

Taxonomy of the Subgenus *Parabates* Förster of *Netelia* Gray, 1860 (Hymenoptera: Ichneumonidae: Tryphoninae) from South Korea

Jin-Kyung Choi^{1,2} and Jong-Wook Lee^{2*}

¹Department of Life Sciences, the Natural History Museum, Cromwell Road, London SW7 5BD, UK

²Department of Life Sciences, Yeungnam University, Gyeongsan 38541, Korea

한국산 애자루맵시벌아속 (벌목: 맵시벌과: 뭉툭맵시벌아과)의 분류

최진경^{1,2} · 이종욱^{2*}

¹영국자연사박물관, ²영남대학교 생명과학과

ABSTRACT: A taxonomic study of South Korean *Netelia* (*Parabates*) is presented. Three species are recognized, and one of which [*N. (P.) nigricarpus*] is reported for the first time from South Korea. Diagnoses and photographs of the known species are provided.

Key words: *Netelia*, New record, *Parabates*, South Korea, Taxonomy

초록: 한국산 자루맵시벌속(Genus *Netelia* Gray)의 12개 아속 중 하나인, 애자루맵시벌아속의 분류학적 연구를 수행하였으며, 그 결과로 1미기록 종 [*Netelia (Parabates) nigricarpus* (Thomson, 1888) (검은점애자루맵시벌: 신칭)]을 국내에 처음 보고한다. 애자루맵시벌아속의 3종에 대한 식별 형질과 외형 사진을 제공한다.

검색어: 애자루맵시벌아속, 미기록종, 자루맵시벌속, 한국, 분류

The subgenus *Parabates* Förster, 1869 is one of 12 subgenera of the genus *Netelia* belonging to the subfamily Tryphoninae. *Parabates* is a small subgenus with only six species worldwide: three from the Palaearctic, two from the Nearctic and two from the Oriental regions (Yu et al., 2016). It was originally described as a genus by Förster (1869) based on *Parabatus nigricarpus*.

In South Korea, Lee and Cha (1996, 2000) reported *N. (P.) fusca* Konishi and *N. (P.) ishiharai* Uchida. In the present study, an additional, *N. (P.) nigricarpus*, is for the first time from South Korea. Diagnoses and photographs of the diagnostic characteristics of known species are provided.

Materials and Methods

The morphological terminology used in the present study follows that of Gauld (1991). Terminology for the male genitalia follows that of Snodgrass (1941). The genitalia were dissected following Konishi (2005). The heads and mesosoma were measured by the methods of Konishi (1985). The following indices (Gauld and Michell, 1981) were used:

Geno-orbital index = maximum breadth of eye in profile / maximum breadth of gena in the same line

Nervellar index of hind wing = length of Cu1 between cu-a and M / length of cu-a

Specimens were examined using a Canon EOS 450D digital camera attached to Helicon Remote (ver. 3.6.6w). Images were stacked using Helicon Focus 6@. Distributional data mainly follow that of Yu et al. (2016). Species descriptions and

*Corresponding author: jwlee1@ynu.ac.kr

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diagnoses are based on South Korean specimens.

All examined specimens have been deposited in the Yeungnam University (YNU), Gyeongsan, South Korea. Abbreviations are as follows: **HU**, Hokkaido University, Faculty of Agriculture, Entomological Institute, Sapporo, Japan; **KU**, Kyushu University, Entomological Laboratory, Fukuoka, Kyushu, Japan. (A. Nakanishi collection.); **ZI**, Zoologiska Institutionen, Helgonavägen 3, S-223 62 Lund, Sweden.; **GB**, Gyeongsangbuk-do; **GN**, Gyeongsangnam-do; **JB**, Jollabuk-do; **JJ**, Jeju-do.

Taxonomic accounts

Genus *Netelia* Gray, 1860 자루맷시벌속

Netelia Gray, 1860: 341. Type species: *Paniscus inquinatus* Gravenhorst, 1829

Subgenus *Parabates* Förster, 1869 애자루맷시벌아속

Parabates Förster, 1869: 150. Type species: *Parabatus nigricarpus* Thomson, 1888, by designation of Enderlein, 1912.

Parabatus Thomson, 1888: 1194. Type species: *Ichneumon virgatus*

Opheltoideus Ashmead, 1900: 95. Type species: *Opheltoideus johnsoni* Ashmead, 1900.

Diagnosis. Occipital carina completely absent. Scutellum with lateral carinae present only on basal. Areolet of fore wing open or closed (most specimens lack vein 3rs-m of fore wing). Ovipositor length 2 times apical height of metasoma. In the basal apodeme of the aedeagus is broadened and its dorsal margin is convex.

