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A review of the tribe Spilomicrini (Diapriidae: Diapriinae) in South Korea with description of four new species

Обзор трибы Spilomicrini (Diapriidae: Diapriinae) в Южной Корее с описанием четырех новых видов

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KEY WORDS: diapriids, wasps, *Idiotypa*, *Paramesius*, *Spilomicrus*, new taxa, new records, East Palaearctic fauna.
КЛЮЧЕВЫЕ СЛОВА: наездники, диаприиды, *Idiotypa*, *Paramesius*, *Spilomicrus*, новые таксоны, новые находки, фауна восточной Палеарктики

ABSTRACT. The fauna of the Spilomicrini tribe is reviewed in South Korea. Twelve species of this tribe have been recorded in South Korea for the first time: two species from the *Paramesius* Westwood genus, three species from the *Idiotypa* Förster, and seven from the *Spilomicrus* Westwood genus. The genera *Paramesius* and *Idiotypa* are firstly recorded in South Korea. Four new species: *Paramesius orientalis* **sp.n.**, *Spilomicrus basalicus* **sp.n.**, *S. planalis* **sp.n.** and *S. visorus* **sp.n.**, are described and illustrated. Based on the results of this research and of previous studies of diapriid wasps, 27 species of Spilomicrini are currently indicated in the fauna of South Korea.

РЕЗЮМЕ. Дан обзор фауны трибы Spilomicrini Южной Кореи. Двенадцать видов этой трибы впервые указываются в Южной Корее: два вида рода *Paramesius* Westwood, три вида рода *Idiotypa* Förster и семь видов рода *Spilomicrus* Westwood. Рода *Paramesius* и *Idiotypa* впервые зарегистрированы в Южной Корее. Описаны и проиллюстрированы четыре новых вида: *Paramesius orientalis* **sp.n.**, *Spilomicris basalicus* **sp.n.**, *S. planalis* **sp.n.** и *S. visorus sp.n.* На основании результатов данного и предшествующих исследований к настоящему моменту в фауне Южной Кореи обнаружено 27 видов наездников диприид трибы Spilomicrini.

Introduction

The diapriids of the Spilomicrini tribe is a quite easily indicated group of wasps. In the Palaearctic they can be distinguished from all other diapriids by their specific venation and 13-segmented antennae in females and males. Six genera are currently indicated in the Palaearctic fauna: *Entomacis* Förster, 1856, *Idiotypa* Förster, 1856, *Paramesius* Westwood, 1832, *Pentapria* Kieffer, 1905, *Spilomicrus* Westwood, 1832 and *Symphytopria* Kieffer, 1910. *Symphytopria* species are known only from South Europe, *Pentapria* species recorded from East Palaearctic, while other genera are widely distributed in Palaearctic and worldwide [Masner, García, 2002; Chemyreva, Kolyada, 2013; Chemyreva, 2019, 2024]. In the East Palaearctic, mainly the fauna of the Far East of Russia and Japan were studied. These studies included only a few samples from South Korea. To date only eleven species of the Spilomicrini were recorded for South Korea. Six of the 11 known in the Eastern Palearctic species of *Entomacis*: *E. balloona* Rajmohana et Narendran, 2006, *E. kasparyani* Chemyreva, 2014, *E. graeffei* Kieffer, 1909, *E. leptos* Chemyreva, 2015, *E. platyptera* (Haliday, 1857) and *E. spinosa* Rajmohana et Narendran, 2006, were recorded from Korea [Chemyreva, 2014, 2015b]. This is only a few more than half of the fauna of this genus known in the Eastern Palaearctic. Seven species of *Spilomicrus*: *S. abnormis* Marshall, 1868, *S. duplicarina* Chemyreva, 2023, *S. kumaonensis* Sharma, *S. leleji* Chemyreva, 2016; *S. magnus* Kim et Lee, 2016, *S. metopotrypus* Chemyreva, 2018, *S. notaulus* Chemyreva, 2015 were recorded from South Korea before [Chemyreva,

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2015a, c, 2018, 2021, 2023; Kim, Lee, 2016]. Three other genera of Spilomicrini: *Idiotypa*, *Paramesius*, *Pentapria*, are still unknown in Korea, despite having been recorded in neighbouring countries.

This review forms part of an ongoing project to study the fauna of Diapriidae in South Korea. In this article we give an overview of the tribe Spilomicrini in the fauna of Korea (except for the genus *Entomacis,* which we plan to study separately), and describe three species so far found only in the fauna of South Korea and one species from South Korea and the Far East of Russia.

Material and methods

Material observed in this study originates from the several collections: NIBR — the National Institute of Biological Resources, Incheon, Republic of Korea; SMNE — the Science Museum of Natural Enemies, Geochang, Republic of Korea; ZISP — the Zoological Institute of the Russian Academy of Sciences, St Petersburg, Russia. Holotypes of the new species are stored in NIBR. Images were taken with a Nikon stereo microscope SMZ25 equipped with objective lens Plan Apo 1.6X and digital camera DS-10. Final images were stacked using Helicon Focus 7.6. The morphological terminology, abbreviations and measurements follow Masner [1991], Masner, García [2002], Yoder [2004] and the Hymenoptera Anatomy Ontology [Yoder *et al.*, 2010]. Some abbreviations of the Korean provinces are used: CB —Chungcheongbuk-do; CN — Chungcheongnam-do; GB — Gyeongsangbuk-do; GG — Gyeonggi-do (including Seoul); GN and KN — Gyeongsangnam-do (including Busan); GW — Gangwon-do; JJ — Jeju-do; JN — Jeollanam-do. New records are asterisked (*).

Taxonomy

Order **Hymenoptera**
Family **Diapriidae**
Subfamily **Diapriinae**
Tribe **Spilomicrini**
Genus ***Idiotypa*** Förster, 1856

Idiotypa Förster, 1856: 122, 125.

Type species: *Psilus maritimus* Haliday, 1833: 275, designated by Ashmead, 1893.

Idiotypa mariae Gregor, 1939

Idiotypa marii Gregor, 1939: 133, 134.

Idiotypa mariae Chemyreva *et al.*, 2021: 130.

MATERIAL EXAMINED. South Korea [CB] Yeongdong-gun, Sangchon-myeon, Murhan valley, MT, 4.VIII–24.IX.2002, 1♂ (NIBR).

DISTRIBUTION. Europe, Russia (European part, Siberia, Far East); Mongolia, Japan and *South Korea [Chemyreva *et al*., 2021].

Idiotypa maritima Haliday, 1833

Psilus maritimus Haliday, 1833: 275.

Mionopria rufiventris Thomson, 1858: 373. Synonymized by Chemyreva *et al.* [2021].

Idiotypa nigriceps Kieffer, 1909: 386. Synonymized by Chemyreva et al. [2021].

Idiotypa maritima Chemyreva *et al.*, 2021: 133.

MATERIAL EXAMINED. S. Korea, [GW] Chuncheon-si, Nam-myeon, Hudong-ri, MT, 16.VII–20.X.2003, 1♂ (NIBR); [GW] Yeongwol-gun, Jungdong-myeon, Hwawon2-ri, Mt. Yemisan, 10–24.V.2017, MT, 37°9′6.85′′N 128°38′7.03′′E, Hyeong-Keon Lee leg., 1♂ (ZISP).

DISTRIBUTION. Europe, Russia (European part, Siberia, Far East), Japan and *South Korea [Chemyreva *et al*., 2021].

Idiotypa digita Liu et Xu, 2015

Idiotypa digita, Liu et Xu, 2015: 237.

MATERIAL EXAMINED. South Korea, [CB] Yeongdeck-ri, Sancheon-myeon, Chungju-si, MT, 37°3′23.14′′N 127°58′33.89′′E, 21.VI–5.VII.2017, 27.IX–11.X.2017, Hyung-Keun Lee leg., 2♂♂ (ZISP); [KN] Changchon-ri, Ilbanseong-myeon, Jinju-si, MT, 13.VIII–10.IX.2022, 10.X–12.XI.2022, Tae-Ho An leg., 4♀♀ (NIBR and SMNE); [JJ] Sanghyowon, Seogwipo-si, MT, 31.V–15.VI.2024, Deokseo Ku & Muncheol Kwon legs, 2♀♀ (ZISP); [JN], Deokcheon-ri, Gundong-myeon, Gangiin-gun, 17–31.VII.2017, MT, 34°55′47.64′′N 126°57′49.37′′E, Hyung-Keun Lee leg., 1♀ (SMNE)..

DISTRIBUTION. South Korea and China (Hainan) [Liu, Xu, 2015].

Genus ***Paramesius*** Westwood, 1832

Paramesius Westwood, 1832: 129.

Aparamesius Kieffer, 1913: 436. Synonymized by Masner & Muesebeck in Krombein & Burks [1967].

Type species *Paramesius belytoides* Marshall, 1867 [Chemyreva, Kolyada, 2018].

Paramesius ocampus Chemyreva et Kolyada, 2018

Paramesius ocampus, Chemyreva et Kolyada, 2018: 462.

