Invertebrate Fauna of Korea

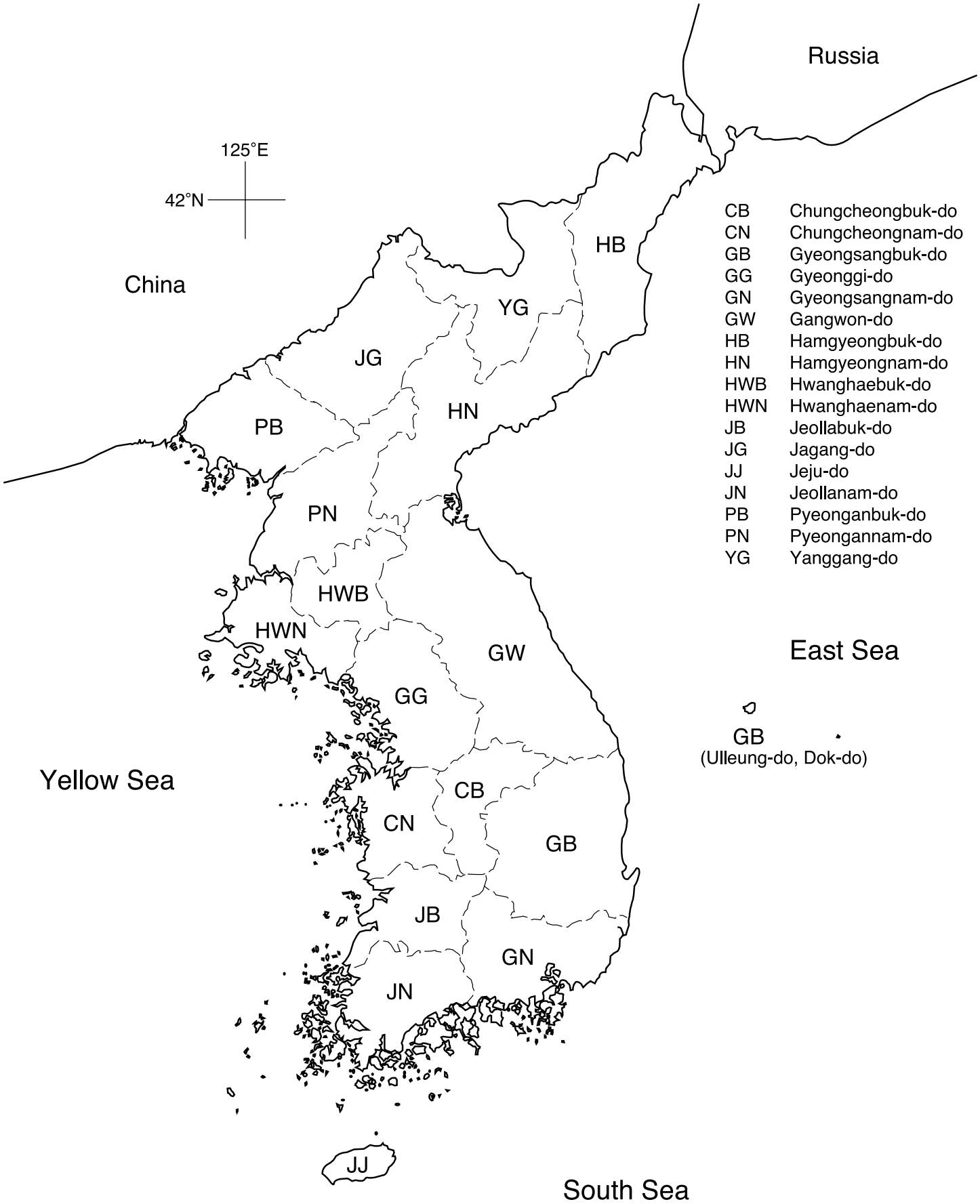
Volume 21, Number 41

Arthropoda: Crustacea: Decapoda: Brachyura: Majoidea

Crabs and Zoeas IV

Flora and Fauna of Korea

National Institute of Biological Resources
Ministry of Environment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HB Hamgyeongbuk-do
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HWB Hwanghaebuk-do
HWN Hwanghaenam-do
JB Jeollabuk-do
JG Jagang-do
JJ Jeju-do
JN Jeollanam-do
PB Pyeonganbuk-do
PN Pyeongannam-do
YG Yanggang-do

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Hyun-Sook Ko and Seok-Hyun Lee
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The Flora and Fauna of Korea logo was designed to represent six major target groups of the project including vertebrates, invertebrates, insects, algae, fungi, and bacteria. The book cover and the logo were designed by Jee-Yeon Koo.

Preface

The biological resources include all the composition of organisms and genetic resources which possess the practical and potential values essential to human live. Biological resources will be firmed competition of the nation because they will be used as fundamental sources to make highly valued products such as new lines or varieties, new material, and drugs. As the Nagoya Protocol was adopted in 2010 and entered into force in the 12th Conference of Parties of the Convention on Biological Diversity (CBD) in 2014, it is expected that the competition to get biological resources will be much intensive under the rapidly changed circumstance on the access and benefic sharing of the genetic resources (ABS). Therefore, each nation is investigating and clearing information of native species within its territory in order to secure its sovereignty rights over biological resources.

The National Institute of Biological Resources of the Ministry of Environment has been publishing the 'Flora and Fauna of Korea' since 2006 to manage biological resources in comprehensive ways and to enhance national competitiveness by building up the foundation for the sovereignty over biological resources. Professional research groups consisting of professors and related experts of taxonomy examined systematically a total of 12,631 species for the past eight years to publish 151 volumes in both Korean and English versions, and two volumes of World Monograph covering 216 species. This year, 11 volumes of the Flora and Fauna of Korea in both Korean and English versions including 517 species of invertebrates, insects and algae are additionally published. Flora and Fauna of Korea were the first professional records to describe all the species of the nation in a comprehensive way, and they would contribute to level up the taxonomic capacity. Furthermore, publication of flora and fauna through identification of native species and investigation of national biota would be helpful to declare sovereignty rights over our native biological resources, be used as positive proof, and be utilized to provide the basic information of biological resources for industrial application.

The National Institute of Biological Resources of the Ministry of Environment will continue to accelerate the project of the publication of the 'Flora and Fauna of Korea'. Personally I would like to express my sincere appreciation for Professor Hyun-Sook Ko and Dr. Seok-Hyun Lee of Silla University who have continuously made a lot of efforts to publish an excellent version of Korean fauna.

Kim, Sang-Bae
President
National Institute of Biological Resources

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Introduction

Majoid crabs are known either spider crabs or decorator crabs because of their long legs and their behavior of camouflaging themselves using bits of algae, sponges or other materials. They can be found from the intertidal zone to the continental slopes and usually feed on algae, detritus, and smaller invertebrates.

In his brachyuran monograph of Korea, Kim (1973) recorded 27 species assigned to the Majidae *sensu lato*. These species are *Huenia proteus* (= *H. heraldica*), *Pugettia incisa*, *Pugettia quadridens*, *Hyastenus diacanthus*, *Hyastenus elongatus*, *Hyastenus pleione*, *Sphenocarcinus stimpsoni* (= *Oxypleurodon stimpsoni*), *Pisoides bidentatus*, *Scyra compressipes*, *Achaeus japonicus*, *Achaeus spinosus*, *Achaeus tuberculatus*, *Platymaia wyvillethomsoni*, *Pleistacantha sanctijohannis*, *Entomonyx spinosus*, *Leptomithrax bifidus*, *Leptomithrax edwardsii*, *Maja miersi*, *Maja spinigera*, *Chlorinoides longispinus* (= *Prismatopus longispinus*), *Zewa okamotoi* (= *Pseudomicippe okamotoi*), *Micippa cristata granulipes* (= *Micippa cristata*), *Micippa philyra*, *Micippa thalia*, *Chionoecetes opilio*, *Hyas coarctatus*, and *Oregonia gracilis*. Later, seven additional species (*Menaethius monoceros*, *Pugettia intermedia*, *Pugettia minor*, *Pugettia pellucens*, *Achaeus lacertosus*, *Pyromaia tuberculata*, and *Chionoecetes japonicus*) were included in the list of The Korean Society of Systematic Zoology (1997). Recently, a species of *Micippa platipes* by Yang and Ko (2000), two species of *Xenocarcinus conicus* and *Hoplophrys oatesi* by Lee and Kim (2007) and Lee et al. (2008), and a species of *Pseudomicippe nipponica* by Lee and Ko (2013) were described. Currently, 38 Majoidea species are known from Korean waters and these are reported upon in this present study.

Fertilization in female crabs is internal and spawning usually takes place between late spring to early autumn with the eggs being deposited on the pleopods. The eggs hatch out larvae known as zoea. At each molt, the zoeas grow in size and some appendage setae increase in number. For example, the four natatory setae on the distal segment of the first and second maxillipeds acquire two additional setae during the subsequent molt from first to second stage zoea. The majoid species show abbreviated zoeal development by having only two zoeal stages, while, the grapsoid or xanthoid species usually have four zoeal stages. Over the course of succeeding molts, the terminal zoeal stage metamorphoses into the megalopal phase which is transitional between a planktonic and benthic life style. The abdomen remains in the horizontal position and is still functional for swimming via the use of the pleopods. The megalop in turn metamorphoses into the first crab stage in which the abdomen is finally tucked under the sternum and is no longer function for swimming with the pleopods eventually developing further after a number of juvenile molts. In females the pleopods hold eggs and in males the first two pleopods only are retained and modified to be used to transfer sperm into the female.

From plankton samples, identification of the majoid zoeas is relatively easy under the microscope because the first stage zoeas have pereiopodal buds under the carapace and pleopodal buds on the abdomen (vs. absent in most of brachyuran first stage zoeas). In addition, the presences of a biramous third maxilliped, a plumose anterior seta and posterior setae on the ventral carapace margin, and endopods on the antennules and antenna are useful characteristics. Provisional keys are included for the identification of zoeas of species belonging to the Majoidea and color images of representative majoid species of zoeas are provided.

Materials and Methods

The adults examined for the present study were collected from the mainland of South Korea associated islands. Adults were examined under a Leica EZ40 microscope and digital photographs of crabs taken using an Olympus E-30 camera. The following abbreviations are used in this book: CL (carapace length) from the tip of rostrum to the posterior dorsal margin of the carapace, CW (carapace width) across the widest point of the carapace including length of carapace spines, and PCL (postrostral carapace length) carapace length excluding rostrum. Measurements were made by using digital vernier caliper (Mitutojo, CD-15APX). The terminology used for carapace regions and spines generally follows that of Poore (2004).

Most of zoeas were hatched from ovigerous female crabs in the laboratory and dissected under a Leitz zoom stereomicroscope. Zoeal appendages were examined under a Leitz Laborlux S microscope. Chromatophores of zoeas were recorded by using a Leitz camera and zoom stereomicroscope. These images were then processed in Photoshop. All specimens were preserved in 95% ethyl alcohol.

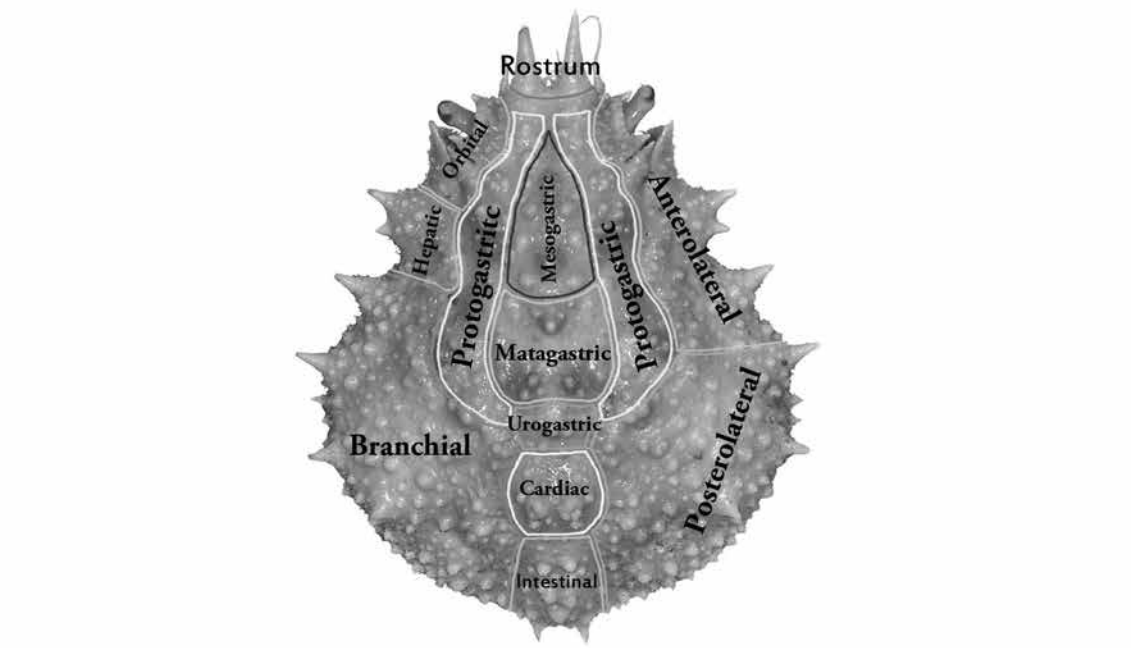
In zoeas, CL is measured from the anterior margin of the eye to the most posterior dorsal margin of the carapace and RDL (rostral spine to dorsal spine length) from the tip of rostral spine to the tip of dorsal spine. Descriptions of zoeas are based on the malacostracan somite plan, from anterior to posterior. Setal armature of the appendages is described from proximal to distal segments (Clark et al., 1998).

The classification generally follows that of Ng et al. (2008). The families and subfamilies are arranged in alphabetical order. Most of specimens examined were deposited at the National Institute of Biological Resources, Korea and Department of Biological Science, Silla University, Busan, Korea.

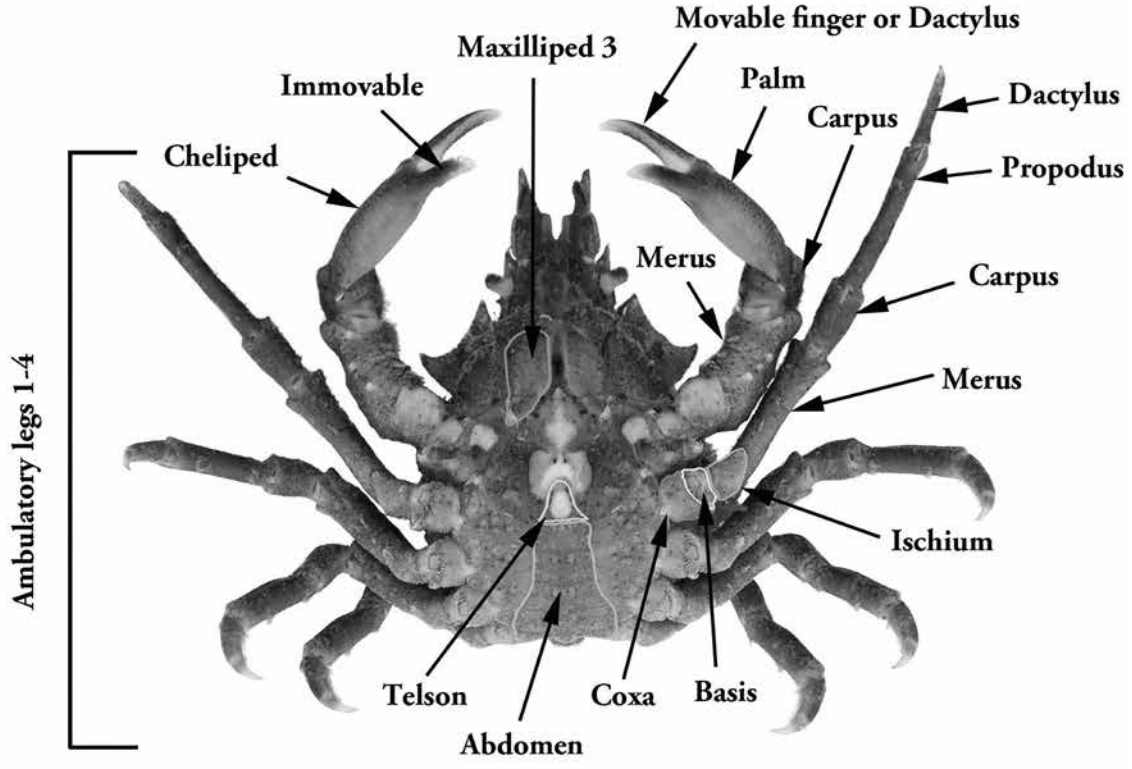
Morphology of crabs and zoeas

The adult morphology described in this book is based on a majoid crab. The dorsal surface of the carapace is divided into several regions (Fig. 1A). The five pairs of pereiopods consist of chelipeds and four pairs of ambulatory legs (Fig. 1B). The antennules and antennae are sensory organs in crabs (Figs. 2, 3). The buccal (mouth) cavity is covered by the third maxillipeds (Fig. 1B). The abdomen of male is with two pairs of pleopods (gonopods), compared with the female which is broader and with four pairs of pleopods. The species of five majoid families (Epialtidae, Inachidae, Inachoididae, Majidae, and Oregonidae) can often be recognized by the characters of the eyestalk, orbit, basal antennal article, and spines or lobes surrounding orbit (Figs. 2, 3).

The zoeal carapace is globose and usually armed with three spines (rostral, dorsal and lateral). These spines may function as buoyancy devices. The abdomen is flexible for rapid locomotion and the telson is forked. Three pairs of appendages i.e., the mandible, maxillule, maxilla, are used for feeding and the first and second maxillipeds are functional for swimming (Fig. 4).



A



B

Fig. 1. External morphology of majoid crabs. A, dorsal view of *Leptomithrax edwardsii*; B, ventral view of *Pugettia quadridens*.