Key to species of South Korean *Netelia* (*Parabates*)

1. Subapical portion of dorsal margin of paramere produced to form a flat spine. Pterostigma of fore wing brown to pale yellow. **2**
- Paramere without a spine. Pterostigma of fore wing blackish brown (Fig. 2E).
..... *N. (P.) nigricarpus* (Thomson)
2. Vein Cu-a interstitial of vein Rs+M (Fig. 1A). Pterostigma of fore wing brown. Spine of paramere small and subtriangular in lateral view. *N. (P.) fusca* Konishi
- Vein Cu-a basad of vein Rs+M (Fig. 1D). Pterostigma

of fore wing yellow. Spine of paramere long and parallel-sided, with apex rounded, about 2 times as long as wide. *N. (P.) ishiharai* Uchida

Netelia (*Parabates*) *fusca* Konishi, 1985 애자루맷시벌 (Fig. 1A-C)

Netelia (*Parabates*) *fusca* Konishi, 1985: 620. Type: male; type depository: KU.

Diagnosis. Body length: 8.5 mm; fore wing: 8.0 mm. Head light yellow (Fig. 1B); antenna brown with 40 flagellomere; interocellar area yellow, darker than face; occiput dark brown; geno-orbital index: 1.15. Mesosoma yellow to brown, mesosternum dark brown; mesoscutum yellowish brown with dark brownish stripes (Fig. 1A); legs yellow; stigma of fore wing light brown; vein Cu-a opposite to vein Rs+M; fore wing with areolet incompletely; nervellar index of hind wing: 0.19. Metasoma reddish brown (Fig. 1A); apical margin of paramere rounded (Fig. 1C); subapical portion of dorsal margin of paramere produced, with short spine; penis valve widened toward apex.

Material examined. [South Korea] [JJ] 1♂, Jeju-si Mt. Hallasan, 2.VI.1968, (YNU).

Distribution. South Korea, Japan.

Region. Eastern Palaearctic.

Netelia (*Parabates*) *ishiharai* Uchida, 1953 남방자루맷시벌 (Fig. 1D-F)

Netelia (*Parabates*) *ishiharai* Uchida, 1953: 131. Type: male; type depository: HU.

Diagnosis. Body length: 6.2-6.5 mm; fore wing: 6.5-7.0 mm. Head yellow (Fig. 1E); antenna brown with 36 flagellomere; interocellar area and occiput yellow; geno-orbital index: 2.4. Mesosoma light yellow (Fig. 1D), mesosternum light yellow; mesoscutum yellow to yellowish brown with light yellowish brown stripes; legs yellow; stigma of fore wing light yellow; vein Cu-a basad of vein Rs+M; fore wing without areolet; nervellar index of hind wing: 0.4. Metasoma yellowish brown; apical margin of paramere rounded (Fig. 1F); subapical portion of dorsal margin of paramere produced, with long spine; penis valve slightly widened toward apex, basal corner pointed.