MATERIAL EXAMINED. South Korea, [GN] Sacheon-si, Sinsudong, Shinsudo Daewang Gisan, MT, 17.VI–7.VII.2024, Deokseo Ku, Jiwon Park, Dandi Yun legs, 1♀ (NIBR); same locality and data, 1♂ (SMNE).

DISTRIBUTION. Far East of Russia, *South Korea [Chemyreva, Kolyada, 2018].

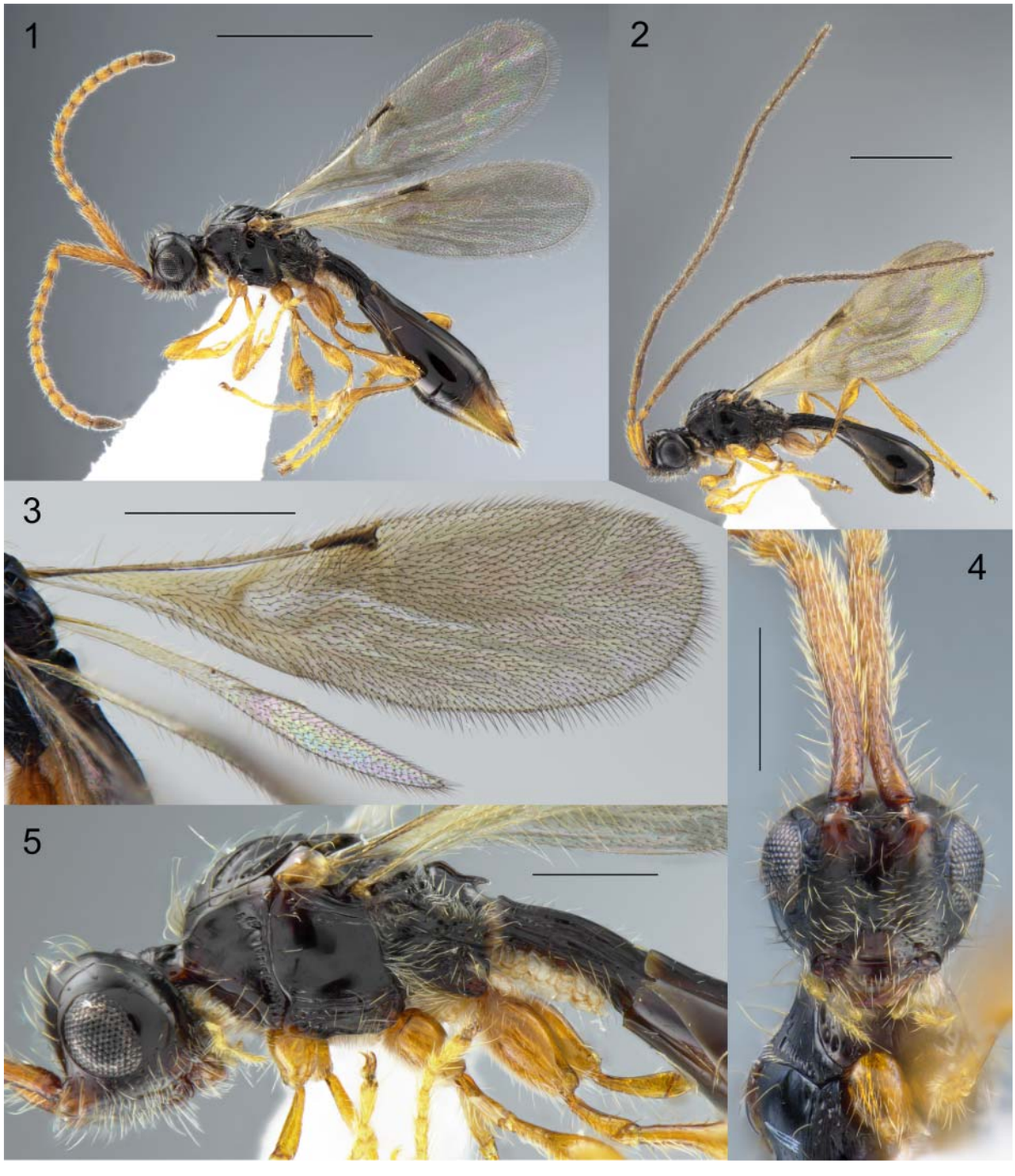
Paramesius orientalis **sp.n.**

Figs 1–11.

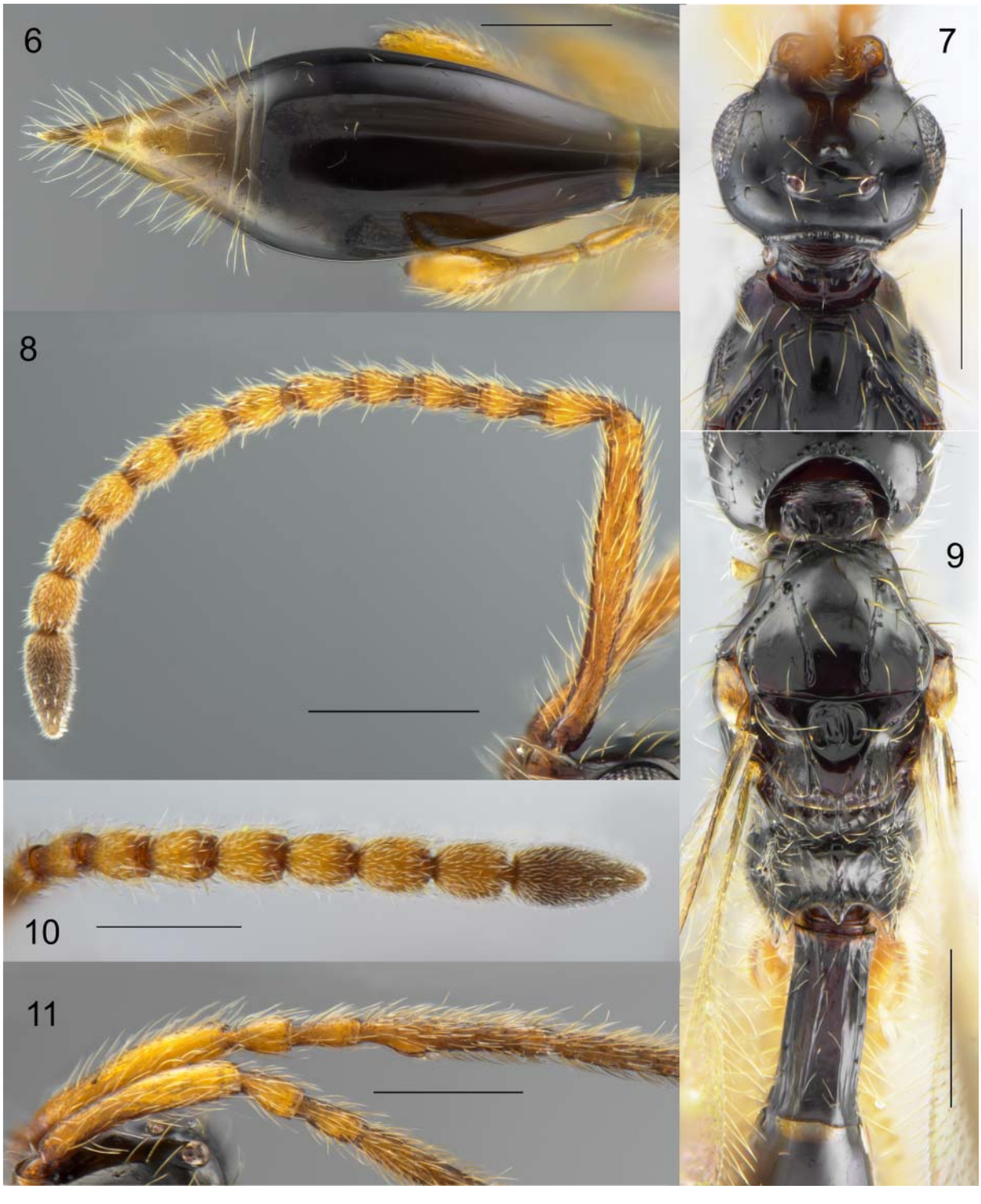
HOLOTYPE. South Korea [GN] Jinju-si, Geumsan-myeon, Galjeon-ri, 35.18906°N 128.1779°E, 25.VII.2024, E. Tselikh leg., ♀ (NIBR). PARATYPES. South Korea, same labels as holotype, 2♀♀, 3♂♂; [GN] Jinju-si, Jeongpyeong-ri, Jiphyeon-myeon, 35.29655°N 128.05850°E, 23.VII.2024, E. Tselikh leg., 1♂; [KN] Oryang-ri, Sadeung-myeon, Geoje-si, 34°52′50.67′′N 128°30′30.48′′E, MT, 5–20.VI.2017, 20.VI–4.VII.2017, 1–15.VIII.2017, 29.VIII–12.IX.2017, Hyung-Keun Lee leg., 2♀♀, 2♂♂; [CB] Boeun-gun, MT, 6–20.VIII.2018, Hyung-Keun Lee leg., 1♂; [GN] 1-2 Beoppyeong-ri, Chahwang-myeon, Sancheong-gun, 35.48604°N 127.9746°E, 22.VII.2024, S. Belokobylskij leg., 3♀♀, 4♂♂; [GN], 38 Songjeong-ri, Geochang-eup, Geochang, 35.6709°N, 127.888°E, YPT, 21–23.VII.2024, V. Chemyreva leg., 1♀, 4♂♂; [GN] Geoje-si, Dundeok-myeon, Sangdun 5-gil 46, Bongeunsa Temple, Mt. Sanbangsan, 34.86°N, 128.55°E, 26.VII.2024, V. Chemyreva leg., 1♀, 2♂♂ (ZISP, SMNE).