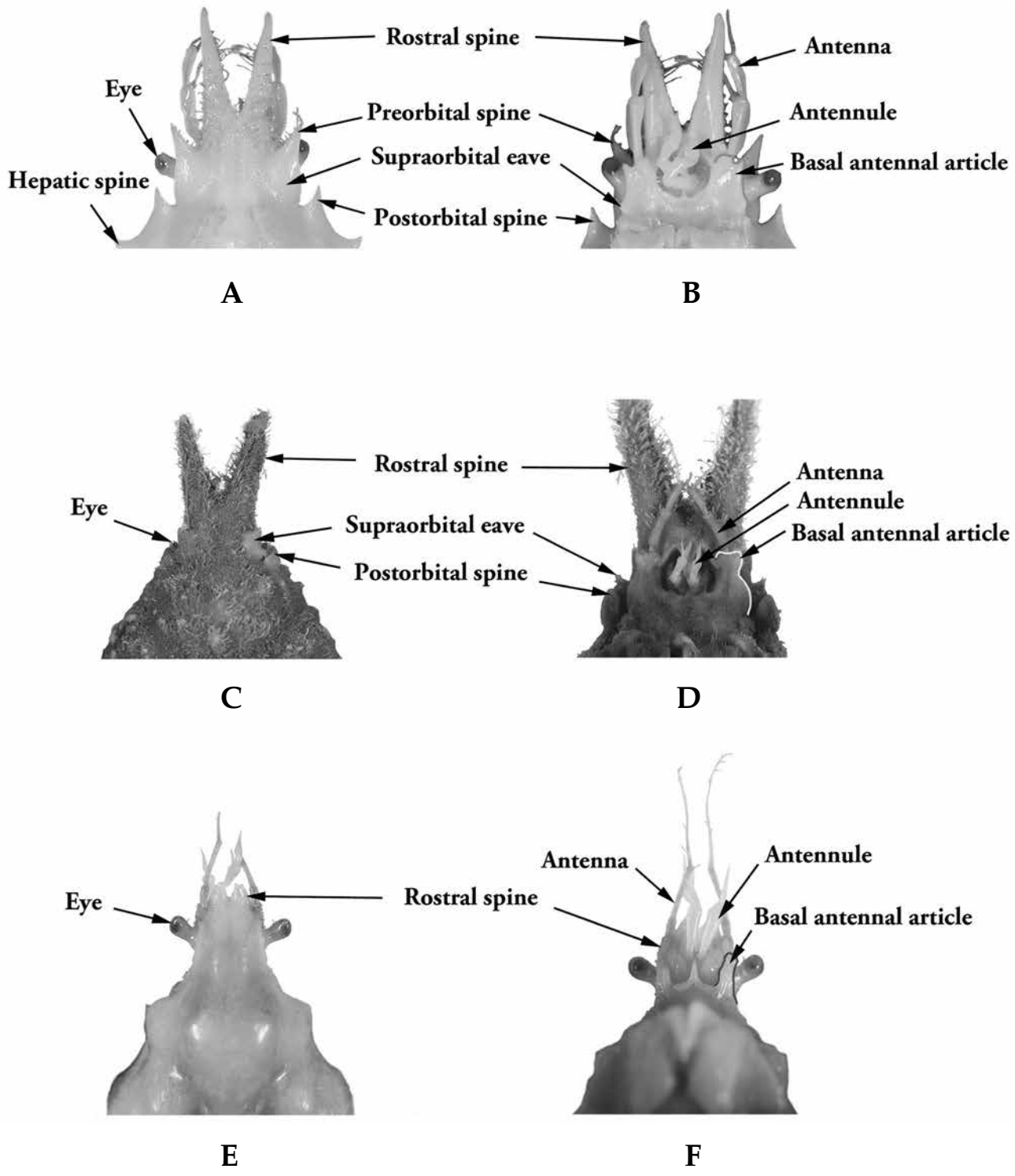


Fig. 2. Dorsal and ventral views of anterior regions in majoid crabs. A, B. Epialtidae Epialtinae: *Pugettia quadridens*; C, D. Epialtidae Pisinae: *Hyastenus pleione*; E, F. Inachidae *Achaeus japonicus*.

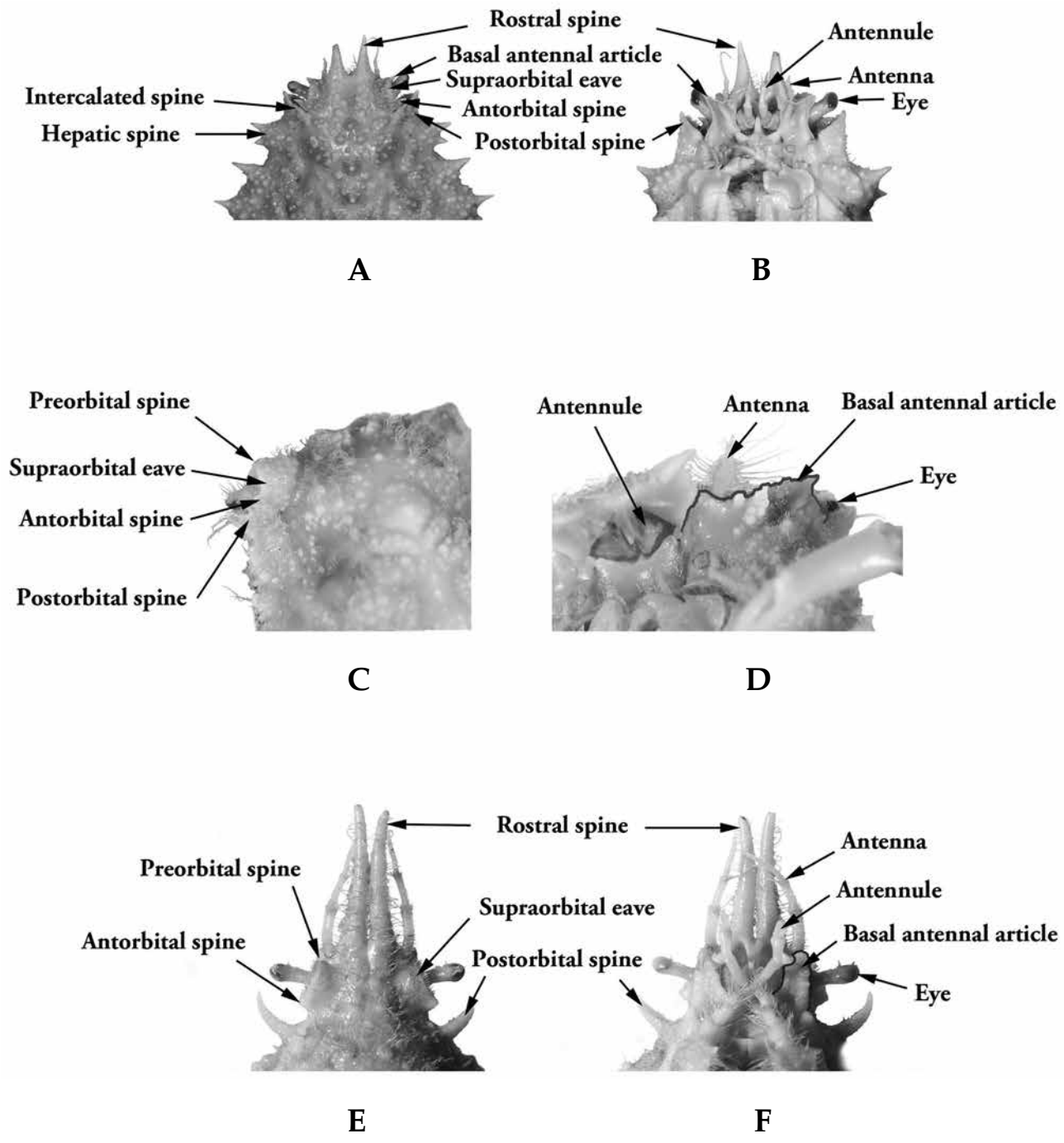


Fig. 3. Dorsal and ventral views of anterior regions in majoid crabs. A, B. Majidae Majinae: *Leptomithrax edwardsii*; C, D. Majidae Mithracinae: *Micippa philyra*; E, F. Oregoniidae *Oregonia gracilis*.

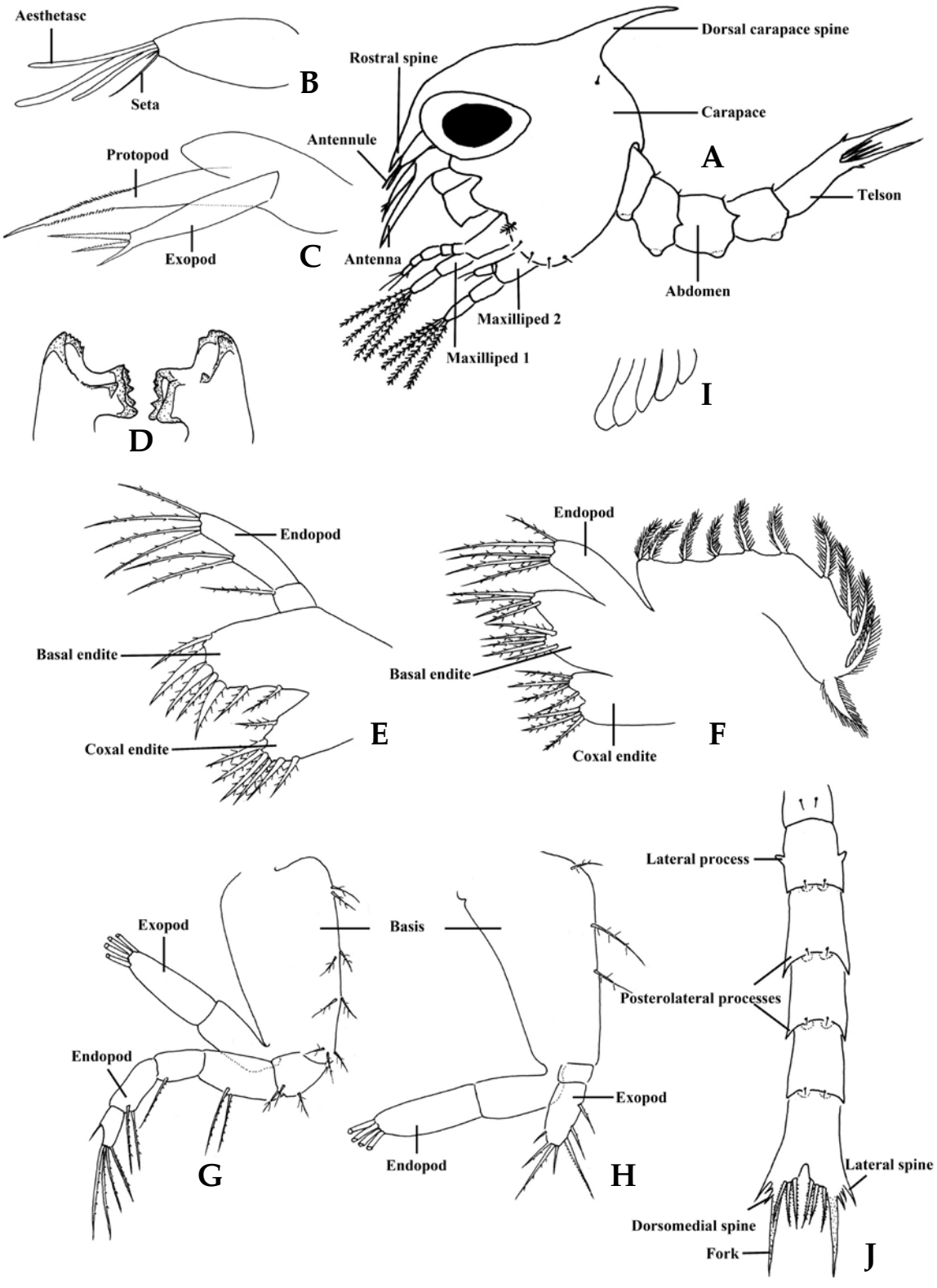


Fig. 4. Diagrammatic external morphology of brachyuran zoea *Leptomithrax edwardsii*. A. lateral view; B. antennule; C. antenna; D. mandibles; E. maxillule; F. maxilla; G. maxilliped 1; H. maxilliped 2; I. pereiopodal buds; J. abdomen, pleopodal buds, and telson.

Taxonomic Notes

Class Crustacea Brünnich, 1772
Gab-gak-gang (갑각강)

Subclass Malacostraca Latreille, 1802
Jin-yeon-gab-a-gang (진연갑아강)

Order Decapoda Latreille, 1802
Sib-gak-mok (십각목)

Infraorder Brachyura Latreille, 1802
Dan-mi-ha-mok (단미하목)

Superfamily Majoidea Samouelle, 1819
Mul-ma-ji-ge-sang-gwa (물맞이게상과)

Carapace narrow anteriorly, widest posteriorly; pear-shaped, subtriangular, or subcircular; surface often with hooked setae, with spines around orbit; branchial region swollen. Rostrum prominent, single or bifurcate. Antennule usually folds longitudinally. Ambulatory legs relatively long, slender, often with hooked setae. Abdomen usually with 6 somites and telson. Female genital opening on thoracic sternum; male genital opening on coxa of last ambulatory leg.

Families 5 (5 in Korea), genera over 121 (22 in Korea).
Distribution: Worldwide.

Key to the family of superfamily Majoidea

1. Eye with complete orbit ····· Majidae
− Eye without complete orbit ····· 2
2. Eye with incomplete orbit ····· 3
− Eye without orbit ····· 4
3. Eyestalk short, slender ····· Epialtidae
− Eyestalk long, slender or short, thick ····· Oregonidae
4. Rostrum bifurcate ····· Inachidae
− Rostrum single ····· Inachoididae

Family Epialtidae MacLeay, 1838

Pul-mul-ma-ji-ge-gwa (뿔물맞이게과)

Carapace pear-shaped, subtriangular or subcircular. Rostrum single, bifurcate, or with 2 spines. Preorbital spine present; postorbital spine or lobe present. Eye with incomplete orbit. Eyestalk short, slender. Basal antennal article short, truncate, or broad proximally. Two subfamilies (Epialtinae and Pisinae) in Korea.

Genera 67 (9 in Korea), species over 350 (15 in Korea).
Distribution: Worldwide.

Key to the genera of family Epialtidae

1. Basal antennal article short, truncate ····· 2 (Subfamily Epialtinae)
− Basal antennal article not truncate, moderately broader proximally, slender distally ····· 5 (Subfamily Pisinae)
2. Rostrum single ····· 3
− Rostrum bifurcate, with 2 spines ····· *Pugettia*
3. Preorbital spine absent ····· *Xenocarcinus*
− Preorbital spine present ····· 4
4. Branchial region of carapace with lobe ····· *Huenia*
− Branchial region of carapace with spine ····· *Menaethius*
5. Carapace subcircular ····· *Pisoides*
− Carapace not subcircular ····· 6
6. Carapace subtriangular ····· *Oxypleurodon*
− Carapace pear-shaped ····· 7
7. Rostral spine long, slender ····· *Hyastenus*
− Rostral spine short, broad ····· 8
8. Rostral spines fused in basal half, surface of carapace with few tubercles ····· *Scyra*
− Rostral spines divergent, surface of carapace with spines ····· *Hoplophrys*

Key to the zoeas of family Epialtidae

Rostral carapace spine short; dorsal carapace spine approximately equal to or shorter than CL (rarely absent in *Menaethius monoceros*); lateral spine absent; antennal endopod bud present, exopod with 2 subterminal setae, nearly equal length of protopod; endopod of maxillule with 4−6 setae on distal segment; endopod and basis of maxilliped each with 3, 2, 1, 2, 5 and 2+2+2 (rarely 3)+3 setae, respectively; endopod and basis of maxilliped 2 each with 0, 1, 4 and 1+1+1 setae, respectively; lateral processes on abdominal somite 2; fork of telson with 1 lateral spine.

1. Dorsal carapace spine present ····· 2
− Dorsal carapace spine absent ····· *Menaethius monoceros*
2. Endopod of maxillule with seta on proximal segment ····· 3
− Endopod of maxillule without seta on proximal segment ····· *Huenia heraldica*
3. Endopod of maxillule with 1, 4 setae ····· 4
− Endopod of maxillule with 1, 5 or 1, 6 setae ····· 9
4. Endopod of maxilla with 3 setae ····· *Pugettia incisa*

− Endopod of maxilla with 4 setae ····· 5
5. Distal segment of endopod of maxilliped with 1 spinous subterminal seta ····· 6
− Distal segment of endopod of maxilliped with 1 plumose subterminal seta ····· *Scyra compressipes*
6. Anterior base of dorsal carapace spine with chromatophore ····· 7
− Anterior base of dorsal carapace spine without chromatophore ····· *Pugettia marissinica*
7. Middle of dorsal carapace spine without chromatophore ····· 8
− Middle of dorsal carapace spine with chromatophore ····· *Pugettia quadridens*
8. Eye with chromatophore laterally ····· *Pugettia intermedia*
− Eye without chromatophore laterally ····· *Pisoides bidentatus*
9. Endopod of maxillule with 1, 6 setae ····· *Hyastenus elongatus*
− Endopod of maxillule with 1, 5 setae ····· *Hyastenus diacanthus*

Subfamily Epialtinae MacLeay, 1838

Pul-mul-ma-ji-ge-a-gwa (뿔물맞이게아과)

Carapace pear-shaped, subtriangular, usually with spine or lobe on hepatic and branchial margins. Supraorbital eave developed, with preorbital spine. Eye with incomplete orbit; eyestalk short, slender. Basal antennal article short, truncate.

Genera 23 (4 in Korea), species over 114 (8 in Korea).
Distribution: Worldwide.

Genus *Huenia* De Haan, 1837

Oe-pul-ge-sok (외뿔게속)

Carapace subtriangular, much longer than broad in male, as broad as long in female; rostrum single; dorsal surface smooth; preorbital spine present, postorbital spine absent; branchial margin with large lobe. Eye with incomplete orbit. Basal antennal article short, truncate. Male and female diamorphic. Abdomen 6 somites and telson in male, somites 4−6 fused in female.

Species 8 (1 in Korea).

1. *Huenia heraldica* (De Haan, 1837) (Pl. 1)

Oe-pul-ge (외뿔게)

Maja (*Huenia*) *heraldica* De Haan, 1837, pl. 23, fig. 6.
Maja (*Huenia*) *proteus* De Haan, 1839, p. 95, fig. G.

Huenia proteus: Kim, 1973, p. 532, pl. 104, fig. 195; T. Sakai, 1976, p. 207, pl. 71; Miyake, 1983, p. 36, pl. 12, fig. 6; Griffin and Tranter, 1986, p. 84, fig. 24c–d; Dai and Yang, 1991, p. 133, pl. 15 (1, 2), fig. 68 (2).
Huenia heraldica: Holthuis, 1987, p. 15.
Huenia proteus: Terada, 1981a (zoeal stages).

Adult: Carapace as broad as long; rostrum triangular, with numerous setae on margin, approximately 0.3 CL; dorsal surface smooth; regions indistinct, gastric and cardiac tubercles present; preorbital spine slender, projecting forwads; hepatic lobe twice broader than branchial lobe, anterolateral margin strongly curved inwards; branchial lobe concave on lateral margin. Eye with incomplete orbit. Basal antennal article short, truncate. Chelipeds short; ambulatory legs flattened, crested, each merus with 1 large blunt spine on anterodistal margin. CL 20 mm, PCL 14 mm, CW 19 mm.

Zoea I: Carapace with short rostral and dorsal spines, lateral spines absent. Protopod of antenna spinous with spinules, longer than rostral spine; exopod with 2 subterminal setae, approximately equal length of protopod. Endopod of maxillule with 0, 1 + 4 setae. Endopod of maxilla with 4 setae. Basis and endopod of maxilliped 1 each with 2 + 2 + 2 + 3 (9) setae and 3, 2, 1, 2, 5 setae, respectively. Basis and endopod of maxilliped 2 each with 1 + 1 + 1 (3) setae and 0, 1, 4 setae, respectively. Lateral processes on abdominal somite 2. Fork of telson short, with 1 stout lateral spine. CL 0.70 mm, RDL 0.97 mm (Terada, 1981a).

