



Annotated checklist of the plant bug tribe Mirini (Heteroptera: Miridae: Mirinae) recorded on the Korean Peninsula, with descriptions of three new species

MINSUK OH^{1,2}, TOMOHIDE YASUNAGA³, RAM KESHARI DUWAL⁴ and SEUNGHWAN LEE^{1,2,*}

¹ Laboratory of Insect Biosystematics, Department of Agricultural Biotechnology, Seoul National University, Seoul 08826, Korea; e-mail: seung@snu.ac.kr

² Research Institute of Agriculture and Life Sciences, Seoul National University, Korea; e-mail: ary364@snu.ac.kr

³ Research Associate, Division of Invertebrate Zoology, American Museum of Natural History, New York, NY 10024, USA; e-mail: yasunagat.amnh@gmail.com

⁴ Visiting Scientists, Agriculture and Agri-food Canada, 960 Carling Avenue, Ottawa, Ontario, K1A, 0C6, Canada; e-mail: ramkeshariduwal@gmail.com

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Abstract. An annotated checklist of the tribe Mirini (Miridae: Mirinae) recorded on the Korean peninsula is presented. A total of 113 species, including newly described and newly recorded species are recognized. Three new species, *Apolygus hwasoonanus* Oh, Yasunaga & Lee, sp. n., *A. seonheulensis* Oh, Yasunaga & Lee, sp. n. and *Stenotus penniseticola* Oh, Yasunaga & Lee, sp. n., are described. Eight species, *Apolygus adustus* (Jakovlev, 1876), *Charagochilus (Charagochilus) longicornis* Reuter, 1885, *C. (C.) pallidicollis* Zheng, 1990, *Pinalitopsis rhodopotnia* Yasunaga, Schwartz & Chérot, 2002, *Philostephanus tibialis* (Lu & Zheng, 1998), *Rhabdomiris striatellus* (Fabricius, 1794), *Yamatolygus insulanus* Yasunaga, 1992 and *Y. pilosus* Yasunaga, 1992 are reported for the first time from the Korean peninsula. Korean specimens previously identified as *Eurystylus luteus* Hsiao, 1941 are correctly recognized as *E. sauteri* Poppius, 1915. Three new synonyms are proposed: *Apolygus atriclavus* Kim & Jung, 2016 syn. n. of *A. xanthomelas* Yasunaga & Yasunaga, 2000, *A. josifovi* Kim & Jung, 2016 syn. n. of *A. subpulchellus* (Kerzhner, 1988) and *Capsus koreanus* Kim & Jung, 2015 syn. n. of *C. wagneri* Remane, 1950. Dorsal habitus photographs of the newly described or recorded species are presented along with figures of the genitalia of the new species. Keys to Korean genera and to species of *Apolygus* and *Stenotus* are provided. Zoogeography of the East Asian Mirini fauna is also discussed.

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INTRODUCTION

Mirinae is the most diverse subfamily within the family Miridae (Hemiptera: Heteroptera) and includes more than 4,000 species (Cassis & Schuh, 2012). In Korea, mirids were recorded early in the 20th century by several Japanese researchers, and Korean researchers started to contribute to the Korean mirid fauna from mid-1940s (Cho, 1947; Miyamoto & Lee, 1966). Since then, numerous new species of plant bugs from the Korean peninsula have been recognized and described.

M. Josifov and I.M. Kerzhner made substantial contributions to the taxonomy of Korean Miridae from 1970 to 1995. Josifov & Kerzhner (1972) describe and report 57 species of Miridae from the Korean peninsula (including 33 spp. of Mirini). Josifov (1992) later reports 102 species

of Miridae from North Korea (including 26 spp. of Mirini). In 1999, Kerzhner & Josifov (1999) published their collective work in a catalogue, in which 46 new species from the Korean peninsula are described (Josifov, 1992). The Korean researchers C.E. Lee and Y.J. Kwon also describe the Korean Heteroptera in a catalogue (Lee, 1971; Lee et al., 1994; Lee & Kwon, 1991; Kwon et al., 2001).

Prior to this study, a total of 98 species of Mirinae (including 87 spp. of Mirini) were recorded from the Korean peninsula (Lee et al., 2013). Ongoing studies by Korean researchers have increased the total number of Korean species of Mirini to 104 (Seong & Lee, 2007; Cho & Kwon, 2008; Cho et al., 2008, 2011; Seong et al., 2009a, b; Kim et al., 2015a, b, 2016, 2017; Cho et al., 2016; Kim & Jung, 2016a, b, c, 2018; Oh & Lee, 2017; Oh et al., 2017). In this

* Corresponding author; e-mail: seung@snu.ac.kr

paper, we provide an annotated checklist of 113 species of Mirini in Korea with three new species and 8 new records, correct one published misidentification and propose arguments for the synonymy of three species. Zoogeography of the fauna of Mirini in East Asia is also discussed.

MATERIAL AND METHODS

Most of the specimens examined are deposited in the Insect Collection of Seoul National University (SNUM), Seoul, South Korea. Additional specimens of those examined are housed in the following institutions: Hungarian Museum of Natural History (HNHM), Budapest, Hungary (an exchanged specimen, examined at Korean NIBR); Korean National Arboretum (KNIC), Pocheon, South Korea; National Institute of Agricultural Sciences (NAAS), Wanju, South Korea; National Institute of Biological Resources (NIBR), Incheon, South Korea.

Classification of the Mirini in this paper is based on Schuh (1995; 2002–2014, online catalogue). Each distribution record is categorized by province and climate following Duwal et al. (2016) (Table 1, 2; Fig. 1).

To document the distribution records, we consulted Kerzhner & Josifov (1999) and Kwon et al. (2001), and used additional references to confirm newly recorded species. Synonymic lists for species are not included, as comprehensive catalogues are available (Kerzhner & Josifov, 1999; Schuh, 1995, 2002–2014, online catalogue).

Digital images of external characters were taken using a Canon EOS 70D, with a Canon MP-E 65 mm F2.8 1–5× macro lens. For observing the structures of the genitalia, the abdominal segment IX (of males) and segment V–IX (of females) were removed from specimens and placed in 10% KOH solution for 30 min (male) or 1–2 h (female) at 70°C. Processed segments were dissected and observed under a Leica DM 4000B microscope, and images were taken using a digital camera attached to the microscope (Lumenera Infinity 3). All measurements (mean and range) are in millimeters.

Terminology used to describe the male and female genitalia follows Yasunaga (1991a, b, 1992a, b), Yasunaga & Schwartz (2007) and Yasunaga et al. (2017a). Some additional terms (median process, median sclerite) are used for females. Abbreviations are as follows: **Male:** ALB – accessory lobe; HP – hypophysis; LS – lateral sclerite; MS – median sclerite; NS – needle-shaped spicule; PLB – primary lobe; SGP – secondary gonopore; SL – sensory lobe; SLB – secondary lobe; SLS – sublateral sclerite; SP – speculum; VSC – ventral sclerite; WS – wing-shaped sclerite. **Female:** DLP – dorsal labiate plate; IRL – interramal lobe; IRS – interramal sclerite; LL – lateral lobe; MP – median process; MS – median sclerite; SD – seminal depository; SR – sclerotized ring; VLP – ventral labiate plate.

ANNOTATED CHECKLIST OF MIRINI RECORDED ON THE KOREAN PENINSULA

Genus *Adelphocoris* Reuter, 1896

Kerzhner & Josifov, 1999; Kwon et al., 2001.

1. *Adelphocoris albonotatus* (Jakovlev, 1881). **Asia:** North Korea, South Korea, China (Central, Northeastern, Northern, Southeastern, Southwestern), Japan, Russia (Far East).
2. *Adelphocoris demissus* Horváth, 1905. **Asia:** South Korea, Japan.
3. *Adelphocoris fasciaticollis* Reuter, 1903. **Asia:** North Korea, China (Central, Northeastern, Northern, Southeastern, Southwestern).

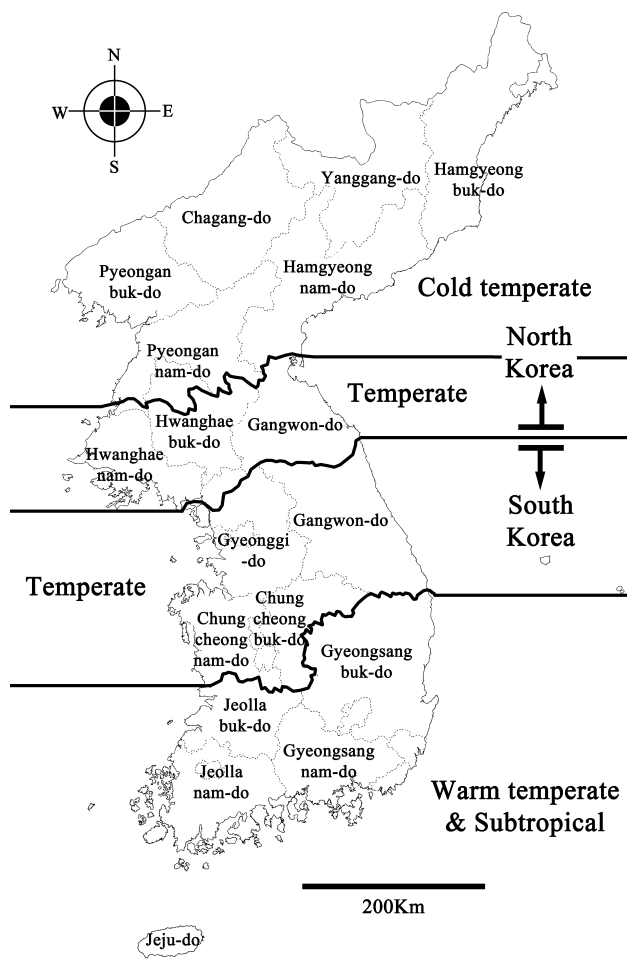


Fig. 1. Map of the Korean Peninsula.

4. *Adelphocoris lineolatus* (Goeze, 1778). **Asia:** North Korea, South Korea, Afghanistan, Armenia, Azerbaijan, China (Central, Northeastern, Northern, Northwestern, Southeastern, Southwestern, Western Plateau), Georgia, Iran, Japan, Kazakhstan (Asian part), Kirgizia, Mongolia, Pakistan, Russia (East Siberia, Far East, West Siberia), Tadjikistan, Turkey (Asian part), Turkmenistan, Uzbekistan; **Europe:** Central, Eastern, Northern, Southern, Western; **North Africa:** Algeria, Tunisia; **North America** (introduced).

5. *Adelphocoris obliquefasciatus* Lindberg, 1934. **Asia:** South Korea, China (Central, Northeastern, Northern), Russia (Far East).

6. *Adelphocoris piceosetosus* Kulik, 1965. **Asia:** North Korea, South Korea, China (Northern), Japan, Russia (Far East).

7. *Adelphocoris ponghvariensis* Josifov, 1978. **Asia:** North Korea, South Korea, China (Central, Northeastern, Northern), Russia (Far East).

8. *Adelphocoris quadripunctatus* (Fabricius, 1794). **Asia:** North Korea, China (Central, Northeastern, Northern, Northwestern, Southwestern), Japan, Kazakhstan (Asian part), Russia (East Siberia, Far East, West Siberia), Mongolia; **Europe:** Central, Eastern, Northern, Southern, Western.

9. *Adelphocoris reicheli* (Fieber, 1836). **Asia:** North Korea, South Korea, China (Northeastern, Northern), Japan, Kazakhstan (Asian part), Russia (East Siberia, Far East, West Siberia); **Europe:** Central, Eastern, Southern, Western.

10. *Adelphocoris rufescens* Hsiao, 1962. **Asia:** North Korea, China (Central, Northeastern, Northern, Southeastern), Russia (Far East).

Table 1. Detailed records of the distribution of the tribe Mirini in Korea. * Specimen(s) examined by the authors. Abbreviations: CB – Chungcheongbuk-do; CN – Chungcheongnam-do; GB – Gyeongsangbuk-do, GN – Gyeongsangnam-do; GG – Gyeonggi-do; GW – Gangwon-do; JB – Jeollabuk-do; JJ – Jeju-do; JN – Jeollanam-do; NK – North Korea.

Genus	Species/subspecies	CB	CN	GB	GN	GG	GW	JB	JN	JJ	NK
Adelphocoris	<i>Adelphocoris albonotatus</i> (Jakovlev, 1881) *		•	•	•	•	•		•		•
	<i>Adelphocoris demissus</i> Horváth, 1905 *		•	•	•	•	•		•		•
	<i>Adelphocoris fasciaticollis</i> Reuter, 1903										
	<i>Adelphocoris lineolatus</i> (Goeze, 1778) *		•	•	•	•	•				
	<i>Adelphocoris obliquefasciatus</i> Lindberg, 1934 *										
	<i>Adelphocoris piceosetosus</i> Kulik, 1965										
	<i>Adelphocoris ponghvariensis</i> Josifov, 1978										
	<i>Adelphocoris quadripunctatus</i> (Fabricius, 1794) *										
	<i>Adelphocoris reicheli</i> (Fieber, 1836)	•									
	<i>Adelphocoris rufescens</i> Hsiao, 1962	•									
	<i>Adelphocoris suturalis</i> (Jakovlev, 1882) *	•									
	<i>Adelphocoris tenebrosus</i> (Reuter, 1875) *	•									
	<i>Adelphocoris triannulatus</i> (Stål, 1858)	•									
	<i>Adelphocoris variabilis</i> (Uhler, 1897)	•									
Adelphocorisella	<i>Adelphocorisella lespedezae</i> Miyamoto & Yasunaga, 1993 *										
Apolygopsis	<i>Apolygopsis nigrifolia</i> (Linnavuori, 1963)										
Apolygus	<i>Apolygus adustus</i> (Jakovlev, 1876)										
	<i>Apolygus fraxinicola</i> (Kerzhner, 1988) *										
	<i>Apolygus hilaris</i> (Horváth, 1905) *		•	•	•	•	•				
	<i>Apolygus hwasonganus</i> Oh, Yasunaga & Lee, sp. n. *										
	<i>Apolygus infamis</i> (Kerzhner, 1977) *										
	<i>Apolygus limbatus</i> (Fallén, 1807)										
	<i>Apolygus lucorum</i> (Meyer-dür, 1843) *		•	•	•	•	•				
	<i>Apolygus nigrovirens</i> (Kerzhner, 1988)	•	•	•	•	•	•				
	<i>Apolygus pulchellus</i> (Reuter, 1906) *		•	•	•	•	•				
	<i>Apolygus roseofemoralis</i> (Yasunaga, 1992) *		•	•	•	•	•				
	<i>Apolygus rubrifasciatus</i> Kim & Jung, 2016										
	<i>Apolygus seonheulensis</i> Oh, Yasunaga & Lee, sp. n. *										
	<i>Apolygus spinolae</i> (Meyer-Dür, 1841) *		•	•	•	•	•				
	<i>Apolygus subhilaris</i> (Yasunaga, 1992) *										
	<i>Apolygus subpulchellus</i> (Kerzhner, 1988) *										
	<i>Apolygus xanthomelas</i> Yasunaga & Yasunaga, 2000 *										
	<i>Apolygus watajii</i> Yasunaga & Yasunaga, 2000 *	•									
Bertsia	<i>Bertsia lankana</i> (Kirby, 1891) *										
Capsodes	<i>Capsodes gothicus graeseri</i> (Aultrich & Reuter, 1888) *										
Capsus	<i>Capsus cinctus</i> (Kolenati, 1845)										
	<i>Capsus pilifer</i> Remane, 1950 *										
	<i>Capsus wagneri</i> Remane, 1950 *		•								
Castanopsides	<i>Castanopsides falkovitshi</i> (Kerzhner, 1979) *										
	<i>Castanopsides kerzhneri</i> (Josifov, 1985) *										
	<i>Castanopsides potanini</i> (Reuter, 1906) *	•	•	•	•	•	•	•	•	•	•
Charagochilus	<i>Charagochilus (Charagochilus) augusticollis</i> Linnavuori, 1961 *	•	•	•	•	•	•	•	•	•	•
	<i>Charagochilus (Charagochilus) longicornis</i> Reuter, 1885										
	<i>Charagochilus (Charagochilus) pallidicollis</i> Zheng, 1990 *										
Cleistrotomus	<i>Cleistrotomus fulvomaculatus</i> (De Geer, 1773) *										
Creontiades	<i>Creontiades coloripes</i> Hsiao & Meng, 1963										
Cyphodemidea	<i>Cyphodemidea saundersi</i> (Reuter, 1896) *										
Eolygus	<i>Eolygus rubrolineatus</i> (Matsumura, 1913) *										
Eurystylus	<i>Eurystylus coelestialium</i> (Kirkaidy, 1902) *	•	•	•	•	•	•				
	<i>Eurystylus sauteri</i> Poppius, 1915 *		•	•	•	•	•				
Gigantomiris	<i>Gigantomiris jupiter</i> Miyamoto & Yasunaga, 1988 *										
Josifovolygus	<i>Josifovolygus niger</i> (Josifov, 1992) *										
Koreocoris	<i>Koreocoris bicoloratus</i> Cho & Kwon, 2008 *										
Loristes	<i>Loristes decoratus</i> (Reuter, 1908) *										
Lygocorides	<i>Lygocorides (Lygocorides) rubronasutus</i> (Linnavuori, 1961) *										
Lygocoris	<i>Lygocoris (Lygocoris) idoneus</i> (Linnavuori, 1963) *										
	<i>Lygocoris (Lygocoris) pabulinus</i> (Linnaeus, 1761) *										
Lygus	<i>Lygus rugulipennis</i> Poppius, 1911	•	•	•	•	•	•				
	<i>Lygus sibiricus</i> Aglyamzyanov, 1990										
	<i>Lygus wagneri</i> Remane, 1955										
Macrolygus	<i>Macrolygus viridulus</i> Yasunaga, 1992 *										
Mermiteocerus	<i>Mermiteocerus annulipes annulipes</i> Reuter, 1908 *										
Neolygus	<i>Neolygus aceris</i> (Kerzhner, 1988)										
	<i>Neolygus hakusanensis</i> (Yasunaga, 1991)										
	<i>Neolygus hoberlandti</i> (Kulik, 1965) *										
	<i>Neolygus honsuensis</i> (Linnavuori, 1961) *		•	•	•	•	•				
	<i>Neolygus juglandis</i> (Kerzhner, 1988) *										
	<i>Neolygus mjoljanganicus</i> (Josifov, 1992)										
	<i>Neolygus roseus</i> (Yasunaga, 1991) *										
	<i>Neolygus sylvaticus</i> (Josifov, 1992)	•	•	•	•	•	•				
	<i>Neolygus tiliicola</i> (Kulik, 1965) *										
	<i>Neolygus viridis</i> (Fallén, 1807) *										
	<i>Neolygus zhugei</i> (Yasunaga, 1991) *										
Neomegacoelum	<i>Neomegacoelum vitreum</i> (Kerzhner, 1988) *										
Orthops	<i>Orthops (Orthops) scutellatus</i> Uhler, 1877 *										
Pachylygus	<i>Pachylygus nigrescens</i> (Kerzhner, 1977) *										
Pantilius	<i>Pantilius (Coreidomiris) hayashii</i> Miyamoto & Yasunaga, 1989										
Peltidolygus	<i>Peltidolygus scutellatus</i> (Yasunaga & Lu, 1994) *										
Philostephanus	<i>Philostephanus glaber</i> (Kerzhner, 1988) *										
	<i>Philostephanus rubripes</i> (Josifov, 1876) *	•	•	•	•	•	•	•	•	•	
	<i>Philostephanus tibialis</i> (Lu & Zheng, 1998) *										
	<i>Philostephanus ulmi</i> (Kerzhner, 1979) *										
Phytocoris	<i>Phytocoris (Ktenocoris) nowickyi</i> Fieber, 1870										
	<i>Phytocoris (Phytocoris) goryeonus</i> Oh, Yasunaga & Lee, 2017 *										
	<i>Phytocoris (Phytocoris) intricatus</i> Flor, 1861 *										
	<i>Phytocoris (Phytocoris) longipennis</i> Flor, 1861 *		•	•	•	•	•				
	<i>Phytocoris (Phytocoris) minakatai</i> Yasunaga & Schwartz, 2015 *	•									
	<i>Phytocoris (Phytocoris) ohataensis</i> Linnavuori, 1963 *										
	<i>Phytocoris (Phytocoris) pallidicollis</i> Kerzhner, 1977 *										
	<i>Phytocoris (Phytocoris) shabliovskii</i> Kerzhner, 1988 *	•									
Pinalitopsis	<i>Pinalitopsis rhodopontia</i> Yasunaga, Schwartz and Chérot, 2002 *										
Pinalitus	<i>Pinalitus nigriceps</i> Kerzhner, 1988 *										
	<i>Pinalitus rubeolus</i> (Kulik, 1965)										
Polymerias	<i>Polymerias opacipennis</i> (Lindberg, 1934) *	•									
Polymerus	<i>Polymerus (Pachycentrum) carpathicus</i> (Horváth, 1882)										
	<i>Polymerus (Pachycentrum) nigrita</i> (Fallén, 1807)										
	<i>Polymerus (Poeciloscytus) brevicornis</i> (Reuter, 1879)										
	<i>Polymerus (Poeciloscytus) cognatus</i> (Fieber, 1858)	•	•	•	•	•	•				
	<i>Polymerus (Poeciloscytus) palustris</i> (Reuter, 1905)										
	<i>Polymerus (Poeciloscytus) unifasciatus</i> (Fabricius, 1794)										
	<i>Polymerus (Polymerus) amurensis</i> Kerzhner, 1988 *										
	<i>Polymerus (Polymerus) pekinensis</i> Horváth, 1901 *										
Proboscidoecoris	<i>Proboscidoecoris varicornis</i> (Jakovlev, 1904) *										
Rhabdomiris	<i>Rhabdomiris pulcherrimus</i> (Lindberg, 1934) *	•									
	<i>Rhabdomiris striatellus</i> (Fabricius, 1794)										
Stenotus	<i>Stenotus binotatus</i> (Fabricius, 1794)										
	<i>Stenotus binotatus</i> Oh, Yasunaga & Lee, sp. n. *										
	<i>Stenotus rubrovittatus</i> (Matsumura, 1913) *										
	<i>Taylorilygus apicalis</i> (Fieber, 1861) *										
Taylorilygus	<i>Taylorilygus apicalis</i> (Fieber, 1861) *										
Tingnotum	<i>Tingnotum perlatum</i> Linnavuori, 1961 *										
	<i>Tingnotum pini</i> Kulik, 1965										
Yamatolygus	<i>Yamatolygus insulanus</i> Yasunaga, 1992 *										
	<i>Yamatolygus pilosus</i> Yasunaga, 1992 *										