ETYMOLOGY. The name of this species is the Latin adjective meaning “eastern.”

DIAGNOSIS. *Paramesius orientalis* **sp.n.** can be differentiated from all described Palaearctic and Oriental species by the combination of these states: pleurostoma with small semicircular blades anteriorly next to mandibles; occipital flange (carina) narrow and sculptured (Figs 7, 9); all antennomeres of female elongate in dorsal and lateral views (Figs 8, 10); male emargination of A4 not extending 0.4 of this segment length (Fig. 11); pronotal cervical area transversely wrinkled, with several long and stout setae (Fig. 7); neck bare; notauli and mesoscutal suprahumeral sulcus complete and well impressed throughout mesoscutum; mesopleuron ventrally with distinct carina extending from fore- to mid- coxae (Fig. 5); median carina of propodeum as well as plicae and mesopleural carinae form teeth posteriorly (Fig. 9); pro-, meso- and metapleurons,



Figs 1–5. *Paramesius orientalis* **sp.n.** female, holotype (1, 3–5) and male, paratype (2). 1, 2 — habitus, lateral view; 3 — fore wing; 4 — face; 5 — head, mesosoma and basal part of metasoma, lateral view. Scale bars: 1, 2 — 1 mm; 3 — 0.5 mm; 4, 5 — 0.3 mm.
Рис. 1–5. *Paramesius orientalis* **sp.n.** самка, голотип (1, 3–5) и самец, паратип (2). 1, 2 — габитус сбоку; 3 — переднее крыло; 4 — лицо; 5 — голова, мезосома и базальная часть брюшка сбоку. Линейки: 1, 2 — 1 мм; 3 — 0,5 мм; 4, 5 — 0,3 мм.



Figs 6–11. *Paramesius orientalis* **sp.n.** female, holotype (6–10) and male, paratype (11). 6 — abdomen, dorsal view; 7 — head, dorsal view; 8 — antenna, lateral view; 9 — mesosoma and basal part of metasoma, dorsal view; 10 — apex of antenna, dorsal view; 11 — base of antenna. Scale bars: 10 — 0.2 mm; other — 0.3 mm.

Рис. 6–11. *Paramesius orientalis* **sp.n.**, самка, голотип (6–10) и самец, паратип (11). 6 — брюшко сверху; 7 — голова сверху; 8 — усик сбоку; 9 — мезосома и базальная часть брюшка сверху; 10 — вершина усика сверху; 11 — основание усика. Линейки: 10 — 0,2 мм; другие — 0,3 мм.

base of hind coxae and petiole ventrally covered with yellowish foamy structure (Fig. 5); female petiole about 0.44 times as long as T2.

DESCRIPTION. Holotype. Female. Body length 2.6 mm; fore wing length 2.0 mm; antennae length 1.9 mm. Head, mesosoma, venation and metasoma (except apex) dark brown; legs, tegula, antennae (only A13 slightly darker then other antennomeres) and apical tergae T5–T7 and S6 yellowish brown.

Head in dorsal view very slightly wider than long, with scattered long setae. Occipital flange narrow, finely punctured. Postgenal cushion absent. Head in lateral view 1.1 times as high as long, subglobular. Eye twice as high as malar space length. Antennal shelf in frontal view with shallow pressure in the middle part between toruli. Face punctured and pubescent. Malar sulcus absent. Clypeus convex, semicircular, 1.6 times as wide as high. Epistomal sulcus shallow. Labrum exposed, large and semicircular. Tentorial pits small. Mandibles bidentate, upper tooth smaller than lower one.

Antenna filiform without clava. Apical clavomeres with same wide in dorsal and lateral views. In lateral view connection between apical antennometes not shift dorsally (Fig. 8). Ratios of length to width of antennomeres in dorsal and lateral views are in Figs 8, 10.

Mesosoma slightly compressed, 1.1 times as high as wide. Neck bare and only finally sculptured. Pronotal cervical area with numerous long upstanding setae, separated from neck with step-like groove (Fig. 7). Pronotal cushion absent, only row of long setae along anterior margin present. Side of pronotum with row of foveae along posterior margin and row of short setae between these foveae and posterior margin. Propleura covered with yellowish foamy structure in anterior two thirds, and setose in posterior third. Mesoscutum distinctly convex, with a few scattered semi-decumbent setae. Notauli complete throughout and deep, weakly convergent posteriorly; smallest distance between notauli as long as between notauli and humeral sulcus. Humeral sulcus deep, sculptured at bottom; mesoscutal suprahumeral sulcus deep and shortly interrupt before its fusion with notauli (Fig. 9). Anterior scutellar pit deep and circular, with two carinae inside. Two lateral scutellar pit deep and narrow. Posterior scutellar pits more distinct medially and shallow laterally on lateral rim. Mesopleuron with four carinae under tegula; sternaulus complete. Epicnemial pit bare inside and tiny. Area below sternaulus longitudinally carinate; mesopleuron ventrally with distinct carina extending from fore- to mid- coxae; area between these carinae with yellowish foamy structure. Metascutellum narrow, coarsely sculptured, scarcely pubescent, with low medial carina and one low lateral carina. Propodeum distinctly transverse, its dorsal area bare, lateral area unevenly pubescent: only area between plicae and mesopleural carina and mesopleura ventrally densely pubescent. Median propodeal carina slightly projecting anteriorly upwards, significantly projecting posteriorly backward and form median tooth. Propodeal spiracle cap small, pale than propodeum. Plicae, mesopleural carina and metapleural epicoxal carina form three small teeth posteriorly. Metapleura ventrally with yellowish foamy structures. Fore wing with costal and subcostal vein sclerotised, marginal vein 2.8 times as long as its median width; stigmal vein very short. Legs slender with tarsomeres elongate, claws curved and darker than tarsomeres.

Metasoma. Petiole in dorsal view cylindrical, 2.4 times as long as wide, with several longitudinal ridges and almost bare; in lateral view very slightly curved, with yellowish foamy structures ventrally and scattered setae laterally. T2 lateral notch small; T3−T4 narrow and bare; apex of metasoma sharply conical, T5−T7 compressed laterally with numerous erect setae; T5 longer than T6 and than T3–T4 together. S2 with numerous erect setae; S3–S5 narrow and bare; S6 large, 2.8 times longer than S3–S5 together, with long erect setae.

Variation. Female. Body length 2.5–3.2 mm; pleurostoma with small semicircular blades anteriorly next to mandibles or almost without it; mesoscutal suprahumeral sulcus shortly interrupt before its fusion with notauli to complete; foamy structures yellowish brown to white; anterior scutellar pit with 2–3 complete low carinae, to several sort carinae developed posteriorly, to even completely smooth.

Male. Body length 2.0–2.9 mm. Similar to female, but differs mainly in following: head in dorsal view more transverse; antenna thin and long, about 1.7 times as long as body, pale brown and very slightly darkened towards apex (Fig. 2); A3–A13 with dense, semi-decumbent pubescence, as long as maximal width of appropriate antennomeres; A4 with carina extending to 0.27–0.44 of A4 length; anterior scutellar pit with 2–4 complete low carinae, to several sort carinae developed posteriorly, to even smooth; propodeum with shorter teeth posteriorly, almost smooth between median carina and plicae to carinate or even rugose; petiole 0.48–0.52 times as long as T2; white foamy structures developed in anterior third of propleura, on ventral side of mesopleura along mesodicriment, on ventral side of metapleura, and on ventral side of petiole in anterior quarter.

DISTRIBUTION. South Korea.

Paramesius primorus Chemyreva et Kolyada, 2018

Paramesius primorus Chemyreva et Kolyada, 2018: 464.

MATERIAL EXAMINED. South Korea, [JJ] Manse hill, Gwangryeong-ri, Aewol-up, Jeju-si, 6–12.VIII.2017, MT, 33°21′56.28′′N 126°30′20.49′′E, Hyung-Keun Lee leg., 1♂ (NIBR).

DISTRIBUTION. Far East of Russia, *South Korea [Chemyreva, Kolyada, 2018].

Genus ***Spilomicrus*** Westwood, 1832

Spilomicrus Westwood, 1832: 129.

Type species: *Spilomicrus stigmaticalis* Westwood, 1832, by monotypy.