Distribution: Kenya, Indonesia, Taiwan, Japan, Australia, Hawaiian Islands, Korea (K. Sakai, 2004).

Habitat: Rocks or pebbles; 50 m (Kim, 1973).

Korea: JJ.

Specimens examined: JJ: 1♀ (Jeju: 30.xi.1983, J.J. Lee).

Remarks: Adults mimic the algae in which they live. The carapace of male is triangular (Kim, 1973). The female specimen is deposited at Folklore and Natural History Museum of Jeju.

Genus *Menaethius* H. Milne-Edwards, 1834

Il-gak-ge-sok (일각게속)

Carapace subtriangular, longer than broad; rostrum single; preorbital spine present; branchial margin with 2 blunt spines. Eye with incomplete orbit. Basal antennal article short, truncate. Abdomen 6 somites and telson in male, somites 4–6 fused in female.

Species 2 (1 in Korea).

2. *Menaethius monoceros* (Latreille, 1825) (Pls. 2, 3)
Il-gak-ge (일각게)

Pisa monoceros Latreille, 1825, p. 139.
Menaethius monoceros: T. Sakai, 1976, p. 205, pl. 170, fig. 1; Kim and Chang, 1985, p. 47, fig. 3; Griffin and Tranter, 1986, p. 353, fig. 105d; Dai and Yang, 1991, p. 132, fig. 68 (1), pl. 14 (8); Poore, 2004, p. 353, fig. 105d.
Menaethius monoceros: Terada, 1981a (zoeal stages).

Adult: Carapace subtriangular; rostrum single, long, spinous, with numerous hooked setae on margin, approximately 0.3 CL; regions indistinct; gastric regions slightly convex, with 3 small tubercles; cardiac regions convex, with 1 larger tubercle; intestinal region slightly convex, with 1 small tubercle; epibranchial region with 1 small tubercle; preorbital spine triangular; hepatic margin with 1 small blunt spine; branchial margin produced, with 2 blunt (1 large, 1 smaller) spines on lateral margin. Eye non-retractile, with incomplete orbit. Basal antennal article short, truncate, with 1 distal spine on outer margin. Merus of maxilliped 3 subquadrate, outer margin produced distally. Chelipeds longer than ambulatory legs 2–4; fingers short, movable finger with 1 blunt tooth on cutting margin. Ambulatory legs relatively short, with scattered setae; each merus with 2 blunt spines on anterior margin; each dactylus spinulate along posterior margin. Abdomen 6 somites and telson, somite 3 widest, somite 6 longest. Gonopod 1 stout, straight, with numerous setae on outer margin, distal part curved outwards at 90°. CL 15 mm, PCL 11 mm, CW 9 mm.

Zoea I: Carapace with short rostral spine, dorsal and lateral spines absent. Protopod of antenna spinous with spinules, twice longer than rostral spine; exopod with 2 subterminal setae, approximately equal length of protopod. Endopod of maxillule with 0, 1+4 setae. Endopod of maxilla with 5 setae. Basis and endopod of maxilliped 1 each with 2+2+2+3 (9) setae and 3, 2, 1, 2, 5 setae, respectively. Basis and endopod of maxilliped 2 each with 1+1+1 (3) setae and 0, 1, 4 setae, respectively. Lateral processes on abdominal somite 2. Fork of telson relatively short, with 1 stout lateral spine. CL 0.58 mm.

Distribution: Madagascar, Red Sea, Pakistan, India, Indonesia, Philippines, China, Japan, Australia, Hawaiian Islands, Korea (K. Sakai, 2004).
Habitat: Intertidal rocky shore, under stone.
Korea: JJ.
Specimens examined: JJ: 1♂ (Moseulpo: 23.v.2009, S.H. Lee), GN: zoeas (Busan: 11.iii.2010, S.H. Lee).

Genus *Pugettia* Dana, 1851
Pul-mul-ma-ji-ge-sok (뿔물맞이게속)

Carapace subtriangular, pear-shaped; rostrum bifurcate, with 2 slender spines; preorbital and postorbital spines distinct; hepatic and branchial margins produced. Eye without true orbit; basal antennal article moderately short, truncate. Chelipeds prismatic in meri. Abdomen 6 somites and telson in both sexes.

Species 19 (5 in Korea).

3. *Pugettia incisa* (De Haan, 1839) (Pls. 4–6)
O-nui-i-ma-mul-ma-ji-ge (오늬이마물맞이게)

Pisa (*Menoethius*) *incisus* De Haan, 1839, p. 98.
Pugettia incisa: Miers, 1879, p. 23; Kamita, 1941, p. 63, fig. 27; Kim, 1973, p. 529, pl. 103, fig. 193; T. Sakai, 1976, p. 195, pl. 68, fig. 102; Dai and Yang, 1991, p. 130, fig. 66 (3), pl. 14 (5).
Pugettia incisa: Terada, 1981a (zoeal stages).

Adult: Carapace subtriangular; rostrum with 2 spines, which divergent at 60°, covered with hooked setae, approximately 0.3 CL; regions distinct by grooves; gastric region strongly convex, protogastric region with hooked setae, metagastric region with 1 acute tubercle; cardiac region strongly convex, with 1 large acute tubercle; intestinal region strongly convex, with1 smaller acute tubercle; epibranchial region with 1 prominent spine projecting laterally, with hooked setae on anterolateral margin. Preorbital spine prominent, acute; postorbital spine and hepatic lobe fused as wing-shaped plate. Eye non-retractile, with incomplete orbit. Basal antennal article short, truncate, with 1 distal spine on outer margin. Pterigostomial region with 4 small tubercles. Chelipeds compressed, longer than ambulatory legs 3–5; each merus prismatic, with 3 crests; carpus crested on upper surface. Ambulatory legs compressed, with marginal setae; each merus with crest on anterior margin. Abdomen 6 somites and telson. Gonopod 1 relatively stout; distal part triangular, with 2 medial lobes, in which ventral lobe minute. CL 21 mm, PCL 15 mm, CW 14 mm.

Zoea I: Carapace with short rostral and long dorsal spines, lateral spines absent. Protopod of antenna spinous with spinules, twice longer than rostral spine; exopod with 2 subterminal setae, approximately equal length of protopod. Endopod of maxillule with 1, 4 setae. Endopod of maxilla with 3 setae. Maxilliped 1 with 2 + 2 + 2 + 3 (9) setae on basis, endopod with 3, 2, 1, 2, 5 setae, subterminal seta on distal segment spinous. Basis and endopod of maxilliped 2 each with 1 + 1 + 1 (3) setae and 0, 1, 4 setae, respectively. Lateral processes on abdominal somite 2. Fork of telson long, with 1 stout lateral spine. CL 0.46 mm, RDL 1.00 mm (Terada, 1981a).

Distribution: China, Japan, Korea (Kim, 1973).
Habitat: Muddy sand or sand; 50–100 m (Kim, 1973).
Korea: GB, GN, JN, JJ (Kim, 1973).
Specimens examined: GN: 1♂ (Busan: 27.xi.2008, H.S. Ko).

4. *Pugettia intermedia* T. Sakai, 1938 (Pls. 7, 8)
Jung-gan-pul-mul-ma-ji-ge (중간뿔물맞이게)

Pugettia minor (not Ortmann, 1893) Shen, 1937, p. 287, fig. 5a, d, f, g.
Pugettia quadridens intermedia T. Sakai, 1938, p. 258, pl. 36, fig. 2; 1976, p. 197, fig. 103b.
Not *Pugettia quadridens intermedia*: Kim and Kim, 1998, p. 303, fig. 1 (= *P. quadridens*).
Pugettia intermedia: Griffin and Tranter, 1986a, p. 93, fig. 28a, b; Lee et al., 2014, pp. 45, 46, figs. 1, 2.
Pugettia intermedia: Ko, 1998 (zoeal stages).

Adult: Carapace subtriangular; rostrum with 2 spines, which divergent at 50°, covered with

hooked setae, approximately 0.3 CL; regions distinct by grooves; gastric region slightly convex, with 4 small tubercles, protogastric region with hooked setae; cardiac region strongly convex, with 1 large tubercle; intestinal region strongly convex, with 1 smaller tubercle; epibranchial region with 2 (1 large, 1 smaller) tubercles, with hooked setae on anterolateral margin. Preorbital spine prominent, acute; postorbital and hepatic spines subequal, fused at their base; branchial spine prominent, its tip projecting laterally. Eye non-retractile, with incomplete orbit. Basal antennal article short, truncate, with 1 distal spine on outer margin. Pterigostomial region with 4 small tubercles. Chelipeds compressed, longer than ambulatory legs 2–4; each merus prismatic, with 4 longitudinal crests, no tubercle; each carpus strongly crested on inner margin and upper surface. Ambulatory legs with short setae, scattering of longer setae. Abdomen 6 somites and telson. Gonopod 1 relatively stout; distal part triangular, 2 medial lobes subequal in length. CL 18 mm, PCL 13 mm, CW 12 mm.

Zoea I: Carapace with short rostral and long dorsal spines, lateral spines absent. Eye with chromatophore laterally. Protopod of antenna spinous with spinules, twice longer than rostral spine; exopod with 2 subterminal setae, approximately equal length of protopod. Endopod of maxillule with 1, 4 setae. Endopod of maxilla with 4 setae. Maxilliped 1 with 2+2+2+3 (9) setae on basis, endopod with 3, 2, 1, 2, 5 setae, subterminal seta on distal segment spinous. Basis and endopod of maxilliped 2 each with 1+1+1 (3) setae and 0, 1, 4 setae, respectively. Lateral processes on abdominal somite 2. Fork of telson long, with 1 stout lateral spine. CL 0.69 mm, RDL 1.16 mm.

Distribution: China, Taiwan, Japan, Korea (K. Sakai, 2004).
Habitat: Subtidal to 72 m (K. Sakai, 2004).
Korea: CN, GN.
Specimens examined: CN: 2♂ (Taean: 8.Vi.2010, H.S. Ko), GN: zoeas (Busan: 11.Vi.1996, H.S. Ko).
Remarks: Distal part of left rostral spine of the crab has broken in Pls. 7 and 8. Kim and Kim (1998) described this species, but, their figure is *P. quadridens* because the ventral lobe of gonopod 1 is much smaller than the dorsal lobe, not subequal.

5. *Pugettia minor* Ortmann, 1893
Ko-ma-mul-ma-ji-ge (꼬마물맞이게)

Pugettia minor Ortmann, 1893, p. 44; T. Sakai, 1976, p. 199, pl. 68, fig. 2; Takeda, 1982, p. 121, fig. 355; Miyake, 1983, p. 35, pl. 12, fig. 3; Kim and Chang, 1985, p. 47, fig. 2; Griffin and Tranter, 1986, p. 96; Dai and Yang, 1991, p. 131, fig. 67 (2), pl. 14 (7); Lee, 2007, p. 28, fig. 7.

Adult: Carapace more elongate than its congeners; rostrum with 2 spines, which divergent at 40°, approximately 0.3 CL; gastric region with 1 spinous tubercle; cardiac region with 1 prominent spine; intestinal region with 1 small tubercle. Preorbital spine small, acute; postorbital and hepatic spines distinct, not fused at their base, former larger than latter; branchial spine smaller than hepatic spine. Chelipeds shorter than ambulatory leg 2; each merus and carpus prominently crested. Ambulatory legs long, slender, almost smooth; each dactylus with more than 10 minute denticles on posterior margin. Gonopod 1 relatively stout; distal part triangular, with 2 medial lobes, ventral lobe slightly smaller than dorsal lobe. CL 9 mm, CW 6 mm (Kim and Chang, 1985).

Distribution: China, Japan, Korea (K. Sakai, 2004).
Habitat: 35−540 m depth (K. Sakai, 2004).
Korea: JJ (Kim and Chang, 1985).
Remarks: Larvae are unknown.

6. *Pugettia pellucens* Rathbun, 1932 (Pls. 9, 10)

Ko-ma-pul-mul-ma-ji-ge (꼬마뿔물맞이게)

Pugettia quadridens pellucens Rathbun, 1932, p. 31; T. Sakai, 1938, p. 258, pl. 36, fig. 3; 1976, p. 197; Miyake, 1983, p. 206 (list); Griffin and Tranter, 1986, p. 92 (key); Lee, 2007, p. 39, fig. 10B.
? *Pugettia quadridens pellucens*: Lee, 2007, p. 39, fig. 10.
Pugettia pellucens: Muraoka, 1998, p. 24; Ng et al., 2008, p. 101 (list); Ohtsuchi et al., 2014, p. 558, figs. 1−3, 6A−E.
? *Pugettia pellucens*: Lee et al., 2014, p. 47, figs. 3B, 4B.

Adult: Carapace elongated pear-shaped; rostrum with 2 long spines, which divergent at 50°, covered with hooked setae, approximately 0.3 CL; dorsal surface with scattering of setae; regions indistinct; gastric, cardiac, and intestinal regions slightly convex, without tubercle; branchial region slightly convex, without tubercle, hooked setae on anterolateral margin. Preorbital spine acute; concavity between blunt antorbital angle and postorbital spine U-shaped; postorbital and hepatic spines partially fused at their base; postorbital spine triangular much smaller than hepatic spine; hepatic spine acute, with curved tip, much larger than branchial spine. Eye non-retractile, with incomplete orbit. Basal antennal article short, truncate, with 1 distal spine on outer margin. Pterigostomial region with 4 small tubercles. Merus of each chelipeds prismatic; upper crest distinct, with 3 large tubercles; lower surface with 3 small tubercles; inner margin unarmed; outer margin with 3 rudimentary tubercles; each carpus with 3 crests; upper crest, short, including 3 rudimentary tubercles; inner crest with 3−4 rudimentary tubercles; outer crest prominently sharp; each palm sharply crested on upper margin. Ambulatory legs with scattering of setae; each merus with 1 distal spine; margins with longer setae; each dactylus with spinules on posterior margin. Abdomen 6 somites and telson. Gonopod 1 relatively stout; distal part triangular, with 2 medial lobes subequal in length. CL 13 mm, RCL 9 mm, CW 7 mm.

Distribution: Japan (Ohtsuchi et al., 2014), Korea.
Habitat: With algae in rocky bottom; 5 m depth.
Korea: JJ.
Specimens examined: JJ: 1♂ (Seogwipo: 30.iii.2011, S.H. Lee).
Remarks: Larvae are unknown. Lee (2007) and Lee et al. (2014) have reported this species, however, their figures differ from those by Ohtsuchi et al. (2014) as follows: 1) the ratio of length of rostral spine to PCL is approximately 0.30 [vs. 0.40−0.50 in Ohtsuchi et al. (2014)], 2) the rostral spines are not widely divergent in the distal half, and 3) the hepatic spine is subequal to and not much larger than the postorbital spine. Therefore, the specimens of Lee (2007) and Lee et al. (2014) are probably not this species.

7. *Pugettia quadridens* (De Haan, 1839) (Fig. 2A, B; Pls. 11, 12,)
Pul-mul-ma-ji-ge (뿔물맞이게)

Pisa (*Menoethius*) *quadridens* De Haan, 1839, p. 97, pl. G.
Pugettia quadridens: Miers, 1879, p. 23; T. Sakai, 1936, p. 88, fig. 37, pl. 20, fig. 2; Kamita, 1941, p. 65, fig. 28; Kim, 1973, p. 530, pl. 53, fig. 194; Takeda, 1982, p. 120, fig. 354; Kim and Chang, 1985, p. 45; Griffin and Tranter, 1986, p. 97, fig. 28e−f; Dai and Yang, 1991, p. 129, fig. 66 (2), pl. 14 (4).
Pugettia quadridens quadridens: T. Sakai, 1976, p. 196, fig. 103a, pl. 68, fig. 1; Miyake, 1983, p. 35, pl. 12, fig. 2.
Pugettia quadridens: Ko, 1998 (zoeal stages).

Adult: Carapace subtriangular; rostrum with 2 spines, which divergent at 40°, covered with hooked setae, approximately 0.2 CL, its outer margins subparallel; regions relatively indistinct; gastric region slightly convex, with 2 tubercles, with hooked setae on protogastric region; cardiac and intestinal regions strongly convex, each with 1 tubercle; epibranchial region with 2 tubercles, with hooked setae on anterolateral margin. Preorbital spine acute; postorbital and hepatic spines fused at their base, former much smaller than latter; branchial spine subequal to hepatic spine, its tip projecting forwards. Eyes non-retractile, without true orbits. Basal antennal article short, truncate, with 1 distal spine on outer margin. Pterigostomial region with 4 small tubercles. Merus of maxilliped 3 subquadrate. Chelipeds smooth, stout, longer than ambulatory legs; each merus prismatic, with 3 tubercles on upper margin; each carpus crested on inner and outer margins. Ambulatory legs smooth, slender; each dactylus spinulate on posterior margin. Abdomen 6 somites and telson. Gonopod 1 relatively stout; distal part triangular, with 2 medial lobes; ventral lobe smaller than dorsal lobe, tips curved, projecting posteriorly. CL 29 mm, PCL 22 mm, CW 23 mm.

Zoea I: Carapace with short rostral and long dorsal spines, lateral spines absent. Chromatophores on eye laterally, at base and in middle of dorsal carapace spine. Protopod of antenna spinous with spinules, twice longer than rostral spine; exopod with 2 subterminal setae, approximately equal length of protopod. Endopod of maxillule with 1, 4 setae. Endopod of maxilla with 4 setae. Maxilliped 1 with 2 + 2 + 2 + 3 (9) setae on basis, endopod with 3, 2, 1, 2, 5 setae, subterminal seta on distal segment spinous. Basis and endopod of maxilliped 2 each with 1 + 1 + 1 (3) setae and 0, 1, 4 setae, respectively. Lateral processes on abdominal somite 2. Fork of telson long, with 1 stout lateral spine. CL 0.75 mm, RDL 1.22 mm.

Distribution: China, Japan, Korea (Kim, 1973).
Habitat: With algae in rocky bottom; shallow water (Kim, 1973).
Korea: GW, GN, JN, JJ, JB, CN, GG (Kim, 1973).
Specimens examined: GB: 1♂ (Uljin: 29.v.2012, H.S. Ko), GN: zoeas (Busan: 11.v.1997, H.S. Ko).
Remarks: This species can be distinguished from *P. intermedia* based on the following characteristics: 1) the ventral and dorsal lobes of the gonopod 1 are not equal in length (vs. subequal in *P. intermedia*) and 2) the gastric region of carapace has 2 tubercles (vs. 4 tubercles in *P. intermedia*).

