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## Checklist of the water mites (Acari, Hydrachnidia) of Korea, with description of one new subgenus and two new species

VLADIMIR PEŠIĆ

*Department of Biology, University of Montenegro, Cetinjski put b.b, 81000 Podgorica, Montenegro. E-mail: vladopesic@gmail.com.*

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### Abstract

Using published records and original data, a checklist was compiled of the water mite (Acari, Hydrachnidia) fauna of Korea. The total number of species and subspecies recorded from Korea up to date is 74 species, in 32 genera and 13 families. One new subgenus, *Orientmomonia*, and two new species are described: *Albia (Albiella) kseniae* and *Momonia (Orientmomonia) koreana*; the first description of the male is given for *Atractides gracilis* (Sokolow, 1934). *Woolastookia concava* Kim & Chung, 1996 is synonymized with *W. elongata* (Sokolow, 1934). Additionally, first records for Korea are given for *Panisopsis orientalis* Imamura & Mitchell, 1967, *Hydrodroma torrenticola* (Walter, 1908), *Hygrobates (Hygrobates) longiporus* Thor, 1898, and *Arrenurus (Truncaturus) sp. near corsicus* (E. Angelier, 1951).

**Key words:** Acari, water mites, checklist, taxonomy, new species.

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### Introduction

Research on water mites in South Korea started as late as the last decade of the 20th century with a series of papers by Chung and Kim (1991, 1993, 1995, 1997). The same authors (Kim and Chung 1995, 1996) published the most comprehensive study on the aturid mites from South Korea, describing many new species. Recently, Pešić *et al.* (2013) reported eight species of the family Torrenticolidae, two of them new for science. Moreover, three new species of the marine water mite family Pontarachnidae were reported from Korean coast (Pešić 2013). Finally, Smit and Pešić (in press) published a new species of the genus *Thoracophoracarus* K. Viets, 1914 from South Korea.

We can conclude that the rheophilic water mite fauna is moderately studied. The water mite fauna of standing waters in South Korea is almost unknown, and in addition, large portions of the country, are still poorly documented. It is worth to mention that fauna of North Korea is not documented at all. Publishing a first checklist of Korean water mites will support future research activities by highlighting major gaps in our knowledge. However, this checklist represents the state of the art, as most of the species listed could not be examined by the author.

The present study is based on all published data and material collected by the author in 2012 and 2013 in South Korea, as part of the project aimed at uncovering Korean invertebrate diversity, and led by the National Institute of Biological Resources (NIBR).

## Material and Methods

The data from all publications which contain data on distribution of water mites in South Korea are included in the systematic part of this paper. The species referred to in postgraduate theses and scientific meetings are no formal publications and are consequently not included.

For each species, the Korean provinces (Fig. 1) are listed where the species has been collected. The names of the species are in accordance with the most recent literature (e.g., Davids *et al.* 2007, Di Sabatino *et al.* 2010).

For new records, water mite were collected by hand netting, sorted on the spot from the living material, conserved in Koenike's fluid and dissected as described elsewhere (e.g., Gerecke *et al.* 2007). Holotypes will be deposited in the National Institute of Biological Resources, Korea (NIBR).

In the section 'New records' collecting site abbreviations derive from the geographical database Pešić. The composition of the material is given as: males/females/deutonymphs or adults/deutonymphs. All measurements are given in  $\mu\text{m}$ . For a detailed description and discussion of the characteristics of the genus *Atractides* and a detailed methodological introduction, see Gerecke (2003).



**Figure 1.** Map of Provinces of South Korea.

The following abbreviations are used: Ac-1 = first acetabulum, asl = above sea level, Cx-I = first coxae, Cxgl-4 = coxoglandularia of fourth coxae (= E4 in Wiles 1997), Dgl-1 = dorsoglandularia, dL = dorsal length, H = height, L = length, Lgl-1 = lateroglandularia 1, I-Leg-6 = Leg 1, sixth segment (tarsus), Mt = mountain, n = number of specimens examined, NP = National Park, P-1 = palp, first segment, S-1 = proximal large ventral seta at I-L-5, S-2 = distal large ventral seta at I-L-5, Vgl-1 = ventroglandularia 1, vL = ventral length, W = width.

## Systematics

### Superfamily Hydryphantoidea

#### Family HYDRYPHANTIDAE Piersig, 1896

##### Subfamily Euthyadinae K. Viets, 1931

##### Genus *Japonothyas* Imamura & Mitchell, 1967

##### *Japonothyas ornatus* Imamura & Mitchell, 1967

**Records from Korea:** Gangwon Province – Chung and Kim (1993).

**Habitat:** Mountain streams.

**Distribution:** Japan (Tochigi), Korea.

##### Genus *Panisopsis* K. Viets, 1926

##### *Panisopsis orientalis* Imamura & Mitchell, 1967

**New records:** South Korea, Gyeonggi Province, stream in the Bukhsan National Park, 37°39.329'N, 126°57.058'E, 12.iv.2012 Pešić & Karanović 0/1/0 (mounted).

**Habitat:** Streams.

**Distribution:** Japan (Tochigi). New for the fauna of Korea.

##### Subfamily Protziinae Koenike, 1909

##### Genus *Protzia* Piersig, 1896

##### *Protzia hadai* (Imamura, 1953)

**Records from Korea:** Gangwon Province – Chung and Kim (1991).

**Habitat:** Streams.

**Distribution:** Japan (Gifu, Hiroshima), Korea.

##### *Protzia japonica* Uchida, 1934

**Records from Korea:** Gangwon Province – Chung and Kim (1991).

**Habitat:** Streams.

**Distribution:** Japan (Hokkaido), Korea.

#### Family HYDRODROMIDAE K. Viets, 1936

##### Genus *Hydrodroma* Koch, 1837

##### *Hydrodroma despiciens* (Müller, 1776)

**Records from Korea:** Jeollanam Province – Chung and Kim (1995).

**Habitat:** Lakes, ponds.

**Distribution:** Holarctic.

***Hydrodroma torrenticola* (Walter, 1908)**

**New records:** Korea: CR2 Seoul, Ui-dong stream, 37°39.554'N, 127°00.249'E, 114 m asl., 7.x.2012, Pešić & Choi 1/0/0; CR9 Jeollabuk Province, Ne myeon Mt, Naeyeansan NP, stream near Naeyeansan Info Center, 35°38'25.623"N, 126°34'53.1438"E, 10.x.2012, Pešić & Choi 0/9/0; CR11 Gwangju, Mudeung Mt., stream, 35°8'50.2584"N 126°59'18.942"E, 11.x.2012, Pešić & Choi 2/2/0.

**Habitat:** Pools of low order streams, slowly flowing reaches of higher order streams.

**Distribution:** Palearctic. New for the fauna of Korea.

**Superfamily Lebertioidea****Family ANISITSIELLIDAE Koenike, 1910****Genus *Bandakia* Thor, 1913*****Bandakia japonica* Imamura, 1965**

**Records from Korea:** Gangwon Province – Chung and Kim (1993).

**Habitat:** Mountain streams.

**Distribution:** Japan (Mie), Korea.

**Family SPERCHONTIDAE Thor, 1900****Genus *Sperchon* Kramer, 1877*****Sperchon (Sperchon) fluviatilis* Uchida, 1934**

**Records from Korea:** Gangwon Province – Chung and Kim (1991).

**Habitat:** Rhitrobiont.

**Distribution:** Japan (Hokkaido), Korea.

***Sperchon (Hispidosperchon) hispidus* Koenike, 1895**

**Records from Korea:** Gangwon Province – “*Sperchon (Hispidosperchon) plumifer plumifer*“ Chung and Kim (1991).

**Habitat:** Middle and high order streams.

**Distribution:** Palaearctic.

**Genus *Sperchonopsis* Piersig, 1896*****Sperchonopsis verrucosa* (Protz, 1896)**

**Records from Korea:** Gangwon Province – Chung and Kim (1991); Jeollanam Province – Chung and Kim (1995).

**Habitat:** Rhitrobiont.

**Distribution:** Holarctic.

**Family TORRENTICOLIDAE Piersig, 1902****Subfamily Torrenticolinae Piersig, 1902****Genus *Torrenticola* Piersig, 1896*****Torrenticola (Torrenticola) brevirostris* (Halbert, 1911)**

**Records from Korea:** Jeollabuk Province – Pešić *et al.* (2013).

**Habitat:** Low order streams.

**Distribution:** Palaearctic.

***Torrenticola (Torrenticola) dentifera* (Wiles, 1911)**

**Records from Korea:** Jeollabuk Province – Pešić *et al.* (2013).

**Habitat:** Middle and low order streams.

**Distribution:** Malaysia, Korea.

***Torrenticola (Torrenticola) kimichungi* Pešić, Semenchenko & Lee, 2013**

**Records from Korea:** Gangwon Province – Pešić *et al.* (2013).

**Habitat:** Middle and high order streams.

**Distribution:** Russia (Primory Territory), Korea.

***Torrenticola (Torrenticola) nipponica* (Enami, 1940)**

**Records from Korea:** Jeollanam Province – Chung and Kim (1995); Seoul – Pešić *et al.* (2013).

**Habitat:** Middle order streams.

**Distribution:** Japan, Russia (Primory Territory), Korea.

***Torrenticola (Torrenticola) recentis* Tuzovskij, 2003**

**Records from Korea:** Seoul – Pešić *et al.* (2013), Gangwon Province – Pešić *et al.* (2013); Gwangju – Pešić *et al.* (2013); Jeollabuk Province – Pešić *et al.* (2013).

**Habitat:** Middle and high order streams.

**Distribution:** Russia (Primory Territory), Korea.

***Torrenticola (Torrenticola) ussuriensis* (Sokolow, 1940)**

**Records from Korea:** Gangwon Province – Pešić *et al.* (2013).

**Habitat:** Low order streams.

**Distribution:** Far East of Russia, Japan, Korea.

***Torrenticola (Torrenticola) turkestanica* (Sokolow, 1926)**

**Records from Korea:** Gangwon Province – Pešić *et al.* (2013).

**Habitat:** Low order streams.

**Distribution:** Tadjikistan, Indian Himalayas, Thailand, Korea.

**Genus *Monatractides* K.Viets, 1926**

***Monatractides (Monatractides) abei* Pešić, Semenchenko & Lee, 2013**

**Records from Korea:** Seoul – Pešić *et al.* (2013).

**Habitat:** Middle and low order streams.

**Distribution:** Russia (Primory Territory), Korea.

**Superfamily Hygrobatoidae**

**Family LIMNESIIDAE Thor, 1900**

**Subfamily Limnesiinae Thor, 1900**

**Genus *Limnesia* Koch, 1836**

***Limnesia (Limnesia) undulata* (Müller, 1776)**

**Records from Korea:** Gangwon Province – Chung and Kim (1997).

**Habitat:** Lakes, ponds.

**Distribution:** Holarctic.

**Family HYGROBATIDAE Koch, 1842**

**Genus *Atractides* Koch, 1837**

Records not classified to species level from Korea: Gangwon Province – Chung and Kim (1991).

