

Neomegadicylus, a new genus of Pteromalidae (Hymenoptera, Chalcidoidea) from the Palearctic region

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Abstract

A new genus of Pteromalidae *Neomegadicylus* **gen. nov.**, along with its type species *Neomegadicylus gracileus* **sp. nov.**, is described from the Republic of Korea and Japan, and *N. klarissae* **sp. nov.**, is described from the Republic of Korea. This genus can be distinguished from its putatively close relative *Megadicylus* Girault, 1929 by the following combination of characters – antennal clava with large micropilosity area, F1–F6 much longer than broad; clypeus smooth and shiny; notauli deep and incomplete and anterior part of propodeum strongly sloping in lateral view. An identification key to species of *Neomegadicylus* is provided, based on females.

Keywords

Key, new species, Pteromalinae, taxonomy

Introduction

With an estimated diversity of about 500,000 species, Chalcidoidea (Hymenoptera) has undergone a spectacular radiation (Cruaud et al., submitted). Although phytophagous species are known, most species are parasitoids. Because chalcidoid wasps attack all life stages from eggs to adults in virtually all insect orders, they represent one of the most important group of insects for biological control in both natural and agricultural ecosystems (Noyes 2019). With 33 subfamilies and about 640 genera, Pteromalidae was the largest family in Chalcidoidea. It has been recently revised to include 8 subfamilies and 424 genera (Burks et al. 2022). Like other chalcidoid families, Pteromalidae is poorly known and many species remained to be described. During our study of the family in the Eastern Palaearctic region, several specimens were collected in forested areas of South Korea and Japan that appeared to belong to a new genus.

Herein, the new genus *Neomegadicylus* gen. nov., and two new species *Neomegadicylus gracileus* sp. nov., and *N. klarissae* sp. nov., are described. Unfortunately, males and biology are not known but females exhibit morphological characters diagnostic of Pteromalinae in which the new genus is placed. An identification key to females of Palaearctic species of *Neomegadicylus* is also provided.

Materials and methods

The material used in this study is deposited in the Hymenoptera collections of the Science Museum of Natural Enemies, Geochang, Republic of Korea (**SMNE**), the National Institute of Biological Resources, Incheon, Republic of Korea (**NIBR**), the Korea National Arboretum, Pocheon, Republic of Korea (**KNA**), Zoological Institute of the Russian Academy of Sciences, St. Petersburg, Russia (**ZISP**) and the Centre for Population Biology and Management, Montpellier, France (**CBGP**).

Morphological terminology, including sculpture and wing venation nomenclature, follows Bouček and Rasplus (1991) and Gibson (1997). The flagellum consists of two anelli, the funicle composed of six funicular segments and the clava. The following abbreviations are used: **POL** – posterior ocellar line, the minimum distance between the posterior ocelli; **OOL** – ocello–ocular line, the minimum distance between a posterior ocellus and compound eye; **C1–C3** – claval segments; **PST** – parastigma; **M** – marginal vein; **S** – stigmal vein; **PM** – postmarginal vein; **F1–F6** – funicular segments; **Mt2–Mt8** – metasomal tergites (**Mt1** – petiole). The scape is measured without the radicle; the pedicel is measured in lateral view. The distance between the clypeal lower margin and the toruli is measured from the lower margins of the toruli. Eye height is measured as maximum diameter, eye length as minimum diameter. The mesosoma and metasoma are measured in lateral view, the latter including the ovipositor sheaths.

Observations were made using Micromed MC-2 ZOOM and Leica MZ16 stereomicroscopes, and images were acquired using a Keyence VHX-5000 multiple-focus imaging system.

Taxonomy

Neomegadicylus Tselikh, Rasplus & Ku, gen. nov.

<https://zoobank.org/A308ABA4-1A09-44D9-9120-8D8A56747E81>

Figs 1–16

Type species. *Neomegadicylus gracileus* Tselikh, Rasplus & Ku, sp. nov., by present designation.

