 벌교읍 대포리); 44. Haksan-ri, Byeollyang-myeon, Suncheon-si (전라남도 순천시 별량면 학산리); 45. Woosan-ri, Byeollyang-myeon, Suncheon-si (전라남도 순천시 별량면 우산리); 46. Nongju-ri, Haeryong-myeon, Suncheon-si (전라남도 순천시 해룡면 농주리); 47. Sindeok-dong, Yeosu-si (전라남도 여수시 신덕동); 48. Sujeong-dong, Yeosu-si (전라남도 여수시 수정동); 49. Uhak-ri, Nam-myeon, Yeosu-si (전라남도 여수시 남면 우학리).

Gyeongsangnam-do (경상남도)

50. Deoksin-ri, Seolcheon-myeon, Namhae-gun (경상남도 남해군 설천면 덕신리); 51. Yanga-ri, Sangju-myeon, Namhae-gun (경상남도 남해군 상주면 양아리); 52. Sangju-ri, Sangju-myeon, Namhae-gun (경상남도 남해군 상주면 상주리); 53. Danghang-ri, Changseon-myeon, Namhae-gun (경상남도 남해군 창선면 당항리); 54. Siran-dong, Sacheon-si (경상남도 사천시 실안동); 55. Dumi-ri, Yokji-myeon,

Tongyeong-si (경상남도 통영시 욕지면 두미리); 56. Punghwa-ri, Sanyang-eup, Tongyeong-si (경상남도 통영시 산양읍 풍화리); 57. Minam-ri, Sanyang-eup, Tongyeong-si (경상남도 통영시 산양읍 미남리); 58. Jeorim-ri, Sanyang-eup, Tongyeong-si (경상남도 통영시 산양읍 저림리); 59. Yeongun-ri, Sanyang-eup, Tongyeong-si (경상남도 통영시 산양읍 영운리); 60. Yeomho-ri, Hansan-myeon, Tongyeong-si (경상남도 통영시 한산면 염호리); 61. Dueok-ri, Hansan-myeon, Tongyeong-si (경상남도 통영시 한산면 두억리); 62. Yongho-ri, Hansan-myeon, Tongyeong-si (경상남도 통영시 한산면 용호리); 63. Chubong-ri, Hansan-myeon, Tongyeong-si (경상남도 통영시 한산면 추봉리); 64. Maejuk-ri, Hansan-myeon, Tongyeong-si (경상남도 통영시 한산면 매죽리); 65. Jeogu-ri, Nambu-myeon, Geoje-si (경상남도 거제시 남부면 저구리); 66. Dadae-ri, Nambu-myeon, Geoje-si (경상남도 거제시 남부면 다대리); 67. Galgot-ri, Nambu-myeon, Geoje-si (경상남도 거제시 남부면 갈곶리); 68. Gujora-ri, Irun-myeon, Geoje-si (경상남도 거제시 일운면 구조라리).

Gyeongsangbuk-do (경상북도)

69. Jinha-ri, Seosaeng-myeon, Ulju-gun, Ulsan-si (울산광역시 울주군 서생면 진하리); 70. Jeonchon-ri, Gampo-eup, Gyeongju-si (경상북도 경주시 감포읍 전촌리); 71. Oryu 1-ri, Gampo-eup, Gyeongju-si (경상북도 경주시 감포읍 오류 1리); 72. Janggil-ri, Nam-gu, Guryongpo-eup, Pohang-si (경상북도 포항시 남구 구룡포읍 장길리); 73. Guman-ri, Nam-gu, Homigot-myeon, Pohang-si (경상북도 포항시 남구 호미곶면 구만리); 74. Ibam-ri, Nam-gu, Donghae-myeon, Pohang-si (경상북도 포항시 남구 동해면 입암리); 75. Geumjin-ri, Ganggu-myeon, Yeongdeok-gun (경상북도 영덕군 강구면 금진리).