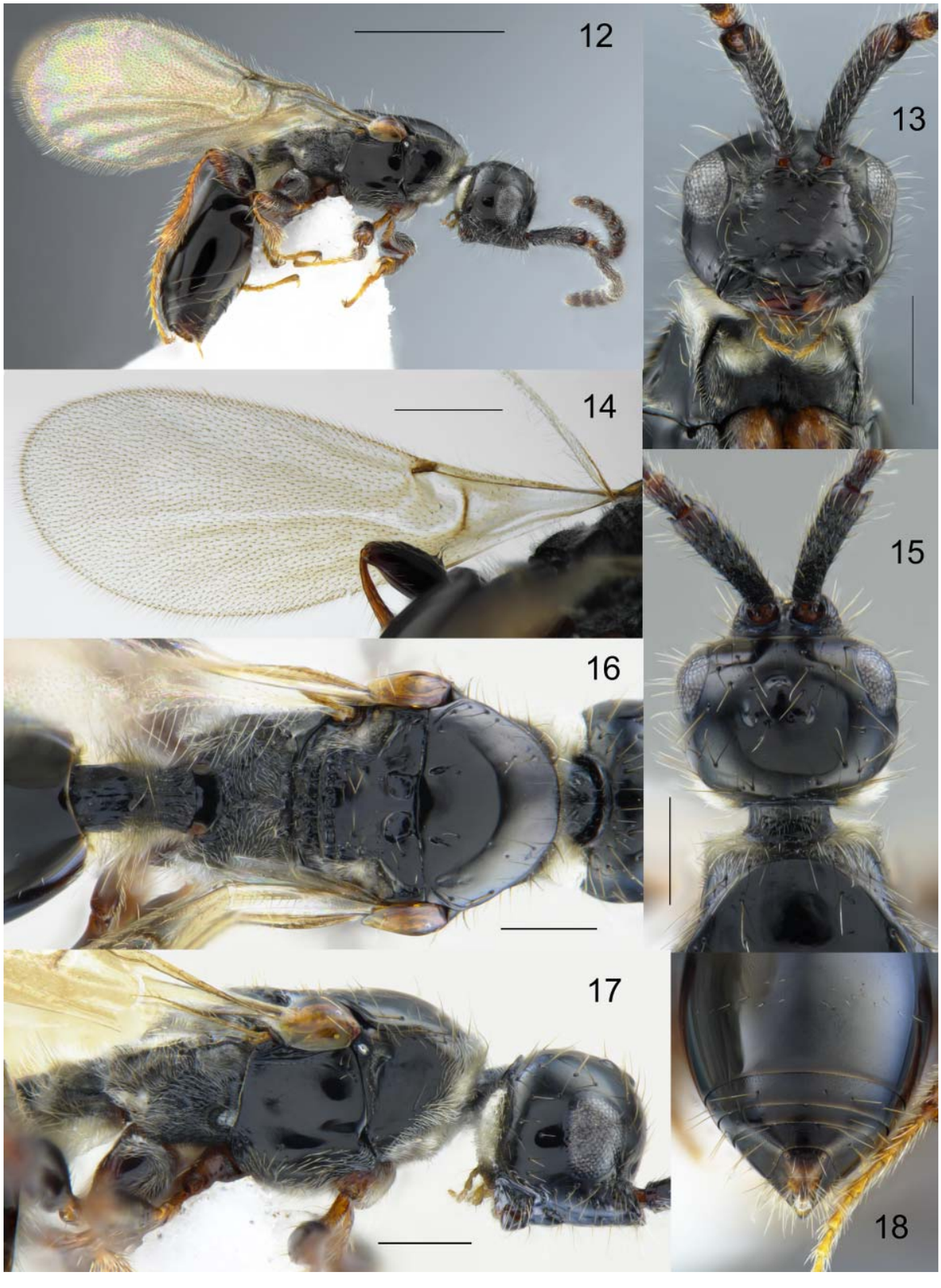
Spilomicrus basalicus **sp.n.**

Figs 12–18, 35, 36.

HOLOTYPE. South Korea, [GN] Uiryong-gun, 15.IV–29.IV.2018, MT, Hyung-Keun Lee leg., ♀ (NIBR). PARATYPES. Russia, Primorskiy Terr., vicinity of Arsenyev, 25–26.V.2016, S. Belokobylskij leg., 7♀♀ (ZISP).

ETYMOLOGY. The species name derives from the Latin "basal" and refers to the presence of the short basal view on the fore wing of the new species.

DIAGNOSIS. *Spilomicrus basalicus* **sp.n.** can be distinguished from all other described Palaearctic and Oriental *Spilomicrus* species by the following features: head dorsally and face smooth with only tiny setigerous punctures; tentorial pits absent; malar sulcus complete and deep; clypeus twice as wide as high and without clypeal flange ventrally (Fig. 13); pleurostomal distance weakly longer than shortest distance between eyes; temples in dorsal view and genae in frontal view moderately long, not convex and parallel to each other (Figs 13, 15); occipital flange narrow and smooth; mesosoma strongly depressed; mesonotum flat, with notauli developed only posteriorly as short grooves; sternaulus absent; area below the usual sternaulus location pubescent; propodeum almost not



Figs 12–18. *Spilomicrus basalicus* **sp.n.** female, holotype. 12 — habitus, lateral view; 13 — face; 14 — fore wing; 15 — head, dorsal view; 16 — mesosoma, dorsal view; 17 — head and mesosoma, lateral view; 18 — apex of metasoma, dorso-caudal view. Scale bars: 12 — 1 mm; 14 — 0.5 mm; other — 0.3 mm.

Рис. 12–18. *Spilomicrus basalicus* **sp.n.**, самка, голотип. 12 — габитус сбоку; 13 — лицо; 14 — переднее крыло; 15 — голова сверху; 16 — мезосома сверху; 17 — голова и мезосома сбоку; 18 — вершина брюшка сверху и снизу. Линейки: 12 — 1 мм; 14 — 0,5 мм; другие — 0,3 мм.

narrowed posteriorly with posterior margin deeply arcuate in dorsal view; basal vein pigmented; femur of all legs widened and with short basal stalk, hind leg without trochantellus; base of T2 smooth and bare; base of S2 with dense cushion of long setae.

COMPARISON. This new species is similar to *S. transversus* Chemyreva, 2018, but it differs mainly in following: antennae more slender and different in shape; indistinct tentorial pit (large and distinct in *S. transversus*); almost smooth neck (deeply grooved in *S. transversus*); anterior scutellar pits partly open anteriorly (completely close in *S. transversus*).

DESCRIPTION. Holotype. Female. Length of body 3.2 mm; length of fore wing 2.6 mm; length of antenna 1.3 mm. Body and basal half of A1 black; tegulae, venation and palpi reddish brown; mandibles, legs and A1–A13 partly reddish, partly dark brown (Fig. 33).

Head hypognathous, in dorsal view as long as wide with distinctly prominent antennal shelf, 0.8 times as wide as mesosoma; not depressed (Fig. 17). Head smooth, shiny with scattered long setae (which similar on eyes) and scattered setigerous punctures. Front almost smooth, with two very shallow depressions. Face smooth below antennal shelf. Tentorial pits absent (or present but only like a setigerous puncture without setae). Malar sulcus outlined as weak narrow line. Clypeus transverse, about twice as wide as high, slightly convex and without separating clypeal flange. Epistomal sulcus shallow but distinct. Pleurostomal distance sligtly longer than shortest distance between eyes and 0.7 times as long as width of head. Mandibles long, widely overlapping, bidentate with upper tooth distinctly shortened narrower. Eye 0.4 times as high as height of head, and 2.1 times as high as malar space. Ocelli large and prominent; LOL 1.7 times as long as largest diameter of anterior ocellus; POL 1.5 times as long as OOL and 2.15 times as long as occipital ocellar line. Temples in dorsal view gradually and widely receding to occipital carina, 0.65 times as long as half of head length. Occipital flange narrow and smooth. Postgenal cushion dense.

Antenna stout, only A3 and A13 elongate, A1 broadened anteriorly, smooth and shiny along apical margin but mainly coarsely coriaceous with deep punctures, covered with numerous strong setae. Apical rim of A1 with two small lamellae laterally (Fig. 36). A2 shiny, with scattered and deep puncturation, not compressed, in lateral and dorsal views elongate, broadened apically and attenuate at base, in lateral view very slightly asymmetrical. Antenna with non-abrupt clava; A8–A13 with hardly indicated MGS brush on its ventral side. In lateral view connection between A8–A13 shift dorsally (Fig. 35); A13 without ventral pit, in dorsal view ovoid and distinctly narrower than A12. Ratios of length to width of antennal segments in dorsal and lateral views can be checked in Figs 35, 36.