Table 2. Detailed records of the distribution of the tribe Mirini in North Korea (based on Josifov & Kerzhner, 1972; Kerzhner, 1988; Josifov, 1992; Kerzhner & Josifov, 1999; Lee & Kwon, 1991; Lee et al., 1994; Kwon et al., 2001). * Reference locality not identified by the author. Abbreviations: CG – Chagang-do; HB – Hamgyeongbuk-do; HN – Hamgyeongnam-do; HWB – Hwanghaebuk-do; HWN – Hwanghaenam-do; PB – Pyeonganbuk-do; PN – Pyeongannam-do; YG – Yanggang-do; RO – Record only.

Genus	Species	CG	GW	HB	HN	HWB	HWN	PB	PN	YG	RO	
<i>Adelphocoris</i>	<i>Adelphocoris albonotatus</i> (Jakovlev, 1881)		•		•			•	•			
	<i>Adelphocoris fasciaticollis</i> Reuter, 1903							•				
	<i>Adelphocoris lineolatus</i> (Goeze, 1778)		•	•						•		
	<i>Adelphocoris piceosetosus</i> Kulik, 1965								•	•		
	<i>Adelphocoris ponghvariensis</i> Josifov, 1978		•							•		
	<i>Adelphocoris quadri-punctatus</i> (Fabricius, 1794)		•							•		
	<i>Adelphocoris reicheli</i> (Fieber, 1836)		•							•		
	<i>Adelphocoris rufescens</i> Hsiao, 1962											•
	<i>Adelphocoris suturalis</i> (Jakovlev, 1882)											
	<i>Adelphocoris tenebrosus</i> (Reuter, 1875)		•						•	•	•	
	<i>Adelphocoris triannulatus</i> (Stål, 1858)				•						•	
	<i>Adelphocoris hilaris</i> (Horváth, 1905)										•	
<i>Apolygus</i>	<i>Apolygus lucorum</i> (Meyer-Dür, 1843)		•		•					•		
	<i>Apolygus nigrovirens</i> (Kerzhner, 1988)			•						•		
	<i>Apolygus spinolae</i> (Meyer-Dür, 1841)		•		•					•		
<i>Capsodes</i>	<i>Capsodes gothicus graeseri</i> (Autran & Reuter, 1888)									•		
	<i>Capsus</i>									•		
<i>Capsus</i>	<i>Capsus cinctus</i> (Kolenati, 1845)									•		
	<i>Capsus pilifer</i> Remane, 1950				•					•		
	<i>Capsus wagneri</i> Remane, 1950									•		
<i>Castanopsides</i>	<i>Castanopsides kerzhneri</i> (Josifov, 1985)					•						
	<i>Castanopsides potanini</i> (Reuter, 1906)					•						
<i>Charagochilus</i>	<i>Charagochilus (Charagochilus) augusticollis</i> Linnavuori, 1961		•									
<i>Clesterotomus</i>	<i>Clesterotomus fulvomaculatus</i> (De Geer, 1773)									•		
<i>Creontiades</i>	<i>Creontiades coloripes</i> Hsiao & Meng, 1963									•		
<i>Cyphodemidea</i>	<i>Cyphodemidea saundersi</i> (Reuter, 1896)			•						•		
	<i>Eurystylus coelestialium</i> (Kirkaldy, 1902)					•				•		
<i>Josifovolygus</i>	<i>Eurystylus sauteri</i> Poppius, 1915									•		
	<i>Josifovolygus niger</i> (Josifov, 1992)									•		
	<i>Loristes decoratus</i> (Reuter, 1908)					•	•			•		
<i>Lygocoris</i>	<i>Lygocoris (Lygocoris) pabulinus</i> (Linnaeus, 1761)									•		
	<i>Lygus</i>									•		
<i>Neolygus</i>	<i>Lygus rugulipennis</i> Poppius, 1911									•		
	<i>Lygus sibiricus</i> Aglyamzyanov, 1990			•						•		
	<i>Lygus wagneri</i> Remane, 1955									•		
	<i>Neolygus aceris</i> (Kerzhner, 1988)		•									
	<i>Neolygus hoberlandti</i> (Kulik, 1965)		•	•								
<i>Orthops</i>	<i>Neolygus mjojiangsanicus</i> (Josifov, 1992)											
	<i>Neolygus sylvaticus</i> (Josifov, 1992)											
	<i>Neolygus tillicola</i> (Kulik, 1965)											
	<i>Neolygus viridis</i> (Fallén, 1807)											
<i>Philostephanus</i>	<i>Orthops (Orthops) scutellatus</i> Uhler, 1877									•		
	<i>Philostephanus glaber</i> (Kerzhner, 1988)									•		
<i>Phytocoris</i>	<i>Philostephanus rubripes</i> (Josifov, 1876)									•		
	<i>Phytocoris (Ktenocoris) nowickyi</i> Fieber, 1870			•						•		
	<i>Phytocoris (Phytocoris) intricatus</i> Flor, 1861			•	•					•		
<i>Pinalitus</i>	<i>Phytocoris (Phytocoris) shabliovskii</i> Kerzhner, 1988									•		
	<i>Pinalitus nigriceps</i> Kerzhner, 1988									•		
<i>Polymerias</i>	<i>Pinalitus rubeolus</i> (Kulik, 1965)										•*	
	<i>Polymerias opacipennis</i> (Lindberg, 1934)											
<i>Polymerus</i>	<i>Polymerus (Pachycentrum) carpathicus</i> (Horváth, 1882)									•		
	<i>Polymerus (Pachycentrum) nigrita</i> (Fallén, 1807)		•									
	<i>Polymerus (Poeciloscytus) brevicornis</i> (Reuter, 1879)									•		
	<i>Polymerus (Poeciloscytus) cognatus</i> (Fieber, 1858)									•		
	<i>Polymerus (Polymerus) pekinensis</i> Horváth, 1901									•		
<i>Proboscidocoris</i>	<i>Proboscidocoris varicornis</i> (Jakovlev, 1904)		•									
	<i>Rhabdomiris pulcherrimus</i> (Lindberg, 1934)									•		
<i>Stenotus</i>	<i>Stenotus rubrovittatus</i> (Matsumura, 1913)									•		

11. *Adelphocoris suturalis* (Jakovlev, 1882). **Asia:** North Korea, South Korea, China (Central, Northeastern, Northern, Southeastern, Southwestern) Japan, Russia (Far East).

12. *Adelphocoris tenebrosus* (Reuter, 1875). **Asia:** North Korea, South Korea, China (Northeastern, Northern), Japan, Russia (East Siberia: Transbaikal Far East).

13. *Adelphocoris triannulatus* (Stål, 1858). **Asia:** North Korea, South Korea, China (Northeastern, Northern), Japan, Mongolia, Russia (East Siberia, Far East, West Siberia: Altai).

14. *Adelphocoris variabilis* (Uhler, 1897). **Asia:** South Korea, Japan, Russia (Far East).

Genus Adelphocorisella Miyamoto & Yasunaga, 1993

Kerzhner & Josifov, 1999; Cho et al., 2008.

15. *Adelphocorisella lepedezae* Miyamoto & Yasunaga, 1993. **Asia:** South Korea, Japan.

Genus Apolygopsis Yasunaga, Schwartz & Chérot, 2002

Kerzhner & Josifov, 1999, Kwon et al., 2001.

16. *Apolygopsis nigrifula* (Linnavuori, 1963). **Asia:** South Korea, China (Central, Southeastern, Southwestern), Japan.

Genus Apolygus China, 1941

Josifov & Kerzhner, 1972; Kerzhner & Josifov, 1999; Kim & Jung, 2016b, c, 2018; Kwon et al., 2001; Seong & Lee, 2007; Yasunaga & Yasunaga, 2000.

17. *Apolygus adustus* (Jakovlev, 1876) (Figs 2C, 9A–B, 10A–B, 11B, F, J, 12B, F, J). **Asia:** South Korea (new record), Japan, Russia (Far East).

Material examined. South Korea, Gangwon-do: 1♂, Mt. Bangtae NRC, Bangdong-ri, Girin-myeon, Inje-gun, from light trap, 20.vi.2013, R.K. Duwal (SNUM); 1♂, Yongdae NRC, Mt. Maebong, Buk-myeon, Inje-gun, from light trap, 19.vi.2013, R.K. Duwal (SNUM).

18. *Apolygus fraxinicola* (Kerzhner, 1988). **Asia:** South Korea, Japan, Russia (Far East).

19. *Apolygus hilaris* (Horváth, 1905). **Asia:** North Korea, South Korea, China (Central), Japan, Russia (Far East).

20. *Apolygus hwasoonanus* Oh, Yasunaga & Lee, sp. n. **Asia:** South Korea. See taxonomic section.

21. *Apolygus infamis* (Kerzhner, 1977). **Asia:** South Korea, Japan, Russia (Far East).

22. *Apolygus limbatus* (Fallén, 1807). **Asia:** South Korea, Kazakhstan (Asian part), Russia (East Siberia, Far East); **Europe:** Central, Eastern, Northern, Southern, Western.

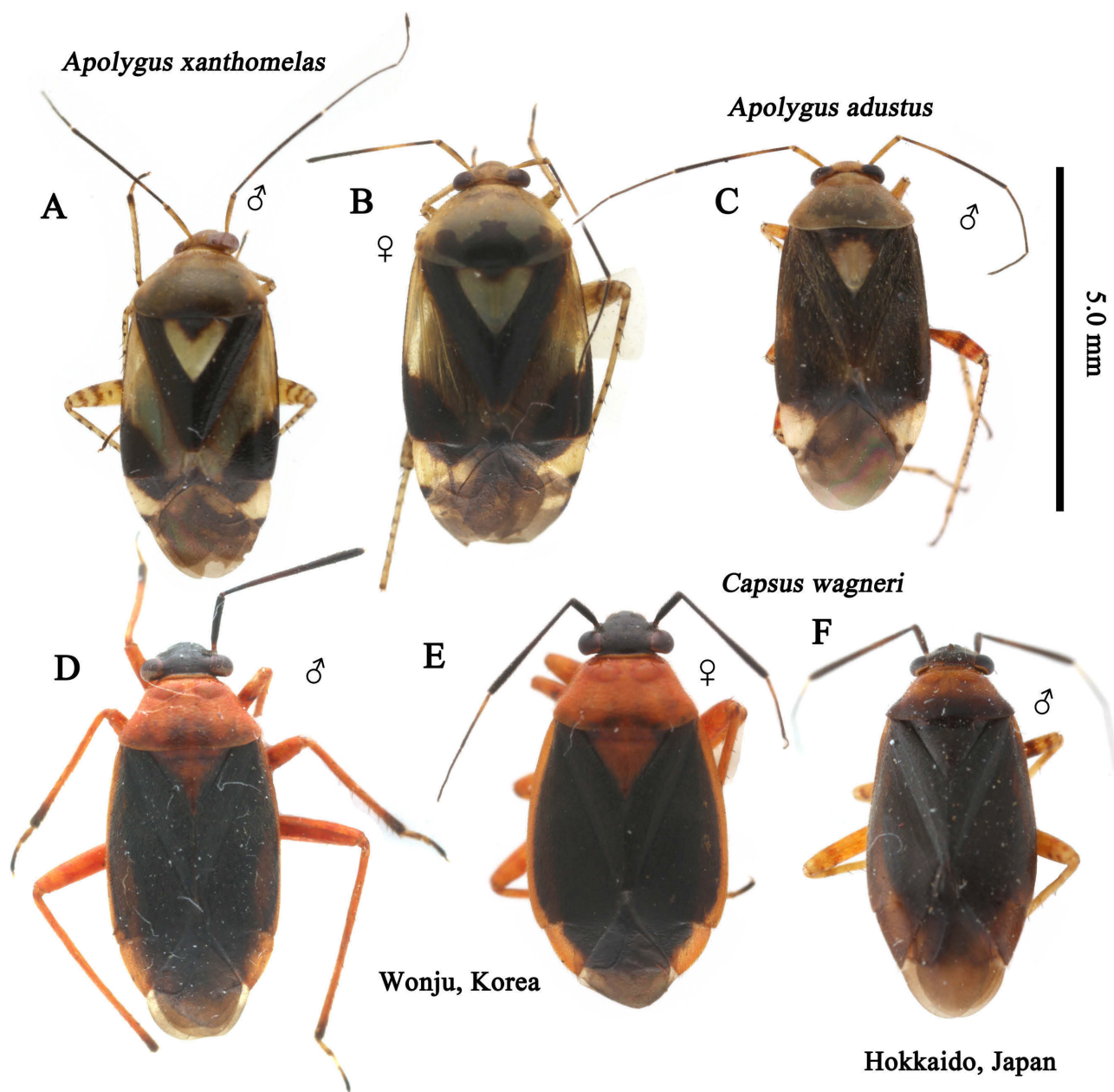


Fig. 2. Dorsal habitus. A, B – *Apolygus xanthomelas*; C – *A. adustus*; D–F – *Capsus wagneri*. A, C, D, F – male; B, E – female.

23. *Apolygus lucorum* (Meyer-Dür, 1843). **Asia:** North Korea, South Korea, Armenia, China (Central, Northeastern, Northern, Northwestern, Southwestern), Georgia, Japan, Kazakhstan (Asian part), Kirgizia, Russia (East Siberia, Far East, West Siberia), Turkey (Asian part), Uzbekistan; **Europe:** Central, Eastern, Northern, Southern, Western.

24. *Apolygus nigrovirens* (Kerzhner, 1988). **Asia:** North Korea, South Korea, Japan, Russia (Far East).

25. *Apolygus pulchellus* (Reuter, 1906) (Figs 11A, E, I, 12A, E, I). **Asia:** South Korea, China (Southwestern), Japan.

26. *Apolygus roseofemorialis* (Yasunaga, 1992). **Asia:** South Korea, Japan.

27. *Apolygus rubrifasciatus* Kim & Jung, 2016. **Asia:** South Korea.

28. *Apolygus seonheulensis* Oh, Yasunaga & Lee, sp. n. **Asia:** South Korea. See taxonomic section.

29. *Apolygus spinolae* (Meyer-Dür, 1841). **Asia:** North Korea, South Korea, Afghanistan, China (Northern, Southwestern),

Japan, Kazakhstan (Asian part), Kirgizia, Russia (East Siberia, Far East, West Siberia); **Europe:** Central, Eastern, Northern, Southern, Western.

30. *Apolygus subhilaris* (Yasunaga, 1992). **Asia:** South Korea, Japan.

31. *Apolygus subpulchellus* (Kerzhner, 1988). **Asia:** North Korea, South Korea, Japan, Russia (Far East). Remark: *A. josifovi* Kim & Jung, 2016 is here synonymized with this species, see taxonomic section.

32. *Apolygus xanthomelas* Yasunaga & Yasunaga, 2000 (Fig. 2A–B). **Asia:** South Korea, Japan (Honshu). Remark: *Apolygus atriclavus* Kim & Jung, 2016 is here synonymized with this species, see taxonomic section.

33. *Apolygus watajii* Yasunaga & Yasunaga, 2000. **Asia:** South Korea, Japan (Ishigaki Is., Iriomote Is.).

Genus *Bertsia* Kirkaldy, 1904

Kerzhner & Josifov, 1999; Kwon et al., 2001; Zheng et al., 2004.