***Atractides gracilis* (Sokolow, 1934)**

(Figs. 2A-E, 3A-F)

**New records:** South Korea: CR1 Seoul, Dobong stream, 37°41.262'N, 127°01.706'E, 19 m asl., 7.x.2012, Pešić & Choi 8/1/0(2[one juvenile]/1[ovig.]/0 mounted); CR2 Seoul, Ui-dong stream 37°39.554'N, 127°00.249'E, 114 m asl., 7.x.2012, Pešić & Choi 1/1/0; CR9 Jeollabuk Province, Ne myeon Mt, Naemyeonsan NP, stream near Naemyeonsan Info Center, 35°38'25.623"N, 126°34'53.1438"E, 10.x.2012, Pešić & Choi 1/0/0 (mounted); CR10 Jeollabuk Province, Ne myeon Mt, stream near Silsung temple, 1.7 km to Jiksopolpol falls, Naemyeonsan NP, 0.6 km from Naemyeonsan Info Center, 35°64'65.978"N, 126°58'62.285"E, 10.x.2012, Pešić & Choi 0/2[juveniles]/0; CR11 Gwangju, Mudeung Mt., stream, 35°8'50.2584"N 126°59'18.942"E, 11.x.2012, Pešić & Choi 1/0/0; CR18 Gyeongsangbuk Province, Haenggok-ri, river, exposed to sunlight, 36°57.182' N, 129°17.670' E, 24.v.2013 Pešić & Karanović 0/1/0.

**Records from Korea:** Gangwon Province – Kim and Chung (1991).

**Morphology**

*General features* — Integument with very fine striation; muscle insertions unsclerotized. Coxal field: mediocaudal margin of Cx-I equally convex, apodemes of Cx-II in an obtuse angle. Genital field: Ac in a weakly curved line. Excretory pore slightly sclerotized (Fig. 3C); Vgl-1: separate from Vgl-2. Palp: without sexual dimorphism, P-2-3 ventral margins straight, P-3 (L/H ratio 3.1-3.6) and P-4 (L/H ratio 6.0-6.6) slender, P-4 ventral margin weakly extended near proximal seta insertions, sword seta near distoventral seta (Figs. 2D-E, 3E-F). Legs: I-L-5 protruding between ventral seta and S-1 insertion, setae S-1 and -2 strongly heteromorphic and widely distanced, S-1 long and very slender, S-2 shorter, enlarged and with pointed tip, I-L-6 long and very slender, equally narrow from the base to the tip.

*Measurements*

*Male* (from CR1, in parentheses specimens from CR9) – Idiosoma L/W 600 (538)/430 (420), glandularia diameter 29 (26); coxal field: L 350 (325); Cx-III W 370 (350); Cx-I+II medial L 102 (114), lateral L 203 (202); genital field L/W 113 (108)/110 (112), L Ac 1-3: 32 (27-28), 35 (30-31), 40 (31-34). Genital field with anterior margin slightly convex, posterior margin indented. Ejaculatory complex L (115).

Palp: palp total L 346 (352-353), dL/H, dL/H ratio: P-1, 29/24, 1.22 (31/25, 1.25); P-2, 60/29, 2.07 (61/31, 2.0); P-3, 97/31, 3.14 (94/29, 3.2); P-4, 121/20, 6.04 (125/20, 6.3); P-5, 39/10.5, 3.7 (41-42/11, 3.7); L ratio P-2/P-4 0.5 (0.49). Gnathosoma L 119 (112), chelicera total L 162 (154).

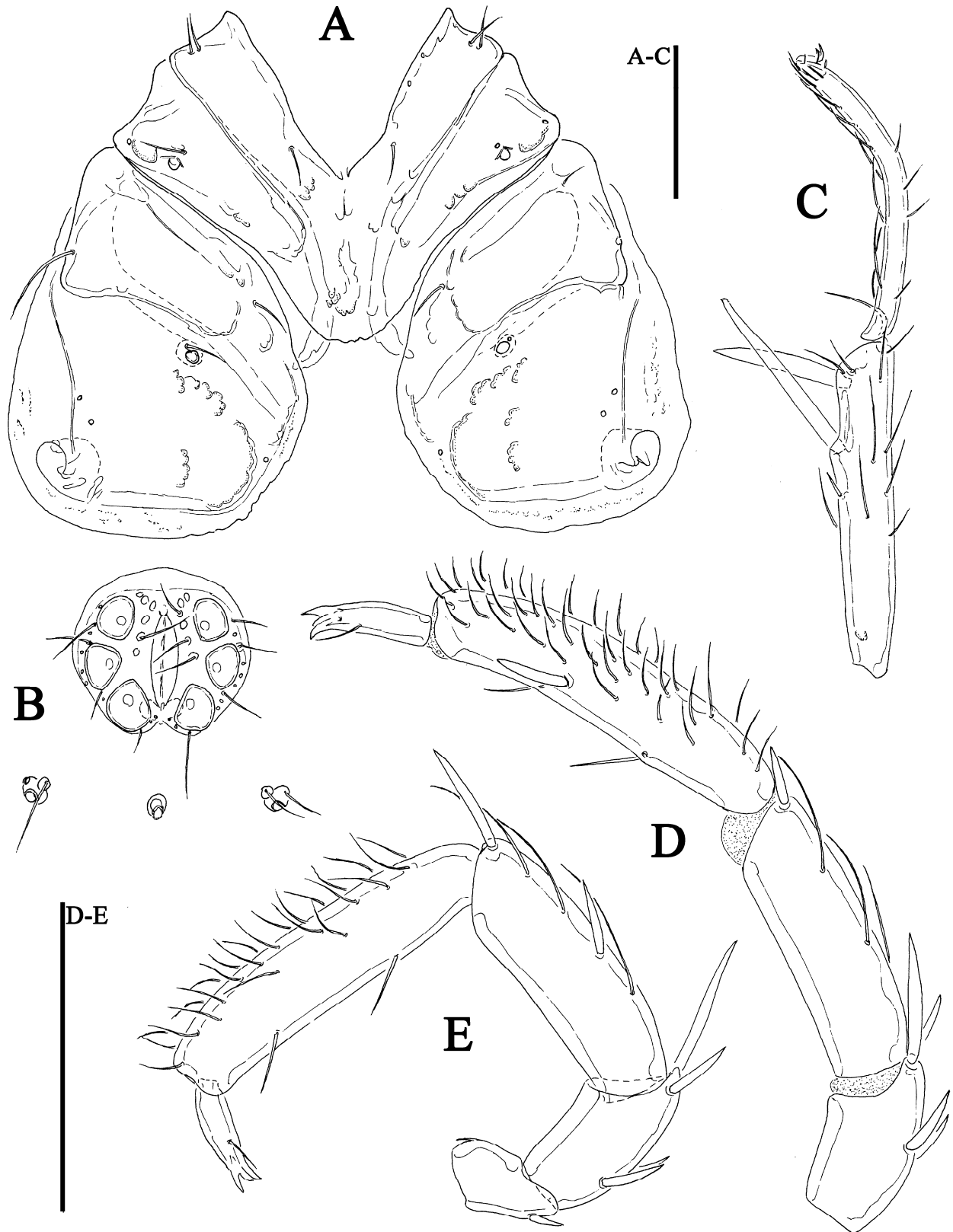
Legs: I-L-5 dL 229 (229), vL 145 (135), dL/vL ratio 1.6 (1.7), maximum H 42 (43), dL/maximum H 5.5 (5.3), S-1 L 126 (134), L/W ratio 12.0 (12.4), S-2 length 91 (94), L/W ratio 7.4 (7.2), distance S-1-2 40 (48), L ratio S-1/2 1.4 (1.43); I-L-6 dL 189 (186), central H 14.5 (14.5), dL/central H ratio 13.0 (12.8); L ratio I-L-5/6 1.21 (1.23).

*Female* (from CR1) – Idiosoma L/W 880/670, glandularia diameter 31; coxal field: L 391; Cx-III W 484; Cx-I+II medial L 113, lateral L 223; genital field L/W 146/165, genital plate L 111-112, L Ac 1-3: 32-39, 34-38, 29-36.