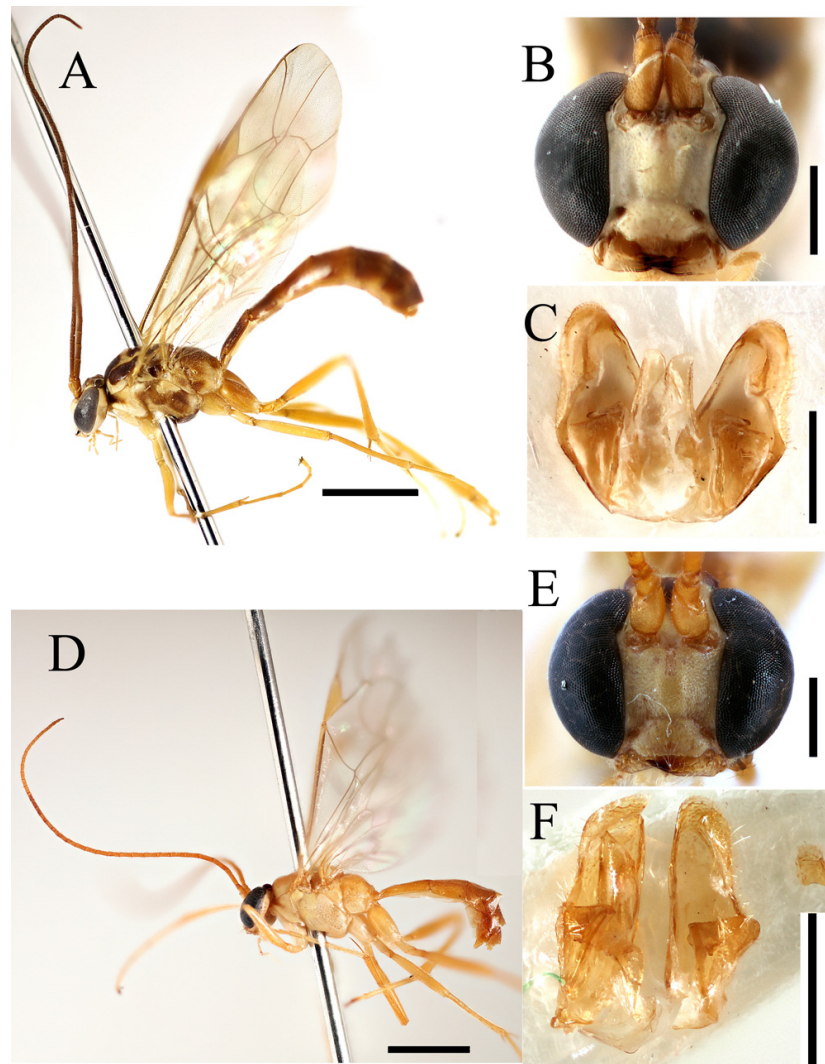


Fig. 1. *Netelia* (*Parabates*) spp. (A-C) *Netelia* (*Parabates*) *fusca*; (D-F) *Netelia* (*Parabates*) *ishiharai*. (A, D) Habitus in lateral view, (B, E) Head in frontal view, (C, F) Male genitalia. Scale bars: 2 mm for A, D; 0.5 mm for B, C, E, F.

Material examined. [South Korea] [GB] 1 ♀, Mt. Sobaeksan National Park, 31.VII.1988 (YNU); [GN] 1 ♂, Mt. Jirisan National Park, 23.VII.1988 (YNU); [JB] 1 ♂, Jirisan National Park Nogodan, 23.VII.1988 (YNU).

Distribution. South Korea, Japan.

Region. Eastern Palearctic, Oriental.

***Netelia* (*Parabates*) *nigricarpus* (Thomson, 1888) 검은점애자루맴시벌 (신칭) (Fig. 2)**

Parabatus nigricarpus Thomson, 1888: 1196. Type: female; type depository: ZI.

Paniscus (*Parabatus*) *nigricarpus*: Kokujev, 1899: 135.

Parabatus nigricarpus var. *semifuscus* Strobl, 1904: 50.

Diagnosis. Body length: 6.5-7.0 mm; fore wing: 6.3-7.0 mm. Head light yellow (Fig. 2B); antenna brown with 46 flagellomere; interocellar area and occiput dark brown (Fig. 2D); geno-orbital index: 2.7. Mesosoma light yellow (Fig. 2C), mesosternum light yellow; mesoscutum yellow with dark brown stripes; legs yellow; stigma of fore wing dark brown; vein Cu-a opposite to vein Rs+M (Fig. 2E); fore wing without areolet; nervellar index of hind wing: 0.21. Metasoma yellowish brown; apical margin of paramere sinuate (Fig. 2F); subapical portion of dorsal margin of paramere not produced, without spine; penis valve widened toward apex, basal corner pointed.

Redescription.

Head: face including clypeus 0.85 times as wide as long, the

punctures becoming denser laterally; clypeus 2.1 times as wide as long, impunctate, with apical margin truncate (Fig. 2B); temple convex, finely and sparsely punctate; occipital carina absent; lateral ocellus not touching eye; frons and ocellar area polished, impunctate; interocellar area flat; vertex and occiput finely and sparsely punctate; first flagellomere 1.33 times as long as second one, 4.0 times as long as wide.

Mesosoma: Mesosoma finely and evenly punctate; mesoscutum 1.2 times as long as wide; notaulus distinct (Fig. 2D), evanescent posteriorly; scutellum 1.3 times as long as distance between the lateral carinae at its base, the lateral carina distinct only on basal half; median portion of propodeum faintly strigate, without sublateral crest. Fore wing without areolet (Fig. 2E); distal hamuli of hind wing with 6. Hind tarsal claw with 7 teeth.

Metasoma: Metasoma finely and evenly punctate. Apical margin of paramere sinuate (Fig. 2F); subapical portion of dorsal margin of paramere without spine, penis valve widened toward apex.

Material examined. [South Korea] [GB] 2♂♂, Yeongyang-gun Irwol-myeon Mt. Irwolsan, 26.VI-15.VII.2014, H.Y. Han (YNU).