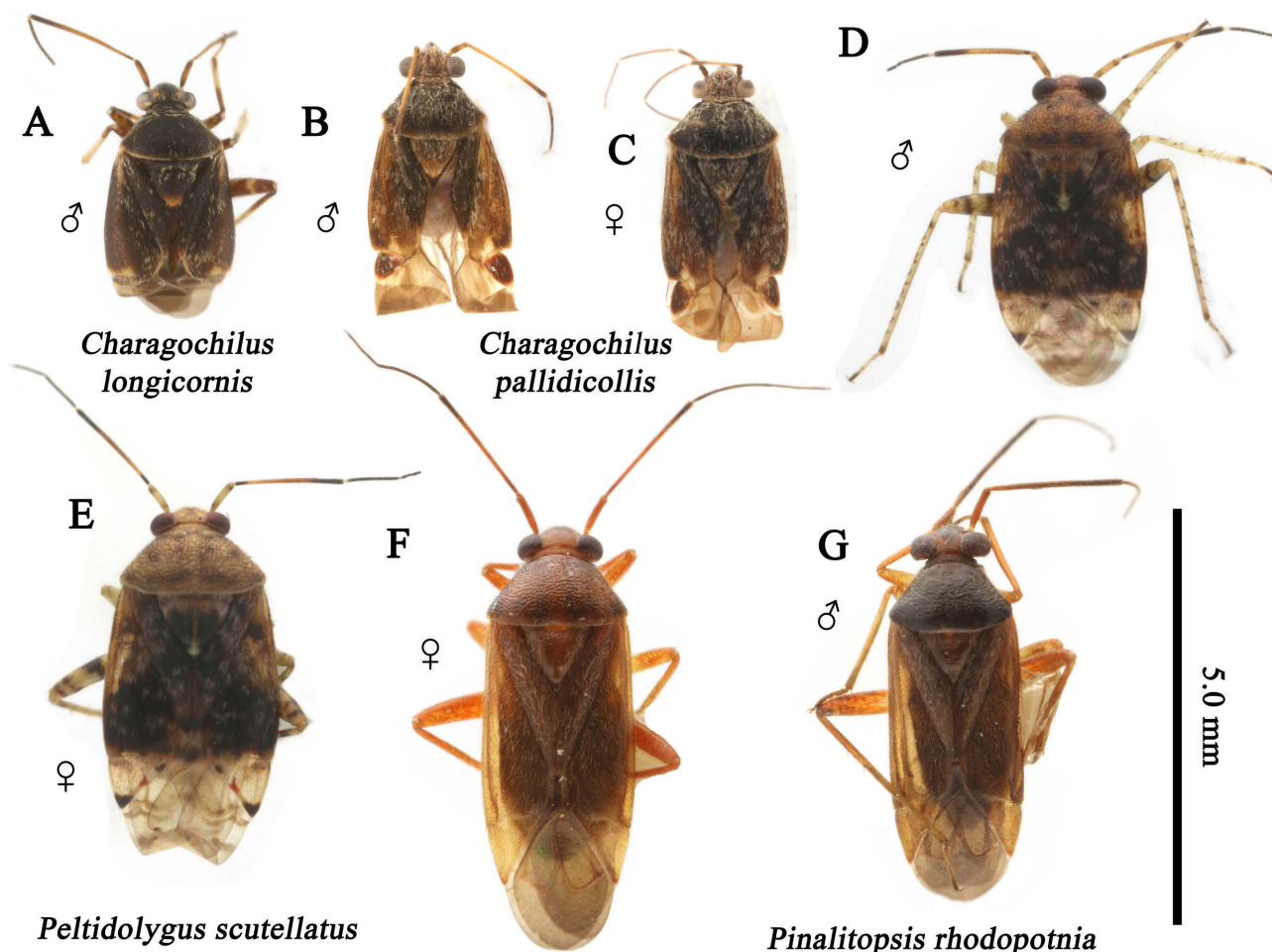


Fig. 3. Dorsal habitus. A – *Charagochilus (Charagochilus) longicornis*; B, C – *C. (C.) pallidicollis*; D, E – *Peltidolygus scutellatus*; F, G – *Pinalitopsis rhodopotnia*. A, B, D, G – male; C, E, F – female.

34. *Bertsia lankana* (Kirby, 1891). **Asia:** South Korea, China (Southern), Japan, Oriental Region: Sri Lanka to Indonesia, Taiwan.

Genus *Capsodes* Dahlbom, 1851

Kerzhner & Josifov, 1999; Kwon et al., 2001.

35. *Capsodes gothicus graeseri* (Autran & Reuter, 1888). **Asia:** North Korea, South Korea, Japan, Russia (Far East).

Genus *Capsus* Fabricius, 1803

Kerzhner & Josifov, 1999; Kim et al., 2015; Kwon et al., 2001; Remane, 1950.

36. *Capsus cinctus* (Kolenati, 1845). **Asia:** North Korea, Armenia, Azerbaijan, China (Northern, Northwestern), Georgia, Kazakhstan (Asian part), Kirgizia, Mongolia, Turkey (Asian part), Russia (East Siberia, Far East, West Siberia), Uzbekistan; **Europe:** Western.

37. *Capsus pilifer* Remane, 1950. **Asia:** North Korea, South Korea, China (Northeastern, Northern), Japan, Kazakhstan (Asian part), Russia (East Siberia, Far East, West Siberia); **Europe:** Central.

38. *Capsus wagneri* Remane, 1950. (Figs 2D–F, 8A–C). **Asia:** North Korea, South Korea, China (Northeastern, Northern), Japan, Mongolia, Russia (East Siberia, Far East, West Siberia); **Europe:** Central, Eastern, Northern, Western. Remark: *Capsus koreanus* Kim & Jung, 2015 is here synonymized with this species, see taxonomic section.

Genus *Castanopsides* Yasunaga, 1992

Kerzhner & Josifov, 1999; Kwon et al., 2001; Kim et al., 2017; Oh & Lee, 2017.

39. *Castanopsides falkovitshi* (Kerzhner, 1979). **Asia:** South Korea, China (Central, Northern, Southeastern, Southwestern), Japan, Russia (Far East).

40. *Castanopsides kerzhneri* (Josifov, 1985). **Asia:** North Korea, South Korea, China (Southwestern), Japan, Russia (Far East).

41. *Castanopsides potanini* (Reuter, 1906). **Asia:** North Korea, South Korea, China (Central, Northeastern, Northern, Southwestern), Japan, Russia (Far East).

Genus *Charagochilus* Fieber, 1858

Kerzhner & Josifov, 1999; Kwon et al., 2001.

Subgenus *Charagochilus* Fieber, 1858

42. *Charagochilus (Charagochilus) augusticollis* Linnavuori, 1961. **Asia:** North Korea, South Korea, China (Central, Northern, Southeastern, Southwestern), Japan, Russia (Far East), Taiwan.

43. *Charagochilus (Charagochilus) longicornis* Reuter, 1885 (Fig. 3A). **Asia:** South Korea (new record), China (Central, Southeastern, Southwestern, Western plateau), Taiwan, Oriental region (India to Java).

Material examined. South Korea, Jeju-do: 1♂, Seogwipo-si, 30.–31.x.2009, R.K. Duwal (SNUM).

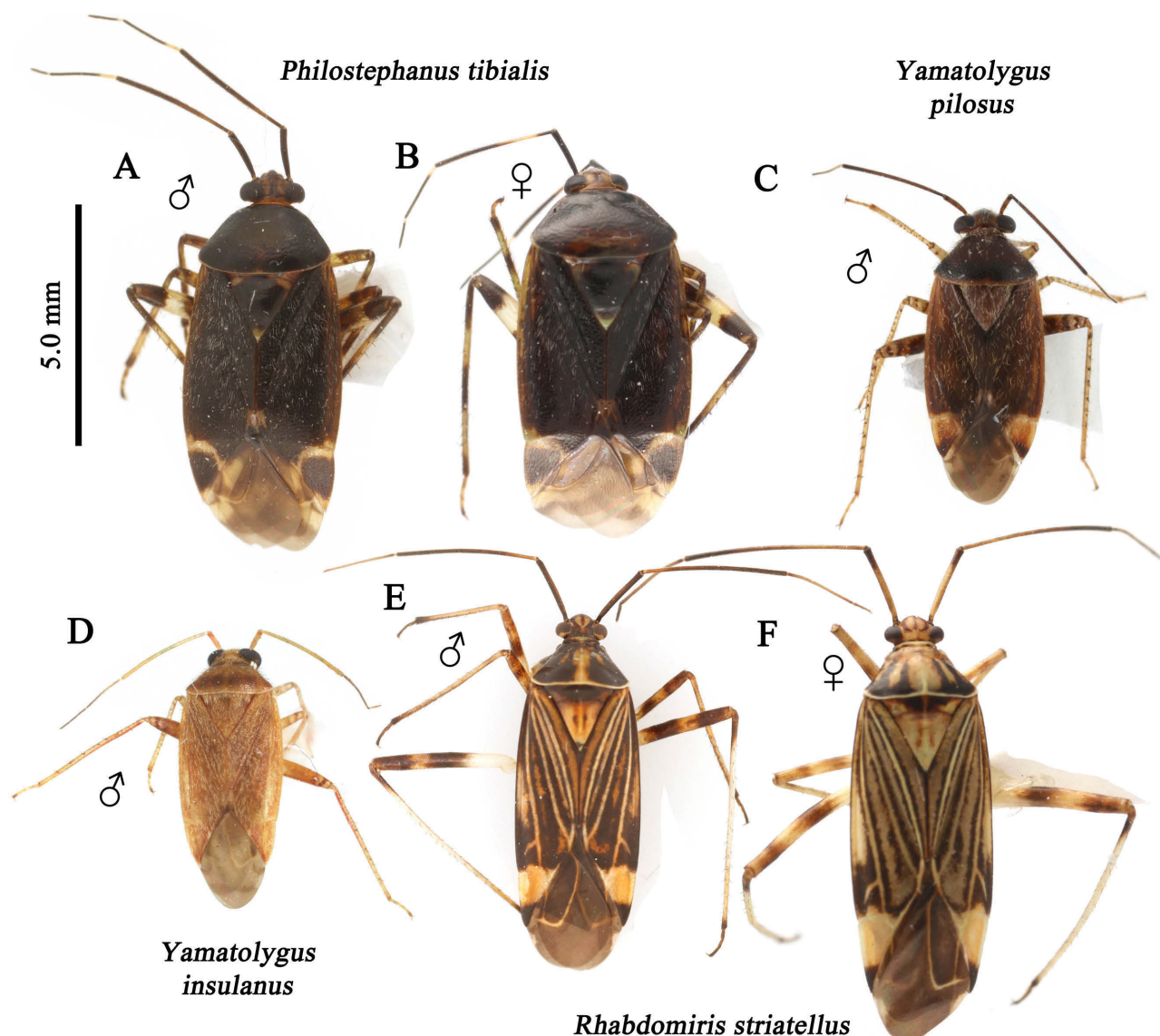


Fig. 4. Dorsal habitus. A, B – *Philostephanus tibialis*; C – *Yamatolygus pilosus*; D – *Yamatolygus insulanus*, E, F – *Rhabdomiris striatellus*. A, C, D, E – male; B, F – female.

44. *Charagochilus (Charagochilus) pallidicollis* Zheng, 1990 (Figs 3B–C). **Asia:** South Korea (new record), China (Central, Southeastern, Southwestern).

Material examined. South Korea, Gyeonggi-do: 6♂, 3♀, Mt. Jungmi, Okcheon-myeon, Yangpyeong-gun, 21.vii.2009, S.H. Lee (SNUM). Gyeongsangbuk-do: 2♂, 2♀, Mt. Sobaek, Dansan-myeon, Yeongju-si, 13.v.2010, S.H. Lee (SNUM).

Genus *Closterotomus* Fieber, 1858

Kerzhner & Josifov, 1999; Kwon et al., 2001.

45. *Closterotomus fulvomaculatus* (De Geer, 1773). **Asia:** North Korea, South Korea, Azerbaijan, Kazakhstan (Asian part), Armenia, Turkey (Asian part), Georgia, Japan, Russia (East Siberia, Far East, West Siberia); **Europe:** Central, Eastern, Northern, Southern, Western; **North America:** Alaska, Northern Canada.

Genus *Creontiades* Distant, 1883

Kerzhner & Josifov, 1999; Kwon et al., 2001.

46. *Creontiades coloripes* Hsiao & Meng, 1963. **Asia:** North Korea, South Korea, China (Northern), Japan, Taiwan.

Genus *Cyphodemidea* Reuter, 1903

Kerzhner & Josifov, 1999; Kwon et al., 2001.

47. *Cyphodemidea saundersi* (Reuter, 1896). **Asia:** North Korea, South Korea, China (Central, Northeastern, Northern, Southwestern), Japan, Russia (Far East).

Genus *Eolygus* Poppius, 1915

Kerzhner & Josifov, 1999; Kwon et al., 2001.

48. *Eolygus rubrolineatus* (Matsumura, 1913) – **Asia:** South Korea, Japan, Russia (Far East: Sakhalin Is.).

Genus *Eurystylus* Stål, 1871

Kerzhner & Josifov, 1999; Kwon et al., 2001; Zheng et al., 2004; Yasunaga et al., 2017b.

49. *Eurystylus coelestialium* (Kirkaldy, 1902). **Asia:** North Korea, South Korea, China (Central, Northeastern, Northern, Southeastern, Southwestern), Japan, Russia (Far East).

50. *Eurystylus sauteri* Poppius, 1915. **Asia:** South Korea, China (Southern), Japan (Ryukyu Is.), Taiwan. Remark. *Eurystylus luteus* Hsiao, 1941 was documented in North Korea by Josifov &

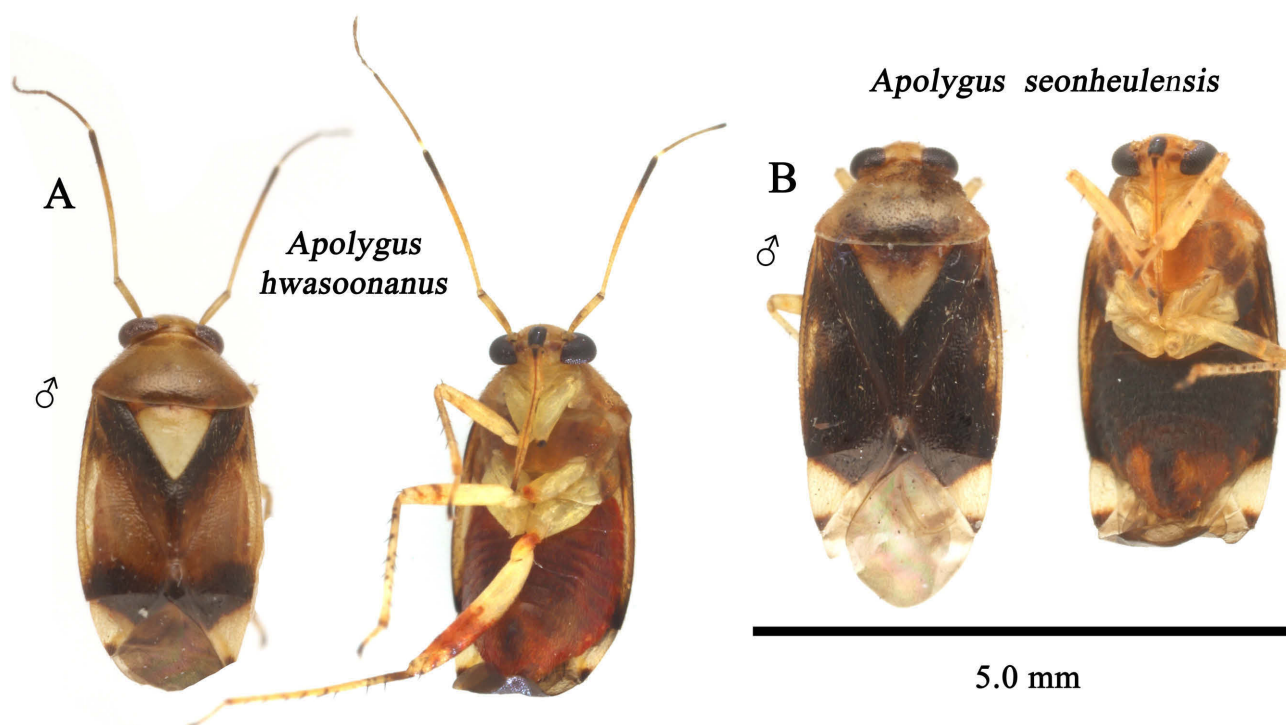


Fig. 5. New species of *Apolygus* from Korea, dorsal and ventral habitus. A – *A. hwasoonanus* sp. n., holotype male; B – *A. seonheulensis* sp. n., holotype male.

Kerzhner (1972). We reexamined Korean specimens identified as *E. luteus* in SNUM, and these are misidentified specimens of *E. sauteri*. Yasunaga et al. (2017b) also suggest that the specimens examined by Josifov & Kerzhner (1972), the first Korean record of *E. luteus*, cannot be positively separated from the holotype of *E. sauteri*. Because of our observations and the lack of strongly supportive references, we exclude *E. luteus* from our list. For figures of the dorsal habitus and genitalia of *E. sauteri*, see Yasunaga et al. (2017b).

Genus *Gigantomiris* Miyamoto & Yasunaga, 1988

Kerzhner & Josifov, 1999; Kwon et al., 2001.

51. *Gigantomiris jupiter* Miyamoto & Yasunaga, 1988. **Asia:** South Korea, Japan, Russia (Far East).

Genus *Josifovolygus* Kerzhner & Schuh, 1995

Kerzhner & Josifov, 1999; Kwon et al., 2001.

52. *Josifovolygus niger* (Josifov, 1992). **Asia:** North Korea, South Korea.

Genus *Koreocoris* Cho & Kwon, 2008

Cho & Kwon, 2008.

53. *Koreocoris bicoloratus* Cho & Kwon, 2008. **Asia:** South Korea.

Genus *Loristes* Josifov & Kerzhner, 1972

Kerzhner & Josifov, 1999; Kwon et al., 2001.

54. *Loristes decoratus* (Reuter, 1908). **Asia:** North Korea, South Korea, China (Northeastern), Japan, Russia (Far East).

Genus *Lygocorides* Yasunaga, 1991

Kerzhner & Josifov, 1999; Kwon et al., 2001.

Subgenus *Lygocorides* Yasunaga, 1991

55. *Lygocorides (Lygocorides) rubronasutus* (Linnavuori, 1961). **Asia:** South Korea, Japan.

Genus *Lygocoris* Reuter, 1875

Kerzhner & Josifov, 1999; Kwon et al., 2001; Zheng et al., 2004.

Subgenus *Lygocoris* Reuter, 1875

56. *Lygocoris (Lygocoris) idoneus* (Linnavuori, 1963). **Asia:** South Korea, China (Central, Southeastern, Southwestern), Japan, Russia (Far East: Kurile Is.).