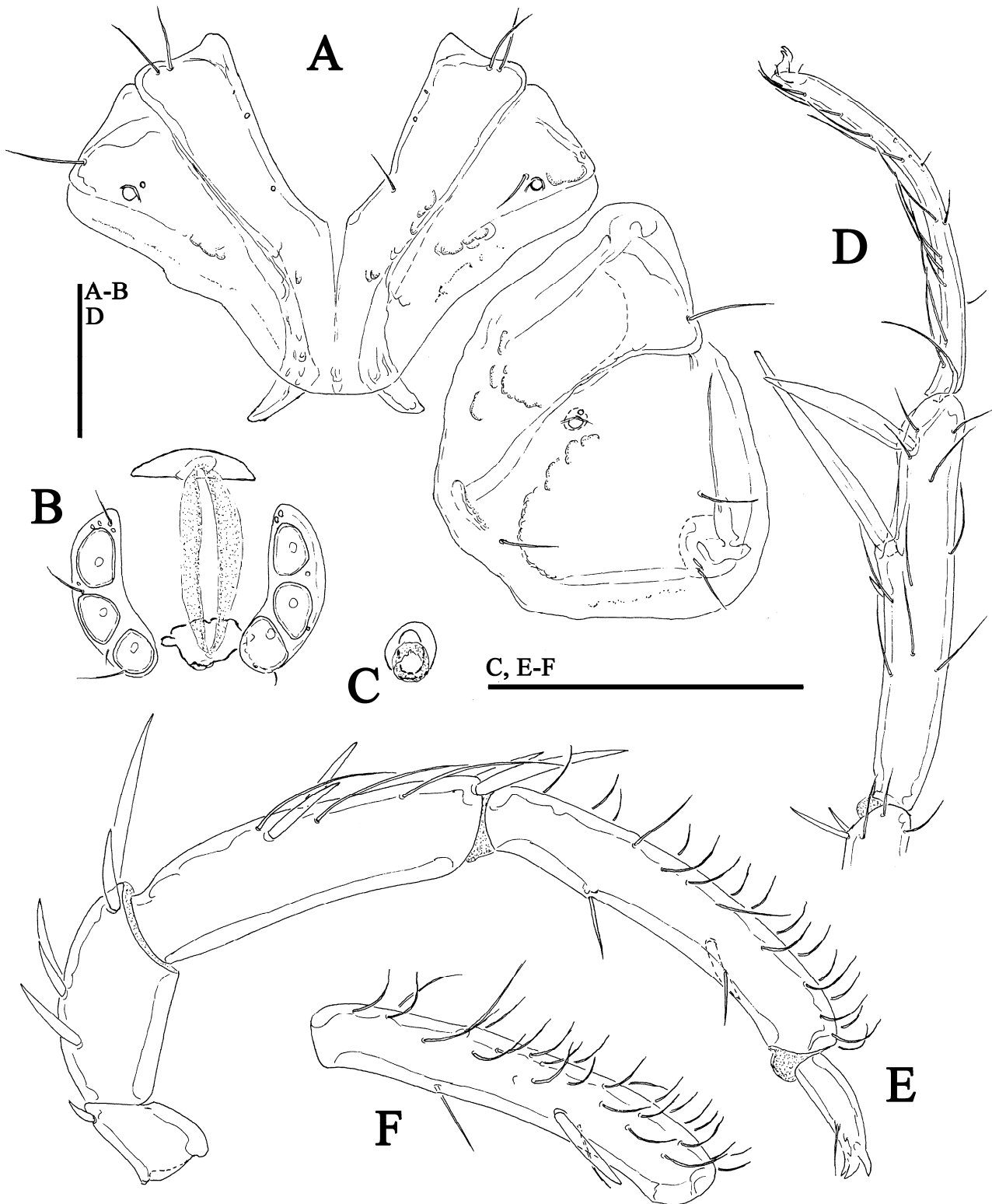
Palp: palp total L 403, dL/H, dL/H ratio: P-1, 32/25, 1.3; P-2, 72/35, 2.0; P-3, 117/32, 3.6; P-4, 139/21, 6.6; P-5, 43/12, 3.5; L ratio P-2/P-4 0.52.

Legs: I-L-5 dL 277, vL 154, dL/vL ratio 1.8, maximum H 52, dL/maximum H 5.3, S-1 L 164, L/W ratio 12.5, S-2 length 109, L/W ratio 7.1, distance S-1-2 66, L ratio S-1/2 1.5; I-L-6 dL 234, central H 14.5, dL/central H ratio 1.6; L ratio I-L-5/6 1.18.

**Remarks.** The description of *Atractides gracilis* was based on a single female from the Primory Territory, in Russian Far East. Later on, female *A. gracilis* were reported by Imamura (1953) from Japan and Kim and Chung (1991) from Korea, but until now no males have been found. The specimens from Korea match the original description, and the following characters of the males collected together with female *A. gracilis* indicate conspecificity: long and very slender I-L-6, setae S-1 and -2 heteromorphic and widely distanced, excretory pore slightly sclerotized, palp with P-2-3 ventral margins straight, and slender P-3 (L/H ratio 3.1-3.6) and P-4 (L/H ratio 6.0-6.6).



**Figure 2.** *Atractides gracilis* (Sokolow, 1934), male (A, C, E – specimen from CR1; B, D – specimen from CR9): A = coxal field; B = genital field, Vgl-1/2 and excretory pore; C = I-L-5 and -6; D = palp, medial view (P-1 lacking); E = palp, lateral view. Scale bars = 100  $\mu$ m.



**Figure 3.** *Atractides gracilis* (Sokolow, 1934), female, CR1 Dobong stream: A = coxal field; B = genital field; C = excretory pore; D = I-L-5 and -6; E = palp, lateral view; E = P-4, medial view. Scale bars = 100  $\mu$ m.

**Habitat:** Rhitrobiont.

**Distribution:** Russia (Primory Territory), Japan (Hiroshima), Korea.



***Atractides (Atractides) izuensis* (Enami, 1940)****Records from Korea:** Gangwon Province – Chung and Kim (1997).**Habitat:** Rhitrobiont.**Distribution:** Japan (Shizuoka, Hiroshima), Korea, Far East of Russia.***Atractides (Atractides) kotoensis* Imamura, 1983****Records from Korea:** Gangwon Province – “*Atractides (Megabates) kotoensis*” Chung and Kim (1997).**Habitat:** Streams.**Distribution:** Japan (Ibaraki), Korea.***Atractides (Atractides) miurai* Imamura, 1956****Records from Korea:** Gangwon Province – Chung and Kim (1997).**Remarks.** Chung and Kim (1997) assigned a single collected female to *Atractides miurai* Imamura, 1956, a species described also by a single female from a well in Hyogo, Japan. This record should be verified by additional material.**Habitat:** Streams.**Distribution:** Japan (Hyogo), Korea.***Atractides (Atractides) nodipalpis* (Thor, 1899)****Records from Korea:** Gangwon Province – Chung and Kim (1991).**Habitat:** Rhitrobiont.**Distribution:** Palaearctic.**Genus *Hygrobates* Koch, 1837*****Hygrobates (Hygrobates) calliger* Piersig, 1896****Records from Korea:** Gangwon Province – “*Hygrobates heteropalpis*” Chung and Kim (1991).**Habitat:** Rhitrobiont.**Remarks:** Matsumoto *et al.* (2005) synonymised with “a little doubt” *Hygrobates heteropalpis* Imamura, 1954 with *H. calliger*. However, they mentioned that the P-2 projection of the European specimens of *H. calliger* tends to be broader than that of either *H. calliger* or *H. heteropalpis* from Japan. The latter feature could be a good reason for reanimating *H. heteropalpis*. Application of molecular techniques could be helpful for understanding the taxonomic position of the populations from Japan and Korea assigned to *H. calliger*.**Distribution:** Palaearctic.***Hygrobates (Hygrobates) longipalpis* (Hermann, 1804)****Records from Korea:** Jeollanam Province – Chung and Kim (1995).**Habitat:** Standing and slowly flowing waters.**Distribution:** Holarctic.***Hygrobates (Hygrobates) longiporus* Thor, 1898****New records:** South Korea, CR2 Seoul, Ui-dong stream 37°39.554'N, 127°00.249' E, 114 m asl., 7.x.2012, Pešić & Choi 1/0/0.**Habitat:** Lakes, pools of streams.**Distribution:** Palaearctic. New for the fauna of Korea.***Hygrobates (Rivobates) microepimeratus* (Sokolow, 1934)****Records from Korea:** Gangwon Province – Chung and Kim (1997).**Habitat:** Streams.**Distribution:** Russia (Primory Territory), Korea.***Hygrobates (Rivobates) taniguchii* Imamura, 1954****Records from Korea:** Gangwon Province – Chung and Kim (1993).**Habitat:** Mountain streams.

**Distribution:** Japan (Hokkaido), Korea.

**Family PONTARACHNIDAE Koenike, 1910**

**Genus *Litarachna* Walter, 1925**

***Litarachna denhami* (Lohmann, 1909)**

**Records from Korea:** Gyeongsangnam Province – Pešić *et al.* (2008).

**Habitat:** Marine littoral.

**Distribution:** Australia, India, Philippines, Korea.

***Litarachna gracilis* Pešić, 2013**

**Records from Korea:** Gangwon Province – Pešić (2013).

**Habitat:** Marine interstitial.

**Distribution:** Korea (East Sea).

***Litarachna lukai* Pešić, 2013**

**Records from Korea:** Jeollanam Province – Pešić (2013).

**Habitat:** Marine interstitial.

**Distribution:** Korea (Yellow Sea); known only from the type locality.

**Genus *Pontarachna* Philippi, 1840**

***Pontarachna ivonae* Pešić, 2013**

**Records from Korea:** Jeollanam Province – Pešić (2013); Gangwon Province– Pešić (2013); Gyeongsangbuk Province – Pešić (2013).

**Habitat:** Marine littoral.

**Distribution:** Korea (Yellow Sea and East Sea).

**Family UNIONICOLIDAE Oudemans, 1909**

**Subfamily Pionatacinae K. Viets, 1916**

**Genus *Neumania* Lebert, 1879**

***Neumania (Neumania) ambigua* Piersig, 1906**

**Records from Korea:** Gangwon Province – Chung and Kim (1991).

**Habitat:** Ponds and slowly flowing streams.

**Distribution:** India, Indonesia, Singapore, Japan, Thailand, Philippines, Japan, Korea, Australia and Russia (Primory Territory).

**Genus *Unionicola* Haldeman, 1842**

***Unionicola (Unionicola) minor* (Soar, 1900)**

**Records from Korea:** Jeollanam Province – “*Unionicola crassipes minor*“ Chung and Kim (1995).

**Habitat:** All kinds of standing waters.

**Distribution:** Palaearctic.

**Family FELTRIIDAE K. Viets, 1926**

**Genus *Feltria* Koenike, 1892**

***Feltria (Feltria) japonica* (Imamura, 1954) nov. stat.**

**Records from Korea:** Gangwon Province – “*Feltria cornuta japonica*” Chung and Kim (1993).

**Remarks.** This taxon was previously treated as a subspecies of *Feltria cornuta* Walter, 1927, a placement not supported in view of clear differences between these two species. *Feltria japonica* differs from *F. cornuta*, and resembles *F. longispina* Motaş & Angelier, 1928 by the III-L-5 distal margin extending to form an acute, pointed projection flanking the insertion of the terminal segment, a lower numbers of Ac (14-28) and generally minor dimensions. *Feltria longispina* differs from *F. japonica* in the stouter shape of male idiosoma, females of the two species cannot be distinguished at our present state of knowledge.