Genus *Xenocarcinus* White, 1847

Mul-bang-ul-mul-ma-ji-ge-sok (물방울물맞이게속)

Carapace elongate pear-shaped; rostrum single; preorbital and postorbital spines absent, lobes present; hepatic and branchial spines absent. Eye with incomplete orbit. Basal antennal article short, truncate. Abdomen of female fused in somites 4−6.

Species 6 (1 in Korea).

8. *Xenocarcinus conicus* (A. Milne-Edwards, 1865)

Mul-bang-ul-mul-ma-ji-ge (물방울물맞이게)

Huenioides conica A. Milne Edwards, 1865, p. 145, pl. 4, fig. 3.
Xenocarcinus nakazawai T. Sakai, 1938, p. 325, fig. 52a−d; 1976, p. 213, fig. 116; Miyake, 1983, p. 38, pl. 13, fig. 5.
Xenocarcinus alcocki T. Sakai, 1965b, p. 92.
Xenocarcinus conicus: Griffin and Tranter, 1986, p. 100, fig. 30c−d; Lee et al., 2008, p. 152, fig. 1.

Adult: Carapace elongate pear-shaped; rostrum single, long, covered with setae, tip slightly bifurcate, approximately 0.3 CL; regions indistinct; gastric region without tubercle; cardiac and intestinal regions each with 2 tubercles side by side; branchial region with 2 (1 large, 1 smaller) tubercles on margin. Eye non-retractile, with incomplete orbit. Basal antennal article short, truncate, with 1 distal spine on outer margin. Pterigostomial region with 3 small tubercles. Chelipeds much shorter than ambulatory legs 1, 2; each merus with 3 tubercles on anterior margin; each carpus with 2 tubercles on upper surface. Ambulatory legs short; each merus with 2−4 spines on anterior margin; each carpus blunt spines on upper surface; each dactylus strongly spinulate on posterior margin. CL 10 mm, PCL 7 mm, CW 4 mm (Lee et al., 2008).

Distribution: Red Sea, Sri Lanka, Andamans, Indonesia, Japan (K. Sakai, 2004), Korea.
Habitat: 13−80 m depth (K. Sakai, 2004).
Korea: JJ (Lee et al., 2008).
Remarks: Larvae are unknown.

Subfamily Pisinae Dana, 1851

Pul-ge-a-gwa (뿔게아과)

Eye with incomplete orbit; supraorbital eave developed. Basal antennal article not truncate, moderately broader proximally, slender distally.

Genera 44 (5 in Korea), species over 236 (7 in Korea).
Distribution: Worldwide.

Genus *Hoplophrys* Henderson, 1893

Yeon-san-ho-pul-ge-sok (연산호뿔게속)

Carapace pear-shaped, dorsal surface with spines. Rostral spines short, divergent. Eye with incomplete orbit; supraorbital eave developed. Basal antennal article not truncate, moderately broader proximally, slender distally. Abdomen 6 somites and telson in male, somites 3−6 fused in female.

Species 1 (1 in Korea).

9. *Hoplophrys oatesi* Henderson, 1893

Yeon-san-ho-pul-ge (연산호뿔게)

Hoplophrys oatesi Henderson, 1893, p. 347, pl. 36, figs. 1−4; T. Sakai, 1938, p. 294; Griffin and Tranter, 1986, p. 119, fig. 37a; Lee and Kim, 2007, p. 103, fig. 1.
Hoplophrys ogilbyi McCulloch, 1908, p. 51, pl. 12, figs. 2, 2a; T. Sakai, 1976, p. 233, pl. 81, fig. 1; Miyake, 1983, p. 43, pl. 15, fig. 3.
Parazewa palauensis Miyake, 1939, p. 195, figs. 12−13; Takeda, 1973, p. 97.

Adult: Carapace pear-shaped; rostrum deflexed downwards, with 2 spines; regions relatively indistinct; gastric region convex, with 10 spines; cardiac and intestinal regions each with 2 blunt spines side by side; branchial region with 1 spine on surface, 1 larger spine on lateral margin, hooked setae on anterolateral margin. Preorbital spine present; postorbital spine present, bifurcate at tip. Eye non-retractile, with incomplete orbit. Basal antennal article not truncate, short, with 1 distal spine on outer margin. Pterigostomial region with 1 tubercle. Chelipeds short, slender; each merus and carpus with irregular tubercles on upper surfaces. Ambulatory legs short, with irregular tubercles on surfaces. Abdomen 6 somites and telson in male, somites 3−6 fused in female. Gonopod 1 slender; gradually narrowing distally, with long marginal setae. CL 9.3 mm (Lee and Kim, 2007).

Distribution: Red Sea, India, Indonesia, Japan, Australia, New Caledonia, Fiji (K. Sakai, 2004), Korea.

Habitat: With soft coral (*Dendronephthya* sp.) (Lee and Kim, 2007).

Korea: JJ (Lee and Kim, 2007).

Remarks: Larvae are unknown.

Genus *Hyastenus* White, 1847

Pul-ge-sok (뿔게속)

Carapace pear-shaped. Rostral spines long, slender. Eye with incomplete orbit; supraorbital eave developed. Basal antennal article not truncate, moderately short, slender. Abdomen 6 somites and telson in male, somites 4–6 fused in female.

Species 14 (3 in Korea).

10. *Hyastenus diacanthus* (De Haan, 1839) (Pl. 13)

Pul-ge (뿔게)

Pisa (*Naxia*) *diacantha* De Haan, 1839, p. 96, pl. G; Yamaguchi, 1993, p. 585.
Naxia diacantha: Adams and White, 1848, p. 10.
Hyastenus diacanthus: Miers, 1879, p. 26; T. Sakai, 1938, p. 279, fig. 36, pl. 29, fig. 2; 1976, p. 225, pl. 77, fig. 1; Kamita, 1941, p. 76; Kim, 1973, p. 535, pl. 105, fig. 197a, b; Takeda, 1982, p. 126, fig. 370; Miyake, 1983, p. 41, pl. 14, fig. 4; Griffin and Tranter, 1986, p. 140, figs. 46c, 48a–c; Dai and Yang, 1991, p. 142, fig. 72 (1), pl. 16 (6).
Hyastenus diacanthus: Kurata, 1969, p. 101, fig. 14 (larval stages).

Adult: Carapace elongate pear-shaped, covered with short dense setae; rostral spines divergent at 45°, approximately 1/3 CL; regions indistinct; gastic and cardiac regions slightly convex, each with 1 tubercle; branchial region with 1 small spine on lateral margin. Supraorbital eave developed; preorbital angle distinct; antorbital lobe weakly projecting; postorbital lobe small, cup-shaped. Basal antennal article not truncate, slender, with 1 distal spine on outer margin; pterygostomial region with 2 tubercles. Chelipeds slender, covered with short dense setae; fingers smooth. Ambulatory legs slender, covered with short dense setae, leg 2 much longer than cheliped. Abdomen 6 somites and telson in male. CL 42 mm, PCL 28 mm, CW 18 mm.

Zoea I: Carapace with short rostral and long dorsal spines, lateral spines absent. Protopod of antenna spinous with spinules, 3 times longer than rostral spine; exopod with 2 subterminal setae, approximately equal length of protopod. Endopod of maxillule with 1, 5 setae. Endopod of maxilla with 3 + 2 (5) setae. Endopod of maxilliped 2 with 0, 1, 4 setae. Lateral processes on abdominal somite 2. Fork of telson long, with 1 small lateral spine. RDL 1.23 mm (Kurata, 1969).

Distribution: Red Sea, India, Malaysia, Philippines, Taiwan, China, Japan, Australia, Korea (K. Sakai, 2004).

Habitat: 50–100 m depth (Kim, 1973).

Korea: JJ.

Specimens examined: JJ: 1♂ (Jeju: 30.xi.1983, K.C. Yang).

Remarks: The specimen is deposited at Folklore and Natural History Museum of Jeju.

11. *Hyastenus elongatus* Ortmann, 1893 (Pl. 14)

Park-pul-ge (박뿔게)

Hyastenus diacanthus var. *elongatus* Ortmann, 1893, p. 55.

Hyastenus elongatus: T. Sakai, 1936, p. 96, fig. 43; 1938, p. 281, pl. 36, fig. 6; 1976, p. 226, pl. 77, fig. 2; Kim, 1973, p. 536, pl. 106, fig. 198a–d; Takeda, 1982, p. 126, fig. 371; Griffin and Tranter, 1986, p. 143, figs. 46e–f, 47a, b.

Hyastenus elongatus: Ko, 1997, p. 3, fig. 1 (zoea I).

Adult: Carapace elongate pear-shaped; rostral spines covered with hooked setae, divergent at 50°, approximately 0.3 CL; surface with scattered setae; regions indistinct; gastric and cardiac slightly convex; branchial region without tubercle or spine. Supraorbital eave developed; preorbital angle small, distinct, projecting anteriorly; antorbital lobe weakly projecting; postorbital lobe small, cup-shaped. Basal antennal article not truncate, moderately short, slender, without distal spine on outer margin; pterygostomial region with 3 tubercles. Chelipeds slender, covered with short setae. Ambulatory legs slender, covered with short setae, leg 2 much longer than cheliped. Abdomen 5 somites, somites 4–6 fused in female. CL 31 mm, PCL 21 mm, CW 16 mm.

Zoea I: Carapace with short rostral and long dorsal spines, lateral spines absent. Protopod of antenna spinous with spinules, twice longer than rostral spine; exopod with 2 subterminal setae, approximately equal length of protopod. Endopod of maxillule with 1, 2+4 setae. Endopod of maxilla with 3+2 (5) setae. Maxilliped 1 with 2+2+3+3 (10) setae on basis, endopod with 3, 2, 1, 2, 5 setae, distal segment with 1 plumose subterminal seta. Basis and endopod of maxilliped 2 each with 1+1+1 (3) setae and 0, 1, 5 setae, respectively. Lateral processes on abdominal somite 2. Fork of telson long, with 1 small lateral spine. CL 0.84 mm, RDL 1.20 mm.

Distribution: Red Sea, Maldives, China Sea, Japan (K. Sakai, 2004), Korea.

Habitat: With algae; 20 m depth.

Korea: JJ, GN.

Specimens examined: GN: 1♀ (Busan: 5.v.2009, S.H. Lee); GN: zoeas (Yokjido Island: 22.x.1996, H.S. Ko).

Remarks: Only the first zoeal stage of the species is known.

12. *Hyastenus pleione* (Herbst, 1803) (Fig. 2C, D; Pls. 15, 16)
Gin-pul-ge (긴뿔게)

Cancer pleione Herbst, 1803, p. 52, pl. 58, fig. 5.
Hyastenus pleione: A. Milne-Edwards, 1872, p. 250; Kamita, 1941, p. 74, fig. 34a, b; Tirmizi and Serène, 1971, p. 24, fig. 2, pl. 2, fig. 4; Kim, 1973, p. 538, pl. 103, fig. 199; Griffin and Tranter, 1986, p. 153; Dai and Yang, 1991, p. 142, fig. 72 (2), pl. 16 (7, 8).

Adult: Carapace pear-shaped; rostral spines divergent at 50°, approximately 0.3 CL; surface covered with short dense setae; regions distinct; mesogastric region strongly convex, with 3 (1 large, 2 smaller) tubercles, protogastric region with 1 small tubercle, urogastric region with 1 small tubercle: cardiac region strongly convex; intestinal region slightly convex, with 1 small tubercle; branchial region less convex, with 3 small tubercles, 1 stout spine on lateral margin. Supraorbital eave well developed; preorbital angle distinct, projecting anteriorly; antorbital lobe weakly projecting; postorbital lobe broad cup-shaped, with1 small tubercle behind of it. Basal antennal article not truncate, moderately short, slender, without distal spine on outer margin; pterygostomial region with 2 or 3 prominent tubercles. Chelipeds short, slender, covered with short dense setae; each merus with 3 small tubercles on upper surface; each carpus with 2 small tubercles on upper surface. Ambulatory legs stout, covered with short dense setae, leg 2 much longer than cheliped. Abdomen 6 somites and telson in male, distal part of gonopod 1 gradually tapering. CL 56 mm, PCL 41 mm, CW 38 mm.

Distribution: Pakistan, South India, Singapore, Indonesia, China (K. Sakai, 2004), Korea.
Habitat: Muddy bottom; 10 m depth.
Korea: JN, GG.
Specimens examined: JN: 1♂ (Jindo Island: 26.vii.2013, S.H. Lee).
Remarks: Larvae are unknown.

Genus *Oxypleurodon* Miers, 1886
Se-mo-pul-ge-sok (세모뿔게속)

Carapace triangular, surface with few swollen plates. Rostral spines present. Eye with incomplete orbit; supraorbital eave developed; basal antennal article not truncate, moderately short, slender. Abdomen 6 somites and telson in both sexes.

Species 17 (1 in Korea).

13. *Oxypleurodon stimpsoni* Miers, 1886
Se-mo-pul-ge (세모뿔게)

Oxypleurodon stimpsoni Miers, 1886, p. 38, pl. 6, figs. 1, 1a–c; Richer de Forges and Ng, 2009, p. 251, fig. 7A.
Sphenocarcinus stimpsoni Alcock, 1899c, p. 51; T. Sakai, 1934, p. 294; 1938, p. 286, pl. 29, fig. 3; 1976, p. 203, pl. 72, fig. 1, pl. 73, fig. 1; Kamita, 1941, p. 245; Kim, 1973, pp. 534, 665, pl. 103, fig. 196; Takeda, 1982, p. 121, fig. 357; Miyake, 1983, p. 37, pl. 13, fig. 1.
Rochinia stimpsoni Griffin and Tranter, 1986, p. 187, fig. 63a–b.

Adult: Carapace triangular; rostrum with 2 long, divergent spines; regions distinct by deep grooves, forming swollen plates; postorbital plate fused with hepatic one; branchial plate extending laterally. Chelipeds stout, each merus prismatic, each carpus crested on upper surface. Ambulatory legs not slender, without spine. PCL 16 mm, CW 14 mm (Kim, 1973).

Distribution: Indonesia, Philippines, Japan, Australia, Korea (K. Sakai, 2004).
Habitat: Muddy or sandy bottom: 200–800 m depth (K. Sakai, 2004).
Korea: Collecting site is unknown (T. Sakai, 1938; Kim, 1973).
Remarks: Larve are unknown.

Genus *Pisoides* H. Milne-Edwards and Lucas, 1843
Eo-ri-mul-ma-ji-ge-sok (어리물맞이게속)

Carapace subcircular, dorsal surface with few tubercles. Rostral spines short, broad, fused in basal half. Eye with incomplete orbit; supraorbital eave developed; basal antennal article not truncate, moderately short, slender. Abdomen 6 somites and telson in both sexes.

Species 4 (1 in Korea).

14. *Pisoides bidentatus* (A. Milne-Edwards, 1873)
Eo-ri-mul-ma-ji-ge (어리물맞이게)

Libinia bidentata Milne Edwards A., 1873, p. 253.
Doclea orientalis Miers, 1879, p. 28, pl. 2, fig. 1.
Pisoides bidentatus: Kamita, 1941, p. 76, fig. 35; Kim, 1973, p. 540, fig. 253, pls. 107, 108; T. Sakai, 1976, p. 230, pl. 79, fig. 3; Griffin and Tranter, 1986, p. 174 (list).
Pisoides bidentatus: Kornienko and Korn, 2010 (larval stages).

Adult: Carapace subcircular, dorsal surface covered with tubercles and short setae; rostral spines short, slightly deflexed downwards, with acute tips; regions distinct; gastric region with 7 tuber-

cles of which 3 tubercles on medial line; cardiac region with 2 tubercles; intestinal region slightly convex, with 1 small tubercle; hepatic region with 2 tubercles; branchial region with 9−10 tubercles, of which one prominent on lateral margin. Supraorbital eave developed; preorbital spine blunt; postorbital spine acute, inner surface cup-shaped. Basal antennal article not truncate, short, slender, with 1 proximal tubercle and 1 distal spine on outer margin; pterygostomial region with 3 prominent tubercles. Chelipeds stout in male, short and slender in female. Ambulatory legs long, leg 2 much longer than cheliped. Abdomen 6 somites and telson, distal part of gonopod 1 gradually tapering, tip with 3 lobes. CL 37 mm, CW 30 mm (Kim, 1973).

Zoea I: Carapace with short rostral and long dorsal spines, lateral spines absent. Protopod of antenna spinous with spinules, 3 times longer than rostral spine; exopod with 2 subterminal setae, shorter than protopod. Endopod of maxillule with 1, 4 setae. Endopod of maxilla with 4 setae. Maxilliped 1 with 2+2+2+3 (9) setae on basis, endopod with 3, 2, 1, 2, 5 setae, distal segment 1 spinous subterminal seta. Basis and endopod of maxilliped 2 each with 1+1+1 (3) setae and 0, 1, 4 setae, respectively. Lateral processes on abdominal somite 2. Fork of telson long, with 1 stout lateral spine. CL 0.74 mm, RDL 1.48 mm (Kornienko and Korn, 2010).

Distribution: Vladivostok, Japan, Korea (Kim, 1973).
Habitat: Sand muddy bottom; 100 m depth (Kim, 1973).
Korea: GW, GB (Kim, 1973).
Remarks: This is cold water species.

Genus *Scyra* Dana, 1852

Nap-jak-pul-ge-sok (납작뿔게속)

Carapace pear-shaped, dorsal surface with few tubercles. Rostral spines short, broad, fused in basal half. Eye with incomplete orbit; supraorbital eave developed; basal antennal article not truncate, moderately short, slender. Abdomen 6 somites and telson in both sexes.

Species 3 (1 in Korea).

15. *Scyra compressipes* Stimpson, 1857 (Pls. 17, 18)

Nap-jak-pul-ge (납작뿔게)

Scyra compressipes Stimpson, 1857b, p. 218; T. Sakai, 1938, p. 287, fig. 38; 1976, p. 229, pl. 78, fig. 1; Kim, 1973, p. 538, fig. 252, pl. 53, fig. 200; Takeda, 1982, p. 127, fig. 373; Dai and Yang, 1991, p. 144, pl. 17 (2), fig. 73.
Scyra compressipes: Kim and Hong, 1999 (larval stages).

Adult: Carapace pear-shaped; rostral spines flattened, leaf-shaped, covered with hooked setae, approximately 0.2 CL; regions distinct; gastric region with 4 small tubercles forming diamond-shaped, hooked setae on protogastric region; cardiac region slightly convex, with 1 strong tubercle;

branchial region with 2 tubercles, hooked setae on anterolateral margin, 1 sharp spine on lateral margin. Supraorbital eave developed; preorbital spine small, projecting anteriorly; antorbital lobe projecting; postorbital spine acute, inner surface cup-shaped, fused with hepatic lobe. Basal antennal article not truncate, short, slender, with 1 distal spine on outer margin; pterygostomial region with 4 tubercles. Chelipeds stout, smooth, longer than ambulatory legs; each merus prismatic, upper surface crested with 2 spines, inner surface crested; each carpus with indistinct ridges on upper surface, crested on inner margin; each palm compressed laterally. Ambulatory legs slender, prismatic, with swollen setae on margins. Abdomen 6 somites and telson in male; gonopod 1 stout, straight; tip triangular, with 1 broad lateral and 2 slender medial lobes. CL 30 mm, PCL 24 mm, CW 24 mm.