Mesosoma. Mesosoma depressed, 1.2 times as wide as high. Neck very finely pubescent and weekly rugose. Pronotal collar smooth, densely pubescent and short; pronotal cushion dense. Pronotal shoulders not prominent. Lateral side of pronotum smooth, with row of stout setae along dorsal margin and short upstanding pubescence along posterior margin. Propleuron smooth and covered with dense uniform pubescence. Mesonotum weakly convex. Notauli developed only posteriorly as short grooves. Humeral sulcus not deep, narrow but distinct. Scutellum flattened, with two large circular and open anteriorly anterior scutellar pits; distance between pits about half of median wide of one pit. Axilla smooth only with few scattered long setae and setigerous punctures. Axillar depression pubescent and smooth. Scutellar disk deeply punctured and rugose postero-laterally but without defined lateral pit. Posterior scutellar pits small and deep. Mesopleuron smooth, with one longitudinal carina dorsally under tegula, shining and bare at medial area. Epicnemial pit distinct, bare inside. Sternaulus totally absent. Ventral side of mesopleura densely pubescent. Acetabular carina distinct laterally and smoothed medially. Postacetabular sulcus absent. Mesopleural epicoxal carina developed only laterally. Mesopleural epicoxal sulcus absent. Metascutellum pubescent and entirely coarsely rugose, with very hardly indicated median, lateral and transverse carinae. Median propodeal carina projecting into not high spine directed upward; propodeum entirely coarsely rugose, slightly narrowed posteriorly, covered with dense short pubescence. Lateral side of propodeum and metapleura entirely densely pubescent with plicae, mesopleural carina and small spiracle. Posterior margin of propodeum in dorsal view deeply arcuate. Legs stout, femur widened and with short basal stalk. Hind leg without delimited trochantellus.

Fore wing clear. Marginal vein 1.6 times as long as wide (measured medially); stigmal vein about 0.4 times as long as length of marginal vein. Costal vein sclerotized and pigmented only basally. Basal vein partly pigmented (Fig. 14). Wing 2.7 times as long as wide.

Metasoma. Petiole cylindrical, 1.75 times as long as its median width, with longitudinal grooves and abundant pubescent (which more dense and long medially) in anterior part, almost smooth and bare posteriorly; ventral side of petiole entirely covered with long and white pubescence. T2 smooth with only few and very short scattered setae and micro-punctures postero-medially (Fig. 18). Following three tergites with very fine punctuation and with few long setae. T5 slightly expanded laterally. T6 small, T7 pointed and with numerous strong setae (Fig. 18). S2 smooth, with dense cushion at base; its posterior surface with scattered setae. Following three sternites with fine punctuation medially and few stout setae. Apical sternite with dense fine punctuation and numerous setae.

Male. Unknown.

DISTRIBUTION. Far East of Russia and *South Korea.

Spilomicrus diversus Chemyreva, 2021

Spilomicrus diversus Chemyreva, 2021: 406.

MATERIAL EXAMINED. South Korea, [GW] Mt. Jeombong, Jindong-ri, Girin-myeon, Inje-gun, 38°2′58.31′′N 128°28′52.10′′E, 22.VI–20.VII.2017, MT, Hyung-Keun Lee leg., 1♀ (NIBR); [GB] Heungpyeong-ri, Guseong-myeon, Gimcheon-si, 36°4′58.6′′N 128°30′30.48′′E, 4–18.VII.2017, Hyung-Keun Lee leg., 6♀♀, 11♂♂ (SMNE).

DISTRIBUTION. Europe, Russia (European Part, Siberia and Far East), *South Korea.

REMARKS. Despite the reasonable division of this species into two species in the western Palaearctic, the characters proposed by the authors for the diagnosis of these two species (*S. diversus* and *S. politus* Hübner et Chemyreva, 2024) are not applicable to this species complex in the eastern Palaearctic [Hübner, Chemyreva, 2024]. At this time, alternative characters have not been identified. Both *S. diversus* and *S. politus* morphs are present in the eastern Palaearctic region. However, diagnosis is challenging due to the overlap in their key characteristics.

Spilomicrus nipponicus Chemyreva, 2023

Spilomicrus nipponicus Chemyreva, 2023: 1028.

MATERIAL EXAMINED. South Korea, Bonghwa-gun, Myeongho-myeon, Gwanchang-ri, Mt. Cheongryany-san, 14.VII.2015, E. Tselikh leg., 1♀ [NIBR]. Common in Korea: 45♀♀ and 28♂♂ from CN, JN, JJ, GB, CB, GG Provinces (SMNE).

DISTRIBUTION. Japan and South Korea.

Spilomicrus orientalis Chemyreva, 2023

Spilomicrus orientalis Chemyreva, 2023: 1031.

MATERIAL EXAMINED. South Korea: Mt. Sudo-san, 23.VIII and 24.VIII.1990, K. Yamagishi leg., 5♂♂ (SMNE); Yeongyang-gun, Irwol-myeon, Mt. Irwol-san, 14.VII.2015, E. Tselikh leg., 1♂ (NIBR); [GW] Mt. Jeombong, Jindong-ri, Girin-myeon, Inje-gun, MT, 22.VI–20.VII.2017, 38°1′58.52′′N 128°27′54.19′′E, and 38°2′6.58′′N 128°27′18.68′′E, 14.IX–16.X.2017, Hyung-Keun Lee leg., 1♀, 1♂ (SMNE).

DISTRIBUTION. Russian Far East, Japan and *South Korea.

Spilomicrus pilosiventris Chemyreva, 2015

Spilomicrus pilosiventris Chemyreva, 2015a: 267.

MATERIAL EXAMINED. South Korea [GN] Sancheong-gun, 30 km NNW Jinju (Chinju), forest, meadow, 800 m, 16.VI.2002, S. Belokobylskij leg., 1♀ (NIBR).

DISTRIBUTION. Russia (Far East), Japan, *South Korea, China (Yunnan Prov.), Taiwan, Nepal [Chemyreva, 2015a].

Spilomicrus planalis **sp.n.**
Figs 19–25, 33, 34.

HOLOTYPE. South Korea, [GN] 1-2, Beoppyeong-ri, Chahwang-myeon, Sancheong-gun, 35.48604°N, 127.9746°E, 22.VII.2024, S. Belokobylskij leg., 1♀ (NIBR).

ETYMOLOGY. The species name derives from the Latin "plana" means "flat" and refers to the strongly depressed body of the new species.

DIAGNOSIS. *Spilomicrus planalis* **sp.n.** can be distinguished from all the other described Palaearctic and Oriental *Spilomicrus* species by the following features: head strongly depressed, face smooth with only tiny setigerous punctures; tentorial pits absent; malar sulcus complete and deep; clypeus subcircular, not convex and slightly pointed ventro-medially, epistomal sulcus smoothed dorsally (Fig. 20); pleurostomal distance as long as shortest distance between eyes; temples in dorsal view and genae in frontal view long and parallel to each other (Figs 20, 22); occipital flange narrow and smooth; mesonotum flat, with notauli developed only posteriorly as short grooves; sternaulus complete developed as groove; area below sternaulus with only few setae; propodeum narrowed posteriorly with posterior margin not arcuate in dorsal view; basal vein nebulous; femur of all legs widened, with short but distinct basal stalk; base of T2 smooth and bare; base of S2 with small cushion of long setae.

COMPARISON. The habitus of this species is similar to *S. yamagishii* Chemyreva, 2023 but differs from it in numerous features indicated above in the diagnosis.

DESCRIPTION. Holotype. Female. Length of body 2.15 mm; length of fore wing 1.7 mm; length of antenna 1.2 mm. Body including mandibles, basal half of A1 and tegulae black; antennomeres and venation dark brown.