**Habitat:** Mountain streams.

**Distribution:** Japan (Hokkaido), Korea.

***Feltria (Feltria) ishikariensis* Imamura, 1954**

**Records from Korea:** Gangwon Province – Chung and Kim (1991).

**Habitat:** Streams.

**Distribution:** Japan (Hokkaido), Korea, Far East of Russia.

***Feltria (Feltriella) macroplata* Imamura, 1954**

**Records from Korea:** Gangwon Province – Chung and Kim (1991).

**Habitat:** Streams.

**Distribution:** Japan (Hokkaido), Korea.

**Family ATURIDAE Thor, 1900****Subfamily Albiinae K. Viets, 1915****Genus *Albia* Thon, 1899*****Albia (Albiella) kseniae* n. sp.**

(Figs. 4A-C, 5A-C)

**Material examined.** Holotype female, dissected and slide mounted, Korea, CR10 Jeollabuk Province, Ne myeon Mt, stream near Silsung temple, 1.7 km to Jiksopolpol falls, Naeyeansan NP, 0.6 km from Naeyeansan Info Center, 35°64'65.978"N, 126°58'62.285"E, 10.x.2012, Pešić & Choi. Paratype: one female, same locality and data as holotype.

**Diagnosis** (Male unknown). Idiosoma > 800; dorsal shield with colour pattern as illustrated in Fig. 5C. Cx-II and -III with a spine-like seta; suture line Cx-II/III undulating, forming a bay embracing Cxgl-4, located anterior to IV-L insertions; L1 anteromedially to L2.

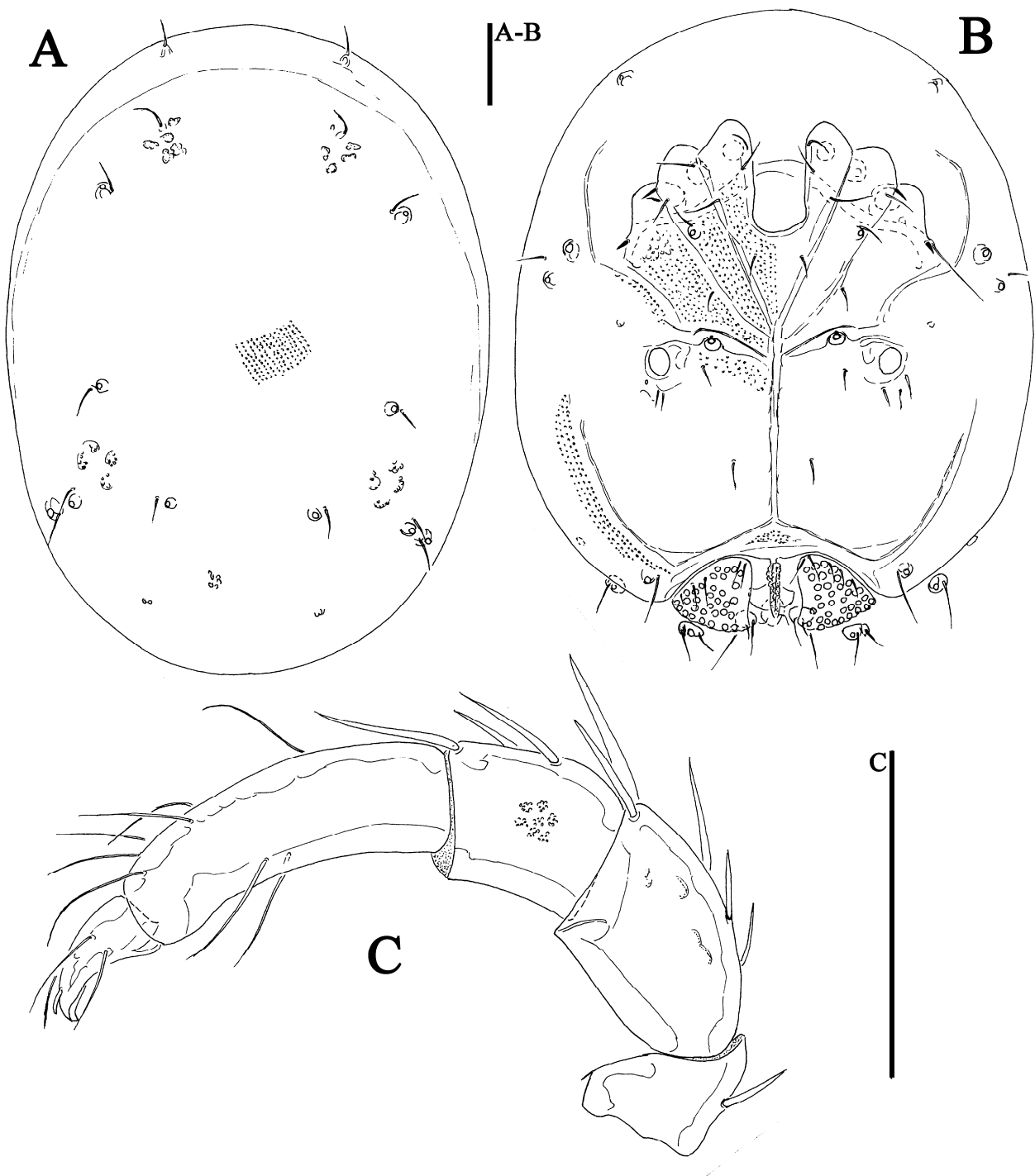
**Description**

**Female** – Colour pale yellow, dorsal shield with colour pattern as illustrated in Fig. 5C. Dorsal shield L 813, W 597, L/W ratio 1.36. Coxal field: Cx-II and Cx-III each with two spine-like setae; gnathosomal bay L 138; suture lines of Cx-II/III and Cx-III/IV continuous, reaching the median line; Cx-II/III median fusion point between Cx-III/IV median fusion point and Cx-I/II median fusion point; suture line Cx-II/III undulating, forming a bay embracing Cxgl-4, located anterior to IV-L insertions (Fig. 4B). Distance Cxgl4-Cxgl4 142, Cxgl 2-Cxgl 2 197; distance between IV-L-insertions 250. L1 anteromedially to L2 Genital field: Acetabular plate L/W 94/98-100, each plate with 37-38 acetabula.

Palp (Fig. 4C): palp total L 325-326, dL/H, d/H ratio: P-1, 40/39, 1.02; P-2, 81/48, 1.7; P-3, 57/43, 1.32; P-4, 106/33, 3.19; P-5, 41-42/18, 2.3; L ratio P-2/P-4 0.76; P-4 with 2 setae in the distal half of ventral margin and 5-6 dorsodistal setae. Gnathosoma vL 134, with apodemes 207; chelicera total L 221, basal segment L 157, claw L 66.

Leg swimming setae numbers: II-L-5, 4; III-L-5, 4-7; IV-L-5, 6-7. dL of I-L-2-6: 49, 65, 80, 91, 104; dL of II-L-2-6: 55, 74, 86, 104, 102; dL of III-L-2-6: 59, 76, 92, 103, 99; dL of IV-L: 126, 52, 93, 111, 122, 97.

**Male** – unknown.



**Figure 4.** *Albia (Albiella) kseniae* n. sp., female, CR10, stream near Silsung temple: A = dorsal shield; B = ventral shield; C = palp. Scale bars = 100  $\mu$ m.

**Etymology.** Named after Ksenia Semenchenko (Vladivostok, Russia), for her contribution to the taxonomy of water mites.

**Remarks.** Due to the similar configuration of coxal suture lines and shifting of Cxgl-4 anterior to IV-L insertions, the new species is most similar to *A. vanimoensis* Wiles, 1992 and *A. papuaensis* Smit, 2013, from Papua, New Guinea, both only known in the female sex (see Wiles 1992 and Smit 2013, respectively). The new species can be distinguished from the abovementioned species by the different colour pattern (dorsal shield posteriorly with a rose tinge in *A. papuaensis*, a blue band across the middle of the dorsal

shield in *A. vanimoensis*) and by having a spine-like seta on Cx-II and Cx-III. *Albia papuaensis* (in parentheses data taken from Smit 2013), is similar in a broader idiosoma (L/W ratio 1.32), and L2 lying anteromedially to L1, but differs in minor idiosoma and palp dimensions (L idiosoma 664, P-2, 60; P-4, 62). *A. vanimoensis* differs in a more slender idiosoma (L/W ratio 1.59) and L2 lying anterior, but both median (Wiles 1992).

**Habitat.** A small sandy/boundary pool near the main stream, shaded by riparian vegetation (Fig. 11).

**Distribution.** South Korea; known only from the type locality.

### Subfamily Aturinae Thor, 1900

#### Genus *Aturus* Kramer, 1875

Records not classified to species level from Korea: Jeollanam Province – Chung and Kim (1995); Gangwon Province – Kim and Chung (1993).