Zoea I: Carapace with short rostral and long dorsal spines, lateral spines absent. Protopod of antenna spinous with spinules, twice longer than rostral spine; exopod with 2 subterminal setae, shorter than protopod. Endopod of maxillule with 1, 4 setae. Endopod of maxilla with 4 setae. Maxilliped 1 with 2+2+2+3 (9) setae on basis, endopod with 3, 2, 1, 2, 5 setae, distal segment 1 plumose subterminal seta. Basis and endopod of maxilliped 2 each with 1+1+1 (3) setae and 0, 1, 4 setae, respectively. Lateral processes on abdominal somite 2. Fork of telson long, with 1 stout lateral spine. CL 0.69 mm, RDL 1.26 mm.

Distribution: Japan, Korea.
Habitat: Sandy bottom; 20 m depth.
Korea: GW, GN.
Specimens examined: GN: 1♂ (Busan: 16.viii.2012, S.H. Lee); GN: zoeas (Yokjido Island: 22.x.1996, H.S. Ko).

Family Inachidae MacLeay, 1838

A-chae-us-ge-gwa (아케우스게과)

Carapace pear-shaped or subcircular, front narrow. Rostrum bifurcate. Basal antennal article extremely long, slender. Eye without orbit, eyestalk usually long.

Genera 36 (3 in Korea), species over 205 (6 in Korea).
Distribution: Worldwide.

Key to the genera of family Inachidae

1. Carapace pear-shaped ····· 2
− Carapace subcircular ····· *Platymaia*
2. Abdomen 5 somites and telson in both sexes ····· *Achaeus*
− Abdomen 6 somites and telson in both sexes ····· *Pleistacantha*

Key to the zoeas of family Inachidae

1. Rostral carapace spine long; dorsal carapace spine more than CL; endopod of maxillule with 1, 2+4 setae; endopod of maxilla with 5 or 6 setae; lateral processes on abdominal somites 2, 3;

fork of telson with 3 or 4 spines ····· 2
− Rostral carapace spine absent; dorsal carapace spine less than CL; endopod of maxillule with 3 setae; endopod of maxilla with 4 setae; lateral process on abdominal somite 2; fork of telson with 1 spine ····· 3
2. Lateral carapace spine present ····· *Pleistacantha sanctijohannis*
− Lateral carapace spine absent ····· *Platymaia wyvillethomsoni*
3. Dorsal carapace spine slightly shorter than CL, chromatophore present behind of its base ····· *Achaeus japonicus*
− Dorsal carapace spine 1/2 CL, chromatophore present infront of its base ····· *Achaeus tuberculatus*

Genus *Achaeus* Leach, 1817

A-chae-u-s-ge-sok (아케우스게속)

Carapace pear-shaped; rostrum bifurcate, with 2 short blunt spines. Eye without orbit, eyestalk long; basal antennal article long, slender. Ambulatory legs extremely long, slender, subcylindrical, more than 2 CL. Abdomen 5 somites and telson in both sexes.

Species 37 (4 in Korea).

16. *Achaeus japonicus* (De Haan, 1839) (Fig. 2E, F; Pl. 19)

A-chae-u-s-ge (아케우스게)

Inachus (*Achaeus*) *japonicus* De Haan, 1839, p. 99, pl. 29, fig. 3.
Achaeus japonicus: Miers, 1886, p. 9; Kamita, 1941, p. 59, fig. 24a–c; Kim, 1973, p. 517, pl. 50, fig. 185; T. Sakai, 1976, p. 158, pl. 49, fig. 1; Takeda, 1982, p. 113, fig. 331; Miyake, 1983, p. 25, pl. 9, fig. 1; Griffin and Tranter, 1986, p. 10; Dai and Yang, 1991, p. 121, fig. 62, pl. 13 (2).
Achaeus japonicus: Ko, 1996, p. 13, fig. 1 (zoea I).

Adult: Carapace pear-shaped; rostrum separated by U-shaped incision, with 2 short blunt spines; dorsal surface relatively smooth; regions distinct; gastric region strongly convex, hepatic region slightly convex; cardiac and branchial regions strongly convex. Preorbital angle indistinct. Basal antennal article long, slender, with spinules on outer and distal margins. Chelipeds stout, with scattered setae; each merus swollen, with few spinules on inner and outer surfaces proximally, inner surface with row of long setae; carpus swollen, shorter than merus, with few spinules on upper surface, inner margin with long setae; palm swollen, with long setae on lower margin. Ambulatory legs extremely long, slender, with scattered setae; each propodus shorter than half length of each dactylus; leg 1 longest; in legs 3, 4 curved dactyli spinulate on posterior margins. Abdomen 5 somites and telson. Gonopod 1 stout, curved inwards, tip blunt. CL 16 mm, CW 12 mm.

Zoea I: Carapace without rostral and lateral spines, dorsal spine long, less than CL. Protopod of antenna spinous with spinules, approximately equal length of dorsal spine; exopod with 2 medial

setae, shorter than protopod. Endopod of maxillule with 3 setae. Endopod of maxilla with 2+2 (4) setae. Maxilliped 1 with 2+2+2+3 (9) setae on basis, endopod with 3, 2, 1, 2, 5 setae. Maxilliped 2 with 1 seta on basis, endopod with 0, 0, 4 setae. Lateral processes on abdominal somite 2; posterolateral processes long in somites 3–5, longest in somite 5. Fork of telson long, with 1 stout dorsal spine. CL 0.84 mm, RDL 1.11 mm.

Distribution: Japan, Korea (Kim, 1973).
Habitat: With algae; 9 m depth.
Korea: GN, JJ.
Specimens examined: GN: 1♂ (Namhae: 4.v.2011, H.S. Ko); GN: zoeas (Tongyeong: 16.vi. 1996, H.S. Ko).
Remarks: The species always has sponges attached to its dorsal surface.

17. *Achaeus lacertosus* Stimpson, 1857
Ga-si-ima-a-chae-u-s-ge (가시이마아케우스게)

Achaeus lacertosus Stimpson, 1857b, p. 218; T. Sakai, 1976, p. 159, fig. 82; Griffin and Tranter, 1986, p. 5 (key), 10; Tirmizi and Kazmi, 1991, p. 128, figs. 38, 39; Poore, 2004, p. 358, fig. 108b.
Achaeus spinifrons T. Sakai, 1938, p. 212, fig. 6; Kamita, 1941, p. 60, fig. 25; Kim, 1973, p. 518, pl. 100, fig. 186.

Adult: Carapace pear-shaped; rostrum with 2 short blunt spines; rotrum, hepatic region and branchial region bearing spinules on margins; dorsal surface relatively smooth; regions indistinct except strongly swollen branchial and hepatic regions. Eyestalk long. Ambulatory legs extremely long, slender, with scattered setae; each propodus subequal length of each dactylus; legs 3, 4 subequal in length, strongly curved dactyli bearing 7–8 spinules on posterior margins. CL 9 mm, CW 7 mm (Kim, 1973).

Distribution: South Africa, Mozambique, Pakistan, India, Andaman, Singapore, Indonesia, Japan, Australia, Korea (K. Sakai, 2004).
Habitat: 6–90 m depth (Poore, 2004).
Korea: JJ (Kamita, 1941).
Remarks: Larvae are unknown.

18. *Achaeus spinosus* Miers, 1879
Ga-si-a-chae-u-s-ge (가시아케우스게)

Achaeus spinosus Miers, 1879, p. 25; T. Sakai, 1976, p. 162, fig. 85; Miyake, 1983, p. 25, pl. 9, fig. 2; Kim, 1985, p. 78, fig. 3A; Griffin and Tranter, 1986, p. 5 (key).

Adult: Carapace pear-shaped; rostrum with 2 short spines; regions distinct with deep grooves; gastric region strongly convex, with 1 tubercle; hepatic region with 2 tubercles; cardiac region

strongly convex, with 2 tubercles; branchial region strongly convex, with 2 tubercles; intestinal region with 1 tubercle. Eyestalk long, anterior surface and distal margin each with 1 tubercle. Chelipeds stout, with scattered tubercles; fingers as long as palm, 1 longitudinal ridge on upper surface of movable finger and lower surface of immovable one. Ambulatory legs extremely long, slender, surface scattering of long and shorter hooked setae; legs 1, 2 with relatively straight dactyli , in legs 3, 4 curved dactyli bearing 2 rows of 30 spinules on posterior margins. CL 8 mm, CW 5 mm (Kim, 1985).

Distribution: Persian Gulf, Maldives, Japan (K. Sakai, 2004), Korea.
Habitat: 77−187 m depth (K. Sakai, 2004).
Korea: JJ (Kim, 1985).
Remarks: Larvae are unknown.

19. *Achaeus tuberculatus* Miers, 1879

Ga-neun-da-ri-a-chae-u-s-ge (가는다리아케우스게)

Achaeus tuberculatus Miers, 1879, p. 25; Kamita, 1941, p. 61, fig. 26; Kim, 1973, p. 520, pl. 51, fig. 187; T. Sakai, 1976, p. 160, pl. 49, fig. 2; Kim and Chang, 1985, p. 45; Griffin and Tranter, 1986, p. 17; Dai and Yang, 1991, p. 122, pl. 13 (3).
Achaeus tuberculatus: Kurata, 1969 (larval stages).

Adult: Carapace pear-shaped; rostrum separated by U-shaped incision, with 2 short blunt spines; regions distinct; gastric region with 1 tubercle, hepatic region strongly swollen; cardiac region convex, with 1 tubercle. Chelipeds stout, swollen; merus and carpus with few tubercles on upper surfaces. Ambulatory legs extremely long, slender, with scattered setae; each dactylus longer than half length of each propodus; legs 1, 2 with relatively straight dactyli; in legs 3, 4 slightly curved dactyli spinulate on posterior margins. Abdomen of male 5 somites and telson. Gonopod 1 stout; distal part curved inwards, tip blunt. CL 11 mm, CW 9 mm (Kim, 1973).

Zoea I: Carapace without rostral and lateral spines, dorsal spine less than CL. Protopod of antenna spinous with spinules, approximately twice length of dorsal spine; exopod with 2 medial setae, equal length of protopod. Endopod of maxillule with 3 setae. Endopod of maxilla with 2 + 2 (4) setae. Maxilliped 2 with 1 seta on basis, endopod with 0, 0, 4 setae. Lateral processes on abdominal somite 2; posterolateral processes long in somites 3−5, longest in somite 5. Fork of telson long, with 1 short dorsal spine. RDL 0.9 mm (Kurata, 1969).

Distribution: China, Japan, Korea (Kim, 1973).
Habitat: Sand muddy bottom; 20−200 m (Kim, 1973).
Korea: GB, GN, JN (Kim, 1973).

Genus *Platymaia* Miers, 1886

Geo-mi-da-ri-ge-sok (거미다리게속)

Carapace subcircular; rostrum bifurcate, with 2 lateral spines. Eye without orbit, eyestalk short. Basal antennal article long, slender, free distally. Ambulatory legs cylindrical, propodi of legs 2–4 flattened. Abdomen 6 somites and telson in both sexes.

Species 10 (1 in Korea).

20. *Platymaia wyvillethomsoni* Miers, 1886 (Pls. 20–22)

Geo-mi-da-ri-ge (거미다리게)

Platymaia wyvillethomsoni Miers, 1886, p. 13, pl. 2, figs. 1, 1a–e; Kim, 1973, p. 515, pl. 50, fig. 184; Griffin and Tranter, 1986, p. 47, pl. 5b, fig. 10c, d.
Platymaia alcocki (not Rathbun, 1916) Seno and Konno, 1954, p. 85, fig. 1, pl. 2; T. Sakai, 1976, p. 176, fig. 94a, pl. 57; Miyake, 1983, p. 29, pl. 10, fig. 2.
Platymaia wyvillethomsoni: Oh and Ko, 2012 (zoeal stages).

Adult: Carapace subcircular; rostrum with 2 lateral spines, 1 interantennular spine present; dorsal surface with few spines, tubercles, and granules; regions indistinct; gastric region with 4 spines, hepatic region with 2 spines; cardiac region with 2 spines side by side; branchial regions with 2 spines medially, 5–6 spines along anterolateral margin; posterior margin with 2 tubercles. Postorbital spine present. Basal antennal article long, slender, movable, with spinules on outer margin. Chelipeds slender, much shorter than ambulatory legs, covered with spines; each merus with long setae on inner margin; each palm swollen. Ambulatory legs extremely long, slender; leg 1 covered with short spines, each merus and propodus with longer spines along inner margins; in legs 2, 3 meri with spinules along inner margins; in legs 2–4 propodi flat, with row of long setae on inner margins. Abdomen 6 somites and telson in male; somite 1 with 3 spines on surface. Gonopod 1 long, curved outwards, tip spoon-shaped. CL 32 mm, CW 35 mm.

Zoea I: Carapace with long rostral and dorsal spines, both more than 1.5 CL, lateral spine absent. Protopod of antenna spinous with spinules, approximately half length of rostral spine; exopod with 2 subterminal setae, shorter than protopod. Endopod of maxillule with 1, 2+4 setae. Endopod of maxilla with 3+2 (5) setae. Maxilliped 1 with 2+2+2+3 (9) setae on basis, endopod with 3, 2, 1, 2, 5 setae. Maxilliped 2 with 1+1+1 (3) setae on basis, endopod with 0, 1, 4 setae. Lateral processes on abdominal somites 2, 3. Fork of telson short, with 1 stout lateral, 2 dorsal spines. CL 1.46 mm, RDL 5.62 mm.

Distribution: Admiralty Islands, East China Sea, Philippines, Japan, Korea (K. Sakai, 2004).
Habitat: Sand muddy bottom; 30–90 m depths.
Korea: GN.
Specimens examined: GN: 1♂ (Busan: 6.viii.2012, H.S. Ko), zoeas (Busan: 1.vi.2007, H.S. Ko).

Genus *Pleistacantha* Miers, 1879

Sam-cheon-ga-si-ge-sok (삼천가시게속)

Carapace pear-shaped; rostrum bifurcate. Eye without orbit, eyestalk short. Basal antennal article long, slender, free distally. Ambulatory legs long, slender. Abdomen 6 somites and telson in both sexes.

Species 14 (1 in Korea).

21. *Pleistacantha sanctijohannis* Miers, 1879

Sam-cheon-ga-si-ge (삼천가시게)

Pleistacantha sancti-johannis Miers, 1879, p. 24, pl. 1, fig. 1; T. Sakai, 1938, p. 233, pl. 23, fig. 1.
Pleistacantha sanctijohannis: Kim and Park, 1972, p. 61, fig. 6A–C, pl. 1, fig. 5; Kim, 1973, p. 513, pl. 100, fig. 183; T. Sakai, 1976, p. 172, pl. 53, fig. 2; Miyake, 1983, p. 26, pl. 9, fig. 5; Kim and Chang, 1985, p. 45; Griffin and Tranter, 1986, p. 52.
Pleistacantha sanctijohannis: Kurata, 1969, p. 93, fig. 6 (zoea I).

Adult: Carapace pear-shaped; rostrum bifurcated distally; dorsal surface covered with few spines and numerous spinules; regions distinct; gastric region with 4 spines; hepatic region with 1 spine; cardiac and intestinal regions each with 2 spines; branchial regions with 2 spines medially, 3 spines along anterolateral margin. Postorbital spine present. Basal antennal article long, slender, movable, with spinules proximally. Chelipeds stout, much shorter than ambulatory legs, covered with spines. Ambulatory legs extremely long, slender, with short spines, each merus and propodus with long setae. Abdomen 6 somites and telson in male. Gonopod 1 long, curved outwards. CL 19 mm, CW 19 mm (Kim, 1973).

Zoea I: Carapace with long rostral and dorsal spines, rostral spine less than 1 CL, dorsal spine more than 1 CL, lateral spine present. Protopod of antenna spinous with spinules, approximately equal length of rostral spine; exopod with 2 subterminal setae, shorter than protopod. Endopod of maxillule with 1, 2 + 4 setae. Endopod of maxilla with 6 setae. Endopod of maxilliped 2 with 0, 1, 5 (6) setae. Lateral processes on abdominal somites 2, 3. Fork of telson short, with 1 stout lateral, 2 (3) dorsal spines. RDL 2.15 mm (Kurata, 1969).

Distribution: Philippines, China, Japan, Korea (K. Sakai, 2004).
Habitat: Sand muddy bottom; 50 m depth (Kim, 1973).
Korea: JJ (Kim, 1973).

Family Inachoididae Dana, 1851

Han-ppul-du-deu-reok-ge-gwa (한뿔두드럭게과)

Carapace pear-shaped. Rostrum single. Outer lateral parts of pleurites 5–8 extending beyond side of carapace. Basal antennal article long, slender. Eye without orbit, eyestalk relatively long. Abdomen 5 somites and telson in male.

Genera 10 (1 in Korea), species over 38 (1 in Korea).
Distribution: Worldwide.

Genus *Pyromaia* Stimpson, 1871

Han-ppul-du-deu-reok-ge-sok (한뿔두드럭게속)

Carapace pear-shaped; rostrum single. Outer lateral parts of pleurites 5–8 extending beyond side of carapace. Postorbital spine curving around eye. Eye without orbit, eyestalk relatively long. Basal antennal article long, slender. Ambulatory legs long, slender, subcylindrical. Abdomen 5 somites and telson in both sexes.

Species 6 (1 in Korea).

22. *Pyromaia tuberculata* (Lockington, 1877) (Pls. 23, 24)

Han-ppul-du-deu-reok-ge (한뿔두드럭게)

Inachus tuberculatus Lockington, 1877, p. 30.
Inachoides tuberculatus: Schmitt, 1921, p. 199, fig. 123a–b.
Pyromaia tuberculata: Rathbun, 1925, p. 133, pl. 40, fig. 3, pl. 218, figs. 1–4; T. Sakai, 1976, p. 168, fig. 92a, b, pl. 51, fig. 2; Takeda, 1982, p. 114, pl. 336; Kim, 1985, p. 78; Jensen, 1995, p. 25, fig. 27; Poore, 2004, p. 366, fig. 110, pl. 20c.
Pyromaia tuberculata: Oh and Ko, 2010a.

Adult: Carapace pear-shaped; rostrum single; dorsal surface with tubercles, cardiac tubercle prominent; regions distinct. Outer lateral parts of pleurites 5–8 extending beyond side of carapace. Postorbital spine acute, tip projecting anteriorly. Basal antennal article long, slender, with 1 strong spine on outer margin, 1 longitudinal row of minute tubercles on ventral surface. Chelipeds short, stout; each merus and carpus with tubercles on inner and outer margins; each palm covered with minute tubercles. Ambulatory legs long, slender, subcylindrical, with scattered setae; leg 1 longest, in legs 2–4 curved dactyli spinulate on posterior margins. Abdomen 5 somites and telson, somite 1 with 1 acute spine on surface. Gonopod 1 slender, straight, tip blunt. CL 11 mm, CW 8 mm.