57. *Lygocoris (Lygocoris) pabulinus* (Linnaeus, 1761). **Asia:** North Korea, South Korea, Azerbaijan, China (Central, Northeastern, Southeastern, Southwestern), Georgia, Japan, India, Russia (East Siberia, Far East, West Siberia), Taiwan; **Europe:** Central, Eastern, Northern, Southern, Western; **North America:**

Genus *Lygus* Hahn, 1833

Kerzhner & Josifov, 1999; Kwon et al., 2001.

58. *Lygus rugulipennis* Poppius, 1911. **Asia:** North Korea, South Korea, Armenia, Azerbaijan, China (Northeastern, Northern, Northwestern, Western plateau), Georgia, Iran, Japan, Kazakhstan (Asian part), Mongolia, Russia (East Siberia, Far East, West Siberia), Turkey (Asian part); **Europe:** Central, Eastern, Northern, Southern, Western; **North America:**

59. *Lygus sibiricus* Aglyamzyanov, 1990. **Asia:** North Korea, China (Northeastern, Northern, Northwestern, Southwestern, Western plateau), Mongolia, Russia (East Siberia, Far East, West Siberia: Altai).

60. *Lygus wagneri* Remane, 1955. **Asia:** North Korea, China (Northeastern, Northern, Northwestern, Southwestern), Georgia, Mongolia, Russia (East Siberia, Far East, West Siberia); **Europe:** Central, Eastern, Northern, Southern, Western.

Genus *Macrolygus* Yasunaga, 1992

Kerzhner & Josifov, 1999; Zheng et al., 2004; Cho et al., 2016.

61. *Macrolygus viridulus* Yasunaga, 1992. **Asia:** South Korea, China (Southwestern), Japan.

Genus *Mermitelocerus* Reuter, 1908

Kerzhner & Josifov, 1999; Kwon et al. 2001.

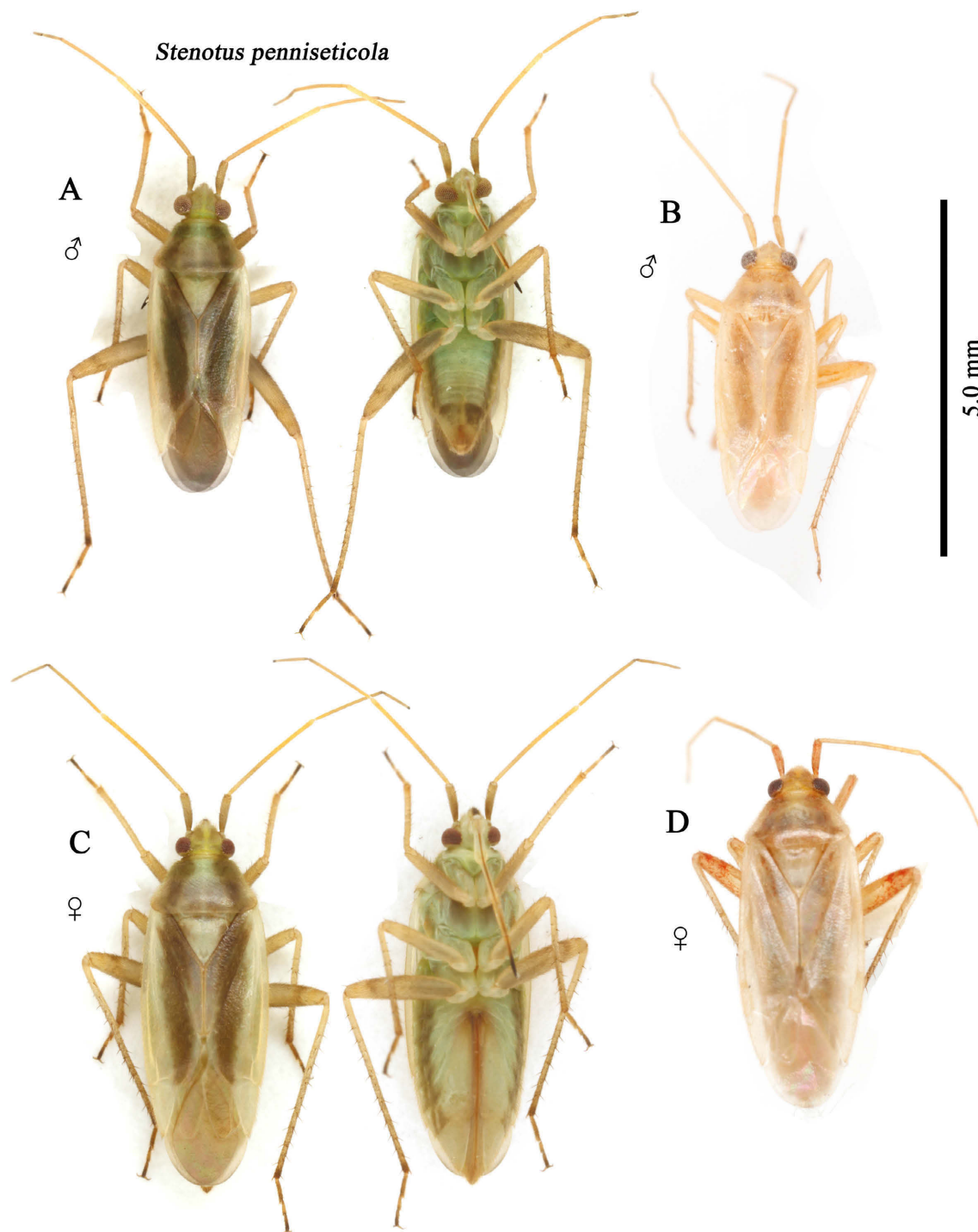


Fig. 6. Dorsal and ventral habitus of *Stenotus penniseticola* sp. n. A, B – male; C, D – female.

62. *Mermiteoecus annulipes annulipes* Reuter, 1908. **Asia:** South Korea, China (Northeastern, Northern), Russia (Far East: mainland part).

Genus Neolygus Knight, 1917

Cho et al., 2011; Kerzhner & Josifov, 1999; Kwon et al., 2001; Zheng et al., 2004; Kim & Jung, 2018.

63. *Neolygus aceris* (Kerzhner, 1988). **Asia:** North Korea, Russia (Far East).

64. *Neolygus hakusanensis* (Yasunaga, 1991). **Asia:** South Korea, Japan (Hokkaido, Honshu).

65. *Neolygus hoberlandti* (Kulik, 1965). **Asia:** North Korea, South Korea, Japan (Hokkaido, Honshu), Russia (Far East: Maritime territory).

66. *Neolygus honshuensis* (Linnavuori, 1961). **Asia:** South Korea, China (Eastern, Southeastern, Southern), Japan, Russia (Far East).

67. *Neolygus juglandis* (Kerzhner, 1988). **Asia:** South Korea, China (Central), Japan, Russia (Far East: Primorsk territory).

68. *Neolygus mjohjangsanicus* (Josifov, 1992). **Asia:** North Korea.

69. *Neolygus roseus* (Yasunaga, 1991). **Asia:** South Korea, Japan.

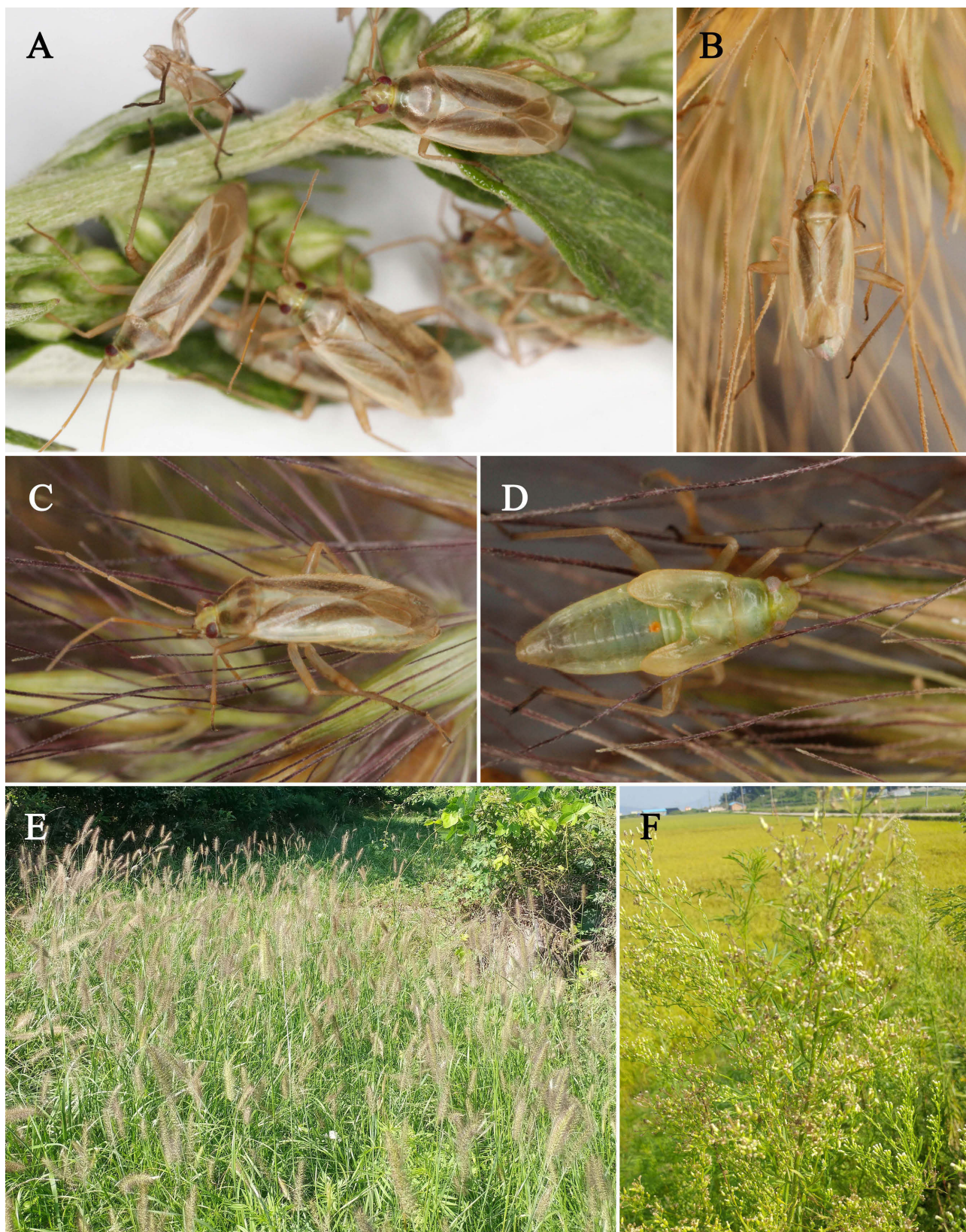


Fig. 7. *Stenotus penniseticola* sp. n., live individuals and host plants. A – adult individuals on *Conyza canadensis*; B – male; C – female; D – final instar nymph (B–D on *Pennisetum alopecuroides*); E – *Pennisetum alopecuroides*; F – *Conyza canadensis*.

70. *Neolygus sylvaticus* (Josifov, 1992). **Asia:** North Korea, South Korea.

71. *Neolygus tiliicola* (Kulik, 1965). **Asia:** North Korea, South Korea, China (Central), Japan, Russia (Far East).

72. *Neolygus viridis* (Fallén, 1807). **Asia:** North Korea, South Korea, Russia (Far East, West Siberia); **Europe:** Central, Eastern, Northern, Southern, Western.

73. *Neolygus zhugei* (Yasunaga, 1991). **Asia:** South Korea, Japan.

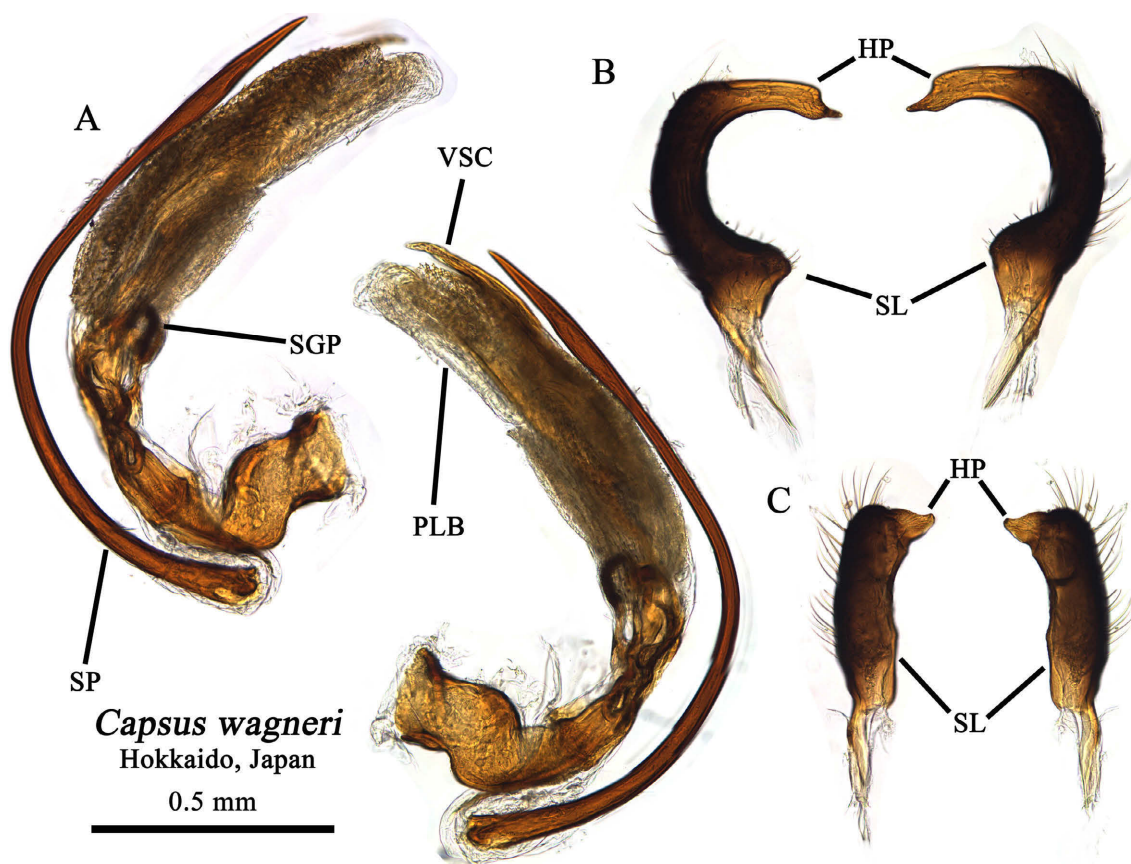


Fig. 8. Male genitalia of Japanese *Capsus wagneri*. A – endosoma; B – left paramere; C – right paramere. Abbreviations: HP – hypophysis; PLB – primary lobe; SGP – secondary gonopore; SL – sensory lobe; SP – speculum; VSC – ventral sclerite.

Genus *Neomegacoelum* Yasunaga, 1998

Kerzhner & Josifov, 1999; Kim et al., 2015a.

74. *Neomegacoelum vitreum* (Kerzhner, 1988). **Asia:** South Korea, Japan, Russia (Far East).

Genus *Orthops* Fieber, 1858

Kerzhner & Josifov, 1999; Kwon et al., 2001.

Subgenus *Orthops* Fieber, 1858

75. *Orthops (Orthops) scutellatus* Uhler, 1877. **Asia:** North Korea, South Korea, China (Northeastern, Northern), Japan, Russia (East Siberia, Far East, West Siberia: Altai).

Genus *Pachylygus* Yasunaga, 1992

Kerzhner & Josifov, 1999; Seong et al., 2009.

76. *Pachylygus nigrescens* (Kerzhner, 1977). **Asia:** South Korea, Japan, Russia (Far East).

Genus *Pantilius* Curtis, 1833

Kerzhner & Josifov, 1999; Kim et al., 2016.

77. *Pantilius (Coreidomiris) hayashii* Miyamoto & Yasunaga, 1989. **Asia:** South Korea, Japan (Honshu).

Genus *Peltidolygus* Poppius, 1915

Kerzhner & Josifov, 1999; Yasunaga, 2001.

78. *Peltidolygus scutellatus* (Yasunaga & Lu, 1994) (Fig. 3D–E). **Asia:** South Korea, China (Southeastern), Japan (Ryukyu Is.), Taiwan. Remarks: Yasunaga (2001) previously recorded this spe-

cies from Korea, but did not record the data for this specimen. Below we provide details of the specimens we examined.

Material examined. South Korea, Jeju-do: 2♂, 4♀, Bannong orum, Gyora-ri, Jocheon-eup, Jeju-si, from light trap, 11.viii.2016, M.S. Oh, J.B. Seung (SNUM); 1♀, Pepper farm, Deoksu-ri, Andeok-myeon, Seogwipo-si, 05.ix.1995, S.H. Lee (NAAS).

Genus *Philostephanus* Distant, 1909

Kerzhner & Josifov, 1999; Yasunaga & Schwartz, 2007; Seong et al., 2009.

79. *Philostephanus glaber* (Kerzhner, 1988). **Asia:** North Korea, South Korea, China (Southwestern), Japan, Russia (Far East).

80. *Philostephanus rubripes* (Josifov, 1876). **Asia:** North Korea, South Korea, China (Northeastern, Northern), Japan, Russia (Far East).

81. *Philostephanus tibialis* (Lu & Zheng, 1998) (Fig. 4A–B). **Asia:** South Korea (new record), China (Central, Northern).