Additional material examined. [Austria] 1♀, Tirol., Kitzbuhel., 18-29.VIII.62, A.H. Hayes (NHM); [Japan] 1♀, Nagano Pref., Outaki-mura, Mt. Ontake-san, Hakkaisan, 35°52'00"N 137°31'28"E, Alt. 1720-1820 m, 6.VIII.2010, K. Watanabe (NHM); [Russia] 1♂, Primorskii krai, Lazovski Zapovednik, c. 170 km, E Vladivostok, Korpud, 43°17'15"N 134°07'10"E, 526 m, Mountain top, M.T. 487, 4-24.VIII.2001, M. Quest (NHM); [Sweden] 1♀, Kivik., 16.VII.1938, D.M.S.P.

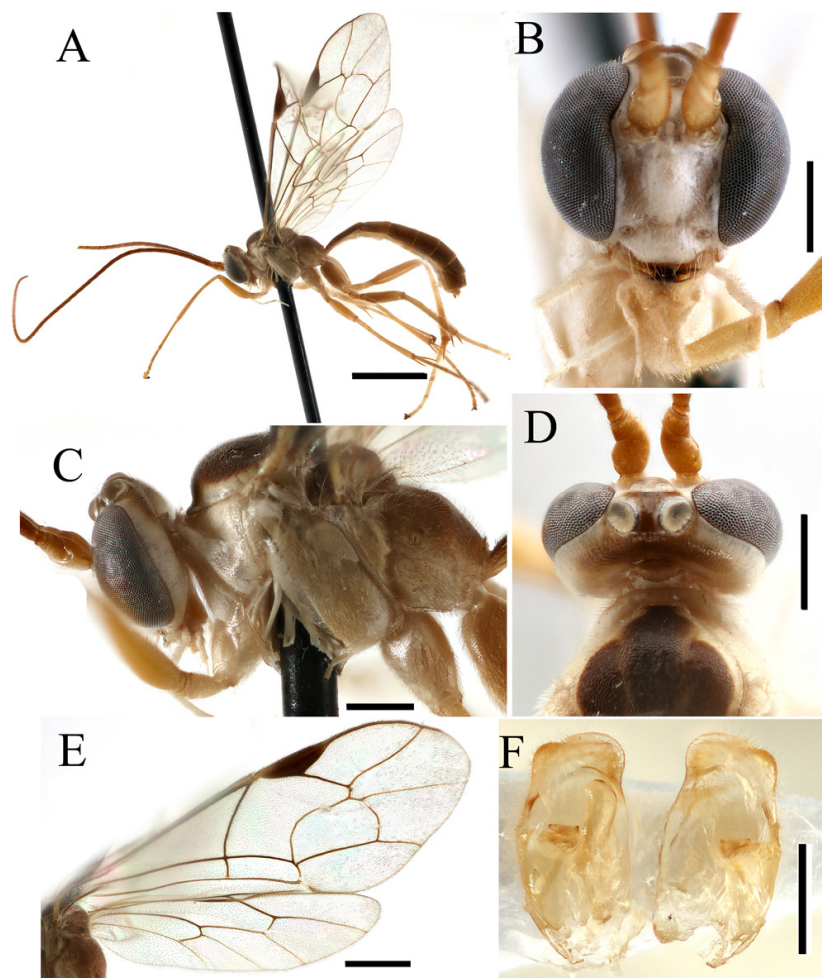


Fig. 2. *Netelia (Parabates) nigricarpus*. (A) Habitus in lateral view, (B) Head in frontal view, (C) Head and mesosoma in lateral view, (D) Head in dorsal view, (E) Wings, (F) Male genitalia. Scale bars: 2 mm for A; 1 mm for E; 0.5 mm for B, C, D, F.

& J.F.P. (NHM); [United Kingdom] 1♂, England, Smrops, Preston, Montford, IX.1980 (NHM); 1♂, England, Castle Eden Dene, I Co. durham, NZ 427392, Rothamsted light trap, 17.v-29.XII.2004, R. Lamboll & P. Gould (NHM); 1♀, England, Wykeham, SE946863, 29.IV-31.XII.2004, Rothamsted light trap, T. Jackson & P. Gould (NHM); 1♂, British Isles, Capron Coll. (NHM); 1♀, Scotland, Inverpolly, VIII.1980 (NHM).

Distribution. South Korea (new record), Japan, Armenia, Austria, Bulgaria, Finland, Georgia, Germany, Hungary, Netherlands, Poland, Russia, Spain, Sweden, Switzerland, Turkey, Ukraine, United Kingdom.

Region. Eastern Palaearctic, Western Palaearctic.

Remarks. Konishi (1985) mentioned the color variation of Japanese specimens of this which have two pattern specimens of, strongly pigmented specimens and weakly one. South Korean specimens are similar to strongly pigmented specimens of Japan.

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