Zoea I: Carapace without rostral and lateral spines, dorsal spine less than CL. Protopod of antenna spinous without spinules, approximately equal length of dorsal spine; exopod with 2 medial

setae, shorter than protopod. Endopod of maxillule with 4 setae. Endopod of maxilla with 3 setae. Maxilliped 1 with 2+2+2+3 (9) setae on basis, endopod with 3, 2, 1, 2, 5 setae. Maxilliped 2 with 1+1+1 (3) setae on basis, endopod with 1, 4 setae. Lateral processes on abdominal somite 2 projecting anteriorly. Fork of telson long, with 1 stout dorsal spine. CL 0.71 mm.

Distribution: Eastern Pacific, Japan, Western Australia (Poore, 2004), Korea.
Habitat: Muddy bottom; 6 m depth.
Korea: GB, GN.
Specimens examined: GB: 1♂ (Youngdeok: 6.ix.2012, S.H. Lee); GN: zoeas (Gijang: 15.ix.2005, H.S. Ko).
Remarks: This species is originally from Pacific coast of America. In Korean waters it was found for the first time at Uljin (GB) in 1982 (Kim, 1985).

Family Majidae Samouelle, 1819

Mul-ma-ji-ge-gwa (물맞이게과)

Supraorbital eave and postorbital lobe present. Eye with complete orbit formed by eave and spines, eyestalk of variable length. Basal antennal article broad. Two subfamilies (Majinae and Mithracinae) in Korea.

Genera 48 (6 in Korea), species over 207 (12 in Korea).
Distribution: Worldwide.

Key to the genera of family Majiidae

1. Basal antennal article broad, not expanding to form floor of orbit ····· 2 (Subfamily Majinae)
− Basal antennal article extremely broad, expanding to form floor of orbit ····· *Micippa* (Subfamily Mithracinae)
2. More than 2/3 length of eyestalk exposed in dorsal view ····· *Pseudomicippe*
− Half length of eyestalk exposed in dorsal view ····· 3
3. Antennal flagellum arising within orbit ····· *Maja*
− Antennal flagellum excluded from orbit by basal antennal article process ····· 4
4. Preorbital angle of eave smooth, rounded ····· *Leptomithrax*
− Preorbital angle of eave produced as spine or tubercle ····· 5
5. Rostral spines long, tips blunt ····· *Prismatopus*
− Rostral spines short, tips acute ····· *Entomonyx*

Key to the zoeas of family Majidae

Rostral carapace spine short, less than 1/2 CL, or rarely absent; dorsal carapace spine usually less than 1/2 CL or absent; lateral carapace spine absent; antennal endopod bud present, exopod with 2 subterminal or 2 medial setae; endopod of maxillule with 1, 2+4 setae, rarely 1, 4 setae; endopod and basis of maxilliped with 3, 2, 1, 2, 5 and 2+2+2 (rarely 3)+3 setae; basis of maxilliped 2 with 1+1+1 setae; lateral processes on abdominal somite 2 or somites 2, 3; fork of telson with 1 lateral spine.

1. Rostral carapace spine absent ····· *Pseudomicippe okamotoi*
− Rorsal carapace spine present ····· 2
2. Dorsal carapace spine absent ····· 3
− Dorsal carapace spine present ····· 4
3. Antennal exopod longer than that of antennal protopod ····· *Micippa thalia*
− Antennal exopod shorter than that of antennal protopod ····· *Micippa philyra*
4. Lateral processes on abdominal somites 2, 3 ····· *Maja spinigera*
− Lateral processes on abdominal somite 2 ····· 5
5. Endopod of maxilliped 2 with 0, 1, 6 setae ····· *Leptomithrax bifidus*
− Endopod of maxilliped 2 with 0, 7 setae ····· *Leptomithrax edwardsii*

Subfamily Majinae Samouelle, 1819

Mul-ma-ji-ge-a-gwa (물맞이게아과)

Eye with complete orbit formed by supraorbital eave and antorbital, postorbital, or intercalated spines. Basal antennal article broad, not expanding to form floor of orbit.

Genera 28 (5 in Korea), species over 97 (8 in Korea).
Distribution: Worldwide.

Genus *Entomonyx* Miers, 1884

Ga-si-pul-ge-sok (가시뿔게속)

Rostrum with 2 short spines, tips acute. Intercalated spine absent. Distal half length of eyestalk exposed in dorsal view. Orbit closed ventrally. Flagellum of antenna excluded from orbit.

Species 1 (1 in Korea).

23. *Entomonyx spinosus* Miers, 1884

Ga-si-pul-ge (가시뿔게)

Entomonyx spinosus Miers, 1884, p. 526, pl. 47, fig. B; Kim, 1973, p. 545, fig. 256, pls. 111, 112, fig. 105a−c; T. Sakai, 1976, p. 253, pl. 87, fig. 2; Takeda, 1982, p. 131, fig. 387; Kim and Chang, 1985, p. 49; Griffin and Tranter, 1986, p. 205.

Adult: Carapace pear-shaped: dorsal surface covered with small granules and hooked setae; rostral spines acute, V- shaped, approximately 0.2 CL; regions distinct; gastric region with 2 blunt spines on medial line; cardiac region with 2 spines side by side; hepatic region with 3 tubercles on

lateral margin; branchial region with 2 long marginal spines; intestinal region with 2 small spines. Supraorbital eave developed, forming tubular orbit, with 3 (2 preorbital, 1 antorbital) spines. Postorbital spines present. Intercalated spine absent. Distal half length of eyestalk exposed in dorsal view. Eye with complete orbit. Basal antennal article broad, not expanding to form floor of orbit; outer margin expanded, with 1 proximal and 2 distal spines. Chelipeds of male stout, covered with small granules; each merus with 6–7 tubercles on upper margin, 5–6 tubercles on lower margin. Ambulatory legs slender, covered with hooked setae; each merus with 1 distal spine on anterior margin. Abdomen 6 somites and telson in both sexes; gonopod 1 slender, straight, distal part curved. PCL 22 mm, CW 17 mm excluding spine (Kim, 1973).

Distribution: Red Sea, Mozambique, Seychelles, Maldives, Andaman Sea, East China Sea, Japan, Western Australia, Korea (K. Sakai, 2004).
Habitat: Muddy or sand muddy bottom; 60–100 m depth (Kim, 1973).
Korea: JJ (Kim, 1973).
Remarks: Larvae are unknown.

Genus *Leptomithrax* Miers, 1876

Du-deu-reok-ge-sok (두드럭게속)

Rostrum with 2 spines. Preorbital angle of eave smooth, rounded. Intercalated spine present. Distal half length of eyestalk exposed in dorsal view. Eye with complete orbit; orbit open ventrally. Basal antennal article broad, not expanding to form floor of orbit. Flagellum of antenna excluded from orbit.

Species 14 (2 in Korea).

24. *Leptomithrax bifidus* (Ortmann, 1893) (Pl. 25)

Ga-si-du-deu-reok-ge (가시두드럭게)

Paramithrax (*Leptomithrax*) *bifidus* Ortmann, 1893, p. 52, pl. 3, fig. 6.
Leptomithrax bifidus: T. Sakai, 1934, p. 298; 1976, p. 243, pl. 87, fig. 1; Kim, 1973, p. 549, pl. 54, fig. 207a–b; Takeda, 1982, p. 129, fig. 381; Kim and Chang, 1985, p. 49; Griffin and Tranter, 1986, p. 209.
Leptomithrax bifidus: Terada, 1981b (zoeal stages).

Adult: Carapace subtriangular; dorsal surface covered with tubercles and hooked setae; rostrum with 2 spines, which divergent at 50°, covered with hooked setae, approximately 0.2 CL; regions distinct by grooves; gastric region convex, with 2 spines in medial line; cardiac region convex, with 2 spines side by side; hepatic region with 2 lateral (1 large, 1 smaller) spines; branchial region with 4 (3 marginal, 1 mesobranchial) spines; posterior margin minutely tuberculate, 2 spines medially.

Supraorbital eave well developed; preorbital angle of eave smooth, rounded; antorbital and intercalated spines present; postorbital spine strong, tip bifid. Distal half length of eyestalk exposed in dorsal view; eye with complete orbit. Basal antennal article broad, not expanding to form floor of orbit, inner and outer margins each with 1 strong distal spine. Chelipeds slender; each merus and carpus covered with acute tubercles; each palm smooth. Ambulatory legs cylindrical, scattering of long setae. Abdomen 6 somites and telson in both sexes. Gonopod 1 long, slender, distal part curved outwards; tip with short setae. CL 32 mm, PCL 25 mm, CW 24 mm.

Zoea I: Carapace with short rostral spine, dorsal spine less than 1/2 CL, lateral spines absent. Protopod of antenna spinous without spinules, approximately 3 times longer than rostral spine; exopod with 2 subterminal setae, slightly shorter than protopod. Endopod of maxillule with 1, 2+4 setae. Endopod of maxilla with 3+2 (5) setae. Maxilliped 1 with 2+2+2+3 (9) setae on basis, endopod with 3, 2, 1, 2, 5 setae. Maxilliped 2 with 1+1+1 (3) setae on basis, endopod with 0, 1, 6 setae. Lateral processes on abdominal somite 2. Fork of telson relatively long, with 3 (1 stout, 2 smaller) dorsal spines. CL 0.68 mm, RDL 0.88 mm (Terada, 1981b).

Distribution: Japan, Korea (Kim, 1973).
Habitat: Muddy bottom; 50−150 m depth (Kim, 1973).
Korea: GN, JJ.
Specimens examined: GN: 1♂ (Namhae: 4.v.2011, K.H. Lee).

25. *Leptomithrax edwardsii* (De Haan, 1835) (Figs. 1A, 3A, 3B, 4; Pls. 26, 27)
Du-deu-reok-ge (두드럭게)

Maja (*Paramithrax*) *edwardsii* De Haan, 1835, p. 92, pl. G.
Paramithrax edwardsi: Adams and White, 1848, p. 14.
Paramithrax (*Leptomithrax*) *edwardsi*: Ortmann, 1893, p. 52.
Leptomithrax edwardsi: Kamita, 1941, p. 78, fig. 36; Kim, 1973, p. 547, pl. 54, fig. 206; T. Sakai, 1976, p. 242, pl. 86; Miyake, 1983, p. 47, pl. 16, fig. 3; Kim and Chang, 1985, p. 49; Griffin and Tranter, 1986, p. 210.
Leptomithrax edwardsii: T. Sakai, 1935, p. 66; Takeda, 1982, p. 129, fig. 380.
Leptomithrax edwardsii: Kang et al., 2012 (zoeal stages).

Adult: Carapace subcircular: dorsal surface covered with small tubercles and short setae; rostrum with 2 short subparalled spines, approximately 0.1 CL; regions distinct by grooves; gastric region convex, 2 spines in medial line; cardiac region slightly convex, 2 tubercles side by side; hepatic region with 2 lateral (1 large, 1 smaller) spines on margin; branchial region with 4 (3 marginal, 1 mesobranchial) spines; intestinal region with 3 prominent tubercles, posterior margin minutely tuberculate, with 2 small spines medially. Supraorbital eave well developed; preorbital angle of eave smooth, rounded; antorbital and intercalated spines present; postorbital spine strong, triangular. Distal half length of eyestalk exposed in dorsal view. Eye with complete orbit. Basal antennal article broad, not forming floor of orbit, inner and outer margins each with 1 strong distal spine. Chelipeds shorter than ambulatory leg 1; each merus and carpus covered with acute tubercles; each palm and finger smooth. Ambulatory legs cylindrical, scattering of short setae; each dacty-

lus smooth, strongly curved. Abdomen 6 somites and telson in both sexes. Gonopod 1 long, distal part strongly curved outwards; tip slender, short setae on outer margin. CL 62 mm, PCL 56 mm, CW 51 mm.

Zoea I: Carapace with short rostral spine, dorsal spine less than 1/2 CL, lateral spines absent. Protopod of antenna spinous without spinules, approximately twice longer than rostral spine; exopod with 2 subterminal setae, shorter than protopod. Endopod of maxillule with 1, 2+4 setae. Endopod of maxilla with 3+2 (5) setae. Maxilliped 1 with 2+2+2+3 (9) setae on basis, endopod with 3, 2, 1, 2, 5 setae. Maxilliped 2 with 1+1+1 (3) setae on basis, endopod with 0, 7 setae. Lateral processes on abdominal somite 2. Fork of telson long, with 3 (1 stout, 2 smaller) lateral spines. CL 1.11 mm, RDL 1.56 mm.

Distribution: Japan, East China Sea, Korea (K. Sakai, 2004).
Habitat: Sandy or sand muddy bottom; 50–150 m depth (Kim, 1973).
Korea: GN, JJ.
Specimens examined: GN: 1♂ (Busan: 23.x.2008 H.S. Ko), zoeas (Busan: 30.xii.2011, H.S. Ko).

Genus *Maja* Lamarck, 1801

Teol-da-ri-ge-sok (털다리게속)

Carapace covered with spines or tubercles. Rostrum with 2 spines. Preorbital angle of eave smooth. Intercalated spine present. Distal half length of eyestalk exposed in dorsal view. Eye with complete orbit. Orbit open ventrally. Basal antennal article broad, not expanding to form floor of orbit. Flagellum of antenna arising from within orbit. Male chelipeds smooth on each carpus and propodus.

Species 19 (2 in Korea).

26. *Maja miersii* Walker, 1887

Ae-gi-teol-da-ri-ge (애기털다리게)

Maia miersii Walker, 1887, p. 113, pl. 6, figs. 1–3.
Maja miersii: T. Sakai, 1938, p. 298, pl. 38, fig. 2; 1976, p. 237, pl. 82, fig. 3; Kim, 1973, p. 544; Miyake, 1983, p. 47, pl. 16, fig. 1; Griffin and Tranter, 1986, p. 217.
Maja miersi: Kim and Chang, 1985, p. 49.

Adult: Dorsal surface of carapace covered with small tubercles; rostrum with 2 short divergent spines, with marginal setae; gastric and cardiac regions each with 1 spine in medial line; hepatic margin with 1 short spine; branchial margin with 4 short spines; posterior margin without spine. Preorbital spine absent; antorbital spine present; postorbital spine prominent. Ambulatory legs without distal spine on each merus. CL 32 mm, CW 25 mm (Kim, 1973).

Distribution: Singapore, Philippines, Japan, Australia, Korea (K. Sakai, 2004).
Habitat: 10−148 m depth (K. Sakai, 2004).
Korea: JJ (Kim, 1973).
Remarks: Larvae are unknown.

27. *Maja spinigera* (De Haan, 1837) (Pls. 28, 29)
Teol-da-ri-ge (털다리게)

Pisa (*Paramaya*) *spinigera* De Haan, 1837, pl. 24, fig. 4.
Maja (*Maja*) *spinigera* De Haan, 1839, p. 93, pl. G.
Maja spinigera: T. Sakai, 1938, p. 297, pl. 30, fig. 1; 1976, p. 237, pl. 83; Kim, 1973, p. 542, pl. 109, fig. 202; Takeda, 1982, p. 128, fig. 377; Miyake, 1983, p. 43, pl. 15, fig. 4; Kim and Chang, 1985, p. 49; Dai and Yang, 1991, p. 151, pl. 18 (3).
Maja spinigera: Terada, 1981b (zoeal stages).

Adult: Carapace pear-shaped; dorsal surface covered with tubercles and setae; rostrum with 2 long cylindrical spines, divergent at 30°, approximately 0.2 CL; regions indistinct; gastric region with 3 spines in medial line; cardiac and intestinal regions each with 1 spine; hepatic region with 1 long spine on margin; branchial region with 1 short medial and 5 (3 long, 2 shorter) marginal spines; posterior margin tuberculate, with 2 short spines medially. Supraorbital eave well developed; preorbital angle of eave smooth, rounded; antorbital spine with blunt tip, intercalated spine present, sharp; postorbital spine long, sharp. Distal half length of eyestalk exposed in dorsal view. Eye with complete orbit. Basal antennal article broad, not forming floor of orbit, with 3 (1 short proximal, 2 longer distal) spines on outer margin. Chelipeds slender, smooth, subcylindrical, shorter than ambulatory leg 1. Ambulatory legs long, cylindrical, covered with soft long setae; each merus with 1 distal spine on upper margin. Abdomen 6 somites and telson in both sexes. Gonopod 1 long, distal part strongly curved outwards; tip blunt. CL 64 mm, PCL 49 mm, CW 52 mm.

Zoea I: Carapace with short rostral spine, dorsal spines less than 1/2 CL, lateral spines absent. Protopod of antenna spinous without spinules, approximately twice longer than rostral spine; exopod with 2 subterminal setae, shorter than protopod. Endopod of maxillule with 1, 2+4 setae. Endopod of maxilla with 3+2 (5) setae. Maxilliped 1 with 2+2+2+3 (9) setae on basis, endopod with 3, 2, 1, 2, 5 setae. Maxilliped 2 with 1+1+1 (3) setae on basis, endopod with 0, 1, 6 setae. Lateral processes on abdominal somites 2, 3. Fork of telson long, with 3 (1 stout, 2 smaller) lateral spines. CL 0.91 mm, RDL 1.26 mm (Terada, 1981b).

Distribution: Pakistan, Taiwan, Japan, Korea (K. Sakai, 2004).
Habitat: Muddy bottom; 30 m depth (Kim, 1973).
Korea: JJ.
Specimens examined: JJ: 1♂ (Jeju: 30.vi.1982, J.J. Lee).
Remarks: The specimen is deposited at Folklore and Natural History Museum of Jeju.

Genus *Prismatopus* Ward, 1933

Moong-tuk-ga-si-pul-ge-sok (뭉툭가시뿔게속)

Rostrum with 2 spines, tips blunt. Preorbital angle of eave produced as spine or tubercle. Half length of eyestalk exposed in dorsal view. Eye with complete orbit. Basal antennal article not expanding to form floor of orbit. Flagellum of antenna excluded from orbit. Male chelipeds with longitudinal ridges or crests on each meus and carpus.

Species 12 (1 in Korea).

28. *Prismatopus longispinus* (De Haan, 1839) (Pl. 30)

Moong-tuk-ga-si-pul-ge (뭉툭가시뿔게)

Maja (*Chorinus*) *longispina* De Haan, 1839, p. 94, pl. G.
Chlorinoides longispinus: Miers, 1886, p. 53; Kim, 1973, p. 544, pl. 110, fig. 204a, b; T. Sakai, 1976, p. 249, pl. 88, fig. 3; Takeda, 1982, p. 130, fig. 384; Miyake, 1983, p. 26; Kim and Chang, 1985, p. 49.
Acanthophrys longispinus: Balss, 1924b, p. 29; T. Sakai, 1938, p. 308, pl. 31, fig. 2; Kim, 1970, p. 25.
Thacanophrys longispinus: Griffin and Tranter, 1986, p. 258.
Prismatopus longispinus: Ng et al., 2008, p. 118 (list).
Chlorinoides longispinus: Terada, 1981b (zoeal stages).