Gangwon-do (강원도)

76. Gungchon-ri, Geundeok-myeon, Samcheok-si (강원도 삼척시 근덕면 궁촌리); 77. Mukhojin-dong, Donghae-si (강원도 동해시 묵호진동); 78. Daejin-dong, Donghae-si (강원도 동해시 대진동); 79. Hyangho-ri, Jumunjin-eup, Gangneung-si (강원도 강릉시 주문진읍 향호리); 80. Namae-ri, Hyeonnam-myeon, Yangyang-gun (강원도 양양군 현남면 남애리); 81. Daepo-dong, Sokcho-si (강원도 속초시 대포동).

Jeju-do (제주도)

82. Hamdeok-ri, Jocheon-eup, Jeju-si (제주도 제주시 조천읍 함덕리); 83.

Yeonpyeong-ri, Udo-myeon, Jeju-si (제주도 제주시 우도면 연평리); 84. Sagye-ri, Andeok-myeon, Seogwipo-si (제주도 서귀포시 안덕면 사계리); 85. Hahyo-dong, Seogwipo-si (제주도 서귀포시 하효동).

국문 초록

한국 해산 다모류(환형동물문, 다모강)의 분류와 생태학적 특성 및 순천만 *Hediste japonica* 개체군의 이차생산

최 현 기
지도교수: 윤 성 명
생명공학과
조선대학교 대학원

본 연구에서는 한국 해산 다모류의 형태분류와 생태학적 특성 및 순천만 *Hediste japonica* 개체군의 이차생산에 관한 내용을 다루었다. 분류학적 연구는 2006년 8월부터 2015년 7월까지 한국 해안의 85개 정점에서 채집된 표본을 바탕으로 수행되었으며, 그 결과 총 34과 99속 150종의 다모류를 확인 할 수 있었다. 본 연구를 통하여 *Sternaspis* sp. nov., *Pseudonereis* sp. nov. 1, *Pseudonereis* sp. nov. 2, *Lagis* sp. nov.의 4종은 신종후보로 분류되었으며, *Glycera tesselata* Grube, 1863, *Arabella monroi* Colbth, 1989, *Scolelepis* (*Scolelepis*) *kudenovi* Hartmann-Schröder, 1981, *Heteromastus filiformis* (Claparède, 1864), *Naineris dendritica* (Kinberg, 1867), *Aphelochaeta monilaris* (Hartman, 1960), *Praxillella pacifica* Berkeley, 1929의 7종은 국내 미기록종으로 확인되었다. 또한 본 연구에서는 2015년에 저자에 의해서 국내에서 새롭게 보고된 *Glycera fallax* Quatrefages, 1850, *Glycinde bonhourei* Gravier, 1904, *Pista shizugawaensis* Nishi and Tanaka, 2006, *Armandia amakusaensis* Saito, Tamaki and Imajima, 2000, *Polyophthalmus qingdaoensis* Purschke, Ding and Müller, 1995, *Nereiphylla hera* Kato and Mawatari, 1999의 6종에 대한 기재와 *Goniada japonica* Izuka, 1912에 대한 재기재를 하였다. 이와 더불어 본 연구에서 확인된 모든 종들과 상위 분류군에 대한 검색표를 제시하였다.

분류학적 연구를 통하여 확인된 다모류의 분류군별 출현종 구성비를 살펴보면, 부채발갯지렁이목(Phyllodocida)이 46%, Scolecida가 19%, 유령갯지렁이목(Terebellida)이 15%, 털갯지렁이목(Eunicida)이 10%, 얼굴갯지렁이목(Spionida)이 5%, 그리고 꽃갯지렁이목이 5%를 각각 차지하였다. 또한 지역별 출현종수는 남해안에서 101종으로 가장 많은 출현종이 확인되었으며, 황해에서 73종, 동해에서 34종이 각각 확인되었다. 서식

지 유형별로는 조간대지역이 127종, 조하대지역이 36종, 양쪽 지역에서 모두 확인된 종이 13종으로 나타났다. 또한 연성기질에서 112종, 경성기질에서 52종이 확인되었으며, 연성 및 경성기질에서 모두 확인된 종은 14종으로 나타났다. 섭식유형별 분포에서는 CMJ형이 20%로 가장 높은 비중을 차지하였으며, HMJ형(16%), SDT형(12%), BMX형(12%), CDJ형(9%)이 대체로 높은 비중을 차지하였다.