Material examined. South Korea, Gangwon-do: 1♀, Hanga-ye-ri, Buk-myeon, Inje-gun, 01.vi.2017, from light trap, M.S. Oh (SNUM); 1♂, Mt. Chiak, Geumdae-ri, Panbu-myeon, Wonju-si, 20.viii.2013, from light trap, R.K. Duwal, Y. Lee, H. Song (SNUM); 1♀, Haggok-ri, Socho-myeon, Wonju-si, from light trap, R.K. Duwal, Y. Lee, H. Song (SNUM). Gyeongsangbuk-do: 1♂, Mt. Irwol, Irwol-myeon, Yeongyang-gun, from light trap, 23.viii.2014, Lee, Lee, Song (SNUM). Jeollanam-do: 1♀, Macheon-myeon, Hamyang-gun, 23.ix.2015, Song, Cho, Choi

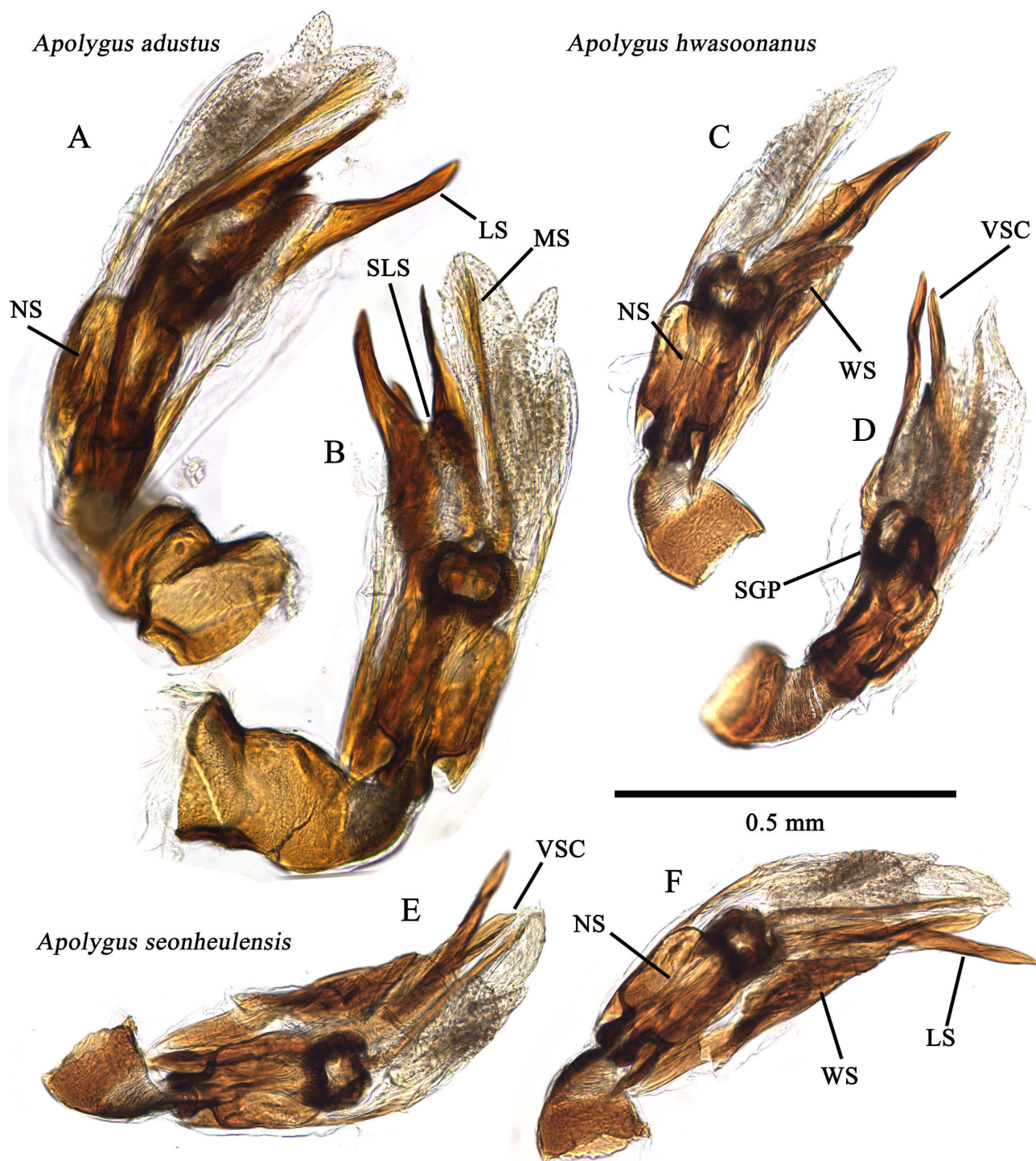


Fig. 9. *Apolygus* species from Korea, endosoma of male genitalia. A, B – *Apolygus adustus*; C, D – *A. hwasoonanus* sp. n.; E, F – *A. seonheulensis* sp. n. Abbreviations: LS – lateral sclerite; MS – median sclerite; NS – needle-shaped spicule; SGP – secondary gonopore; SLS – sublateral sclerite; VSC – ventral sclerite; WS – wing-shaped sclerite.

(SNUM); 1♀, SNUM Chusan experimental forest, Chusan-ri, Okryeong-myeon, Gwangyang-si, from light trap, 22.ix.2015, Song, Cho, Choi (SNUM).

82. *Philostephanus ulmi* (Kerzhner, 1979). **Asia:** South Korea, China (Northeastern), Japan, Russia (Far East).

Genus *Phytocoris* Fallén, 1814

Kerzhner & Josifov, 1999; Kwon et al., 2001; Zheng et al., 2004; Yasunaga & Schwartz, 2015; Oh et al., 2017.

Subgenus *Ktenocoris* Wagner, 1954

83. *Phytocoris nowickyi* Fieber, 1870. **Asia:** North Korea, China (Northern), Japan, Russia (Far East, West Siberia: Altai); **Europe:** Central, Eastern, Southern.

Subgenus *Phytocoris* Fallén, 1814

84. *Phytocoris goryeonus* Oh, Yasunaga & Lee, 2017. **Asia:** South Korea.

85. *Phytocoris intricatus* Flor, 1861. **Asia:** North Korea, South Korea, China (Northern, Northwestern, Southwestern), Russia

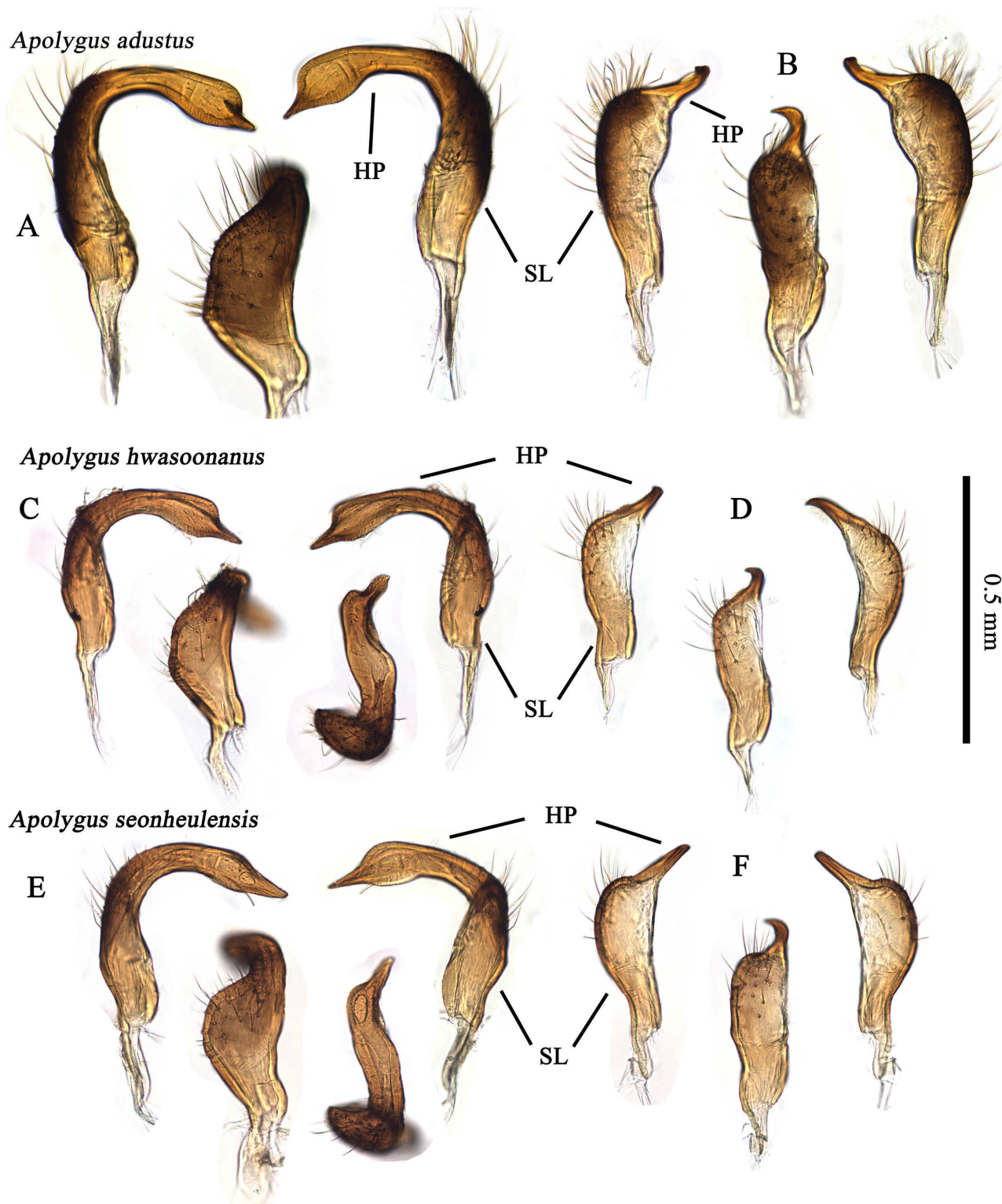


Fig. 10. *Apolygus* species from Korea, paramere of male genitalia. A, B – *Apolygus adustus*; C, D – *A. hwasoonanus* sp. n.; E, F – *A. seonheulensis* sp. n. A, C, E – left paramere; B, D, F – right paramere. Abbreviations: HP – hypophysis; SL – sensory lobe.

(East Siberia, Far East, West Siberia); **Europe:** Central, Eastern, Northern, Western.

86. *Phytocoris longipennis* Flor, 1861. **Asia:** South Korea, China (Northern, Northwestern), Japan, Russia (East Siberia, Far East); **Europe:** Central, Eastern, Northern, Southern, Western.

87. *Phytocoris minakatai* Yasunaga & Schwartz, 2015. **Asia:** South Korea, Japan.

88. *Phytocoris ohataensis* Linnavuori, 1963. **Asia:** South Korea, Japan, Russia (Far East).

89. *Phytocoris pallidicollis* Kerzhner, 1977. **Asia:** South Korea, Japan, Russia (Far East).

90. *Phytocoris shabliovskii* Kerzhner, 1988. **Asia:** North Korea, South Korea, China (Central, Northeastern, Northern), Russia (Far East).

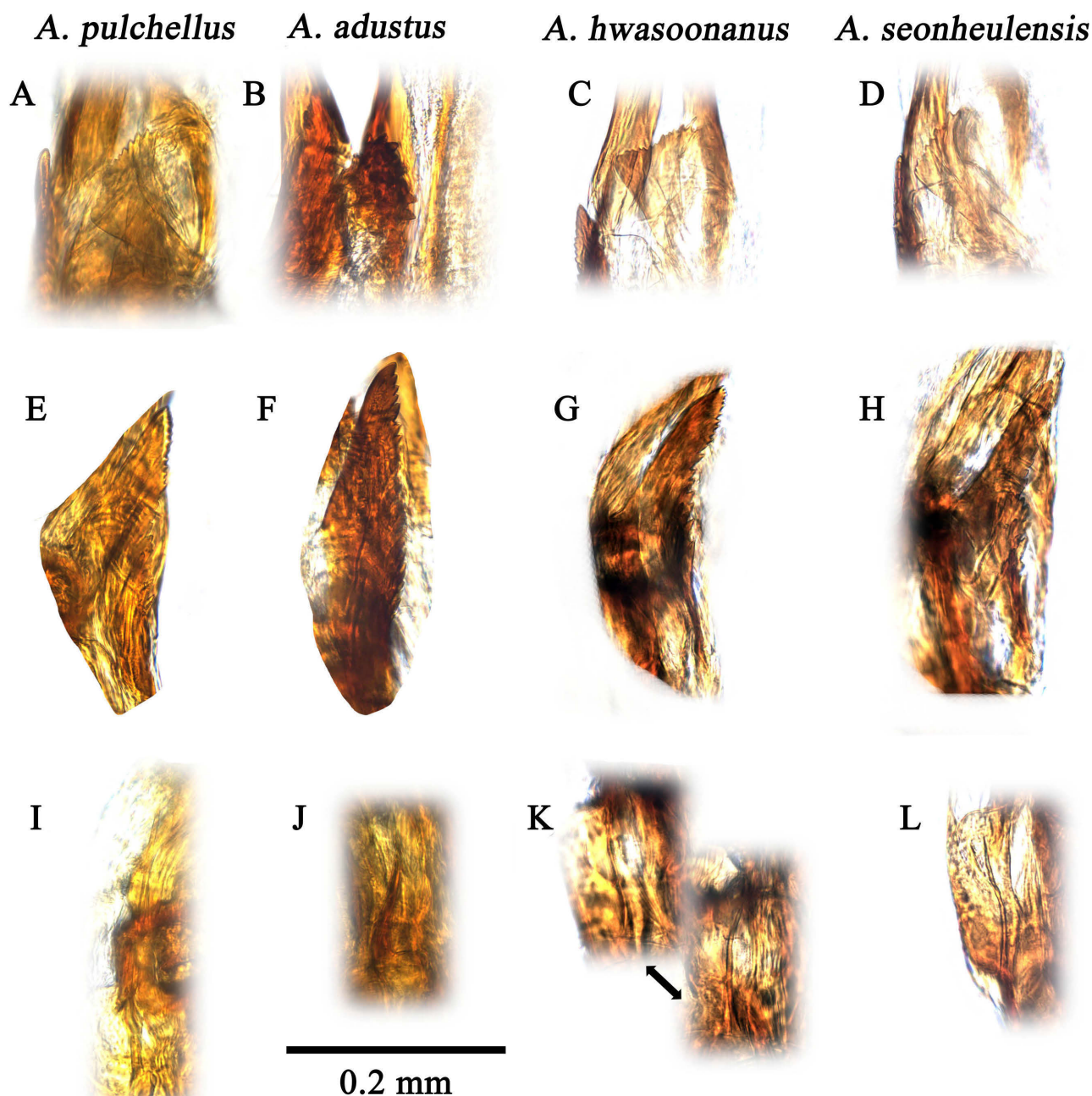


Fig. 11. Endosomal structures of *Apolygus* species from Korea. A, E, I – *Apolygus pulchellus*; B, F, J – *A. adustus*; C, G, K – *A. hwasoonanus* sp. n.; D, H, L – *A. seonheulensis* sp. n. A–D – sublateral sclerite; E–H – wing-shaped sclerite; I–L – needle-shaped spicule.

Genus *Pinalitopsis* Yasunaga, Schwartz & Chérot, 2002

Yasunaga et al., 2002.

91. *Pinalitopsis rhodopotnia* Yasunaga, Schwartz & Chérot, 2002 (Fig. 3F–G). **Asia:** South Korea (new record), Japan.

Material examined. South Korea, Jeju-do: 1♂, 7♀, Seogwipo recreational forest, Daepo-dong, Seogwipo-si, on *Torreya nucifera* (L.) Siebold & Zucc. 05.vii.2017, Oh, Seung, Lee (SNUM); 13♀, Jeolmul recreational forest, Myeongrim-ro, Jeju-si, on *Torreya nucifera* (L.) Siebold & Zucc. 04.vii.2017, Oh, Seung, Lee (SNUM).

Genus *Pinalitus* Kelton, 1955

Kerzhner & Josifov, 1999; Kwon et al., 2001; Zheng et al., 2004.

92. *Pinalitus nigriceps* Kerzhner, 1988. **Asia:** North Korea, South Korea, China (Northeastern, Southwestern), Japan, Russia (Far East).

93. *Pinalitus rubeolus* (Kulik, 1965). **Asia:** North Korea, South Korea, China (Northern, Southwestern), Japan, Russia (Far East).

Genus *Polymerias* Yasunaga, 1997

Kerzhner & Josifov, 1999; Kwon et al., 2001.

94. *Polymerias opacipennis* (Lindberg, 1934). **Asia:** North Korea, South Korea, Japan, Russia (Far East).

Genus *Polymerus* Hahn, 1831

Gapon, 2014; Kerzhner & Josifov, 1999; Kim & Jung, 2018; Kwon et al., 2001; Schwartz et al., 1991.

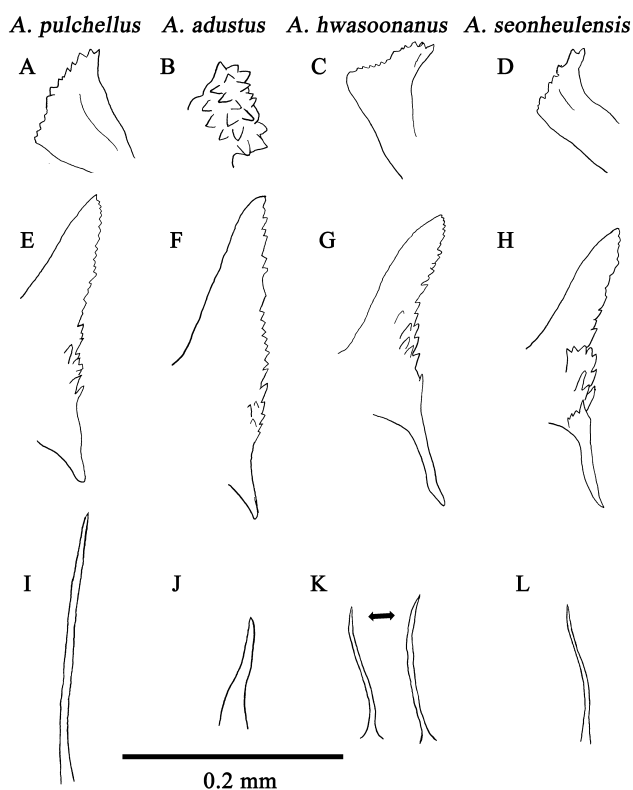


Fig. 12. Drawing of endosomal structures of *Apolygus* species from Korea. A, E, I – *Apolygus pulchellus*; B, F, J – *A. adustus*; C, G, K – *A. hwasoonanus* sp. n.; D, H, L – *A. seonheulensis* sp. n. A–D – sublateral sclerite; E–H – wing-shaped sclerite; I–L – needle-shaped spicule.

Subgenus *Pachycentrum* Gapon, 2014

95. *Polymerus (Pachycentrum) carpathicus* (Horváth, 1882). **Asia:** North Korea, China (Northeastern, Northern), Mongolia, Russia (East Siberia, Far East, West Siberia); **Europe:** Central, Eastern, Southern, Western.

96. *Polymerus (Pachycentrum) nigrita* (Fallén, 1807). **Asia:** North Korea, Azerbaijan, China (Northern, Northwestern), Kazakhstan (Asian part), Kirgizia, Russia (East Siberia, West Siberia, Far East), Uzbekistan; **Europe:** Central, Eastern, Northern, Southern, Western.

Subgenus *Poeciloscytus* Fieber, 1858

97. *Polymerus (Poeciloscytus) brevicornis* (Reuter, 1879). **Asia:** North Korea, South Korea, Afghanistan, Armenia, Azerbaijan, Kazakhstan (Asian part), China (Northeastern, Northern), Georgia, Kirgizia, Russia (East Siberia, Far East, West Siberia), Tadjikistan, Turkey (Asian part), Turkmenistan, Uzbekistan; **Europe:** Central, Eastern, Northern, Southern, Western.

98. *Polymerus (Poeciloscytus) cognatus* (Fieber, 1858). **Asia:** North Korea, South Korea, Armenia, Azerbaijan, China (Northeastern, Northern, Northwestern, Southwestern), Georgia, Kazakhstan (Asian part), Kirgizia, Mongolia, Russia (East Siberia, Far East, West Siberia), Tadjikistan, Turkmenistan, Turkey (Asian part), Uzbekistan; **Europe:** Central, Eastern, Northern, Southern, Western; **North Africa:** Algeria, Azores, Morocco, Tunisia; **North America:** Canada, United States.