#### *Aturus caudatus* Enami, 1940

**Records from Korea:** Gangwon Province – Kim and Chung (1993, 1995).

**Habitat:** Streams.

**Distribution:** Japan, Korea.

#### *Aturus complexus* Sokolow, 1934

**Records from Korea:** Gangwon Province – Kim and Chung (1995).

**Habitat:** Streams.

**Distribution:** Russia (Primory Territory), Korea.

#### *Aturus glaberus* Kim & Chung, 1995

**Records from Korea:** Gangwon Province – Kim and Chung (1995).

**Habitat:** Streams.

**Distribution:** Korea.

#### *Aturus kumariensis* Kim & Chung, 1993

**Records from Korea:** Gangwon Province – Kim and Chung (1993, 1995).

**Habitat:** Streams.

**Distribution:** Korea.

#### *Aturus miyashitai* Imamura, 1960

**Records from Korea:** Gangwon Province – Chung and Kim (1991), Kim and Chung (1995).

**Habitat:** Streams.

**Distribution:** Japan (Hokkaido, Shizuoka, Nagano, Gifu, Kyoto, Hyogo, Hiroshima), Korea, Far East of Russia.

#### *Aturus miyazakii* Imamura, 1953

**Records from Korea:** Cheju Island – Kim and Chung (1993).

**Habitat:** Streams.

**Distribution:** Japan, Korea.

#### *Aturus multiclavus* Kim & Chung, 1993

**Records from Korea:** Gangwon Province – Kim and Chung (1993, 1995).

**Habitat:** Streams.

**Distribution:** Korea, Russia (Primory Territory – Semenchenko and Tuzovskij 2011).

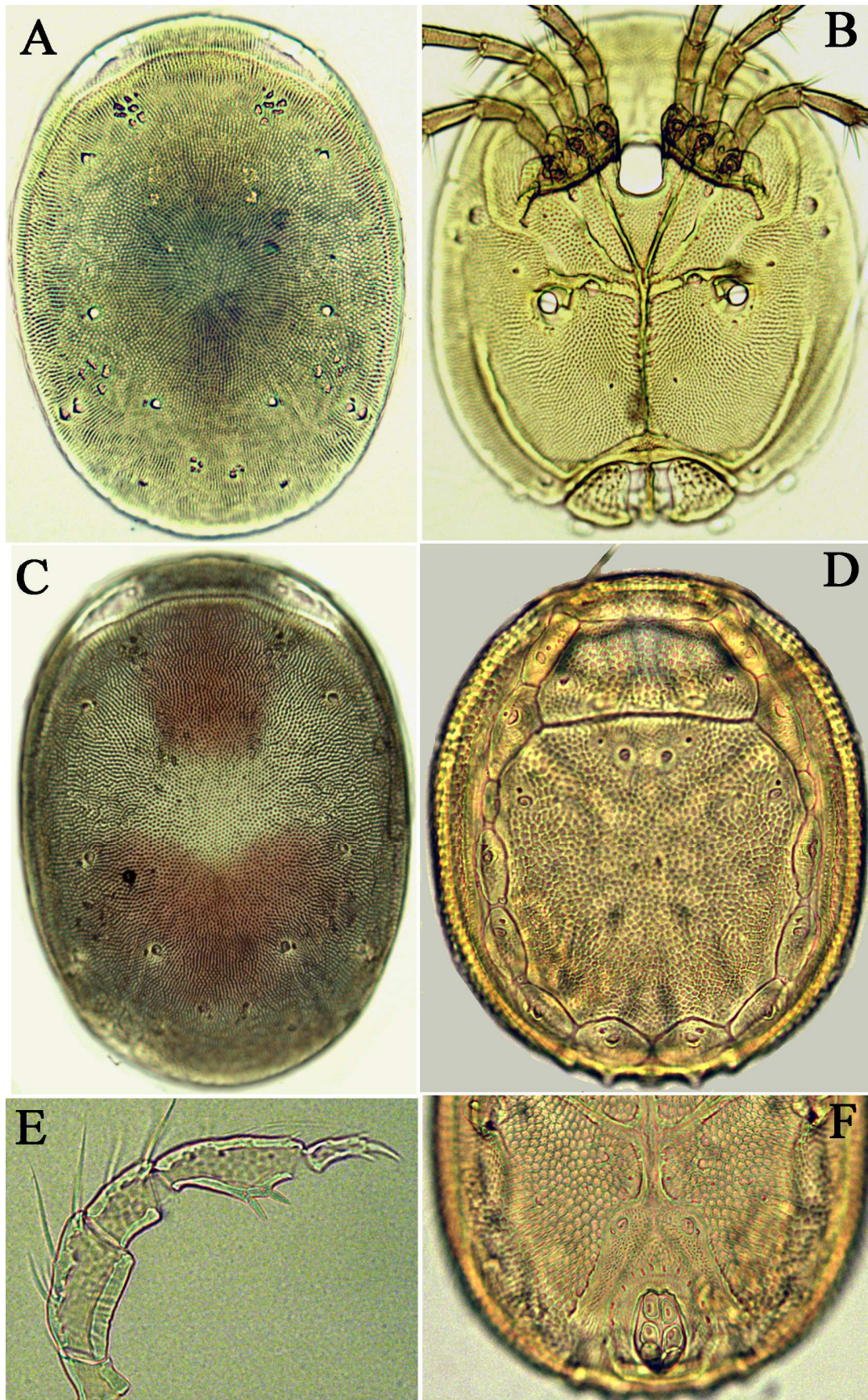
#### *Aturus multisetus* Kim & Chung, 1993

**Records from Korea:** Gangwon Province – Kim and Chung (1993, 1995), Gyeongsangbuk Province – Kim and Chung (1993).

**Habitat:** Streams.

**Distribution:** Korea, Russia (Primory Territory – Semenchenko and Tuzovskij 2011).





**Figure 5.** Photographs. **A-C** *Albia (Albiella) kseniae* n. sp. (A-B – holotype, C – paratype; A mounted in Hoyer's medium, C photographed immediately after dissection): A, C = dorsal shield, B = ventral shield. **D-F** *Momonia koreana* n. sp. holotype: D = idiosoma, dorsal view; E = palp; F = posterior part of venter.

***Aturus orientalis* Imamura, 1960**

**Records from Korea:** Gangwon Province – Chung and Kim (1991).

**Habitat:** Streams.

**Distribution:** Japan, Korea.

***Aturus parapilosus* Kim & Chung, 1993**

**Records from Korea:** Gangwon Province – Kim and Chung (1993, 1995).

**Habitat:** Streams.

**Distribution:** Korea, Far East of Russia.

***Aturus paravarus* Kim & Chung, 1995**

**Records from Korea:** Gangwon Province – Kim and Chung (1995).

**Habitat:** Streams.

**Distribution:** Korea.

***Aturus pilosus* Kim & Chung, 1993**

**Records from Korea:** Gangwon Province – Kim and Chung (1993, 1995).

**Habitat:** Streams.

**Distribution:** Korea.

***Aturus sankyeriense* Kim & Chung, 1995**

**Records from Korea:** Gangwon Province – Kim and Chung (1995).

**Habitat:** Streams.

**Distribution:** Korea, Far East of Russia (Semenchenko 2006; incorrectly indicated as *A. terraconfusensis* in Semenchenko 2010b).