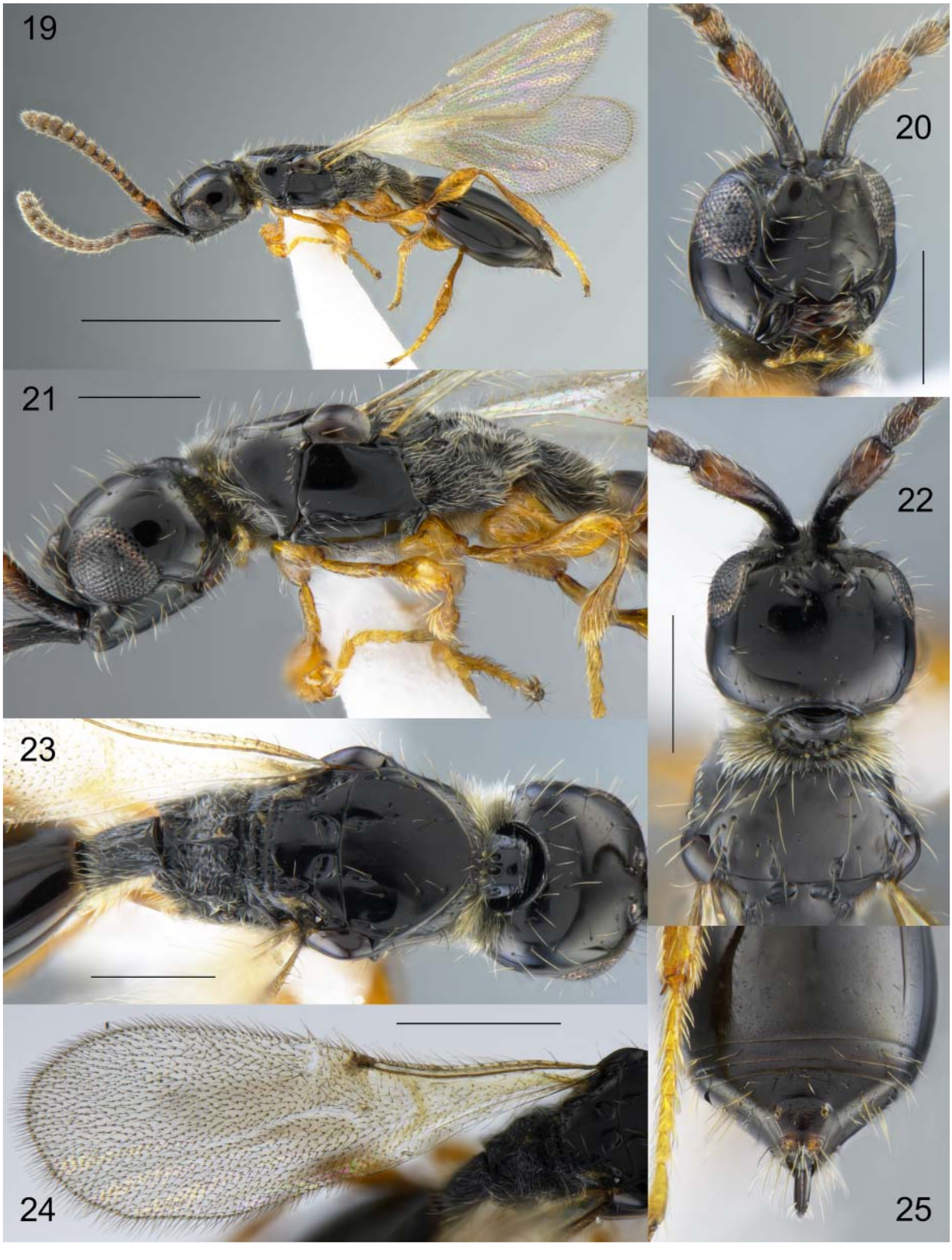
Head opistognatous, in dorsal view very slightly transverse, with distinctly prominent antennal shelf, 0.85 times as wide as mesosoma; in lateral view it distinctly depressed (Figs 19, 21). Head smooth, shiny with scattered long setae (which similar on eyes) and scattered setigerous punctures. Front medially with median carina and two shallow depression on either side of it. Face smooth below antennal shelf. Tentorial pits absent. Malar sulcus complete and deep. Clypeus circular and almost not convex, without projecting clypeal flange and only slightly poined ventrally. Epistomal sulcus very shallow. Pleurostomal distance as long as shortest distance between eyes and 0.6 times as long as width of head. Mandibles long, widely overlapping, bidentate with upper tooth slightly shorter and narrower. Maximal diameter of eye 0.6 times as high as height of head (measured along vertical axis), and 2.3 times as high as malar space. Ocelli large and prominent; LOL equal to largest diameter of anterior ocellus. POL as long as OOL and occipital ocellar line 2.7 times as long as POL. Temples in dorsal view parallel to each other and long, as long as half of the head length, so the head looks subquadrate (Fig. 22). Occipital flange narrow and smooth. Postgenal cushion dense.

Antenna. A1 broadened anteriorly, curved, partly smooth and shiny, partly with fine coriaceous sculpture, covered with scattered pale setae. Apical rim of A1 simple. A2 not compressed, in lateral and dorsal views elongate, broadened apically and attenuate at base, in lateral view asymmetrical. Antenna with non-abrupt clava; A9–A13 with hardly indicated MGS brush on ventral side. Connection between A7–A13 in lateral view in upper parts (Fig. 33). A13 distinctly narrower than A12. A13 with very shallow ventral pit at base. Ratios of length to width of antennal segments in dorsal and lateral views can be checked on Figs 33, 34.

Mesosoma. Mesosoma depressed, 1.53 times as wide as high. Neck smooth and bare anteriorly, with deep grooves and finely pubescent posteriorly. Pronotal collar smooth, densely pubescent and short. Pronotal cushion dense. Pronotal shoulders slightly prominent, rounded. Lateral side of pronotum smooth, with row of stout setae along dorsal margin and short upstanding setae along posterior margin. Propleuron smooth, dense and evenly pubescent. Mesonotum flat. Notauli developed only posteriorly as short grooves. Humeral sulcus not deep, narrow but distinct. Scutellum flat, with two circular, and close anteriorly, anterior scutellar pits; distance between pits about half of median width of one pit. Axilla smooth only with long setae and setigerous punctures along its postero-lateral margin. Axillar depression pubescent and smooth. Scutellar disk with large lateral scutellar pit. Posterior scutellar pits small and shallow. Mesopleuron smooth, with one longitudinal carina dorsally under tegula, shining and bare at medial area. Epicnemial pit distinct, small and shortly setose inside. Sternaulus complete throughout as carina; area of mesopleuron below it poorly setose only along margins. Ventral side of mesopleura pubescent only medially. Acetabular carina distinct laterally and smoothed medially. Postacetabular sulcus absent. Mesopleural epicoxal carina developed only laterally. Mesopleural epicoxal sulcus absent. Metascutellum pubescent and entirely coarsely rugose, with distinct median, lateral and transverse carinae. Median propodeal carina distinct and almost not raised upwards anteriorly; propodeum entirely coarsely rugose, distinctly narrowed posteriorly, covered with not dense short pubescence. Dorsal and lateral side of propodeum longitudinally carinate posteriorly. Metapleura entirely densely pubescent and coarsely rugose with very small spiracle. Posterior margin of propodeum in dorsal view not arcuate. Legs moderately stout, femur widened and with quite short but distinct basal stalk. Hind leg with delimited trochantellus.

Fore wing clear. Marginal vein 1.7 times as long as wide (measured medially); stigmal vein about 0.4 times as long as length of marginal vein. Costal vein sclerotized but only partly pigmented. Basal vein nebulous (Fig. 25). Fore wing 3 times as long as wide.

Metasoma. Petiole cylindrical, 1.5 times as long as its median width, with shallow longitudinal grooves and uniform pubescent, only short part of petiole posteriorly almost smooth and bare; ventral side of petiole entirely covered with long, white pubescence. T2 smooth and bare with single row of short setae posteriorly. Following three tergites short, each with a



Figs 19–25. *Spilomicrus planalis* **sp.n.** female, holotype. 19 — habitus, lateral view; 20 — face; 21 — head and mesosoma, lateral view; 22 — head, dorsal view; 23 — mesosoma, dorsal view; 24 — fore wing; 25 — apex of metasoma, dorso-caudal view. Scale bars: 19 — 1 mm; 24 — 0.5 mm; other — 0.3 mm.

Рис. 19–25. *Spilomirus planalis* **sp.n.**, самка, голотип. 19 — габитус, вид сбоку; 20 — лицо; 21 — голова и мезосома, вид сбоку; 22 — голова, вид сверху; 23 — мезосома, вид сверху; 24 — переднее крыло; 25 — вершина брюшка, вид сверху и снизу. Линейки: 19 — 1 мм; 24 — 0,5 мм; другие — 0,3 мм.

row of long stout setae, with only T5 finally punctuated medially and slightly expanded laterally. T6 medially as long as T4 and T5 measured together, micropunctured and with few setae, T7 subtriangular and setose (Fig. 25). S2 smooth, with dense cushion at base; its posterior surface with scattered setae. Following three sternites short with fine punctuation medially and a row of stout setae. Apical sternite longer than S3–S5 measured together and covered with fine punctuation and numerous setae posteriorly.

Male. Unknown.

DISTRIBUTION. South Korea.

Spilomicrus rugosus Chemyreva, 2023

Spilomicrus rugosus Chemyreva, 2023: 1036.

MATERIAL EXAMINED. South Korea, [GN] Geochang-gun, Mari-myeon, Yeongseung-ri, 35.714060°N, 127.876997°E, 6.VII.2023, E. Tselikh leg., 1♂ (NIBR); Kangwon-do, Chuncheon, Nam-myeon, Hudong-li, 16.V–20.X.2003, M. Sharkey leg., 2♂♂ (CNCI); Chungham Keumsan, Posok-sa, 8–29.IX.2002, P. Tripotin leg., 1♂ (CNCI); [JJ] Bonggae-dong, 78-1sam, Jeolmul Natural Recreation Forest, 15–30.IV.2023, 26.III–15.IV.2024, Deokseo Ku & Muncheol Kwon legs, 7♀♀ (SMNE); parking lot in Gyorae-ri, Jocheong-eup, Jeju-si, MT, 15–30.IV.2024, 1–15.V.2024, 26.III–15.IV.2024, Deokseo Ku & Muncheol Kwon legs, 13♀♀ (ZISP); san2-11, Daepo-dong, Seogwipo-si, 26.III–15.IV.2024, 15–30.IV.2024, 15–30.V.2024 and 31.V–15.VI.2024, Deokseo Ku & Muncheol Kwon legs, 26♀♀ (SMNE); Georinsaseum-Observatory san2-11, Daepo-dong, Seogvipo-si, MT, 26.III–15.IV.2024, Deokseo Ku & Muncheol Kwon legs, 6♀♀ (SMNE).