99. *Polymerus (Poeciloscytus) palustris* (Reuter, 1905). **Asia:** South Korea, China (Northeastern), Japan, Russia (East Siberia, Far East, West Siberia); **Europe:** Central, Eastern, Northern, Southern, Western.

100. *Polymerus (Poeciloscytus) unifasciatus* (Fabricius, 1794). **Asia:** South Korea, Armenia, Azerbaijan, China (Northern, Northwestern, Southwestern), Georgia, Japan, Kazakhstan (Asian part), Kirgizia, Turkey (Asian part), Mongolia, Russia (East Siberia, Far East, West Siberia), Tadjikistan, Turkmenistan, Uzbekistan; **Europe:** Central, Eastern, Northern, Southern, Western; **North Africa:** Algeria, Canary Is., Morocco; **North America:**

Subgenus *Polymerus* Hahn, 1831

101. *Polymerus (Polymerus) amurensis* Kerzhner, 1988. **Asia:** South Korea, Russia (Far East).

102. *Polymerus (Polymerus) peginensis* Horváth, 1901. **Asia:** North Korea, South Korea, China (Central, Northeastern, Northern, Southeastern, Southwestern), Japan, Russia (Far East), Vietnam.

Genus *Proboscidocoris* Reuter, 1882

Kerzhner & Josifov, 1999; Kwon et al., 2001.

103. *Proboscidocoris varicornis* (Jakovlev, 1904). **Asia:** North Korea, South Korea, Japan, Taiwan.

Genus *Rhodomiris* Wagner, 1968

Kerzhner & Josifov, 1999; Zheng et al., 2004; Henry, 2017.

104. *Rhodomiris pulcherrimus* (Lindberg, 1934). **Asia:** North Korea, South Korea, China (Northern), Japan, Russia (Far East).

105. *Rhodomiris striatellus* (Fabricius, 1794) (Fig. 4E–F). **Asia:** South Korea (new record), Armenia, Azerbaijan, China (Central, Northern), Georgia, Turkey (Asian part); **Europe:** Central, Eastern, Northern, Southern, Western. **North America:**

Material examined. South Korea, Gangwon-do: 1♀, Hangeyae-ri, Buk-myeon, Inje-gun, 29.v.2017, from light trap, Oh, Lee, Seung, Nam (SNUM); 1♀, Bangtae NRC, Girin-myeon, Inje-gun, 06.vi.2015, M.S. Oh, S.H. Lee (SNUM); 1♂, Namjeon-ri, Nammyeon, Inje-gun, from light trap, 28.v.2017, M.S. Oh (SNUM).

Genus *Stenotus* Jakovlev, 1877

Kerzhner & Josifov, 1999; Kim & Jung, 2016a; Namyatova et al., 2013.

106. *Stenotus binotatus* (Fabricius, 1794). **Asia:** South Korea, Azerbaijan, Georgia, Japan, Turkey (Asian part), Russia (East Siberia: Krasnoyarsk, Far East, West Siberia: Altai); **Europe:** Central, Eastern, Northern, Southern, Western; **North America:** Canada, United States of America (mainland, introduced in Hawaii); **Australasia:** Australia, New Zealand (introduced).

107. *Stenotus penniseticola* Oh, Yasunaga & Lee, sp. n. **Asia:** South Korea. See taxonomic section.

108. *Stenotus rubrovittatus* (Matsumura, 1913). **Asia:** North Korea, South Korea, China (Central, Northern), Japan, Russia (Far East).

Genus *Taylorilygus* Leston, 1952

Kerzhner & Josifov, 1999; Kwon et al., 2001; Namyatova et al., 2013.

109. *Taylorilygus apicalis* (Fieber, 1861). **Asia:** South Korea, China (Southeastern), Cyprus, Egypt (Sinai), Iran, Iraq, Israel, Japan, Lebanon, Saudi Arabia, Taiwan, Turkey (Asian part), Yemen, Oriental Region; **Europe:** Central, Eastern, Southern, Western; **North America:** Cuba, Mexico, United States of America (mainland, introduced in Hawaii); **Australasia:** Australia.

Genus *Tingnotum* Kirkaldy, 1902

Kerzhner & Josifov, 1999; Kwon et al., 2001; Zheng et al., 2004.

110. *Tinginotum perlatum* Linnavuori, 1961. **Asia**: South Korea, China (Southwestern), Japan, Taiwan.

111. *Tinginotum pini* Kulik, 1965. **Asia**: South Korea, China (Central, Eastern, Southeastern), Japan, Russia (Far East).

Genus *Yamatolygus* Yasunaga, 1992

Yasunaga, 1992c; Kerzhner & Josifov, 1999.

112. *Yamatolygus insulanus* Yasunaga, 1992 (Fig. 4D) – **Asia**: South Korea (new record), Japan,

Material examined. South Korea, Jeju-do: 1♂, Jeju-si, 12.v.2008, T. Yasunaga, S.H. Jung & R.K. Duwal (SNUM); Jeollanam-do: 1♂, Choosan-ri, Okryeong-myeon, Gwangyang-si, 16.–19.vi.2008, S.H. Jung & R.K. Duwal (SNUM).

113. *Yamatolygus pilosus* Yasunaga, 1992 (Fig. 4C). **Asia**: South Korea (new record), Japan,

Material examined. South Korea, Gangwon-do: 1♂, Yongdae NRC, Mt. Maebong, Buk-myeon, Inje-gun, from light trap, 31.vii.2013, R.K. Duwal (SNUM); Gyeongsangnam-do: 1♂, Mt. Jiri, Yupyong-ri, Samjang-myeon, Sancheong-gun, 29.viii.1997, L.G. Hyung (NAAS).

Summary. Previously, 104 species of Mirini were recorded from the Korean peninsula. In this study, the total number of species is raised to 113. Among these, dry specimens of 91 species were examined by the senior author, three new species are described and 8 species are newly recorded from Korea. In addition, records of *A. atriclavus* are replaced by the newly recognized senior synonym *A. xanthomelas*, and *A. josifovi* and *C. koreanus* are replaced by the senior synonym *A. subpulchellus* and *C. wagneri* respectively. Korean records of *E. luteus* were reexamined and ascribed to *E. sauteri*.

Key to the genera of Mirini in Korea

- 1 Body dorsally and ventrally covered with white, scale-like setae 2
 - Body not dorsally and ventrally covered with white, scale-like setae 5
- 2 Head distinctly projected, pointed anteriorly. Pretarsal claw with denticle (see Gapon, 2014, Fig. 19O, P)..... *Proboscidocoris*
 - Head moderately or weakly projected, not pointed. Pretarsal claw without denticle (see Gapon, 2014, Fig. 19L, M)..... 3
- 3 Dorsum shallowly punctured. Ratio of median length of pronotal collar to width of antennal segment II is near 1 : 1. Hind tarsomere I shorter than II 4
 - Dorsum deeply punctured, ratio of median length of pronotal collar (on dorsal side) to width of antennal segment II is 2 : 1. Hind tarsomere I as long as II..... *Charagochilus*
- 4 Ratio of head width to basal pronotal width greater than 1 : 2. Border between corium and cuneus without a pale portion, membrane vein dark *Polymerias*
 - Ratio of head width to basal pronotal width not over 1 : 2. At least border between corium and cuneus pale, membrane vein pale..... *Polymerus*
- 5 Scutellum distinctly tumid..... 6
 - Scutellum not distinctly tumid..... 7
- 6 Head entirely, or partly dark brown. Inner corner of cuneus without reddish tinge. Spicule rather thick and curved, basal part of seminal duct with frontal sclerite, lateral sclerite comparatively small, spinulate *Pachylygus*
 - Head almost entirely pale brown to brown. Inner corner of cuneus with reddish tinge. Spicule thin and straight, basal part

- of seminal duct without any sclerite, lateral sclerite highly developed along endosomal membrane..... *Peltidolygus*
- 7 Body larger than 12 mm, dorsum reddish to blackish.....
 - *Gigantomiris*
 - Body not larger than 10 mm..... 8
- 8 Body larger than 7.2 mm. Pronotum and apex of cuneus with dark markings. Hemelytra with several dark brown stripes along each vein 9
 - Body size and colouration not as above, or if similar, at least apex of cuneus pale (e.g. *Adelphocoris quadripunctatus*). 10
- 9 Body pale green or green, antennal segment I thicker than tibial width, antennal segment II clavate *Mermitelocerus*
 - Body yellowish or pale yellowish green, antennal segment I not thicker than tibial width, antennal segment II not clavate *Rhabdomiris*
- 10 Dorsum matt, mottled with pale or dark brown colouration. Pronotum densely covered with erect or semierect setae 11
 - Dorsum rather glabrous or not mottled with pale or dark brown colouration. Pronotum covered with reclining setae ... 12
- 11 Antennal segment I longer than head width. Ratio of width across hemelytron to length of metafemur over 1 : 1.5..... *Phytocoris*
 - Antennal segment I shorter than head width. Ratio of width across hemelytron to length of metafemur not over 1 : 1.2..... *Tinginotum*
- 12 Antennal segment II more or less clavate, thicker or as thick as segment I 13
 - Antennal segment II rather slender or not thicker than segment I..... 16
- 13 Median length of pronotal collar subequal to length of callus. Pronotum impunctate, with a pair of black spots. Cuneal fracture steep..... *Eurystylus*
 - Pronotal collar medially short, shorter than length of callus. Pronotum impunctate and without a pair of black spots. Cuneal fracture moderate 14
- 14 Dorsal colouration sanguineous, with prominent black spots and stripes *Eolygus*
 - Dorsal colouration not as above 15
- 15 Head without basal transverse carina. Corium and cuneus without white spot *Capsus*
 - Head with basal transverse carina. Corium and cuneus with a pair of white, oblique fascia *Bertsia*
- 16 Basal transverse carina of head distinct, not medially obsolete 17
 - Basal transverse carina of head weakly developed or reduced, or medially obsolete..... 26
- 17 Tibial spine of hindleg blackish..... 18
 - Tibial spine of hindleg pale brown or brown..... 22
- 18 Metatibia with large, dark spot 19
 - Metatibia lacks large, dark spot or only with small spot 20
- 19 Endosoma with two long, slender spicules and trough-shaped sclerite, median sclerite spinous *Apolygopsis*
 - Endosoma with one long, slender spicule and wing-shaped sclerite, median sclerite not spinous *Apolygus*
- 20 Body longer than 6.3 mm and if shorter (e.g. *C. falkovitshi*), pronotum glabrous and impunctate. Ratio of antennal segment III to IV over 1.8 : 1 *Castanopsides*
 - Body length not longer than 6.2 mm. Pronotum rather punctate. Ratio of antennal segment III to IV not over 1.4 : 1.... 21
- 21 Scutellum rather rugose, weakly glabrous and covered with reclining setae *Lygus*
 - Scutellum smooth, glabrous and covered with erect or sub-erect setae *Orthops*

Stenotus penniseticola

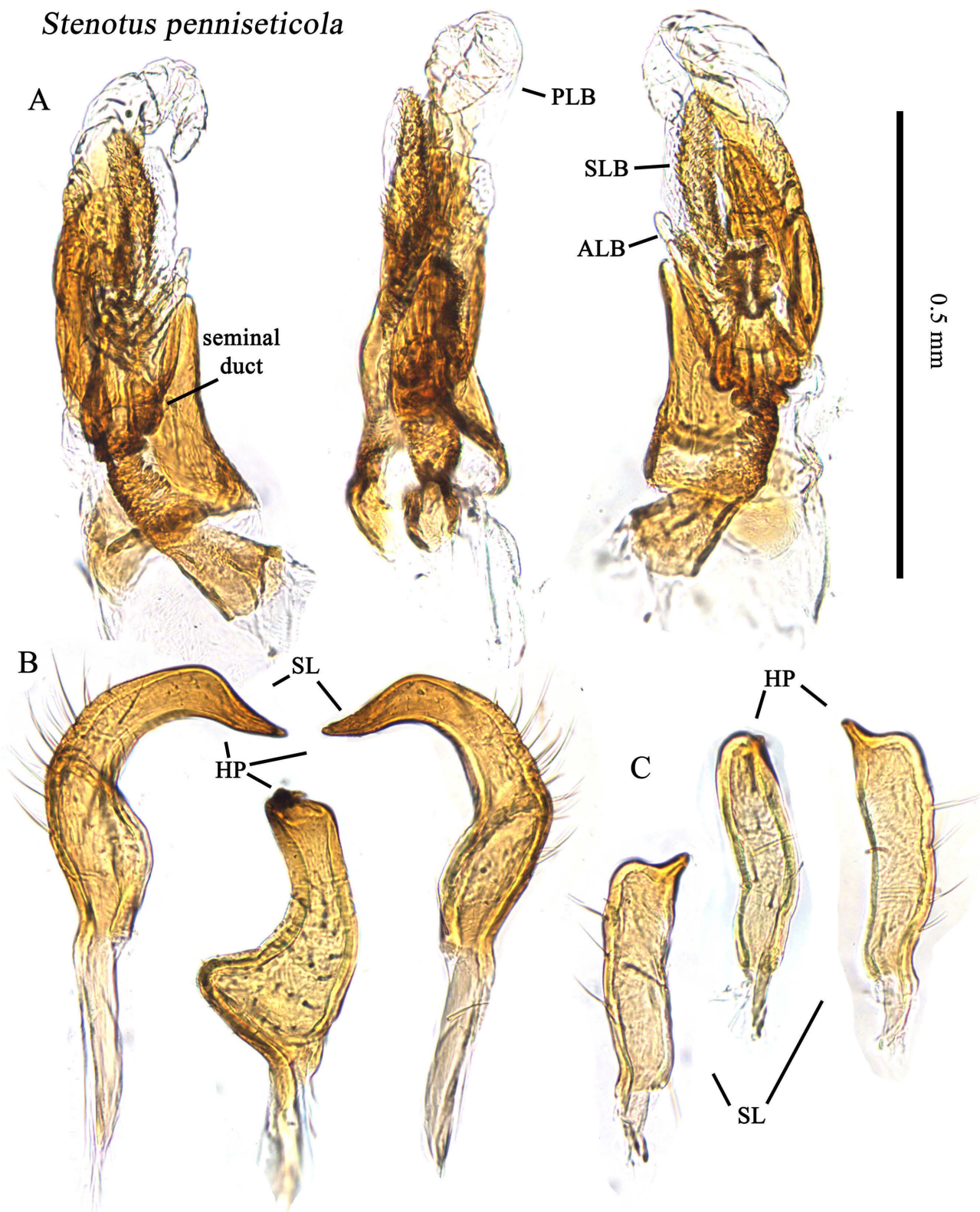


Fig. 13. Male genitalia of *Stenotus penniseticola* sp. n. A – endosoma; B – left paramere; C – right paramere. Abbreviations: ALB – accessory lobe; HP – hypophysis; PLB – primary lobe; SL – sensory lobe; SLB – secondary lobe.

- 22 Body pale green to green, rarely tinged with red. Apex of sensory lobe of left paramere with distinct subapical structure... 23
- Body brown to reddish brown, not tinged with green. Apex of sensory lobe of left paramere without subapical structure . 24

- 23 Dorsum covered with pale, reclining sericeous setae. Scutellum usually with a pair of brownish spots. Left paramere with lamellate process on sensory lobe (For detailed figure for left paramere, see Carvalho & Gagné, 1968: Fig. 46) *Taylorilygus*

Stenotus penniseticola

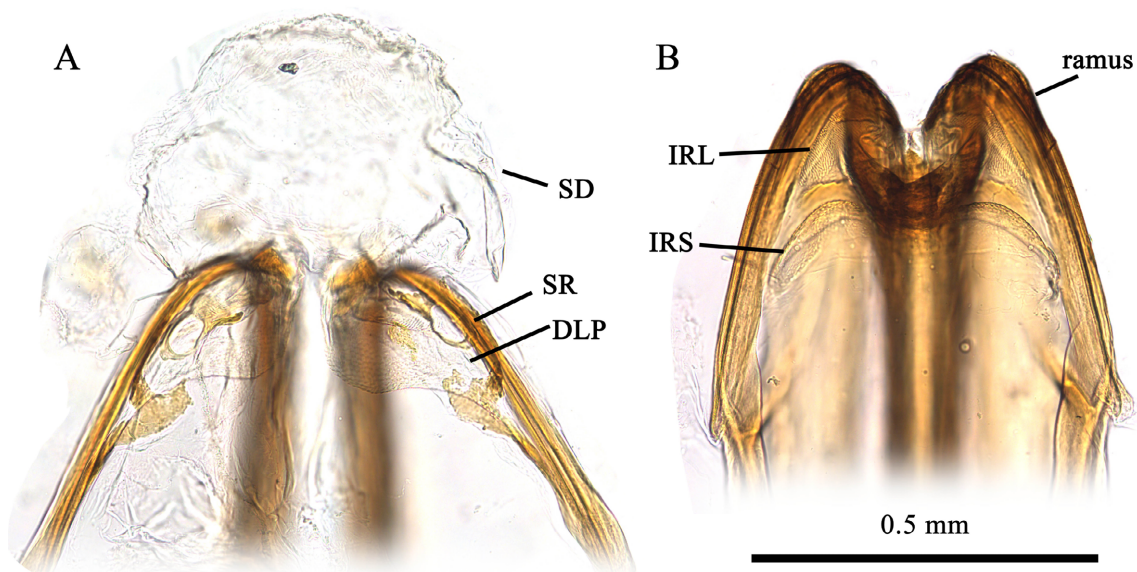


Fig. 14. Female genitalia of *Stenotus penniseticola* sp. n. A – bursa copulatrix; B – posterior wall. Abbreviations: DLP – dorsal labiate plate; IRL – interramal lobe; IRS – interramal sclerite; SD – seminal depository; SR – sclerotized ring.