***Aturus terraconfusensis* Habeeb, 1965**

**Records from Korea:** Gangwon Province – Kim and Chung (1995).

**Habitat:** Streams.

**Distribution:** North America, Korea.

***Aturus trifurcatus* Kim & Chung, 1995**

**Records from Korea:** Gangwon Province – Kim and Chung (1995).

**Habitat:** Streams.

**Distribution:** Korea.

***Aturus vietsi* Imamura & Nagatsuka, 1983**

**Records from Korea:** Gangwon Province – Chung and Kim (1991, 1995).

**Habitat:** Streams.

**Distribution:** Japan, Korea.

***Aturus quadratus* Kim & Chung, 1995**

**Records from Korea:** Gangwon Province – Kim and Chung (1995).

**Habitat:** Streams.

**Distribution:** Korea.

**Genus *Bharatalbia* Cook, 1967**

***Bharatalbia (Japonalbia) ibarakiensis* Imamura, 1977**

**Records from Korea:** Jeollanam Province – Chung and Kim (1995).

**Habitat:** Streams.

**Distribution:** Japan (Ibaraki), Korea.

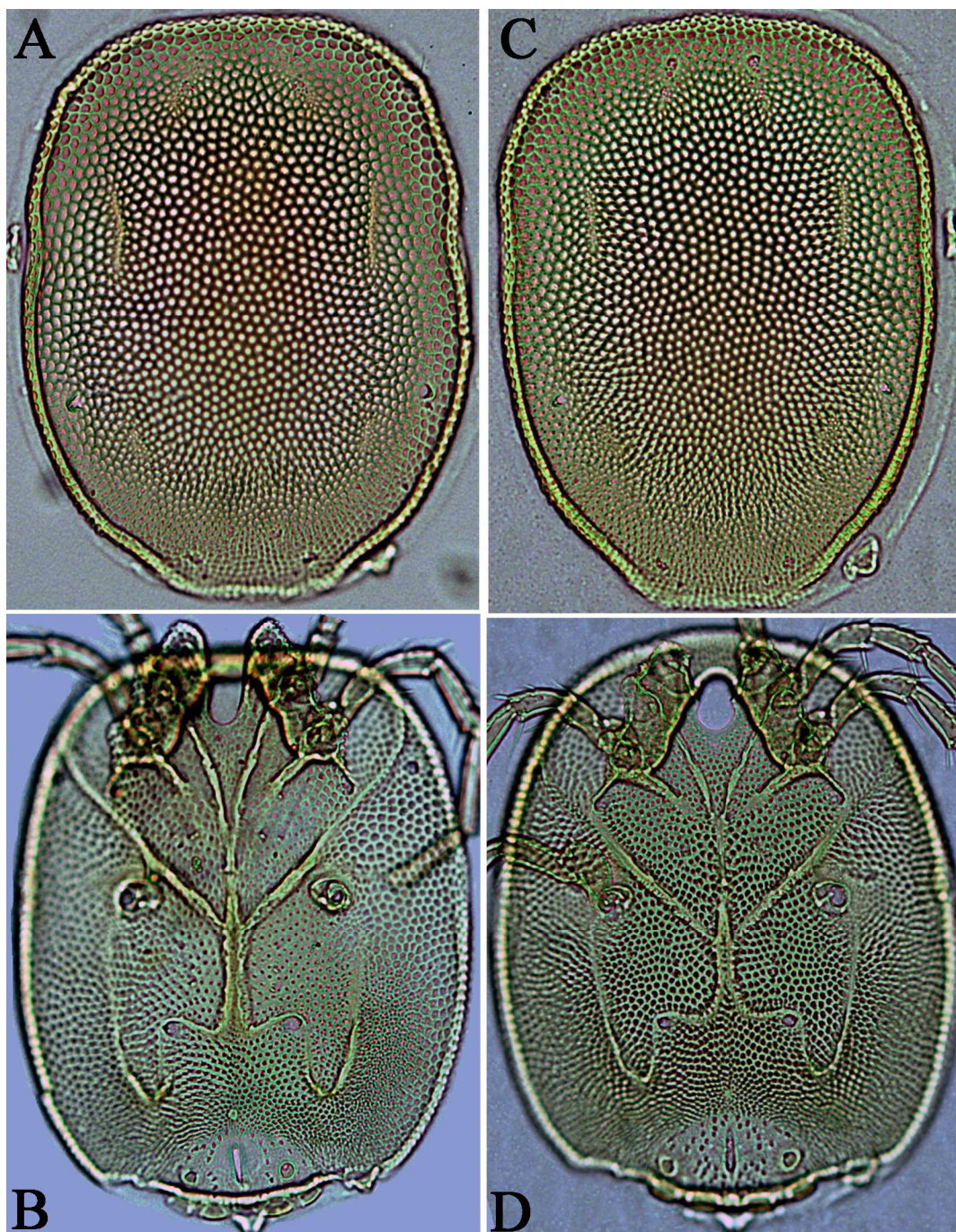
**Genus *Kongsbergia* Thor, 1899**

***Kongsbergia materna* Thor, 1899****Records from Korea:** Gangwon Province – Chung and Kim (1991).**Habitat:** Rhitrobiont.**Distribution:** Palaearctic.**Subfamily Axonopsinae K. Viets, 1929****Genus *Albaxona* Szalay, 1944*****Albaxona dubia* Kim & Chung, 1996****Records from Korea:** Gangwon Province – Kim and Chung (1996).**Habitat:** Streams.**Distribution:** Korea.***Albaxona libera* Kim & Chung, 1996****Records from Korea:** Gangwon Province – “*Albaxona (Vietsaxona) libera*“ Kim and Chung (1996).**Habitat:** Streams.**Distribution:** Korea; known only from the type locality (small stream near Sagimak in Kangreung).***Albaxona lunata* Kim & Chung, 1996****Records from Korea:** Gangwon Province – Kim and Chung (1996).**Habitat:** Streams.**Distribution:** Korea.**Genus *Brachypoda* Lebert, 1879*****Brachypoda (Brachypoda) rapida* Kim & Chung, 1996****New records:** South Korea: CR3 Gangwon Province, River Inje, 38°03.961'N, 128°10.516'E, 225 m asl., 8.x.2012 Pešić & Karanović 0/2/0; CR9 Jeollabuk Province, Ne myeon Mt, Naebyeansan NP, stream near Naebyeansan Info Center, 35°38'25.623"N, 126°34'53.1438"E, 10.x.2012, Pešić & Choi 0/11/0; CR10 Jeollabuk Province, Ne myeon Mt, stream near Silsung temple, 1.7 km to Jiksopolpol falls, Naebyeansan NP, 0.6 km from Naebyeansan Info Center, 35°64'65.978"N, 126°58'62.285"E, 10.x.2012, Pešić & Choi 0/8/0.**Habitat:** Streams.**Distribution:** Korea.***Brachypoda (Brachypoda) rubidata* Kim & Chung, 1996****Records from Korea:** Jeollanam Province – Kim and Chung (1996); Jeollabuk Province – Pešić and Semenchenko (2014).**Habitat:** Ponds and pools of streams.**Distribution:** Korea.***Brachypoda (Ocybrachypoda) milicaae* Pešić & Semenchenko, 2014****Records from Korea:** Jeollabuk Province – Pešić and Semenchenko (2014).**Habitat:** A permanent sandy/bouldary stream.**Distribution:** Korea, known only from the type locality.**Genus *Ljania* Thor, 1898*****Ljania orientalis* Tuzovskij, 2012**

(Figs. 6C-D)

**New records:** South Korea: CR4 Gangwon Province, Seoraksan NP, stream near Temple, 38°10.399' N, 128°29.050' E, 196 m asl., 8.x.2012, Pešić & Karanović 0/1/0; CR9 Jeollabuk Province, Ne myeon Mt, Naebyeansan NP, stream near Naebyeansan Info Center, 35°38'25.623"N, 126°34'53.1438"E, 10.x.2012, Pešić & Choi 1/1/0 (1/0/0 mounted).





**Figure 6.** Photographs of dorsal (A, C) and ventral shields (B, D). **A-B** *Ljanía propinqua* Kim & Chung, 1996, male, CR9 (stream in Mudeung Mt). **C-D** *Ljanía orientalis* Tuzovskij, 2012, male, CR11 (stream in Naeyeansan NP).

**Remarks:** This species, recently described from the Primory Territory in the Russian Far East, can be distinguished from *L. japonica* Imamura, 1956 (described after a single male from Japan, Imamura 1956) by the posterior pair of setae on dorsal shield associated with glandularia, the excretory pore located dorsally, the complete median suture line Cx-II/III, P-3 dorsoproximal setae considerably shorter than dorsodistal setae, and presence of a transverse suture line between the middle of the lateral margin of the Cx-IV and the lateral margin of the ventral shield (Tuzovskij 2012).

Kim and Chung (1996) reported and illustrated *L. japonica* from Korea. As their illustrations (Kim and Chung 1996: Figs. 12, 13A-B) show a general conformity with *L. orientalis* in all abovementioned characters, it is very likely that the specimens attributed to *L. japonica* refers to *L. orientalis*.

**Habitat:** Streams.

**Distribution:** Russia (Primory Territory), Korea.

***Ljania propinqua* Kim & Chung, 1996**

(Figs. 6A-B)

**New records:** South Korea, CR11 Gwangju, Mudeung Mt., stream, 35°8'50.2584" N 126°59'18.942" E, 11.x.2012, Pešić & Choi 1/0/0 (mounted).

**Records from Korea:** Gangwon Province (Kangreung: Sagimak) – Kim and Chung (1996).

**Remarks.** Males of this species described after a single male from Gangwon Province, differ from *L. orientalis* (in parentheses, from Tuzovskij 2012) in the dorsal shield bearing 5 pairs of setae (6 pairs), Dgl-4 more distanced from lateral margin of the dorsal shield (close to lateral margin), anterior margin of Cx-I extending beyond frontal margin (not extending beyond frontal margin) and by the lower number of genital setae on each side, 10-11 (18-22). The female of *L. propinqua* is still unknown.

**Habitat:** Streams.

**Distribution:** Korea.

**Genus *Woolastookia* Habeeb, 1954**

***Woolastookia elongata* (Sokolow, 1934)**

(Fig. 7A-C)

*Woolastookia concava* Kim & Chung, 1996, **nov. syn.**

**New records:** South Korea: CR1 Seoul, Dobong stream, 37°41.262'N, 127°01.706'E, 19 m asl., 7.x.2012, Pešić & Choi 1/3/0 (1/0/0 mounted); CR4 Gangwon Province, Seoraksan NP, stream near Temple, 38°10.399'N, 128°29.050'E, 196 m asl., 8.x.2012, Pešić & Karanović 9/10/0 (1/0/0 mounted); CR7 Gangwon Province, Odaesan NP, stream, 37°49.642'N 128°42.170'E, 215 m asl., 9.x.2012, Pešić & Karanović 0/3/0; CR14 Jeollabuk Province, Duckyu San NP, stream, 35°53'50"N, 127°46'35"E, 11.x.2012, Pešić & Choi 1/1/0; CR18 Gyeongsangbuk Province, Haenggok-ri, river, exposed to sunlight, 36°57.182' N, 129°17.670' E, 24.v.2013 Pešić & Karanović 1/0/0; CR19 Chungcheongbuk Province, Sobaeksan NP, shaded stream, 36°57.660' N, 128°25.534' E, 24.v.2013 Pešić & Karanović 0/1/0; CR21 Chungcheongbuk Province, Woraksan National Park, Jungseonam, river, 36°52.644' N, 128°17.784' E, 25.v.2013 Pešić & Karanović 0/12/0; CR22 Gangwon Province, Chiaksan NP, Silim town, stream, 37°17.081' N, 128°15.389' E, 25.v.2013 Pešić & Karanović 0/2/0.

**Records from Korea:** Gyeongsangbuk Province – “*Woolastookia spatulata*“ Kim and Chung (1996), “*W. concava*“ Kim and Chung (1996); Gangwon Province – “*W. concava*“ Kim and Chung (1996).

**Remarks:** Kim and Chung (1996) described *W. concava* from the type locality of *W. spatulata* Kim & Chung, 1996, a species synonymized by Semenchenko (2010) with *W. elongata*. They stated that *W. concava* differs in the ventrally concave shape of IV-L-6. However, as mentioned by Semenchenko (2010) this character may not be suitable for species discrimination, and *W. concava* should be considered as a further junior synonym of *W. elongata*. She showed that, if the IV-L is placed in lightly lateral position, its tarsus seems to be narrower and concave ventrally (see Fig. 7C).

**Habitat:** Rhitrobiont.

**Distribution:** Korea, Far East of Russia.

**Genus *Javalbia* K. Viets, 1935**

***Javalbia (Javalbicula) ovata* Kim & Chung, 1996**

**Records from Korea:** Gangwon Province – Kim and Chung (1996).

**Habitat:** Streams.

**Distribution:** Korea; known only from the type locality (small stream near Yonghyunsa Temple at Sagimak).





**Figure 7.** Photographs of *Woolastookia elongata* (Sokolow, 1934), male, CR1, stream Dobong: A = dorsal shield; B = ventral shield; C = IV-L-5 and -6.

**Family LETHAXONIDAE Cook, Smith & Harvey, 2000**

**Genus *Lethaxona* K.Viets, 1932**

***Lethaxona hyogoensis* Imamura, 1956**

**Records from Korea:** Gangwon Province – Kim and Chung (1996).

**Habitat:** Stream.

**Distribution:** Japan, Korea.

**Family MOMONIIDAE K. Viets, 1929**

**Subfamily Momoniinae K. Viets, 1926**

**Genus *Momonia* Halbert, 1906****Subgenus *Orientmomonia* nov. subgen.**

**Diagnosis.** Characters of the genus *Momonia* (see Cook 1974); dorsal shield composed of small anterior and a large posterior plate, flanked by ring composed of 7 pairs of platelets, with 1th, 2nd, 4th, 5th, 6th and 7th pairs bearing glandularia, and 4 pairs of tiny sclerites bearing slit organs.

**Type species.** *Momonia koreana* n. sp.

**Remarks.** The genus *Momonia* includes six species from three subgenera. The typical subgenus is known from Europe (one species) and North America (three species). Two other subgenera are monotypic, *Momonia karelica* (Sokolow, 1926), type species of the subgenus *Kondia* Sokolow, 1926, is known from two female specimens from Russia and Sweden; *M. fuscina* Yi & Jin, 2012, type species of the subgenus *Paramomoniam* Yi & Jin, 2012, was described in both sexes from China (Yi & Jin 2012). In these three subgenera, the idiosoma varies from mostly membranous, lacking extensive shields (*Kondia*) to heavily sclerotized, with dorsal and ventral shields, dorsal shield entire (*Paramomoniam*) or consisting of anterior and posterior plates (*Momonia* s.s.). The new subgenus resembles *Momonia* s.s. due the presence of a two-parted dorsal shield but differs in a ring composed of 7 pairs of platelets flanking anterior and posterior plates of dorsal shield. The cyclic arrangement of dorsal platelets appears to represent a unique evolutionary development that does not indicate close relationship with other known subgenera.