DISTRIBUTION. Japan and *South Korea [Chemyreva, 2023].

Spilomicrus transversus Chemyreva, 2018

Spilomicrus transversus Chemyreva, 2018: 15.

MATERIAL EXAMINED. South Korea, Yang-ri, Dalseong-gun, Daegu, 35.71331°N, 128.5114°E, 12.VII.2025, V. Chemyreva leg., 1♂ (NIBR).

DISTRIBUTION. Far East of Russia, Japan and *South Korea [Chemyreva, 2018, 2023].

Spilomicrus visorus **sp.n.**
Figs 26–32, 37, 38.

HOLOTYPE. South Korea [KN] Oryang-ri, Sadeung-myeon, Geoje-si, 25.IV–9.V.2017, 34°52´50.67´´N 128°30´30.48´´E, MT, Hyung-Keun Lee leg., ♀ (NIBR). PARATYPE, South Korea: Gangwondo, Pyeonchang, Yongpyeong-myeon, Nodong Valley, 900 m, 37°42.08′N, 128°28.89′E, MT in shade, small stream, 31.V–5.VI.206, P. Tripotin leg., 1♀ (ZISP).

ETYMOLOGY. The species name derives from the Latin word “visor” and refers to the presence of a shelf or a visor like structure at the upper margin of clypeus in the new species.

DIAGNOSIS. *Spilomicrus visorus* **sp.n.** can be distinguished from all other described Palaearctic and Oriental *Spilomicrus* species by the following features: head dorsally and face smooth with only tiny setigerous punctures; tentorial pits tiny; malar sulcus complete and deep; clypeus transverse but less then twice as wide as high, its upper and lower parts projecting forwards (Fig. 28); pleurostomal distance distinctly wide than shortest distance between eyes; temples in dorsal view and genae in frontal view long and convex (extend beyond width of head at eye level) (Figs 27, 29); occipital flange narrow and smooth; mesonotum flattened, with notauli expanded only at it posterior half; sternaulus complete developed as groove; area below sternaulus densely pubescent; propodeum narrowed posteriorly with posterior margin almost not arcuate in dorsal view; basal vein nebulous; legs slender; base of T2 smooth and bare; base of S2 with dense cushion of long setae.

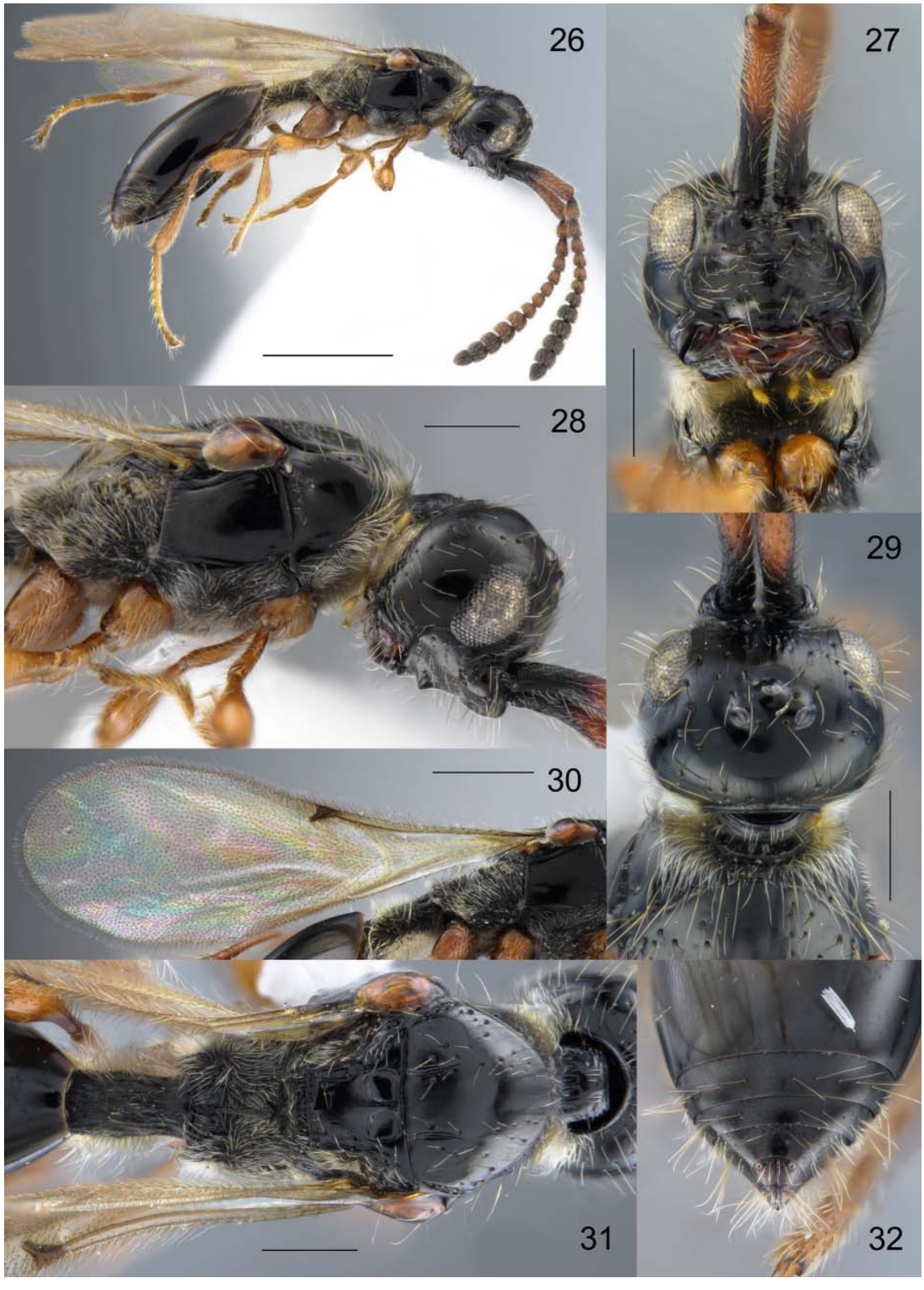
COMPARISON. This species is similar to *S. siwalikensis* Sharma, 1979 and *S. hondai* Chemyreva, 2023 but differs from them in shape of head and characters of clypeus.

DESCRIPTION. Holotype. Female. Length of body 3.2 mm; length of fore wing 2.7 mm; length of antenna 1.9 mm. Body mainly black; tegula, legs, venation, distal part of A1 and A2–A7 yellowish brown; antennomeres A8–A13 and mandible dark brown.

Head in dorsal view slightly transverse with distinctly prominent antennal shelf, very slightly narrower than mesosoma; in lateral view about as long as high. Head smooth, shiny with scattered long setae. Front medially without carina, with two shallow depression only. Tentorial pits tiny. Malar sulcus complete and deep. Clypeus about twice as wide as high, semicircular and convex with its upper and lower parts projecting forwards (Fig. 28). Epistomal sulcus shallow. Pleurostomal distance 1.2 times as wide as shortest distance between eyes and 0.7 times as wide as head. Mandibles long, weakly overlapping, bidentate with upper tooth slightly shortened. Eye 0.46 times as high as height of head, and 2.2 times as high as malar space, eyes covered with long setae. Ocelli large and prominent; LOL equal to largest diameter of anterior ocellus; POL twice as long as OOL. Occipital flange narrow and smooth. Postgenal cushion dense.