Description. Clypeus smooth and shiny, with lower margin slightly emarginated medially, tentorial pits indistinct (Figs 3, 10); antennal formula 11263, toruli slightly above lower ocular line; F1–F6 longer than broad, antennal clava with large micropilosity area on C1–C3 (Fig. 2); gena conspicuously carinate (Fig. 7); right mandible with 4 teeth, left with 3 teeth; occiput with carina. Pronotum almost as wide as mesoscutum, with collar margin weakly carinate (Figs 7, 15); prepectus as long as tegula; notauli deep, long but incomplete (Figs 2, 11); scutellum convex and with distinct reticulate frenal area, but without frenal groove (Figs 2, 11, 16); upper mesepimeron alutaceous or with lower part smooth, upper part alutaceous; metapleuron strongly reticulate; part of propodeum before nucha strongly sloping in lateral view (Fig. 15), dorsally with poorly defined converging plicae and large convex nucha (Figs 8, 16). Fore wing hyaline with distinct speculum (Figs 4, 12). Hind coxa dorsally bare. Metasoma lanceolate, on distinct but short smooth cylindrical petiole, Mt2 longer than broad (Figs 6, 14); cerci with setae subequal in length; ovipositor not much protruding.

Remarks. The new genus is similar to the Australian genus *Megadicylus* Girault, 1929 (Bouček, 1988) in having the clypeal lower margin slightly emarginated (Figs 3, 18); antennal formula 11263 (Figs 5, 13, 19); propodeum in lateral view sloping (Figs 9, 13, 17), dorsally with converging plicae and large nucha (Figs 8, 16, 20); cylindrical petiole.

However, *Megadicylus* Girault (based on observation of non-type female of *Megadicylus dubius* Girault, 1917, only known species of the genus, collected in Australia and deposited in CBGP) and *Neomegadicylus*, gen. nov., can be distinguished as follows:

Neomegadicylus – antennal clava with large micropilosity area extending over C1–C3 (Fig. 2), F5–F6 much longer than broad (Figs 5, 13); clypeus smooth and shiny medially (Figs 3, 10); notauli deep but incomplete (Figs 2, 11); anterior part of propodeum strongly sloping in lateral view (Fig. 15);

Megadicylus – antennal clava with small micropilosity area only on C3 (Fig. 19), F5–F6 shorter than broad (Fig. 19); clypeus radially striate (Fig. 18); notauli shallow but complete (Fig. 20); propodeum in lateral view not that strongly sloping (Fig. 17).

Key to females of *Neomegadicylus* gen. nov.

- 1 Propodeum without costula (Fig. 8). Mt2 posteriorly emarginate (Fig. 6). Antenna with F1 3.25–3.65 times as long as broad (Fig. 5). Scape 1.27–1.33

times as long as eye length. Combined length of pedicel and flagellum 1.57–1.75 times breadth of head. Notauli straight (Fig. 2). Fore wing with basal cell bare, M 1.94–2.10 times as long as S (Fig. 4).....

.....*N. gracileus* Tselikh, Rasplus & Ku, sp. nov.

– Propodeum with costula (Fig. 16). Mt2 posteriorly curved (Fig. 14). Antenna with F1 2.45–2.60 times as long as broad (Fig. 13). Scape 1.05–1.09 times as long as eye length. Combined length of pedicel and flagellum 1.24–1.30 times breadth of head. Notauli curved (Fig. 11). Fore wing with basal cell pilose apically, M 2.60–2.80 times as long as S (Fig. 12).....

.....*N. klarissae* Tselikh, Rasplus & Ku, sp. nov.

***Neomegadicylus gracileus* Tselikh, Rasplus & Ku, sp. nov.**

<https://zoobank.org/D47451C7-960E-4995-A0F3-E6F40F91BB89>

Figs 1–8

Description. Female. Body length 2.60–2.80 mm. Fore wing length 1.90–2.10 mm.

Head and mesosoma dark metallic green with diffuse coppery lustre; metasoma brown, partly with metallic green and coppery lustre. Antenna with scape and pedicel yellowish-brown, F1–F4 dorsally yellowish-brown, ventrally yellowish-brown or yellow, F5 dorsally yellowish-brown, ventrally yellow, F6 and clava brown. All coxae dark metallic blue-green with diffuse coppery lustre; all femora yellowish-brown; tibiae and tarsi yellow. Fore wing hyaline, venation yellowish-brown.