Adult: Carapace pear-shaped; dorsal surface covered with hooked setae; rostrum with 2 blunt spines, divergent at 90°, approximately 0.1 CL; regions indistinct; gastric region with 2 blunt spines in medial line; cardiac region 2 blunt spines side by side, fused on their base; intestinal regions with 2 blunt spines in medial line; hepatic region with 2 short blunt spines on margin; branchial region with 2 (1 lateral, 1 marginal) blunt spines. Supraorbital eave well developed, with 3 (2 preorbital, 1 antorbital) spines; intercalated spine short, sharp; postorbital lobe long, tip bifid. Basal antennal article broad, not forming floor to orbit, with 3 (1 proximal, 2 distal) spines on outer margin. Distal half length of eyestalk exposed in dorsal view. Eye with complete orbit. Chelipeds relatively slender; merus crested on upper and lower margins, with 4–5 denticles; carpus and palm crested. Ambulatory legs covered with long hooked setae; each merus with 1 distal spine on upper margin. CL 26 mm, PCL 24 mm, CW 21 mm excluding carapace spine.

Zoea I: Carapace with short rostral spine, lateral and dorsal spines absent. Protopod of antenna spinous without spinules, approximately twice longer than rostral spine; exopod with 2 subterminal setae, slightly shorter than protopod. Lateral processes on abdominal somite 2. Fork of telson short, with 3 (1 stout, 2 smaller) lateral spines. CL 1.34 mm (Terada, 1981b).

Distribution: Mozambique, India, Andaman Sea, Indonesia, Philippines, Taiwan, Japan, Australia, Korea (K. Sakai, 2004).
Habitat: Rocky bottom; 10–30 m depth (Kim, 1973).
Korea: JJ.
Specimens examined: JJ: 1♀ (Jeju: 30.vi.1982, J.J. Lee).

Remarks: Terada (1981b) did not describe the number of setae on the zoeal mouthpart appendages (the maxillule, maxilla, and maxillipeds) for this species. The specimen is deposited at Folklore and Natural History Museum of Jeju.

Genus *Pseudomicippe* Heller, 1861

Eo-ri-nu-deok-ot-ge-sok (어리누덕옷게속)

Rostrum with 2 spines. Preorbital angle of eave produced as spine. Intercalated spine absent. More than 2/3 length of eyestalk exposed in dorsal view. Eye with complete orbit. Basal antennal article not expanding to form floor of orbit. Flagellum of antenna excluded from orbit.

Species 13 (2 in Korea).

29. *Pseudomicippe nipponica* (T. Sakai, 1938) (Pl. 31)

Je-ju-eo-ri-nu-deok-ot-ge (제주어리누덕옷게)

Pseudomicippe tenuipes (not A. Milne-Edwards, 1865) Balss, 1924, p. 35, pl. 1, fig. 6; T. Sakai, 1936, p. 84, pl. 20, fig. 1.
Zewa nipponica T. Sakai, 1938, p. 244, fig. 22a–d, pl. 25, fig. 1; 1976, p. 188, figs. 99, 100a.
Pseudomicippe nipponica: Griffin and Tranter, 1986, p. 234, fig. 87b; Lee and Ko, 2013, p. 132, figs. 3, 4.
Zewa nipponica: Suzuki, 1979 (larval stages).

Adult: Carapace pear-shaped; dorsal surface covered with tubercles and hooked setae; rostrum with 2 spines, divergent at 90°, distal part strongly deflexed downwards, covered with hooked setae, approximately 0.1 CL; regions distinct; gastric region convex, with 4 tubercles in medial line; cardiac region with 4 tubercles; intestinal region with 3 (1 large, 2 smaller) tubercles; hepatic region with 3 spines on margin; branchial region with several tubercles including 2 or 3 marginal ones. Supraorbital eave well developed; preorbital angle of eave without spine; antorbital spine with 1 small accessory spinule, intercalated spine absent; postorbital spine present. Eyestalk slender, with more than 2/3 length exposed in dorsal view. Eye with complete orbit. Basal antennal article broad, not forming floor of orbit, 1 distal spine on outer margin; flagellum excluded from orbit. Chelipeds slender, shorter than ambulatory leg 1; each merus with 1 proximal tubercle. Ambulatory legs covered with long and hooked setae; each dactylus spinulated on posterior margin, tip strongly curved. CL 28 mm, PCL 25 mm, CW 21 mm.

Zoea I: Carapace without rostral, dorsal, and lateral spines. Protopod of antenna spinous with spinules; exopod with 2 subterminal setae, slightly shorter than protopod. Endopod of maxillule with 1, 4 setae. Endopod of maxilla with 3 + 2 (5) setae. Maxilliped 1 with 2, 2, 2, 3 (9) setae on basis, endopod with 3, 2, 1, 2, 5 setae. Maxilliped 2 with 1 + 1 + 1 (3) setae on basis, endopod with 0, 1, 6 setae. Lateral processes on abdominal somite 2. Fork of telson long, with 1 stout lateral spine. CL 0.91 mm (Suzuki, 1979).

Distribution: Japan (Griffin and Tranter, 1986), Korea.
Habitat: With brown algae on rocky bottom; intertidal pool.
Korea: JJ.
Specimens examined: JJ: 1♀ (Seongsanpo: 24.vii.2010, K.H. Lee).

30. *Pseudomicippe okamotoi* (T. Sakai, 1938) (Pl. 32)
Eo-ri-nu-deok-ot-ge (어리누덕옷게)

Zewa okamotoi T. Sakai, 1938, p. 246, fig. 23a–c, pl. 36, fig. 1; 1976, p. 189, fig. 100b; Kim, 1970, p. 24, pl. 5, fig. 1; 1973, p. 527, fig. 246, pl. 103, fig. 192a, b; Kim and Chang, 1985, p. 45.
Pseudomicippe okamotoi: Griffin and Tranter, 1986, p. 226 (key).

Adult: Carapace elongate pear-shaped; dorsal surface covered with hooked setae; rostrum with 2 spines, which divergent at 60°, covered with hooked setae, approximately 0.1 CL; regions distinct; gastric region convex, with 5 tubercles in medial line, each side with 2 small tubercles; cardiac region with 4 tubercles; intestinal region with 5 (1 large, 4 smaller) tubercles; hepatic region with 10 tubercles; branchial region with 16–18 tubercles including 3 larger marginal tubercles. Supraorbital eave well developed; preorbital angle without spine; antorbital spine present; postorbital spine broad, with acute tip. Eyestalk slender, with more than 2/3 length exposed in dorsal view. Eye with complete orbit. Basal antennal article with 1 long distal spine on outer margin. Chelipeds stout; each merus cylindrical, 2–5 tubercles on upper margin; each palm smooth. Ambulatory legs slender, with long setae. Abdomen 6 somites and telson in both sexes. Gonopod 1 relatively long; distal part slender, with 1 small lobe subterminally. CL 23 mm, PCL 15 mm, CW 12 mm.

Distribution: Japan, Korea.
Habitat: Rocky bottom with algae; intertidal-20 m (Kim, 1973).
Korea: GN, JJ.
Specimens examined: JJ: 1♂ (Jeju: 30.x.1985, K.C. Yang).
Remarks: Larvae are unknown. A crab of the species was collected in Yokjido Island (GN) by the first author in 2001. The specimen is deposited at Folklore and Natural History Museum of Jeju.

Subfamily Mithracinae MacLeay, 1838
Nu-deok-ot-ge-a-gwa (누덕옷게아과)

Carapace broad anteriorly, dorsal surface covered with dense setae. Eye with complete orbit, formed by supraorbital eave and antorbital, postorbital, and intercalated spines. Basal antennal article extremely broad, expanding to form floor of orbit.

Genera 17 (1 in Korea), species over 105 (4 in Korea).
Distribution: Worldwide.

Genus *Micippa* Leach, 1817

Nu-deok-ot-ge-sok (누덕옷게속)

Carapace subquadrate. Rostrum broad, deflexed, fused for proximal 2/3. Eye with complete orbit. Basal antennal article extremely broad, expanding to form floor of orbit.

Species 10 (4 in Korea).

31. *Micippa cristata* (Linnaeus, 1758)

Ga-si-nu-deok-ot-ge (가시누덕옷게)

Cancer cristatus Linnaeus, 1758, p. 629.
Micippa cristata granulipes (not Zehntner, 1894): T. Sakai, 1932, p. 51, fig. 6; 1938, p. 313; 1976, p. 255, figs. 136, 137a; Kamita, 1941, p. 81; Kim, 1973, p. 553, fig. 261.
Micippa cristata: Adams and White, 1848: 16; Takeda, 1973, p. 110, fig. 4E, pl. 3, fig. D; Griffin and Tranter, 1986, p. 275; Ng et al., 2008, p. 119 (list); K. Sakai, 2004.

Adult: Dorsal surface of carapace covered with tubercles, scattering of sharp spines. Rostrum deflexed downwards at 90°, its tip divided into 2 lobes, each lobe with 4–5 spines on outer margin. Chelipeds with granules on each merus, carpus, and palm; wide gap present proximally when fingers closed. Ambulatory legs cylindrical, each carpus with 1 longitudinal groove on upper surface. CL 40 mm, CW 34 mm (Kim, 1973).

Distribution: Indonesia, Philippines, Palau, Japan, Korea (K. Sakai, 2004).
Habitat: Unknown.
Korea: JJ (T. Sakai, 1938).
Remarks: Larvae are unknown.

32. *Micippa philyra* (Herbst, 1803) (Fig. 3C, 3D; Pls. 33–35)

Kko-ma-nu-deok-ot-ge (꼬마누덕옷게)

Cancer philyra Herbst, 1803, p. 51, pl. 58, fig. 4.
Micippa philyra: H. Milne-Edwards, 1834, p. 330; T. Sakai, 1938, p. 315, fig. 45, pl. 38, fig. 6; 1976, p. 257, fig. 138a, a′, pl. 90, fig. 3; Kamita, 1941, p. 79, fig. 37a–d; Kim, 1973, p. 552, pl. 112, fig. 209; Takeda, 1982, p. 132, fig. 389; Miyake, 1983, p. 50, pl. 17, fig. 4; Kim and Chang, 1985, p. 49; Griffin and Tranter, 1986, p. 277; Dai and Yang, 1991, p. 157, fig. 80A (1, 2), pl. 19 (3); Poore, 2004, p. 382, fig. 117c.
Micippa philyra: Ko, 1995 (larval stages).

Adult: Carapace subquadrate, dorsal surface covered with dense hooked setae and tubercles;

rostrum covered with hooked setae, deflexed downwards at 90°, divided into 4 distal lobes, of which lateral 2 lobes directed laterally; regions indistinct; hepatic region strongly depressed; anterolateral margin with 6 spines; posterior margin tuberculate, with 2 small spines medially. Supraorbital eave well developed, without spine; intercalated and postorbital spines fused at base. Eye with complete orbit; orbit closed below. Basal antennal article extremely broad, tuberculate, forming floor of orbit; segment 1 of antennal flagellum flattened, not subovate. Chelipeds of female smooth, slender, shorter than ambulatory leg 1. Ambulatory legs slightly flattened, covered with dense hooked setae. Abdomen 6 somites and telson in both sexes. CL 25 mm, CW 22 mm.

Zoea I: Carapace with rostral spine approximately 1/2 CL, dorsal spine absent, lateral spines short. Protopod of antenna spinous without spinules, slightly shorter than rostral spine; exopod with 2 submedial setae, shorter than protopod. Endopod of maxillule with 1, 2+4 setae. Endopod of maxilla with 3+3 (6) setae. Maxilliped 1 with 2+2+3+3 (10) setae on basis, endopod with 3, 2, 1, 2, 5 setae. Maxilliped 2 with 1+1+1 (3) setae on basis, endopod with 0, 1, 4 setae. Lateral processes on abdominal somites 2, 3. Fork of telson moderately long, with 3 (1 stout lateral, 1 small lateral, 1 small dorsal) spines. CL 0.80 mm.

Distribution: Zanzibar, Madagascar, Persian Gulf, Malaysia, Indonesia, Palau, Japan, Hawaiian Islands, Korea (K. Sakai, 2004).

Habitat: Sandy bottom; intertidal to 20 m depth.

Korea: JJ.

Specimens examined: JJ: 1♀ (Whasoon: 12.viii.2008, I.H. Kim); zoeas (Mosulpo: 17.vii.1993, H.S. Ko).

Remarks: *Micippa* crabs decorate heavily with fragments of algae, hydroids, bryozons, and sponges.

33. *Micippa platipes* Rüppell, 1830

Ip-sul-i-ma-nu-deok-ot-ge (입술이마누덕옷게)

Micippa platipes Rüppell, 1830, p. 8, pl. 1, fig. 4; T. Sakai, 1976, p. 258, fig. 138b, b′, pl. 90, fig. 2; Griffin and Tranter, 1986, p. 279; Dai and Yang, 1991, p. 158, fig. 80A (3), pl. 19 (4); Yang and Ko, 2000, p. 14, fig. 1; Poore, 2004, p. 382, fig. 117d.
Paramicippe platipes: H. Milne-Edwards, 1834, p. 333.
Micippa philyra var. *platipes*: Kossmann, 1877, pp. 4, 7, pl. 3, fig. 3.

Adult: Carapace subquadrate; dorsal surface covered with dense hooked setae and tubercles; rostrum covered with hooked setae, deflexed downwards at 45°, divided into 4 distal lobes, of which lateral 2 lobes directed posteriorly; regions indistinct; hepatic region strongly depressed; anterolateral margin with 8 spines; posterior margin strongly tuberculate, 2 medial spines prominent. Supraorbital eave well developed, without spine; intercalated and postorbital spines fused at base. Eye with complete orbit; orbit open below. Basal antennal article smooth, extremely broad, forming floor of orbit, 2 spines on outer margin; segment 1 of antennal flagellum subovate. Chelipeds of female relatively smooth, short, slender. Ambulatory legs slightly flattened, covered with dense hooked setae. Abdomen 6 somites and telson in both sexes. CL 17 mm, CW 15 mm.

Distribution: Red Sea, Kenya, Pakistan, Philippines, Indonesia, China, Japan, New Caledonia (K. Sakai, 2004), Korea.

Habitat: Rocky bottom; intertidal to 20 m depth.

Korea: JJ.

Specimens examined: JJ: 1♀ (Seongsanpo: 20.vi.2012, H.S. Ko).

Remarks: Larvae are unknown.

34. *Micippa thalia* (Herbst, 1803) (Pl. 36)

Nu-deok-ot-ge (누덕옷게)

Cancer thalia Herbst, 1803, p. 50, pl. 58, fig. 3.
Pisa (*Paramecippe*) *thalia* De Haan, 1837, pl. 23, fig. 3; 1839, p. 98.
Micippa thalia: Adams and White, 1848, p. 15; Kim, 1973, p. 550, pl. 55, fig. 208; T. Sakai, 1976a, p. 256, fig. 137b, pl. 90, fig. 1; Kim and Chang, 1985, p. 49; Griffin and Tranter, 1986, p. 279; Dai and Yang, 1991, p. 158, fig. 80B (1–3), pl. 19 (5); Poore, 2004, p. 383, fig. 117f.
Micippa thalia: Kurata, 1969 (larval stages).

Adult: Carapace subquadrate; dorsal surface covered with dense hooked setae and strong tubercles; rostrum covered with hooked setae, deflexed downwards at 90°, distal part divided into 2 divergent spines, tips curved outwards; regions distinct; gastric region with 2 strong spines; hepatic region relatively depressed; branchial region with 2 strong spines; anterolateral margin with 6 spines including1 strong spine on branchial margin. Supraorbital eave well developed, with 1 prominent medial spine; anorbital spine small, sharp; intercalated spine larger; postorbital spine largest, broadly triangular. Eye with complete orbit; orbit open below. Basal antennal article smooth, extremely broad, forming floor of orbit, 2 spines on outer margin; segment 1 of antennal flagellum flattened, subovate. Chelipeds of female slender, shorter than ambulatory leg 1; each carpus and palm smooth; fingers black. Ambulatory legs slightly flattened, covered with dense hooked setae. Abdomen 6 somites and telson in both sexes. CL 30 mm, CW 27 mm.

Zoea I: Carapace with rostral spine approximately 1/2 CL, dorsal spine absent, lateral spines short. Protopod of antenna spinous without spinules, slightly shorter than rostral spine; exopod with 2 submedial setae, longer than protopod. Endopod of maxillule with 1, 2+4 setae. Endopod of maxilla with 3+3 (6) setae. Endopod of maxilliped 2 with 0, 1, 4 setae. Lateral processes on abdominal somites 2, 3. Fork of telson moderately long, with 2 lateral spines (1 stout large, 1 smaller). RDL 0.92 mm (Kurata, 1969).

Distribution: Red Sea, Somalia, Mozambique, Madagascar, Pakistan, India, Gulf of Thailand, Indonesia, China, Japan, Australia (K. Sakai, 2004), Korea.

Habitat: Sand muddy bottom; 20–100 m depth (Kim, 1973).

Korea: GN, JJ.

Specimens examined: GN: 1♀ (Busan: 13.ix.2012, S.H. Lee).

Family Oregoniidae Garth, 1958

Gin-jip-ge-bal-ge-gwa (긴집게발게과)

Rostrum bifurcate. Eye with incomplete orbit. Eyestalk long, slender or short, thick. Basal antennal article moderately long. Family including cold water species.

Genera 4 (3 in Korea), species over 7 (4 in Korea).
Distribution: North Pacific, North Atlantic, and Arctic Sea.

Key to the genera of family Oregoniidae

1. Carapace longer than broad; ambulatory legs cylindrical ····· 2
− Carapace broader than long; ambulatory legs flattened ····· *Chionoecetes*
2. Rostrum long ····· *Oregonia*
− Rostrum short ····· *Hyas*

Key to the zoeas of family Oregoniidae

Carapace spines long, spinulate; antennal endopod bud present, exopod with 2 or 3 subterminal setae; endopod of maxillule with 1, 2+4 setae; endopod of maxilla with 3+3 (6) setae; endopod and basis of maxilliped 1 each with 3, 2, 1, 2, 5 and 2+2+3 (rarely 2)+3 setae, respectively; endopod and basis of maxilliped 2 each with 1, 1, 5 and 1+1+1+1 setae, respectively; lateral processes on abdominal somites 2, 3; fork of telson usually with 2 (1 lateral, 1 dorsomedial) spines.