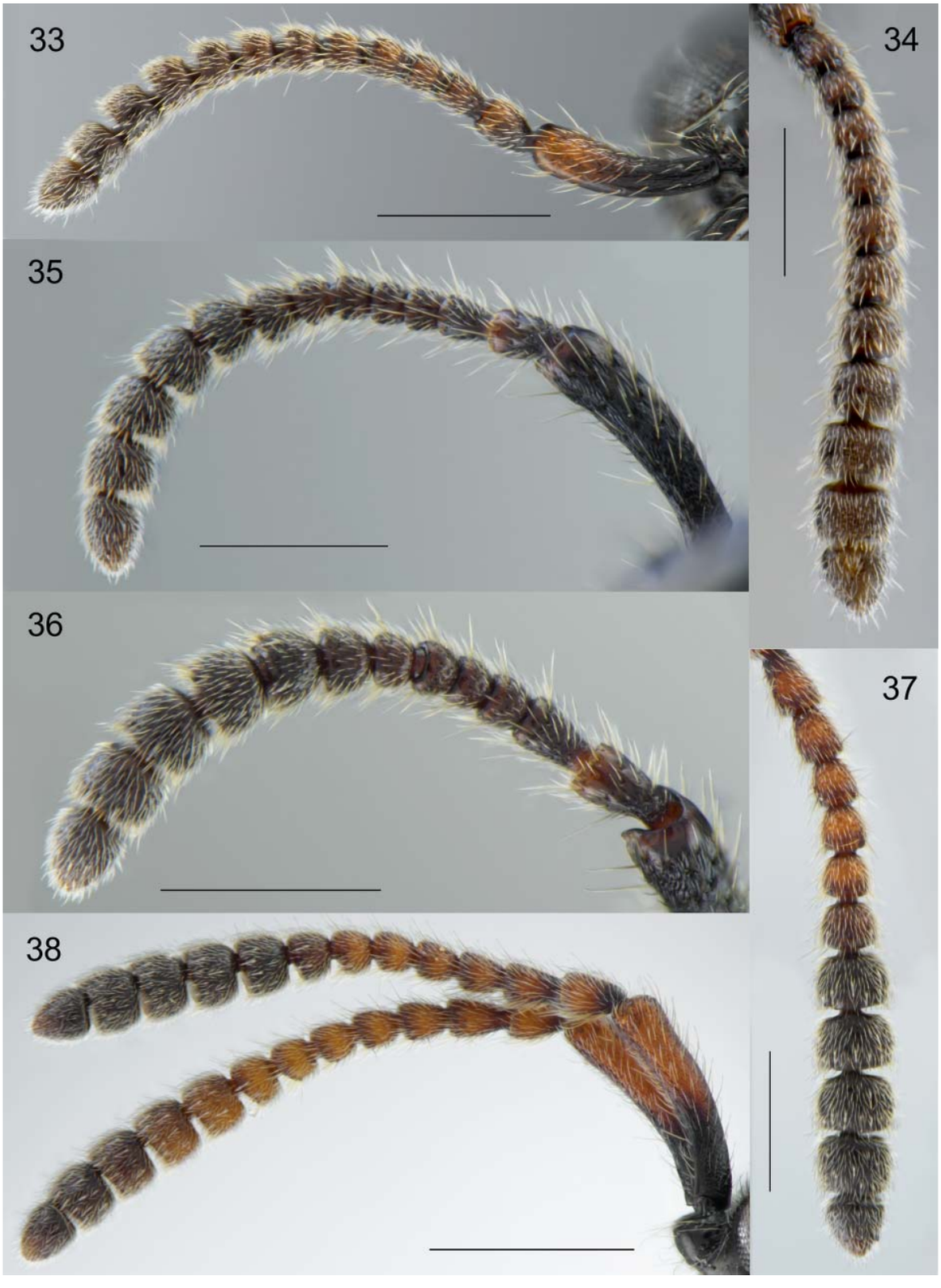
Antenna. A1 weakly broadened anteriorly, curved, covered coriaceous sculpture and pale setae. Apical rim of A1 simple. A2 not compressed, in lateral and dorsal views elongate, broadened apically and attenuate at base. Antenna with non-abrupt clava; A8–A13 with MGS brush and flattened on ventral side. Connection between A7–A13 in lateral view in upper parts (Fig. 38). A13 distinctly narrower than A12. A13 with ventral pit. Ratios of length and width of antennal segments in dorsal and lateral views as on Figs 37, 38.

Mesosoma. Mesosoma depressed, 1.25 times as wide as high. Neck bare, with deep grooves. Median pronotal area smooth, densely pubescent and short. Pronotal cushion dense. Pronotal shoulders weakly prominent and rounded. Lateral side of pronotum smooth. Propleurons with long, dense silvery pubescence. Mesonotum flattened, 1.25 times as wide as long. Notauli expended only at posterior half. Humeral sulcus deep. Scutellum flattened, with two large circular anterior scutellar pits. Axilla with diagonal grooves along posterior margin. (Fig. 31). Axillar depression pubescent and smooth. Lateral scutellar pits distinct and weakly convergent posteriorly. Posterior scutellar pits small and deep. Mesopleura smooth, with one deep longitudinal keel under tegula, shining and bare medially. Epicnemial pit distinct and bare inside. Sternaulus complete developed as groove. Area below sternaulus densely pubescent. Acetabular carina sharp, not dislocated posteriorly and fussed in medial part. Postacetabular sulcus absent. Mesopleural epicoxal carina developed only laterally. Mesopleural epicoxal sulcus absent. Metascutellum pubescent and sculptured, with moderately projecting median and two lateral keels. Median propodeal keel projecting into not high spine directed upward; propodeum entirely coarsely rugose, narrowed posteriorly with dense pilosity. Posterior margin of propodeum in dorsal view almost not arcuate. Legs long and slender. Hind leg with distinct trochantellus.



Figs 26–32. *Spilomicrus visorus* **sp.n.** female, holotype. 26 — habitus, lateral view; 27 — face; 28 — head and mesosoma, lateral view; 29 — head, dorsal view; 30 — fore wing; 31 — mesosoma, dorsal view; 32 — apex of metasoma, dorso-caudal view. Scale bars: 26 — 1 mm; 30 — 0.5 mm; other — 0.3 mm.

Рис. 26–32. *Spilomicrus visorus* **sp.n.**, самка, голотип. 26 — габитус сбоку; 27 — лицо; 28 — голова и мезосома сбоку; 29 — голова сверху; 30 — переднее крыло; 31 — мезосома сверху; 32 — вершина брюшка сверху и снизу. Линейки: 26 — 1 мм; 30 — 0,5 мм; другие — 0,3 мм.



Figs 33–38. *Spilomicrus* spp. female antennae in lateral (33, 35, 38) and dorsal (34, 36, 37) views: 33, 34 — *S. planalis* **sp.n.**; 35, 36 — *S. basalicus* **sp.n.**; 37, 38 — *S. visorus* **sp.n.** Scale bars: 34 — 0.2 mm; 33, 35–37 — 0.3 mm; 38 — 0.5 mm.
Рис. 33–38. Усики самок *Spilomicrus* spp. сбоку (33, 35, 38) и сверху (34, 36, 37): 33, 34 — *S. planalis* **sp.n.**; 35, 36 — *S. basalicus* **sp.n.**; 37, 38 — *S. visorus* **sp.n.** Линейки: 34 — 0,2 мм; 33, 35–37 — 0,3 мм; 38 — 0,5 мм.

Fore wing clear. Marginal vein elongate, about 1.7 times as long as wide; stigmal vein as long as length of marginal vein. Costal vein sclerotized and depigmented. Basal vein nebulous. Wing about 3 times as long as wide.

Metasoma. Petiole cylindrical, twice longer than median width, with shallow longitudinal grooves; entirely pubescent, excluding posterior part, in dorsal view. T2 bare and smooth. Following three tergites with very fine punctuation and with few long setae; setae becoming denser to lateral parts of tergites. T5 not expanded laterally. T6 small, T7 pointed. S2 smooth, with dense cushion at base; its posterior surface with numerous sparse setae. Following three sternites with fine punctation medially and few long setae. Apical sternite with coarse fine punctuation and numerous setae.

Male. Unknown.

DISTRIBUTION. South Korea.

Spilomicrus yamatosus Chemyreva, 2023

Spilomicrus yamatosus Chemyreva, 2023: 1044.

MATERIAL EXAMINED. South Korea, Kangwon-do, Chuncheon, Nam-myeon, Hudong-li, MT, 16.V–20.X.2003, M. Sharkey leg., 1♂ (NIBR).

DISTRIBUTION. Japan and *South Korea [Chemyreva, 2023].

Conclusion

This study and earlier research found 17 species of *Spilomicrus* in South Korea. This represents slightly more than half of the total number of *Spilomicrus* species in the eastern Palaearctic fauna (33 species, including the new species described here). To date, fewer species have been found in Korea than in Japan (24 species) and the Russian Far East (19 species) [Honda, 1969; Notton, 1999; Kim, Lee, 2016; Chemyreva, 2018, 2021, 2023]. We think that the *Spilomicrus* fauna in Korea is more diverse, and that new species will be discovered in the future.

There are seven species of the genus *Paramesius* in the Eastern Palaearctic [Chemyreva, Kolyada, 2018], and only three species were found in South Korea as a result of this research. However, the fauna of the *Paramesius* genus in Japan and China had not been studied, and only one species — *P. japonicus* (Ashmead), was described from Japan. Therefore, this research has only begun to explore the diverse fauna of this genus in the south-eastern Palearctic region.

In this paper, we present new evidence on the occurrence of the *Idiotypa digita* in the Palaearctic Region [Liu, Xu, 2015; Chemyreva *et al.*, 2021]. It is interesting to note that the fauna of South Korea preserves the two transpalearctic species of this genus, although these are few in this region. Concurrently, the local fauna is enriched by the presence of oriental elements, including *I. digita*, a species that is common in Korea.

We still have not found any *Pentapria* species in the studied fauna, but it is likely that they will be found here because it has been recorded in all the neighboring countries: Japan, China and the Russian Far East. As mentioned in introduction, six species of the genus *Entomacis* were listed for Korea. However, new records and new species of this genus are not included in this article and will be discussed in a separate article.

Competing interests. The authors declare no competing interests.

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