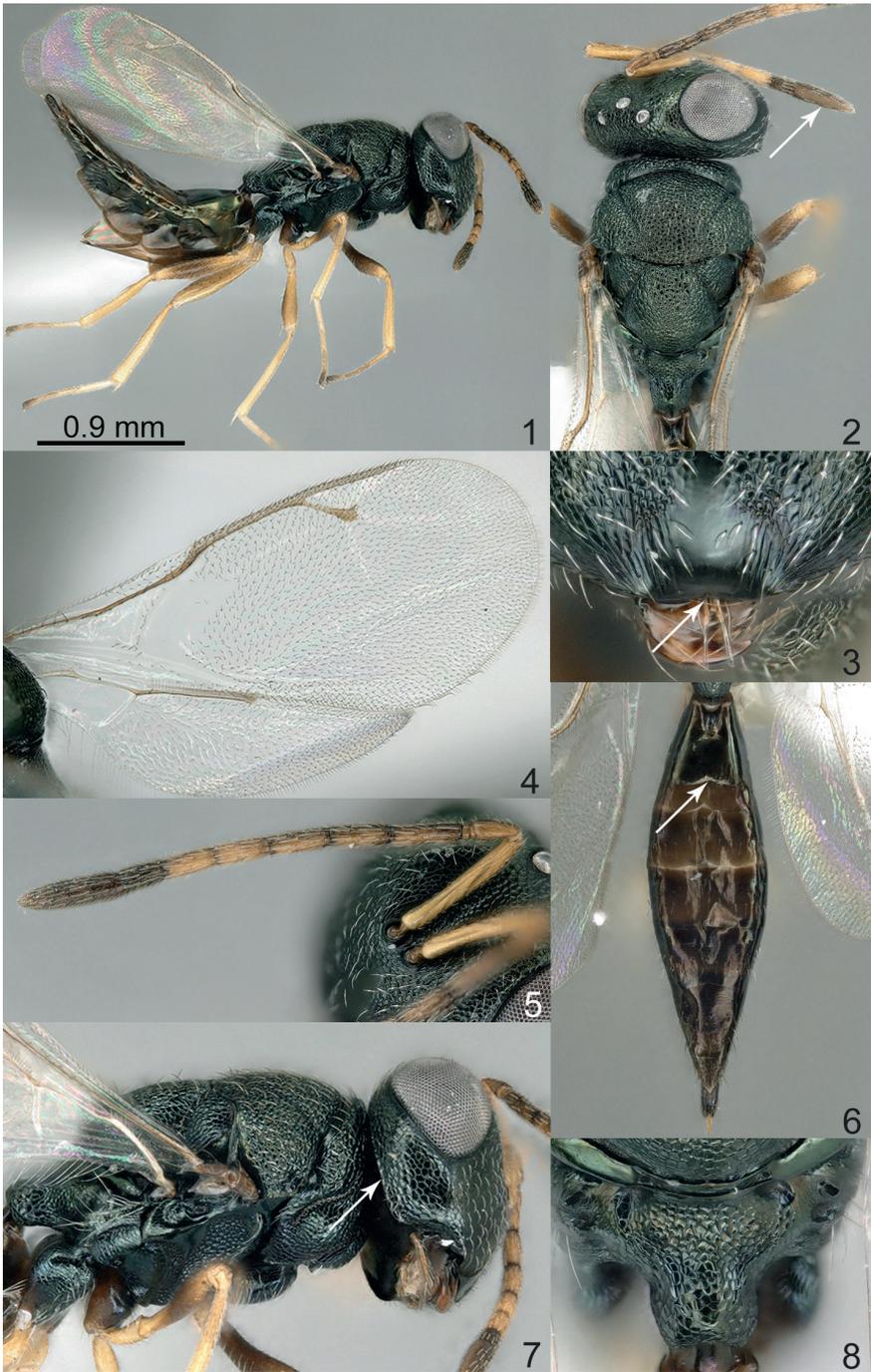
Head in dorsal view 2.14–2.26 times as broad as long and 1.24–1.25 times as broad as mesoscutum; in frontal view 1.17–1.18 times as broad as high. POL 1.30–1.44 times OOL. Eye height 1.40 times eye length and 1.75–1.82 times as long as malar space. Distance between antennal toruli and lower margin of clypeus 0.84–0.88 times distance between antennal toruli and median ocellus. Antenna with scape 0.90–0.95 times as long as eye height and 1.27–1.33 times as long as eye length; pedicel 2.25–2.35 times as long as broad and 0.63–0.71 times as long as F1; combined length of pedicel and flagellum 1.57–1.75 times breadth of head; F1 3.25–3.65 times as long as broad, F2–F6 longer than broad; clava 3.40–3.60 times as long as broad.