본 연구에서는 생태학적 연구로서 2012년 1월부터 2014년 2월까지 한국 남해안에 위치한 순천만의 다모류군집에 대하여 조사를 수행하였다. 그 결과 조사정점의 다모류군집은 총 20종으로 구성되어 있었으며, 이들의 평균 밀도는 1,524 ind./m^2으로 나타났다. 조사정점의 다모류군집에서 우점종은 *Hediste japonica* (39.17%), *Heteromastus filiformis* (29.17%), *Sigambra hanaokai* (13.90%)로 확인되었으며, 다양도지수(H′)는 1.59±0.21, 균등도지수(J′)는 0.82±0.10, 풍부도지수(R)는 0.90±0.24, 우점도지수(D)는 0.74±0.13를 각각 나타냈다.

조사정점에서 확인된 다모류군집의 최우점종인 *Hediste japonica*의 이차생산에 대한 연구를 통하여 이 종의 개체군에서 조사기간 동안 총 2개의 동시출생집단이 출현하는 것을 확인할 수 있었다. 이를 바탕으로 2012년 1월부터 12월까지 확인된 동시출생집단의 연간이차생산량과 평균생물량, P/B비율을 조사한 결과 각각 31.74 g/m^2year^{-1}, 6.10 g/m^2, 5.20 year^{-1}으로 산출되었으며, 2013년 3월부터 2014년 2월까지 확인된 동시출생집단에서는 15.51 g/m^2year^{-1}의 연간이차생산량과 4.49 g/m^2의 평균생물량, 3.45 year^{-1}의 P/B비율을 각각 나타냈다.

감사의 글

박사학위를 마치며 실험실에서 공부했던 지난 시간은 정말 많은 것을 느끼고 배울 수 있었던 제 인생에서 가장 소중한 시간이었다는 것을 새삼 느끼게 됩니다. 하지만 아직도 부족한 부분이 많다는 것을 잘 알고 있기에 앞으로 더욱 노력하여 부족한 부분을 채워 나갈 것이라는 다짐으로 연구자로서의 새로운 출발을 하고자 합니다. 이와 더불어 지난 시간동안 저를 위해 많은 도움을 주신 모든 분들께 지면을 통해 감사의 뜻을 전하고자 합니다. 본 논문의 학문적 기틀을 마련해주시고 세심한 지도와 조언을 아끼지 않으신 은사 윤성명 교수님께 머리 숙여 감사드립니다. 교수님의 가르침으로 지식뿐만 아니라 학자로서 갖추어야 할 인성 또한 함께 배울 수 있었습니다. 비록 많이 부족한 제자이지만 교수님의 가르침을 잊지 않고 훌륭한 학자가 될 수 있도록 더욱 노력하겠습니다. 바쁘신 와중에도 흔쾌히 논문 심사를 맡아주시고 논문의 완성도를 높일 수 있도록 진심어린 조언을 아끼지 않으신 최진우 박사님, 정종우 교수님, 이정섭 교수님, 그리고 송상기 교수님께 감사의 말씀을 드립니다. 또한 항상 격려해주시고 성원해주신 자연과학대학 생명과학과 교수님들과 학부과정동안 많은 지식을 일깨워 주셨던 사범대학 생물교육학과 이규배, 조은희 교수님께도 감사드립니다.

실험실 생활을 시작하면서부터 많은 추억과 시간을 함께 공유한 정태원 선배 덕분에 정말 많은 것을 배울 수 있었습니다. 또한 논문을 준비 할 수 있도록 많은 부분을 양보하고 도움을 준 김종국군 덕분에 무사히 논문을 마칠 수 있었습니다. 지면을 빌어 이들에게 특히 더 고마움을 전하고 싶습니다. 그리고 실험실 업무를 성실히 수행해준 후배 김성훈군과 강주원군에게도 고맙다는 말을 전합니다. 이와 더불어 친절한 조언과 도움을 주신 분자생물학 실험실 박정은 박사님께도 감사 인사를 전합니다.

마지막으로 힘들고 지칠 때마다 힘이 되어준 나의 사랑스런 아내, 그리고 하나밖에 없는 우리 딸 나연이에게 미안함과 함께 감사의 뜻을 전합니다.