- Dorsum not covered with pale, reclining sericeous setae. Scutellum usually unicolourous. Left paramere without lamellate process on sensory lobe*Neolygus*
- 24. Body elongate oval (Fig. 4C, D). Dorsum densely covered with brown setae and pale pubescence. Base of tibial spine with large, dark spot. Metafemur brownish..... *Yamatolygus*
- Body elongate (Fig. 3F, G). Dorsum covered with pale pubescence. Base of tibial spine lacks dark spot. Metafemur usually tinged with red 25
- 25 Labium extending to metacoxae. Pronotal collar narrow, pronotum shallowly punctate. Endosoma with spicule.. *Pinalitus*
- Labium not reaching midcoxa. Pronotal collar broad, pronotum deeply punctate. Endosoma membranous, without spicules..... *Pinalitopsis*
- 26 Pronotum unicolourous orange brown or bright orange. If pronotum not unicolourous, at least basal part of corium and clavus bright orange..... 27
- Pronotum not unicolourous orange..... 28
- 27 Hemelytra orange-brown*Lygocorides*
- Hemelytra black except base*Koreocoris*
- 28 Femora mainly green, sometimes partly tinged with orange, without minute spots or dark area or reddish tinge 29
- Femora not green. If femora green, with minute spots or a dark area or reddish tinge 30
- 29 Body larger than 8.0 mm. Base of metatibia dark *Macrolygus*
- Body not larger than 6.5 mm. Base of metatibia not dark..... *Lygocoris*
- 30 Metatibia densely covered with brown to blackish suberect setae, often with sparsely distributed setae distinctly longer than tibial spine..... 31
- Metatibia densely covered with very short, stiff setae or sparsely covered with pale, short setae..... 33
- 31 Body sparsely covered with long, dark suberect or erect setae. Median length of pronotal collar exceeds basal width of antennal segment II. Scutellum mainly pale yellow to orange except darkened basal corner..... *Capsodes*
- Body not covered with setae as above. Median length of pronotal collar equal to or less than basal width of antennal segment II. Scutellum mainly dark or reddish, often pale laterally 32
- 32 Legs and antenna covered with suberect, stiff setae, as long as or longer than tibial spine. Pronotum and hemelytra covered with suberect or erect black setae*Josifovolygus*
- Legs and antenna covered with suberect setae, significantly shorter than tibial spine. Pronotum and hemelytra covered with reclining, sericeous setae or glabrous.....*Philostephanus*
- 33 Hemelytra hyaline.....*Neomegacoelum*
- Hemelytra not hyaline 34
- 34 Tarsomere I 1.4–2.0 times longer than tarsomere II.. *Stenotus*
- Tarsomere I as long as or shorter than tarsomere II..... 35
- 35 Median length of pronotal collar less than basal width of antennal segment II 36
- Median length of pronotal collar not less than basal width of antennal segment II..... 38
- 36 Antennal segment I and II thick, as thick as width of metafemur. Length of metafemur as long as basal pronotal width.... *Pantilius*
- Antennal segment I and II slender, distinctly thinner than width of metafemur. Length of metafemur distinctly longer than basal pronotal width..... 37
- 37 Body larger, usually 6–10 mm. Antennal segment II–IV brownish, often partly or widely darkened. Endosoma with serrate, comb-shaped spicule..... *Adelphocoris*
- Body smaller, usually 4–6 mm. Antennal segment II–IV always pale yellow. Endosoma with straight and elongated spicule *Adelphocorisella*
- 38 Hemelytra mottled with brown, pale brown and dark brown colouration. Pronotum with pale brown, continuous or discontinuous narrow line medially. Length of metafemur shorter than basal width of pronotum *Cyphodemidea*
- Hemelytra not mottled with brown colouration. Pronotum widely dark or pale, without narrow, pale line medially. Metafemur longer than basal width of pronotum 39
- 39 Ratio of maximum width of antennal segment II to III not greater than 1.2. Pronotum pale, partly tinged with red *Creontiades*

- Ratio of maximum width of antennal segment II to III greater than 1.5. Pronotum dark and partly pale, not tinged with red 40
- 40 Antennal segment II blackish brown without pale spots. Antennal segment III 1.5 times longer than IV. Metafemur and metatibia partly tinged with red. Hemelytra with three pairs of pale spots along outer margin.....*Loristes*
- Antennal segment II dark brown, partly pale. Antennal segment III as long as or slightly longer than IV. Metafemur and metatibia not tinged with red. Hemelytra colouration not as above, mostly dark except for cuneus *Closterotomus*

TAXONOMY

Genus *Apolygus* China, 1941

Apolygus hwasoonanus Oh, Yasunaga & Lee, sp.n.

(Figs 5A, 9C–D, 10C–D, 11C, G, K, 12C, G, K)

ZooBank taxon LSID:

44884BCC-E774-462D-BC50-3F14688BD632

Diagnosis. Recognized by its small size; weakly glabrous and setose hemelytra; basic colouration pale brown with dark markings (Fig. 5A). Male genitalia as in Figs 9C–D, 10C–D; MS slender and elongated; NS weakly developed; WS subtriangular and apically protruded, with arch like upper margin (Figs 11C, G, K, 12C, G, K).

Description. Male. Body oblong oval, small; **Colouration:** Basic colouration pale brown with dark markings; Head pale brown; basal transverse carina of vertex tinged with brown; frons yellowish brown; clypeus entirely dark; maxillary plate tinged with reddish brown. Antennae brown; dark brown except pale brown segment I, basal 3/4 of segment II, and bases of segments III and IV. Labium yellowish brown, apical part of segment IV dark. Pronotum dirty yellowish brown, a pair of brown spots on anterior margin. Scutellum whitish and base narrowly tinged with pale brown. Hemelytra pale brown with dark markings; base and inner margin of clavus and posterior part of corium dark brown; cuneus pale yellow, base and apex dark; membrane smoky grey. Legs pale yellow; distal half and base of metafemur sanguineous, with obscure reddish brown rings apically; tibial spines dark brown, fuscous spot at base; tarsi pale brown, tarsomeres III with dark apex. Abdomen tinged with red. **Surface and vestiture:** Dorsal surface weakly shiny, reclining pale yellow setae widely dispersed on dorsum. Head glossy, sparsely covered with silvery pubescence; frons weakly striolate. Pronotum slightly glabrous, minutely punctate; covered with short, suberect pale setae. Scutellum smooth, surface covered with short, pale pubescence. Hemelytra densely covered with reclining, pale setae. **Structure:** Antennae slender. Labium reaching base of metacoxa. Male genitalia as in Figs 9C–D, 10C–D; sensory lobe of left paramere weakly protruding, sparsely covered with long setae; hypophysis tapering apically, medially thin; sensory lobe of right paramere elongate; hypophysis rather short, crooked apically; NS short, not extending to SGP; MS elongated, medially twisted and narrow; VSC triangular, elongated; SLS horizontally wide and spinous, basal part narrow; LS

slightly bent subapically, more or less slender; WS subtriangular and apically protruding, with arch like upper margin. **Female.** Unknown.

Measurements. Male (n = 1). Total body length 3.71; head width across eyes 1.01; vertex width 0.36; lengths of antennal segment I–IV 0.49, 1.45, 0.85, 0.50; labial length 1.56; mesal pronotal length including collar 0.90; basal pronotal width 1.52; width across hemelytron 1.73; cuneal length 0.80; cuneal width 0.41; lengths of metafemur, tibia and tarsus 1.59, 2.19, 0.51.

Etymology. Named after the type locality, Hwasoon gotzawal; an adjective.

Host. Unknown.

Type material. Holotype: ♂: South Korea, Jeju-do: Hwasoon gotzawal, Hwasoon-ri, Andeok-myeon, Seogwipo-si, on light trap, 10.viii.2016, M.S. Oh, J.B. Seung (SNUM).

Type locality. South Korea, Jeju-do, Hwasoon-ri, Hwasoon gotzawal.

Remarks. In Korea, this species can be confused with congeners of similar appearance [e.g. *A. pulchellus* (Reuter), *A. subhilaris* (Yasunaga)], but can be distinguished by its smaller size, entirely dark clypeus, mainly pale antennal segment II, sanguineous colouration of abdomen, arch-like upper margin of the WS, and laterally wide SLS of male genitalia.

Apolygus seonheulensis Oh, Yasunaga & Lee, sp.n.

(Figs 5B, 9E–F, 10E–F, 11D, H, L, 12D, H, L)

ZooBank taxon LSID:

EC248150-BC3B-4490-8689-462E9E53884F

Diagnosis. Recognized by rather small size; weakly glabrous and setose hemelytra; basic colouration dark brown (Fig. 5B). Male genitalia as in Figs 9E–F, 10E–F; MS slender and elongated; NS short, and thin; WS subtriangular, with serration and several spines laterally (11D, H, L, 12D, H, L).

Description. Male. Body oblong oval, rather small; **Colouration:** Basic colouration dark brown. Head pale brown; basal transverse carina of vertex narrowly brownish; frons pale brown; clypeus entirely dark; maxillary plates widely brownish. Labium pale orange brown, apical part of segment IV dark. Pronotum pale brown; anterior base before calli not dark, weakly tinged with grey posteriorly. Scutellum whitish and base narrowly tinged with pale brown. Hemelytra mainly fuscous; cuneus pale yellow, base and apex dark; membrane smoky grey. Legs pale brown; pro- and midfemur with two obscure brownish spots apically; tibial spines dark brown, fuscous spot at base; tarsi brown, tarsomeres III dark. Abdomen dark brown, pygophore reddish brown. **Surface and vestiture:** Dorsal surface weakly shiny, reclining pale yellow setae widely dispersed on dorsum. Head glossy, sparsely covered with silvery pubescence; frons weakly striolate. Pronotum slightly glabrous, minutely punctate; covered with short, suberect pale setae. Scutellum smooth, surface covered with short, pale pubescence. Hemelytra covered with reclining, pale yellow setae. **Structure:** Antennae missing. Labium reaching base of midcoxa. Male genitalia as in 9E–F, 10E–F; sensory lobe of left paramere weakly protruding, sparsely covered with long setae; hypophysis medially thin, pointed end; sensory lobe of right paramere elongate; hypophysis

straight in lateral view, crooked apically; NS short, not extending to SGP; MS elongate, weakly curved and narrow end; VSC elongate, blunt apically; SLS horizontally wide and spinous, narrow basally; LS more or less straight, pointed; WS subtriangular, with several spines laterally. **Female.** Unknown.

Measurements. Male (n = 1). Total body length 4.23; head width across eyes 1.03; vertex width 0.34; antennae missing; labial length 1.53; mesal pronotal length including collar 1.02; basal pronotal width 1.71; width across hemelytron 1.92; cuneal length 0.85; cuneal width 0.48; hindlegs missing.

Etymology. Named after the type locality, Seonheul; an adjective.

Host. Unknown.

Type material. Holotype: ♂: South Korea: Jeju-do: Dongbaekdongsan, Seonheul-ri, Jocheon-eup, Jeju-si, on light trap, 30.vii.2010, H.C. Park (NAAS).

Type locality. South Korea, Jeju-do, Seonheul-ri, Dongbaekdongsan.

Remarks. In Korea, this species can be confused with other congeners of similar appearance [e.g. *A. hilaris* (Horváth), *A. subhilaris* (Yasunaga)], but can be distinguished by its completely dark clypeus, scutellum with dark markings, weakly developed NS, and WS with a spinous structure.

This new species is based on one male specimen. The antennae and hindlegs are missing and unavailable for description. However, the new species can be distinguished from the Palearctic species with a similar appearance to *A. seonheulensis* (e.g. *A. eous*, *A. fraxinicola*, *A. furvus*, *A. hilaris*) by its pale brown head and widely pale scutellum, dark brown hemelytra and clavus, dark brown abdomen, pro- and midfemur without reddish tinge, peculiar shape of its WS and weakly developed NS.

***Apolygus subpulchellus* (Kerzhner, 1988)**

Lygocoris (Apolygus) subpulchellus Kerzhner, 1988: 806; Yasunaga, 1992b: 292 (diag., descr.); Schuh, 1995: 805 (cat.).

Apolygus subpulchellus Kerzhner & Josifov, 1999: 68 (cat.); Yasunaga, 2001: 218 (diag.); Schuh, 2002–2014 (cat.).

Apolygus josifovi Kim & Jung, 2016b: 348, syn. n.

Material examined. South Korea, Gyeonggi-do: 3♂, 4♀, Mt. Unryusan, Masan-ri, Yangchon-myeon, Gimpo-si, on *Rumex acetosa*, 30.vi.2007, J.W. Seong (SNUM); 1♀, Seoul National University, Sillim-dong, Gwanak-gu, Seoul, 24.ix.2003, J.W. Seong (SNUM). Jeollanam-do: 8♂, 2♀, Daeyeo reservoir, Jangjwa-ri, Wando-eup, Wando-gun, 10. viii. 2007, J.W. Seong (SNUM); 1♂, Jukcheong-ri, Wando-eup, Wando-gun, 11.viii.2007, J.W. Seong (SNUM). Jeju-do: 4♂, 4♀, Dongbaekdongsan, Seonheul-ri, Jocheon-eup, Jeju-si, on *Ampelopsis brevipedunculata* (Maxim) Tratv., 06.vii.2017, Oh, Lee, Lee, Seung (SNUM); 5♂, 7♀, ditto, on *Mallotus japonicus* (L.f.) Mull. Arg., 06.vii.2017, Oh, Lee, Lee, Seung (SNUM).

Remarks. We examined specimens of *Apolygus subpulchellus* in SNUM, and propose *A. josifovi* Kim & Jung, 2016 as a junior synonym of *A. subpulchellus* (Kerzhner, 1988). The diagnostic characters of *A. josifovi* are almost the same as the description of *A. subpulchellus* (Yasunaga, 1992), and the genitalia of both nominal species are identical.

***Apolygus xanthomelas* Yasunaga & Yasunaga, 2000**

(Fig. 2A–B)

Apolygus xanthomelas Yasunaga & Yasunaga, 2000: 82; Yasunaga, 2001: 218 (diag.); Schuh, 2002–2014 (cat.).

Apolygus atriclavus Kim & Jung, 2016c: 595, syn. n.

Material examined. South Korea, Gangwon-do: 1♂, Myeonggae-ri, Nae-myeon, Hongcheon-gun, 01.viii.2007, J.W. Seong (SNUM); 1♂, Hangya-ri, Buk-myeon, Inje-gun, 12.ix.2016, Oh, Lee, Choi, Nam (SNUM). Gyeonggi-do: 1♂, 1♀, Mt. Myeongjisan, Buk-myeon, Gapyeong-gun, 18.viii.1999, G.S. Lee, S.H. Lee (NAAS).

Remarks. We reexamined specimens identified as *Apolygus atriclavus* Kim & Jung, 2016 in SNUM and NAAS collections, and compared them with Japanese *A. xanthomelas* described by Yasunaga & Yasunaga (2000). We found minute differences, larger body size, and colouration of pronotal calli and antennae of Korean population. However, the genitalia are not significantly different in these two taxa. Based on our observations, we propose *A. atriclavus* as a junior synonym of *A. xanthomelas*.

Key to the species of *Apolygus* in Korea (modified from Kim & Jung, 2016c)

- 1 Body pale green to greenish, or yellowish green..... 2
- Body not greenish, brownish to brownish orange, or clavus and apical part of corium widely darkened 5
- 2 Apex of cuneus without a spot 3
- Apex of cuneus with dark brown spot 4
- 3 Apex of antennal segment II dark. Endosomal wing-shaped sclerite rather short, nearly two times shorter than ventral sclerite. Lateral sclerite relatively slender and elongate.....
..... *A. watajii*
- Apex of antennal segment II pale brown. Endosomal wing-shaped sclerite elongate, slightly shorter than ventral sclerite. Lateral sclerite relatively short and thick *A. lucorum*
- 4 Rostrum reaching midcoxa, collected on *Thermopsis lupinoides* on sandy sea coast *A. nigrovirens*
- Rostrum reaching metacoxa, collected on bushes *A. spinolae*
- 5 Basal part of corium greenish 6
- Corium widely dark brown or brownish, generally brownish orange 7
- 6 Clavus partly or entirely dark brown. Legs tinged with red...
..... *A. limbatus*
- Clavus always entirely dark brown. Legs brown, not tinged with red *A. xanthomelas*
- 7 Corium and clavus entirely or mostly dark brown with small pale spot, cuneus without an orange tinge 8
- Corium and clavus not widely dark brown, if dark, then cuneus tinged with orange 10
- 8 Needle-shaped spicule short, not reaching upper margin of secondary gonopore 9
- Needle-shaped spicule developed, extends beyond upper margin of secondary gonopore. Pronotum, scutellum and hemelytra mostly blackish. In Korean specimen, pronotum and scutellum dirty yellow-green, hemelytra with wide pale portion at corium *A. infamis*
- 9 Body rather large, 4.6–5.9 mm. Endosomal wing-shaped sclerite not distinctly modified, needle-shaped spicule short and stout *A. adustus*
- Body smaller, around 4.23 mm. Endosomal wing-shaped sclerite modified with spinous structures, needle-shaped spicule thin and weakly developed *A. seonheulensis* sp. n.

- 10 Base of antennal segment II pale brown..... 11
 – Base of antennal segment II dark brown 16
 11 Tylus entirely dark or its apex mostly darkened..... 12
 – Tylus widely pale except for its apex. Body ventrally tinged with green. Metafemur tinged with red. Sublateral sclerite highly spinous..... *A. roseofemoralis*
 12 Cuneus entirely dark or with red fascia at inner margin..... 13
 – Cuneus widely pale except base and apex..... 14
 13 Hemelytra and scutellum usually dark brown, cuneus usually pale and often with reddish inner margin, rarely entirely blackish. Sublateral sclerite narrow, rather spinose.....
 *A. fraxinicola*
 – Hemelytra and scutellum brownish orange, not mostly dark. Sublateral sclerite laterally wide, upper margin serrate with minute spine..... *A. rubrifasciatus*
 14 Endosoma lacking needle-shaped spicule *A. subpulchellus*
 – Endosoma with a needle-shaped spicule 15
 15 Abdomen tinged with red. Wing-shaped sclerite subtriangular and apically protruded, with arch like margin. Needle-shaped spicule short and thin, not reaching upper margin of secondary gonopore *A. hwasoonanus* sp. n.
 – Abdomen usually not tinged with red. Wing-shaped sclerite subtriangular, with linear margin. Needle-shaped spicule rather developed, long and slender *A. pulchellus*
 16 Antennal segment II almost or entirely dark brown. Tylus mostly pale brown except for apex. Endosoma with short needle-shaped spicule *A. subhilaris*
 – Antennal segment II dark brown, medially pale. Tylus entirely dark brown. Needle-shaped spicule long..... *A. hilaris*

Genus *Capsus* Fabricius, 1803

Capsus wagneri Remane, 1950

(Figs 2D–F, 8A–C)

Capsus intermedius Reuter, 1884: 25 (junior primary homonym of *C. intermedius* Sahlberg, 1848).

Capsus wagneri Remane, 1950: 66; Schuh, 1995: 737 (cat.); Kerzhner & Josifov, 1999: 80 (cat.); Yasunaga, 2001: 226 (diag.); Schuh, 2002–2014 (cat.); Kim et al., 2015b: 590 (diag., descr.).

Capsus koreanus Kim & Jung in Kim et al., 2015b: 586, syn. n.

Material examined. South Korea, Gangwon-do: 1♂, Munmak-eup, Wonju-si, 27.v.2009, R.K. Duwal, S.H. Jung (SNUM); 2♀, ditto, on *Artemisia* sp., R.K. Duwal, S.H. Jung (SNUM); 2♀, ditto, on *Salix* sp., R.K. Duwal, S.H. Jung (SNUM); 14♂, 2♀, Bupheungsa, Bupheung-ri, Suju-myeon, Yeongwol-gun, 21.v.2015, M.S. Oh, H.S. Song (SNUM). Gyeonggi-do: 3♂, 1♀, Nanji Sewage Treatment Center, Deogyang-gu, Goyang-si, 23.v.2007, Y.B. Lee (NAAS); 1♂, Mt. Taehwa, Sanglim-ri, Docheok-myeon, Gwangju-si, 15.vi.2013, S.H. Kim (SNUM); 1♀, Geumsa wetland, Jangheung-ri, Geumsa-myeon, Yeosu-si, on shrub, 12.v.2006, J.C. Son (NAAS). Japan, Hokkaido: 1♂, Aino-sato, Sapporo city, 12.vi.1994, Y. Todo (NAAS).