Mesosoma 1.60–1.68 times as long as broad, notauli straight. Scutellum finely reticulate, 0.90–0.95 times as long as broad. Propodeum 0.66–0.80 times as long as scutellum; costula absent, median carina not complete or absent; nucha large and reticulate. Fore wing 2.40–2.50 times as long as maximum width; basal cell bare; basal vein pilose; speculum open; M 1.07–1.19 times as long as P and 1.94–2.10 times as long as S.

Metasoma 3.30–4.30 times as long as broad, 1.04–1.15 times as long as mesosoma and head; Mt2 posteriorly emarginate. Ovipositor sheath projecting beyond apex of metasoma.

Etymology. The name is a noun in apposition derived from the Latin word “*gracilis*”.

Material examined. Holotype: SOUTH KOREA • ♀; **Gyeonggi-do**, Pocheon-si, Soheul-eup, 37°45'29.2"N, 127°10'0.4"E, 15.X–30.X.2015, coll. Park, Choi,



Figures 1–8. *Neomegadicylus gracileus* Tselikh, Rasplus & Ku, sp. nov., holotype female (**1, 2, 5, 7, 8**), paratype female (**3, 4, 6**) **1** body, lateral view **2** head, dorso-lateral view and mesosoma, dorsal view **3** clypeus, frontal view **4** wings **5** antenna **6** metasoma, dorsal view **7** head and mesosoma, lateral view **8** propodeum, dorsal view.

Nam, Shin, Kim; deposited in NIBR. **Paratypes:** SOUTH KOREA • 2 ♀♀; **Gyeongsangbuk-do**, Bonghwa-gun, Myeongho-myeon, Gwanchang-ri, Mt. Cheongryangsan, 14.VII.2015, coll. E. Tselikh; ZISP • 1 ♀, **Gyeongsangbuk-do**, Gyeongju-si, Hyeongok-myeon, Namsa-ri, 15–29.IX.2005, coll. J.O. Lim; SMNE • 5 ♀♀; **Gyeonggi-do**, Pocheon-si, Soheul-eup, 37°45'29.2"N, 127°10'0.4"E, 15.V.2015, coll. Park, Choi, Nam, Shin, Kim; ZISP • 6 ♀♀; same locality, 30.IX–15.X.2015, 15.X–30.X.2015, coll. Park, Choi, Nam, Shin, Kim; SMNE • 1 ♀; same locality, 37°45'08.7"N, 127°09'07.2"E, 4.V–15.V.2018, coll. Kim, Kim, Gi, Jo; KNA • 1 ♀; **Gyeongsangnam-do**, Geochang-gun, Namsang-myeon, Muchan-ri, Malaise Trap, 8.IX–23.IX.2021, coll. J. Lee, H. Jeong; SMNE. JAPAN • 1 ♀; **Honshu**, Hyogo Pref, Kobe, Rokko Mts., Maya Mt., forest, 4.IX.2005, coll. S. Belokobylskij; (ZISP).

Distribution. South Korea, Japan.