***Momonia (Orientmomoniam) koreana* n. sp.**

(Figs. 5D-F, 8A-B, 9A-I)

**Material examined.** Holotype male, dissected and slide mounted, South Korea, CR10 Jeollabuk Province, Ne myeon Mt, stream near Silsung temple, 1.7 km to Jiksopolpol falls, Naeyeansan NP, 0.6 km from Naeyeansan Info Center, 35°64'65.978"N, 126°58'62.285"E, 10.x.2012, Pešić & Choi.

**Diagnosis.** As for subgenus.

**Description**

*Male* – Colour greenish. Idiosoma oval in shape. Sclerotized plates wrinkled. Lateral eyes enlarged. Dorsum with a transverse anterior plate bearing postocular setae, its anterior margin forming a shallow bay for the unpaired frontal organ, and a large, longitudinally wrinkled posterior plate; anterior and posterior plates flanked by ring composed of 7 pairs of platelets, with 1th, 2nd, 4th, 5th, 6th and 7th pairs bearing glandularia, and 4 pairs of tiny sclerites bearing slit organs (Figs. 5D, 8A).

Venter nearly covered by ventral shield (Fig. 8B); Cx-I+II with distinct medial edges, separated from remainder of venter by an articular membrane; Cxgl-1 located on anterolateral corner of Cx-III, medial margin of Cx-III much longer than medial margin of Cx-IV, Cx-IV with rounded projections covering the IV-L-insertions and on each side a field of about 12 -16 curved setae in posterolateral part, Cxgl-4 located between Cx-IV and genital field. Genital field (Fig. 5F) subterminal, lying between Cx-IV, with three pairs of acetabula in gonopore; 6-8 pairs of genital setae around gonopore; excretory pore and flanking glandularia widely fused to ventral shield.

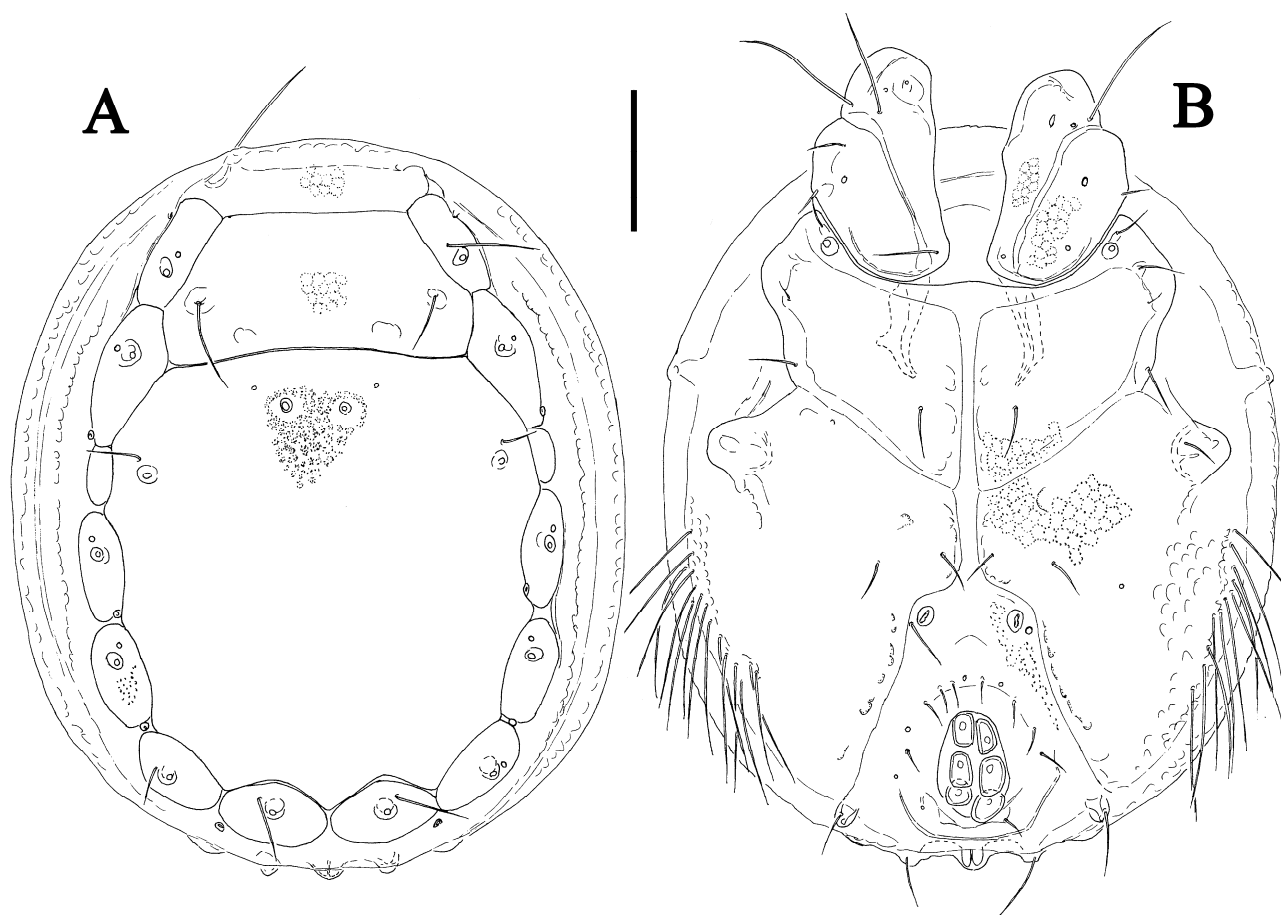
Palp (Figs. 5E, 9F-G): dorsal setae of P-2 and P-3 long and slender, P-4 with a small anterodorsal peg-like seta, two thick ventral setae on a prominent tubercle and four dorsal hair-like setae; P-5 slender, with one main claw flanked by three shorter ones.

I-L modified as characteristic in the genus *Momoniam* (Figs. 9A-B); I-L-5 slightly bowed dorsally; III-L-3-5 and IV-L-4-5 each with 3 long swimming setae, all legs with paired main claws bearing dorsal and ventral clawlets, without claw blade (Fig. 9E); IV-L-3-5 with pennate setae (Fig. 9D).

*Measurements:* Idiosoma L/W 578/441; anterodorsal plate L/W 97/222 (ratio 0.44); posterodorsal plate L/W 328/313 (ratio 1.05); L of dorsal sclerites (1-7) from anterior to posterior: 81-87, 105-106, 41-42, 78-84, 75, 72-78, 78; Cx-I+II L/W 162/228; genital field: gonopore L/W 75/52

Palp: palp total L 294, dL/H, dL/H ratio: P-1, 34/25, 1.38; P-2, 77.5/, 1.8; P-3, 45/34, 1.33; P-4, 83/21, 3.9; P-5, 54/16.5, 3.3; length ratio P-2/P-4 0.93. Gnathosoma vL 119, chelicera total L 119.

Legs: I-L-5 dL 323, central H 40, dL/central H 8.1; I-L-6 dL 109, maximum H 46, dL/maximum H ratio 2.35; L ratio I-L-5/6 3.0; dL of I-L: 56, 119, 144, 153-162, 323, 108-109; dL of IV-L: 73, 94, 113, 122, 156, 156.



**Figure 8.** *Momonia (Orientmomonia) koreana* n. sp., male: A = idiosoma, dorsal view; B = idiosoma, ventral view. Scale bar = 100  $\mu$ m.

*Female* – unknown.

**Etymology.** Named after the country where the new species was detected.

**Habitat.** A small sandy/bouldary pool near the main stream, shaded by riparian vegetation (Fig. 11).

**Distribution.** Korea; known only from the type locality.

### Genus *Stygomomonia* Szalay, 1943

#### *Stygomomonia rotunda* Imamura, 1956

**Records from Korea:** Gangwon Province – Chung and Kim (1997).

**Habitat:** Streams.

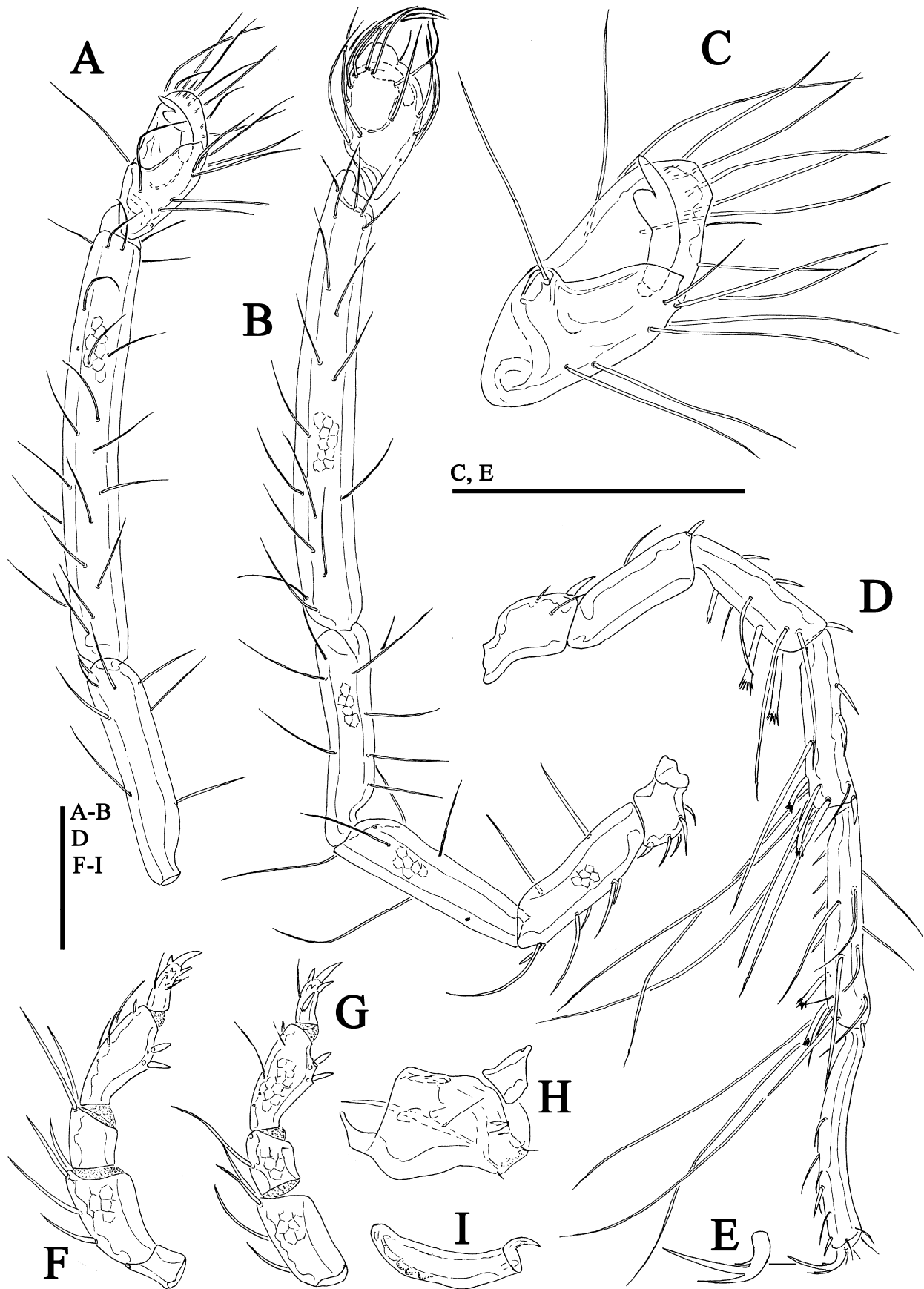
**Distribution:** Japan (Tokyo, Hyogo, Ishikawa), Korea.