Remarks. We reexamined the specimens of *Capsus koreanus* Kim & Jung, 2015 in SNUM and compared these with Japanese *C. wagneri* from NAAS and Kim et al. (2015b). The external characteristics of *C. koreanus* coincide with one of the colour variations documented for *C. wagneri* (Kerzhner, 1988). Furthermore, the genitalia of these nominal species do not differ significantly. For these reasons, we designate *C. koreanus* as a junior synonym of *C. wagneri*.

Genus *Stenotus* Jakovlev, 1877

Stenotus penniseticola Oh, Yasunaga & Lee, sp.n.

(Figs 6A–D, 7A–F, 13A–C, 14A–B)

ZooBank taxon LSID:

3813FAFA-03B3-4721-8C87-E1C79C95E0DD

Diagnosis. Recognized by small the size of males, moderate size of females; body elongate and oval, weakly glabrous; basic colouration pale yellow to greenish, usually with a pair of brownish stripes on dorsum (Figs 6A–D, 7A–F). Male genitalia as in Fig. 13A–C; endosoma with partly membranous ALB and distinctly spiny SLB (Fig. 13A). Female genitalia as in Fig. 14A–B.

Description. Male. Body elongated oval, small to moderate size; **Colouration:** Body pale yellow to greenish; Head pale yellow; frons pale yellow; clypeus brownish or pale yellow, often partly tinged with a pale brown spot. Antennae yellowish brown; antennal segment I basally dark or often weakly tinged with red. Labium yellowish brown, apical part of segment IV dark. Pronotum pale yellow to pale green, with a pair of distinct or obscure stripes. Scutellum pale yellow to pale green. Hemelytra weakly shiny, pale yellow to greenish, distal part of clavus and inner margin of hemelytra with distinct brown stripe or obscure; clavus and inner part of corium slightly dark; cuneus pale yellow; membrane pale grey. Legs pale yellow to brown; metafemur slender, pale yellow to brownish, often tinged with red; metatibiae pale yellow; tibial spines pale brown; tarsi brown, apical 1/3–1/4 of tarsomeres III dark; abdomen pale yellow, with brown, narrow vertical line laterally; pygophore pale brown. **Surface and vestiture:** Dorsal surface weakly shiny, covered with silvery or dark brown setae. Head weakly glabrous, covered with pale brown setae; frons weakly striolate; Antennae covered with short, dark brown setae. Pronotum pale yellow to pale green, covered with pale brown to brown, short setae. Scutellum covered with pale, reclining pubescence. Hemelytra weakly shiny, densely covered with pale, reclining pubescence and pale brown setae. Femora densely covered with suberect, brown setae. **Structure:** Head without basal transverse carina. Antennal segment I short and incrassate, segment II, III and IV slender. Labium reaching apex of metacoxa. Legs slender. Male genitalia as in Fig. 13A–C; sensory lobe on left paramere distinctly protruding, sparsely covered with long setae; hypophysis tapering apically, slightly curved; sensory lobe of right paramere straight, not protruding; hypophysis short, pointed-end; secondary gonopore vertically elongate; accessory lobe partly sclerotized, widely serrate; secondary lobe elongate, highly spinose; primary lobe large, membranous apically; seminal duct spade like.

Female. Body elongate oval, moderate size; body comparatively ovoid, overall colouration paler than in male; often lateral part of sternum partly tinged with red. Not significantly different from male in colouration, surface and vestiture. Female genitalia as in Fig. 14A–B; sclerotized ring small, ovate; dorsal labiate plate protruding towards seminal depository; ventral labiate plate wide, surface rough; interramal sclerite laterally wide and immaculate.

Table 3. Distribution of the tribe Mirini in East Asia (Kerzhner, 1988; Schuh, 1995, 2002–2014; Kerzhner & Josifov, 1999; Chérot et al., 2000; Yasunaga, 2001, 2004, 2008, 2010, 2016; Yasunaga et al., 2002, 2017a, b, 2018; Chiu et al., 2004–2016; Zheng et al., 2004; Qi & Shi, 2005; Yasunaga & Schwartz, 2005, 2007, 2015, 2016; Lin, 2008; Qi et al., 2008; Yasunaga & Duwal, 2008; Trapeznikova, 2009; Konstantinov & Vinokurov, 2011; Konstantinov et al., 2013; Vinokurov & Luo, 2014; Yasunaga & Chérot, 2018).

No.	Genus	Representative countries						E. Asia Total
		China	Japan	Korea	Mongolia	Russia (FE)	Taiwan	
1	<i>Adelphocoris</i>	28	11	14	5	15		33
2	<i>Adelphocorisella</i>		2	1			1	3
3	<i>Agnocoris</i>	1	1		1	1		4
4	<i>Allorhinocoris</i>	4				1		5
5	<i>Apolygopsis</i>	6	3	1				10
6	<i>Apolygus</i>	28	25	17	1	12	4	55
7	<i>Argenis</i>	1					1	2
8	<i>Azumamiris</i>		1					1
9	<i>Babacoris</i>						1	1
10	<i>Bertsa</i>	2	1	1			1	5
11	<i>Brachycoleus</i>	1						1
12	<i>Campiozygum</i>					1		1
13	<i>Capsodes</i>	1	1	1		1		4
14	<i>Capsus</i>	4	2	3	2	4		16
15	<i>Castanopsides</i>	9	5	3		3	5	25
16	<i>Charagochilus</i>	7	2	3	1	3	3	22
17	<i>Cheilocapsidea</i>	2					2	4
18	<i>Cheilocapsus</i>	5	1				2	8
19	<i>Chilocrates</i>	3						3
20	<i>Closterotomus</i>	1	1	1		2		5
21	<i>Creontiades</i>	3	4	1			4	12
22	<i>Cyphodemidea</i>	1	1	1		1		4
23	<i>Dichrooscytus</i>	6						6
24	<i>Elthemidea</i>	2						2
25	<i>Eocalocoris</i>		2					2
26	<i>Eolygus</i>	1	1	1		1	1	5
27	<i>Eurystylopsis</i>	5					1	6
28	<i>Eurystylus</i>	5	4	2		1	4	16
29	<i>Gigantomiris</i>		1	1		1		3
30	<i>Gotoshinomiris</i>						1	1
31	<i>Heterolygus</i>	11						11
32	<i>Heteropantilius</i>	3					1	4
33	<i>Irbisia</i>		1			1		2
34	<i>Josifovolygus</i>			1				1
35	<i>Koreocoris</i>			1				1
36	<i>Liistonotus</i>	2						2
37	<i>Liocapsus</i>	1					2	3
38	<i>Liocoris</i>	1						1
39	<i>Loristes</i>	1	2	1		1		5
40	<i>Lygidea</i>	1			1	1		3
41	<i>Lygocorias</i>		1					1
42	<i>Lygocorides</i>	2	2	1		1	1	7
43	<i>Lygocoris</i>	20	3	2		4	2	31
44	<i>Lygus</i>	16	1	3	12	5	2	49
45	<i>Macrolygus</i>	2	1	1				4
46	<i>Megacoelum</i>	2					1	3
47	<i>Mermitelocerus</i>	1	2	1		1		5
48	<i>Metasequoiamiris</i>	3						3
49	<i>Miridius</i>		1					1
50	<i>Miyamotoa</i>		1					1
51	<i>Neolygopsis</i>		1					1
52	<i>Neolygus</i>	37	31	11	1	16	7	103
53	<i>Neomegacoelum</i>		1	1		1		3
54	<i>Nepiolygus</i>		1					1
55	<i>Orientocapsus</i>	3	1			1	1	6
56	<i>Orientomiris</i>	9	6			1		16
57	<i>Orthops</i>	5	1	1	1	1		10
58	<i>Pachylygus</i>		5	1		2		8
59	<i>Pantilius</i>	2	1	1		1		5
60	<i>Paramiridius</i>	1					1	2
61	<i>Peltidolygus</i>	1	1	1			1	4
62	<i>Philostephanus</i>	12	6	4		4	3	29
63	<i>Phytocoridae</i>	1						1
64	<i>Phytocoris</i>	40	11	8	7	8		74
65	<i>Pinalitopsis</i>		1	1				2
66	<i>Pinalitus</i>	7	2	2		3		14
67	<i>Polymerias</i>		1	1		1		3
68	<i>Polymerus</i>	9	5	8	3	9		34
69	<i>Poppiocapsidea</i>	1					1	2
70	<i>Probosciodocoris</i>	1	1	1			2	5
71	<i>Prolygus</i>	5	2				5	12
72	<i>Pseudolygocoris</i>		2					2
73	<i>Reuterista</i>	1						1
74	<i>Rhabdomiris</i>	2	1	2		1		6
75	<i>Sabactiopus</i>	1					1	2
76	<i>Salignus</i>	2	1		1	2		6
77	<i>Stenotus</i>	6	5	3		2	3	19
78	<i>Taylorilygus</i>	2	1	1			2	6
79	<i>Tingitotopsis</i>	1					1	2
80	<i>Tinginotum</i>	4	6	2		2	2	14
81	<i>Tolongia</i>	1	2					3
82	<i>Warrisia</i>		1					1
83	<i>Yamatolygus</i>		3	2				5
84	<i>Zalmunna</i>						1	1
85	<i>Zygimus</i>					1		1
	Total	61 gen.	56 gen.	41 gen.	12 gen.	38 gen.	34 gen.	85 gen.
		346 sp.	184 sp.	113 sp.	36 sp.	117 sp.	71 sp.	503 sp.

Measurements. Male (n = 5)/**Female** (n = 5). Total body length 3.88–4.15/4.72–5.21; head width across eyes 0.79–0.84/0.85–0.90; vertex width 0.32–0.35/0.41–0.43; lengths of antennal segment I–IV 0.48–0.54, 1.47–1.58, 0.84–0.89, 0.61–0.66/0.53–0.60, 1.51–1.70, 0.89–1.06, 0.63–0.70; labial length 1.76–1.83/2.21–2.31; mesal pronotal length including collar 0.75–0.80/0.89–1.00; basal pronotal width 1.21–1.33/1.41–1.60; width across hemelytron 1.39–1.51/1.66–1.98; cuneal length 0.68–0.76/0.78–0.83; cuneal width 0.32–0.33/0.35–0.38; lengths of metafemur, tibia and tarsus 1.73–1.81, 2.52–2.59, 0.68–0.73/1.72–2.06, 2.63–2.95, 0.69–0.79.

Etymology. Named after its breeding host, *Pennisetum alopecuroides*; an adjective.

Host. *Erigeron canadensis* (L.) Cronquist (Asteraceae), *Pennisetum alopecuroides* (L.) Spreng. (Poaceae) (Fig. 7E–F).

Type material. Holotype: ♂: South Korea, Incheon-si: Dongsan-ri, Gyodong-myeon, Ganghwa-gun, on *Pennisetum alopecuroides* (L.) Spreng., 8.ix.2017, M.S. Oh (SNUM). Paratypes: South Korea, Incheon-si: 3♂, 43♀, same data as holotype (SNUM); 1♂, 9♀, same locality as holotype, on *Erigeron canadensis* (L.) Cronquist, 8.ix.2017, M.S. Oh (SNUM); 4♂, 7♀, same locality as holotype, 37°45'37"N, 126°13'57"E, 26.viii.2007, S.W. Park (SNUM).

Type locality. South Korea, Incheon-si, Gyodong-myeon, Dongsan-ri.

Remarks. The body of this species can be one of two colours. Type I has a pale greenish dorsum, more distinct brownish colouration on the clypeus, pronotum, hemelytra and femora. Type II has a pale stramineous, obscure brownish stripe on the dorsum, abdomen and femora are partly tinged with red.

This species can be confused with *S. rubrovittatus* (Matsumura) and *S. insularis* Poppius, but is distinguished by its more brownish dorsum without red markings, and metafemur that is not mainly sanguineous or reddish. The Australian species, *S. witchelina* Namyatova, Schwartz & Cassis has a similar appearance to the pale phenotype of *S. penniseticola*, but *S. witchelina* can be distinguished as its head lacks red tinge, dorsum has pale brown markings and the structure of its parameres and endosoma.

Key to the species of *Stenotus* in Korea

- 1 Body larger, usually 6.0–6.5 mm. Pronotum and hemelytra with a pair of dark markings, sometimes dark markings on female hemelytra not distinct. Inner margin of right paramere with subapical indentation. Sclerotized ring large, ovoid.....*S. binotatus*
- Body smaller, usually 4.0–5.5 mm. Inner margin of right paramere without indentation. Sclerotized ring comparatively small..... 2
- 2 Pronotum and hemelytra with reddish stripes. Antenna and femora tinged with red.....*S. rubrovittatus*
- Pronotum and hemelytra brown, with a pair of dark brown stripes. Antenna and femora not widely tinged with red.....*S. penniseticola* sp. n.

Zoogeography of the tribe Mirini in East Asia

(Figs 1, 15; Table 3)

East Asia makes up about 30 percent of the total area of the Asian continent (Fig. 15). This subregion includes six states (China, Japan, Mongolia, North Korea, South Korea, Taiwan) and two dependencies (Hong Kong, Macau). Due

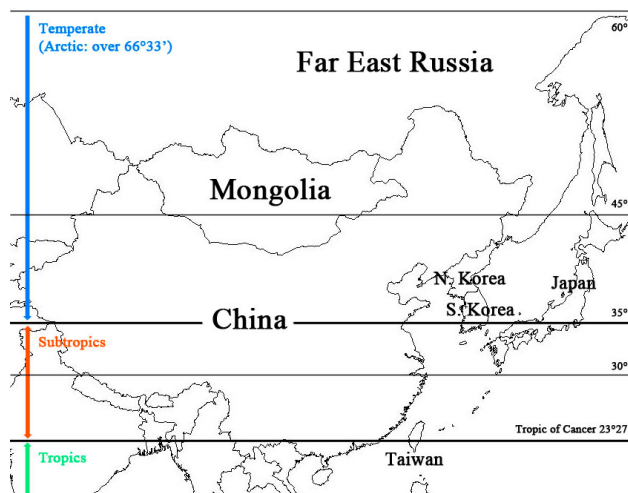


Fig. 15. Map of East Asia.

to its large area, East Asia includes various types of biomes and climates, ranging from tropical, subtropical and temperate to subarctic and boreal.

In this study, we examined faunal data from six states (China, Japan, Korea (includes North and South Korea), Mongolia, the Far East Russia and Taiwan). Details of the species diversity and generic composition in each state are provided in Table 3. A total of 503 species in 85 genera of Mirini are reported in East Asia (Kerzhner, 1988; Schuh, 1995, 2002–2014; Kerzhner & Josifov, 1999; Chérot et al., 2000; Yasunaga, 2001, 2004, 2008, 2010, 2016; Yasunaga et al., 2002, 2017a, b, 2018; Chiu et al., 2004–2016; Zheng et al., 2004; Qi & Shi, 2005; Yasunaga & Schwartz, 2005, 2007, 2015, 2016; Lin, 2008; Qi et al., 2008; Yasunaga & Duwal, 2008; Trapeznikova, 2009; Konstantinov & Vinokurov, 2011; Konstantinov et al., 2013; Vinokurov & Luo, 2014; Yasunaga & Chérot, 2018).

In Korea, 41 genera and 113 species were confirmed. The *Lygus* complex (*Apolygopsis*, *Apolygus*, *Castanopsides*, *Cyphodemidea*, *Eolygus*, *Josifovolygus*, *Koreocoris*, *Lygocorides*, *Lygocoris*, *Lygus*, *Macrolygus*, *Neolygus*, *Orthops*, *Pachylygus*, *Peltidolygus*, *Philostephanus*, *Pinalitopsis*, *Pinalitus*, *Taylorilygus*, *Yamatolygus*) accounts for nearly 50% of the total species. The most diverse genus is *Apolygus* (17 spp.). In addition, *Adelphocoris* (14 spp.), *Neolygus* (11 spp.), *Phytocoris* (8 spp.) and *Polymerus* (8 spp.) also have high species diversity.

Most genera in Korea are also present in adjacent states like China, Far East Russia, Japan and Mongolia, as these states have similar latitudes and climates. Some subtropical genera, such as *Macrolygus*, *Pantilius*, *Pinalitopsis* and *Yamatolygus* were newly reported in the southern area of the Korean Peninsula (e.g. Jeju Island). The presence of these genera in Korea is probably due to recent climate warming in Korea. Of the 41 genera reported from Korea, two are endemic and monotypic: *Josifovolygus* and *Koreocoris*.

China is the biggest state in East Asia, and includes almost all biomes and climates. 61 genera were reported from China with some endemic genera such as *Elthemidea*,

Heterolygus, *Liistonotus*, *Metasequoiamiris* and *Phytocoridae* (the latter is monotypic).

Far East Russia has a cold temperate to subarctic climate, and most regions are classified as boreal forest. 38 genera are reported from Far East Russia, none of which are endemic.

Japan has a range of climates from subtropical to cold temperate. Japan is also made up of a large number of islands, which may have contributed to the high biodiversity recorded there. 56 genera are reported from Japan, with some endemic genera such as *Azumamiris*, *Eocalocoris*, *Lygocorias*, *Miyamotoa*, *Neolygopsis*, *Nepiolygus* and *Pseudolygocoris*. Among them, *Azumamiris*, *Lygocorias*, *Miyamotoa*, *Neolygopsis* and *Nepiolygus* are monotypic, and the last four occur on the subtropical islands, Ryukyu and Bonin.

Mongolia has a cold temperate climate, with biomes such as alpine, desert, shrubland, steppe and temperate forest. None of the 12 genera reported from Mongolia are endemic.

All regions of Taiwan are subtropical or tropical rainforest, and the genera and species are different from those in other East Asian countries. Some genera common in the temperate area of East Asia such as *Adelphocoris*, *Capsus*, *Phytocoris* and *Polymerus* are not reported from Taiwan. *Apolygus* has much fewer species than reported for other countries. Subtropical and tropical genera such as *Argenis*, *Babacoris*, *Cheilocapsidea*, *Cheilocapsus*, *Gotoshinomiris*, *Heteropantilius*, *Liocapsus*, *Paramiridius*, *Poppiocapsidea*, *Sabactiopus*, *Tinginitopsis* and *Zalmunna* are reported in Taiwan. With the exception of *Zalmunna*, these genera are also reported from the southern area of China because of the overlap in climate and geology. 34 genera are reported from Taiwan, including the monotypic, endemic genus *Gotoshinomiris*.

Mirine plant bugs in China, Far East Russia, Japan and Korea have been comprehensively studied. However, new species are still being discovered and known species are being newly recorded in this relatively well-studied area, indicating that additional work in this region is crucial. The Mirini of Mongolia and Taiwan are still poorly documented, and more intensive research is needed in these areas for a more detailed discussion of East Asian Mirini.

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