***Neomegadicylus klarissae* Tselikh, Rasplus & Ku, sp. nov.**

<https://zoobank.org/6C8E6728-4492-4A1C-838D-EB6A1C43D36E>

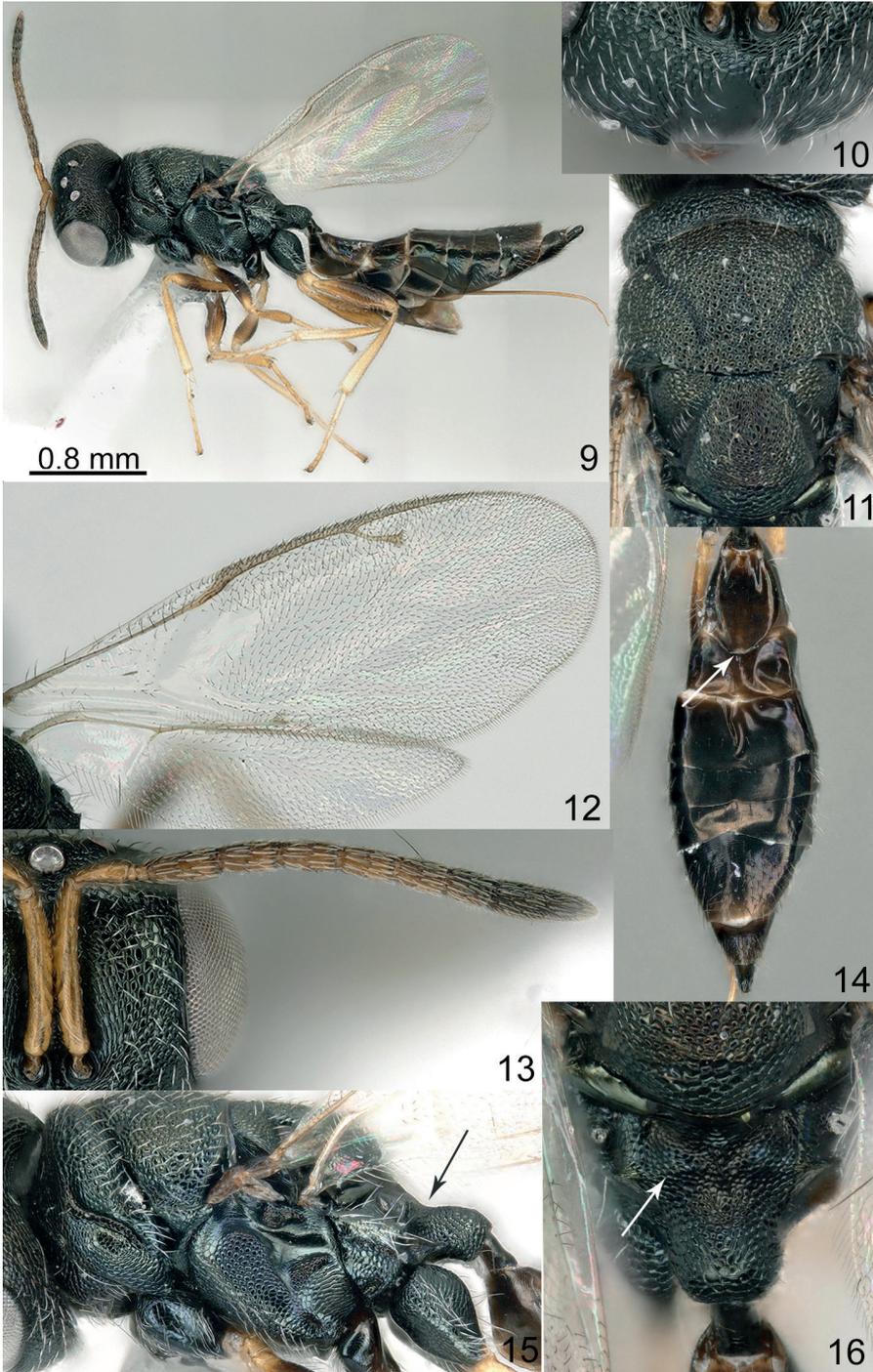
Figs 9–16

Description. Female. Body length 3.20–3.50 mm. Fore wing length 2.00–2.10 mm.

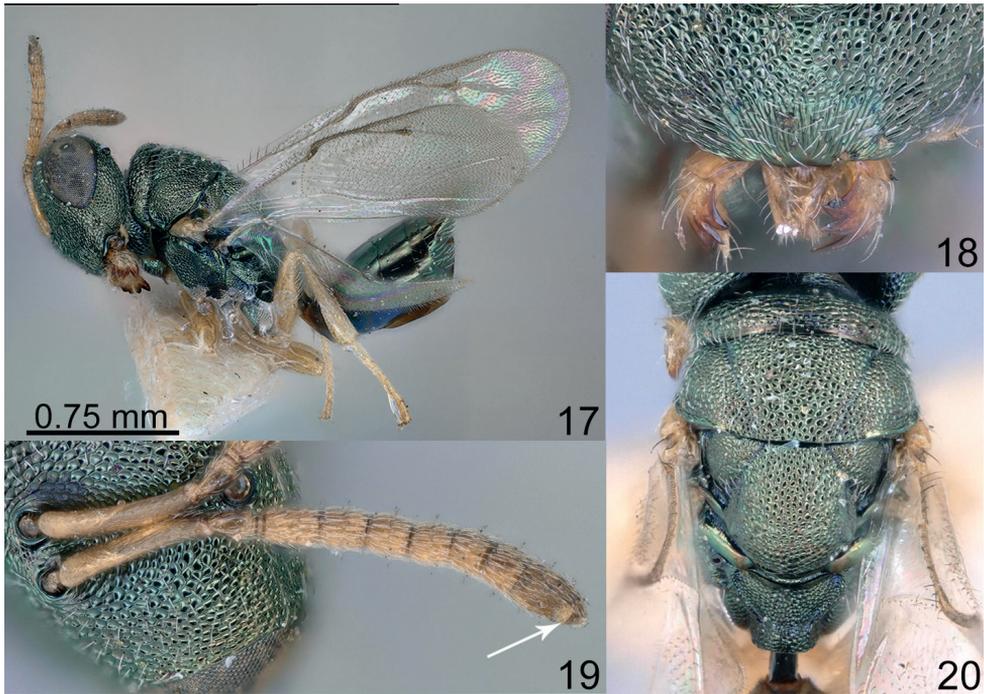
Head and mesosoma black with weak dark metallic blue and coppery lustre; metasoma dark brown, laterally M2–M8 with metallic blue green and coppery lustre, dorsally Mt3, Mt4, Mt7 and Mt8 partly with metallic violet and coppery lustre. Antenna with scape, pedicel and F1–F5 yellowish-brown, F6 dorsally brown, ventrally yellowish-brown, clava brown. All coxae black with dark metallic blue lustre; all femora brown; tibiae and tarsi yellow. Fore wing hyaline, venation yellowish-brown.