1. Lateral process on abdominal somite 2 larger than that of somite 3 ····· 2
− Lateral process on abdominal somite 2 not larger than that of somite 3 ····· 3
2. Posterolateral process on abdominal somite 4 longer than 1/2 length of somite 5 ····· *Hyas coarctatus*
− Posterolateral process on abdominal somite 4 longer than length of somite 5 ····· *Oregonia gracilis*
3. Abdomen with red chromatophores when alive ····· *Chionoecetes japonicus*
− Abdomen without red chromatophores when alive ····· *Chionoecetes opilio*

Genus *Chionoecetes* Krøyer, 1838

Dae-ge-sok (대게속)

Carapace subcircular, broader than long; posterolateral margin with 2 ridges. Rostrum short, with 2 broad spines. Eye with incomplete orbit. Eyestalk short, thick. Ambulatory legs long, flattened.

Species 7 (2 in Korea).

35. *Chionoecetes japonicus* Rathbun, 1932 (Pl. 37)
Hong-ge (홍게)

Chionoecetes japonicus Rathbun, 1932, p. 32; T. Sakai, 1976, p. 187, pl. 65; Takeda, 1982, p. 118, fig. 348; Miyake, 1983, p. 32, pl. 11, fig. 2.
Chionoecetes angulatus bathyalis Derjugin and Kobjakowa, 1935, p. 145, fig. 1.
Chionoecetes japonicus: Motoh, 1976 (larval stages).

Adult: Carapace subcircular, slightly broader than long; dorsal surface with scattered tubercles; rostrum separated by V-shaped notch, with 2 short broad spines; regions relatively distinct by grooves; gastric region slightly convex, with small tubercles; hepatic region with sharp spines on margin; branchial region strongly convex, with tubercles, sharp spines on anterolateral margin; posterolateral margin minutely granulate, 2 ridges fused. Supraorbital eave developed, spinulated on margin; intercalated spine minute; postorbital spine broad, triangular. Eye with incomplete orbit. Eyestalk short, thick. Basal antennal article long, slender, extending into orbit; inner margin tuberculate, outer margin relatively smooth with 1 strong distal spine. Chelipeds shorter than ambulatory legs 1–3; each merus prismatic, acute tubercles along margins; each carpus with acute tubercles on upper surface; each palm swollen, 2 rows of acute tubercles on each upper, inner, and outer surfaces, lower surface with scattered tubercles; fingers smooth, longer than palm, movable finger with 1 broad tooth proximally. Ambulatory legs long, flattened; each merus of leg 1–3 with acute tubercles along inner and outer margins; each carpus with acute tubercles along outer margin; leg 4 with tubercles along outer margins of merus and carpus. Abdomen of male broad, with 6 somites and telson. Gonopod 1 relatively long, slender, S-shaped; distal part with short subterminal setae. CL 91 mm, PCL 87 mm, CW 93 mm.

Zoea I: Carapace with long, heavily spinulate rostral, dorsal, and lateral spines, which exceed CL. Protopod of antenna spinous with spinules, approximately equal length of rostral spine; exopod with 2 subterminal setae, much shorter than protopod. Endopod of maxillule with 1, 2+4 setae. Endopod of maxilla with 3+3 (6) setae. Maxilliped 1 with 2+2+3+3 (10) setae on basis, endopod with 3, 2, 1, 2, 5 setae. Maxilliped 2 with 1+1+1+1 (4) setae on basis, endopod with 1, 1, 5 setae. Lateral process of abdominal somite 2 much shorter than that of somite 3. Fork of telson long, with 2 (1 stout lateral, 1 smaller dorsomedial) spines. RDL 5.21 mm (Motoh, 1976).

Distribution: Japan, Korea.
Habitat: Muddy or fine sandy bottom; 700–1500 m depth (Motoh, 1976).
Korea: GW, GB.
Specimens examined: GB: 1♂ (Gyeongju: 20.xi.2012, H.S. Ko).
Remarks: This species is commercially important in Korea. Konishi and Shikatani (2000) reported that the color of chromatophore was red in the live zoeas of this species, while, it was black or grey in those of *C. opilio*. Female is approximately half size of male.

36. *Chionoecetes opilio* (Fabricius, 1788) (Pl. 38)
Dae-ge (대게)

Cancer opilio Fabricius, 1788, p. 182.
Chionoecetes opilio Krøyer, 1838, p. 249; Kamita, 1941, p. 68, fig. 30; Kim, 1973, p. 525, pl. 52, fig. 191; T. Sakai, 1976, p. 185, pl. 64; Takeda, 1982, p. 118, fig. 347; Miyake, 1983, p. 31, pl. 11, fig. 1.
Chionoecetes behringianus Stimpson, 1857a, p. 84.
Chionoecetes opilio elongatus Rathbun, 1924, p. 3; T. Sakai, 1938, p. 275, pl. 28.
Chionoecetes opilio: Motoh, 1973 (larval stages).

Adult: Carapace subcircular, slightly broader than long; dorsal surface depressed, scattering of tubercles; rostrum bifurcate by V-shaped notch, with 2 short broad spines; regions relatively distinct by grooves; gastric region slightly convex, with small tubercles; hepatic region with small spines; branchial region depressed, with flat, rasp-like tubercles; posterolateral spinulate, 2 ridges parallel. Supraorbital eave developed; intercalated spine minute; postorbital spine broad, triangular. Eye with incomplete orbit; eyestalk short, thick. Basal antennal article long, slender, including orbit; inner and outer margins tuberculate, 1 strong distal spine on outer margin. Chelipeds shorter than ambulatory legs 1, 2; each merus prismatic, acute tubercles along margins; each carpus with tubercles on upper surface; each palm swollen, with 2 rows of tubercles on upper, inner, and outer surfaces, lower surface with scattered tubercles; fingers smooth, longer than palm, movable finger with1 broad tooth proximally. Ambulatory legs long, flattened; in legs 1–3 each merus with tubercles along inner and outer margins, each carpus with tubercles along outer margin, leg 4 granulate along outer margins of merus and carpus. Abdomen of male broad, with 6 somites and telson. Gonopod 1 relatively long, slender, S-shaped; distal part with short subterminal setae. CL 94 mm, PCL 89 mm, CW 95 mm.

Zoea I: Carapace with long, heavily spinulate rostral, dorsal, and lateral spines, which exceed CL. Protopod of antenna spinous with spinules, approximately equal length of rostral spine; exopod with 2 subterminal setae, much shorter than protopod. Endopod of maxillule with 1, 2+4 setae. Endopod of maxilla with 3+3 (6) setae. Maxilliped 1 with 2+2+3+3 (10) setae on basis, endopod with 3, 2, 1, 2, 5 setae. Maxilliped 2 with 1+1+1+1 (4) setae on basis, endopod with 1, 1, 5 setae. Lateral process of abdominal somite 2 slightly shorter than that of somite 3. Fork of telson long, with 2 (1 stout lateral, 1 smaller dorsomedial) spines. RDL 5.1 mm (Motoh, 1973).

Distribution: Japan, Sea of Okhotsk, Kamchatka, Sakhalin, Bering Sea, Arctic Alaska, west Greenland, Korea (K. Sakai, 2004).

Habitat: Muddy or fine sandy bottom; 200–350 m depth (Motoh, 1973).

Korea: HB, HN, GW, GB (Kim, 1973).

Specimens examined: GB: 1♂ (Gyeongju: 20.xi.2012, H.S. Ko).

Remarks: It is the most important commercial species in Korea. Female is approximately half size of male.

Genus *Hyas* Leach, 1814

Du-kkeo-bi-ge-sok (두꺼비게속)

Carapace pear-shaped, longer than broad. Rostrum short, with 2 broad spines. Eye with incomplete orbit; eyestalk short, thick. Ambulatory legs long, cylindrical.

Species 5 (1 in Korea).

37. *Hyas coarctatus* Leach, 1815 (Pls. 39, 40)

Du-keo-bi-ge (두꺼비게)

Hyas coarctatus Leach, 1815, p. 329; Kamita, 1941, p. 71, fig. 31; Kim, 1973, p. 523, pl. 51, fig. 189.
Hyas coarctatus alutaceus: Kim, 1973, p. 524; T. Sakai, 1976, p. 184, pl. 63, fig. 2.
Hyas coarctatus: Christianson, 1973 (larval stages).

Adult: Carapace pear-shaped, longer than broad; dorsal surface with scattered tubercles; rostrum bifurcate, each half converging distally; regions distinct by grooves; gastric region strongly convex, with 2 (1 small, 1 larger) tubercles in medial line and 1 pair of 4 small tubercles side by side; branchial region strongly convex, swollen laterally, 5 unequal-sized tubercles on surface, 8 small tubercles along lateral margin; cardiac region with 1 large tubercle; intestinal region with 2 indistinct tubercles. Supraorbital eave developed; intercalated spine vestigial; postorbital spine large, expanded laterally. Eye with incomplete orbit; eyestalk short, thick. Basal antennal article relatively long, broad, extending into orbit; outer margin granulated, with 1 blunt distal spine. Chelipeds stout, slightly shorter than ambulatory leg 1; each merus prismatic, with tubercles on margin; each carpus with few tubercles on upper surface and inner margin; each palm smooth, swollen; fingers smooth, shorter than palm, cutting margins without teeth except in movable finger having 1 broad tooth proximally. Ambulatory legs long, cylindrical; each merus and carpus with 1 row of hooked setae on upper surface; each dactylus covered with short setae. Abdomen of male broad, with 6 somites and telson. Gonopod 1 relatively long, slender; distal part strongly curved outwards, with short subterminal setae. CL 70 mm, PCL 60 mm, CW 50 mm.

Zoea I: Carapace with long, slightly spinulate rostral and dorsal spines, which exceed CL, lateral spines short. Protopod of antenna spinous with spinules, much shorter than rostral spine; exopod with 2 subterminal setae, approximately 1/3 length of protopod. Endopod of maxillule with 1, 2+4 setae. Endopod of maxilla with 3+3 (6) setae. Maxilliped 1 with 2+2+3+3 (10) setae on basis, endopod with 3, 2, 1, 2, 5 setae. Maxilliped 2 with 1+1+1+1 (4) setae on basis, endopod with 1, 1, 5 setae. Lateral process of abdominal somite 2 larger than that of somite 3, posterolateral process of somite 4 longer than 1/2 length of somite 5. Fork of telson long, with 2 (1 stout lateral, 1 smaller dorsomedial) spines. CL 1.06 mm, RDL 3.87 mm (Christianson, 1973).

Distribution: Japan, Okhotsk Sea, Bering Sea, Korea (Kim, 1973).
Habitat: Muddy, sandy or gravelly bottom; 30–300 m depth (Kim, 1973).
Korea: GW, GB.

Specimens examined: GB: 1♂ (Uljin: 29.v.2012, S.H. Lee), GW: 2♀ (Yangyang: 23.viii.2011, S.H. Lee).

Remarks: Chelipeds of female are shorter than those of male.

Genus *Oregonia* Dana, 1851

Gin-jip-ge-bal-ge-sok (긴집게발게속)

Carapace pear-shaped, longer than broad. Rostrum long, with 2 parallel spines. Eye with incomplete orbit; eyestalk long, slender. Ambulatory legs long, slender, subcylindrical.

Species 2 (1 in Korea).

38. *Oregonia gracilis* Dana, 1851 (Fig. 3E, F; Pl. 41)

Gin-jip-ge-bal-ge (긴집게발게)

Oregonia gracilis Dana, 1851, p. 270; Kamita, 1941, p. 63; Kim, 1973, p. 521, pls. 101, 102, fig. 188; T. Sakai, 1976, p. 183, pl. 63, fig. 1; Takeda, 1982, p. 117, fig. 345; Kim and Chang, 1985, p. 45; Dai and Yang, 1991, p. 125, pl. 13 (8), fig. 63; Jensen, 1995, p. 23, fig. 20; Wicksten, 2011, p. 322.
Oregonia hirta Dana, 1851, p. 270.
Oregonia longimana Bate, 1865, p. 663.
Oregonia gracilis: Oh and Ko, 2010b (larval stages).

Adult: Carapace pear-shaped; dorsal surface covered with tubercles, short and hooked setae present; rostrum covered with hooked setae, with 2 long, slender spines, which parallel, divergent at tips, approximately 0.2 CL; regions distinct by grooves; gastric region slightly convex, 2 distinct tubercles in medial line. Supraorbital eave developed, with short setae on margin; antorbital angle prominent; intercalated spine absent; postorbital spine sharp, long, tip curved anteriorly. Eye with incomplete orbit; eyestalk long, slender. Basal antennal article long, slender, granulate on surface. Chelipeds longer than ambulatory legs; each merus and carpus covered with tubercles, short setae; palm long, covered with short and hooked setae; fingers slender, covered with short setae, movable finger with 1 tooth proximally. Ambulatory legs long, slender, subcylindrical, covered with long setae; each segment except dactylus with 1 longitudinal row of hooked setae on upper surface; each dactylus covered with short setae. Abdomen of male broad, 6 somites and telson. Gonopod 1 long, strongly curved outwards; distal part slender, with short subterminal setae. CL 41 mm, PCL 31 mm, CW 24 mm.

Zoea I: Carapace with long, heavily spinulate rostral and dorsal spines, which exceed CL; lateral spines relatively long, spinulate. Protopod of antenna spinous with spinules, slightly shorter than rostral spine; exopod with 2 subterminal setae, approximately 1/2 length of protopod. Endopod of maxillule with 1, 2 + 4 setae. Endopod of maxilla with 3 + 3 (6) setae. Maxilliped 1 with 2 + 2 + 3 + 3 (10) setae on basis, endopod with 3, 2, 1, 2, 5 setae. Maxilliped 2 with 1 + 1 + 1 + 1 (4) setae on basis,

endopod with 1, 1, 5 setae. Lateral process of abdominal somite 2 larger than that of somite 3, posterolateral process of somite 4 longer than length of somite 5. Fork of telson long, with 2 (1 stout lateral, 1 smaller dorsomedial) spines. CL 0.95 mm, RDL 3.72 mm.

Distribution: China, Japan, Bering Sea, from Alaska to California in America, Korea (Kim, 1973).
Habitat: Muddy or mud sandy bottom; subtidal to 370 m (Kim, 1973).
Korea: GB, GN, JB, GG (Kim, 1973).
Specimens examined: GN: 1♂ (Busan: 14.i.2011, S.H. Lee).
Remarks: This crab decorates with fragments of algae, hydroids, bryozoans, and sponges.

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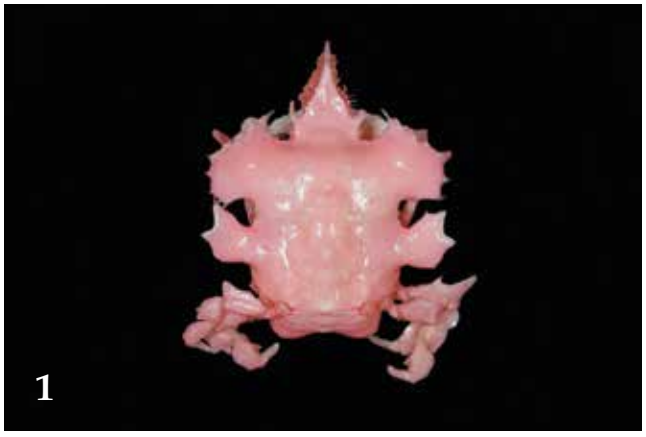
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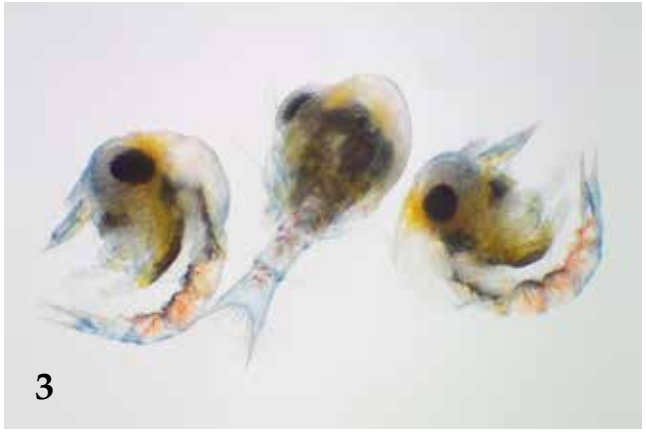
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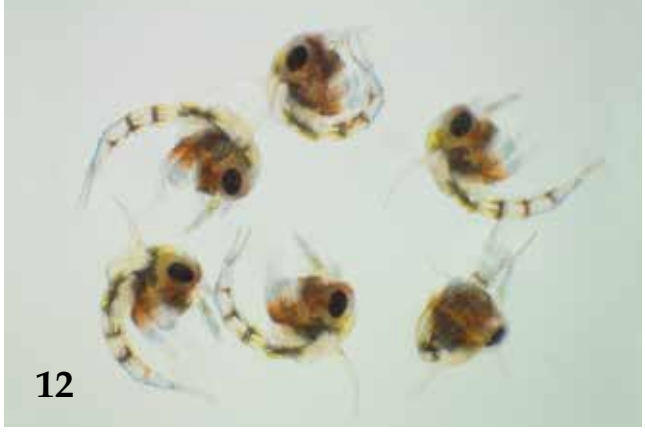
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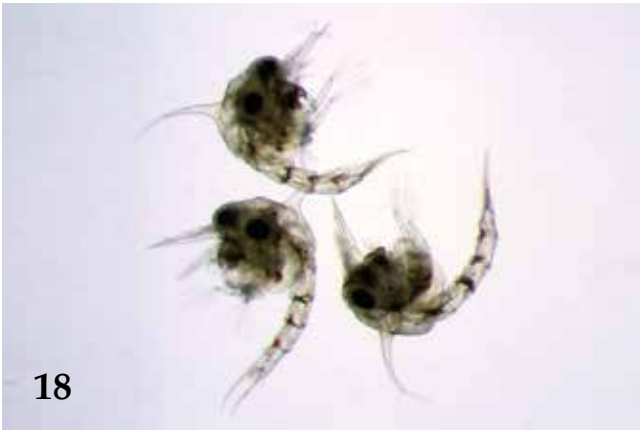
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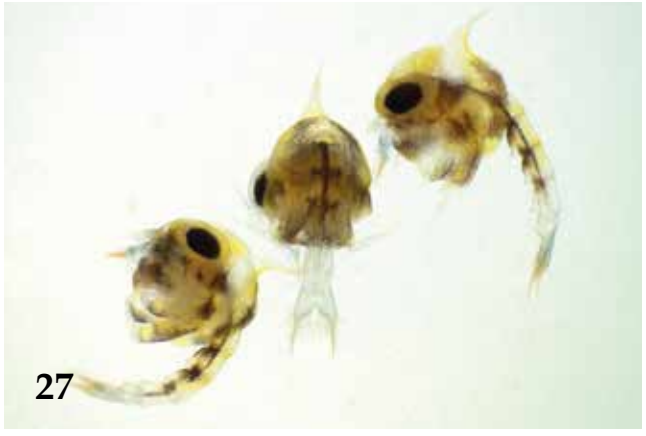
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