### Superfamily Arrenuroidea

#### Family MIDEOPSIDAE Koenike, 1910

#### Subfamily Mideopsinae Koenike, 1910

#### Genus *Mideopsis* Neuman, 1880



**Figure 9.** *Momonia (Orientmomonia) koreana* n. sp., male: A = I-L-4-6; B = I-leg; C = I-L-6; D = IV-leg; E = claw; F-G = palp; H = gnathosoma; I = chelicera. Scale bar = 100  $\mu$ m.



*Mideopsis ryugaensis* Imamura, 1957

**Records from Korea:** Gangwon Province – Chung and Kim (1997).

**Habitat:** Streams.

**Distribution:** Japan (Kochi), Korea.

Family ARRENURIDAE Thor, 1900

Genus *Arrenurus* Dugès, 1834

*Arrenurus (Arrenurus)* sp.

**Records from Korea:** Gangwon Province – Chung and Kim (1991).

*Arrenurus (Truncaturus)* sp. near *corsicus* (E. Angelier, 1951)

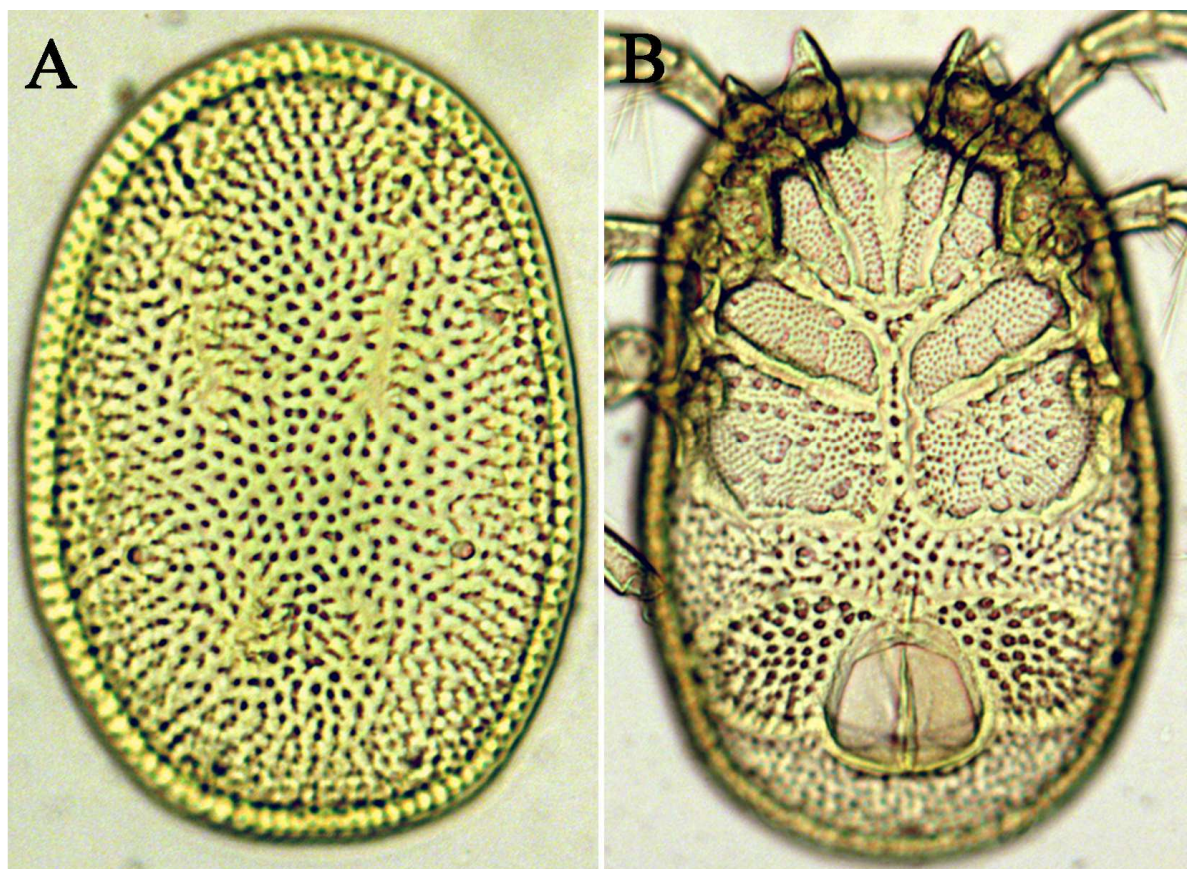
(Figs. 10A-B)

**New records:** South Korea, Gangwon Province, CR7 Odaesan NP, stream, 37°49.642'N, 128°42.170'E, 215 m asl., 9.x.2012, Pešić & Karanović 0/1/0 (mounted).

**Remarks:** The single female specimen examined shows a general conformity with *Arrenurus corsicus* (E. Angelier, 1951), a hyporheobiontic species known from the Palaearctic, most frequently reported from the Mediterranean. So far, a stream in the Khorrasan province (E Iran) represented the easternmost locality of this species (Pešić *et al.* 2006). Our assignment to *A. corsicus* is based mainly on non-identity with alternative species, additional material and description of the male sex is necessary to clarify the taxonomy of this specimen.

**Habitat:** Stream.

**Distribution:** Palaearctic.



**Figure 10.** Photographs of *Arrenurus (Truncaturus)* sp. near *corsicus* (E. Angelier, 1951), female, stream in Odaesan NP: A = dorsal shield; B = ventral shield.





**Figure 11.** Photo of the type locality (CR10, pool near stream in Naeyeansan National Park, South Korea) of *Albia kseniae* n. sp. and *Momonium koreanum* n. sp. (Photo V. Pešić).

#### Genus *Thoracophoracarus* K. Viets, 1914

##### *Thoracophoracarus* sp.

**Records from Korea:** Jeollabuk Province – Smit and Pešić (in press).

**Habitat:** A small sandy/bouldary pool near the main stream.

**Distribution:** Korea, known only from the type locality.

#### Records of species of uncertain assessment from the study area

##### *Hydryphantes bayeri* Pisarovic, 1896

*Species incerta* (Di Sabatino *et al.* 2009)

**Records from Korea:** Chung and Kim (1997).

##### *Feltria (Feltria) minuta* Koenike, 1892

**Records from Korea:** Gangwon Province – Chung and Kim (1991).

**Remarks.** Chung and Kim (1991) assigned two female specimens collected from Kangreung to *F. minuta* Koenike, 1892, a species known from central, northern and western Europe. As the important characters are restricted to males, this assignment is uncertain.

##### *Feltria (Feltria) zschokkei* Koenike, 1896

**Records from Korea:** Gangwon Province – Chung and Kim (1991).



**Remarak.** The posterior margin of genital plate of the illustrated male specimen from Korea assigned by Kim and Chung (1991) is clearly concave, not deeply indented as in *F. zschokkei*. Due to the location of ventral setae on III-L-6 in the distal part, the specimen from Korea resembles *F. brevipes* Walter, 1907 (Europe), but differs in less slender dorsal shield in the male (L/W 1.2, calculated from figure; Kim and Chung 1991: Fig. 7H). The taxonomic status of these specimens should be verified by additional material.

***Ljanja japonica* Imamura, 1956**

**Records from Korea:** Gangwon Province – “*Ljanja bipapillata*“ Chung and Kim (1991); Gangwon Province – Kim and Chung (1996).

**Remarks:** See Remarks under *Ljanja orientalis*.

**Discussion**

At the present state of knowledge, the number of species and subspecies of water mites recorded from Korea is 74, in 32 genera and 13 families; 17 of these species (23%) are indicated as being endemic. The documentation of the water mite fauna in Korea is askew (Table 1). Only from one province (Gangwon) more than 50 species is known. Two provinces Jeollabuk and Jeollanam have 13 and 10 species, respectively, and from the remaining provinces less than 10 species are known.

Compared with the number of water mites in some neighboring areas, such as Japan (223 species and 41 subspecies – Abé 2005), China (193 - Jin *et al.* 2010) and Russian Far East (217 species and 6 subspecies - Semenchenko 2008) we can conclude that the number of 74 species is far below a reliable estimation and further research undoubtedly will increase the number of species known from Korea. The publication of this checklist should help to stimulate further studies on this important but still not well studied group of invertebrates.

**Table 1.** Number of water mite species per Korean province.

	Nb of species		Nb of species
<i>Special cities</i>		<i>Provinces</i>	
Seoul	6	Gyeonggi	1
<i>Metropolitan cities</i>		Gangwon	53
Busan	0	Chungcheongbuk	1
Daegu	0	Chungcheongnam	0
Incheon	0	Jeollabuk	13
Gwangju	3	Jeollanam	10
Daejeon	0	Gyeongsangbuk	4
Ulsan	0	Gyeongsangnam	1
<i>Special self-governing province</i>			
Jeju	1		

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