Head in dorsal view 1.93–1.95 times as broad as long and 1.28–1.32 times as broad as mesoscutum; in frontal view 1.20–1.22 times as broad as high. POL 1.45–1.55 times OOL. Eye height 1.33–1.35 times eye length and 2.00–2.09 times as long as malar space. Distance between antennal toruli and lower margin of clypeus 0.91–0.94 times distance between antennal toruli and median ocellus. Antenna with scape 0.78–0.81 times as long as eye height and 1.05–1.09 times as long as eye length; pedicel 2.22–2.40 times as long as broad and 0.76–0.81 times as long as F1; combined length of pedicel and flagellum 1.24–1.30 times breadth of head; F1 2.45–2.60 times as long as broad, F2–F6 longer than broad; clava 3.10–3.28 times as long as broad.

Mesosoma 2.00 times as long as broad, notauli curved. Scutellum finely reticulate, 1.05 times as long as broad. Propodeum 0.75–0.76 times as long as scutellum; costula distinct, median carina weak; nucha large and reticulate. Fore wing 2.40–2.56 times as long as maximum width; basal cell pilose on upper part; basal vein pilose; speculum open; M 1.16–1.26 times as long as P and 2.60–2.80 times as long as S.



Figures 9–16. *Neomegadicylus klarissae* Tselikh, Rasplus & Ku, sp. nov., holotype female **9** body, lateral view **10** clypeus, frontal view **11** mesosoma, dorsal view **12** wings **13** antenna **14** metasoma, dorsal view **15** mesosoma, lateral view **16** propodeum, dorsal view.



Figures 17–20. *Megadicylus dubius* Girault, 1917, not type female **17** body, lateral view **18** clypeus, frontal view **19** antenna **20** mesosoma, dorsal view.

Metasoma 3.28–3.30 times as long as broad, 1.01–1.06 times as long as mesosoma and head; Mt2 posteriorly curved. Ovipositor sheath projecting beyond apex of metasoma.

Etymology. The species is named in honour of the prominent entomologist, Dr. Klarissa Alekseevna Dzhankmen, an expert on Pteromalidae (Hymenoptera).

Material examined. *Holotype:* SOUTH KOREA • ♀; Gyeongsangnam-do, Geochang-gun, Mari-myeon, Daedong-ri, Malaise Trap, 28.VII–15.VIII.2021, coll. J. Lee, H. Jeong; deposited in NIBR. *Paratype:* SOUTH KOREA • 1 ♀; same data as holotype; ZISP.

Distribution. South Korea.

Conclusion

The pteromalid genus *Neomegadicylus* gen. nov. (type species *Neomegadicylus gracileus* sp. nov.) belongs to the family Pteromalidae, subfamily Pteromalinae and comprises only two species, *N. gracileus* sp. nov. and *N. klarissae* sp. nov. Both species are found in the eastern Palearctic. Unfortunately, the biology of the species of this genus is unknown, but all specimens were collected in the deciduous broadleaved forests.

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