

***Stenamma koreanensis*, sp. n. from the Korean Peninsula
(Hymenoptera: Formicidae: Myrmicinae)**

By

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ABSTRACT

A new species of the ant genus *Stenamma* is described from the Korean peninsula. This new species is compared with related species; this is the second record of any *Stenamma* species from the Korean peninsula; the first from South Korea. Keys for the separation of workers are revised to include this new species. Disposition of type specimens is provided.

INTRODUCTION

The ant genus *Stenamma* was recently reviewed for known species in Europe, Africa, and Asia (DuBois 1998). One stated goal of that publication was to encourage others to fill in gaps in our knowledge of the distribution of this genus. This paper represents such a contribution towards that goal. Although members of this genus were reported from China, Japan, and southeastern Russia, no specimens were known from the Korean peninsula until Collingwood (1976) reported *S. owstoni* from Gaesung, North Korea. The senior author collected specimens of this genus from the Korean peninsula and these represent an undescribed species (most similar to *S. ussuriense*). We describe and illustrate this species below. At present, it is known from a single collection (one nest containing 31 workers and 1 gyne). It is anticipated that further collecting in the region will yield additional specimens.

This species belongs to the *Stenamma owstoni* species group as defined by DuBois (1998: 287 – 288). It appears to be most closely related to *S. ussuriense*. The following description follows that outlined in DuBois (1993, 1998).

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Stenamma koreanensis sp. n.

Worker Measurements (n = 31). Measurements and associated statistics are listed in detail in Tables 1 and 2. Key measurement ranges are presented herein (all measurements are in millimeters). TL 4.50 (4.36-4.69); HL 1.01 (0.98-1.05); HW 0.88 (0.85-0.90); CI 97.21 (84.34-90.00)%; SL 0.75 (0.73-0.78); SI 85.09 (80.56-88.57)%; AL 1.28 (1.23-1.35); PRW 0.61 (0.60-0.63); PL 0.46 (0.43-0.48); PH 0.27 (0.25-0.28).

Holotype Measurements. TL 4.45, HL 1.00, HW 0.88, CI 87.5%, SL 0.78, SI 88.57%, AL 1.25, PRW 0.63, PL 0.45, PH 0.28.

Worker Description. Mandible with 7-8 teeth (apical two prominent), gap after second apical tooth before denticles start (gap approximately same size as tooth). Anterior clypeal margin in full face view with median lobe weakly emarginate; apex in lateral view convex, then flat (near mandible). Compound eye with 12 ommatidia in greatest diameter. Scape not reaching occiput by amount less than first funicular segment. Propodeal spines of moderate length, approximately 1/3 length of declivitous face of propodeum (shorter in some specimens). Metanotal impression very shallow, depth approximately 1/3 the length

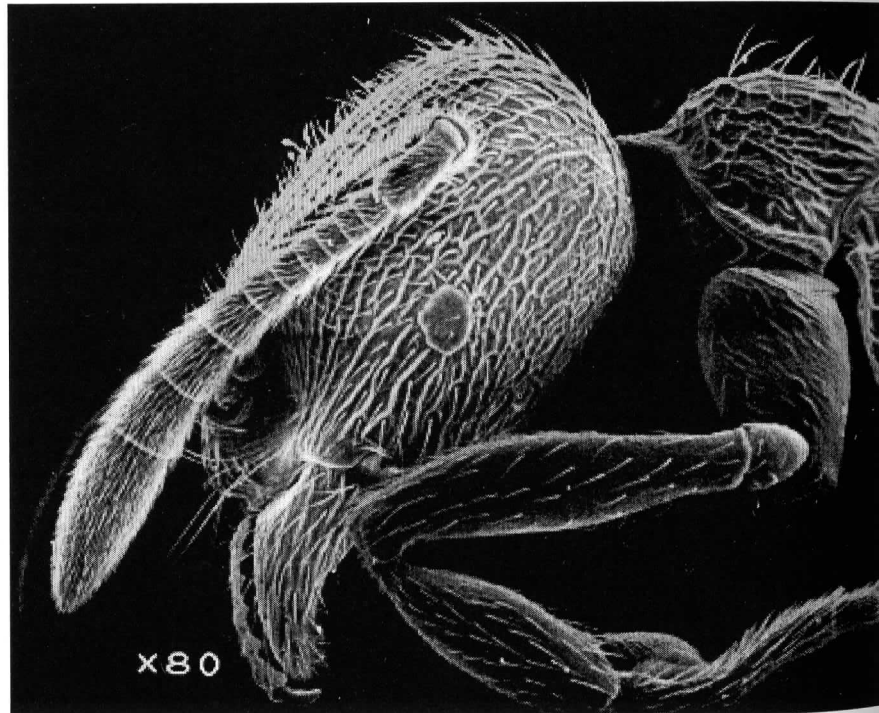


Fig.1. *Stenamma koreanensis* sp.n., head lateral view. SEM photograph by senior author.

Table 1. *Stenamma koreanensis* compared with the related species (mean/ median values). Since sample sizes are rather small for most species, reported statistics include median as well as mean values for comparative purposes.

Measurement	<i>Stenamma koreanensis</i>	<i>Stenamma koreanensis</i>	<i>Stenamma ussuriense</i>	<i>Stenamma ussuriense</i>	<i>Stenamma nipponense</i>	<i>Stenamma nipponense</i>	<i>Stenamma owstoni</i>	<i>Stenamma owstoni</i>	<i>Stenamma kurilense</i>	<i>Stenamma kurilense</i>
	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median
AI	47.94%		47.96	44.12%	44.29%	44.10%	43.68%	43.84%	44.65%	44.65
AL	1.28	1.25	1.25	1.10	1.11	1.15	1.20	1.24	1.05	1.05
CI	87.21%	86.25%	86.08%	86.08%	85.42%	86.95%	88.75%	88.33%	85.15%	85.15%
EL	0.11	0.11	0.10	0.10	0.10	0.08	0.15	0.16	0.11	0.11
HL	1.01	1.01	0.82	0.82	0.83	0.84	0.91	0.95	0.81	0.81
HW	0.88	0.88	0.71	0.71	0.71	0.73	0.81	0.85	0.69	0.69
OI	11.13%	11.19%	12.59%	12.59%	12.96%	9.14%	16.74%	16.67%	13.86%	13.86%
PRW	0.61	0.60	0.48	0.48	0.48	0.51	0.52	0.55	0.47	0.47
PH	0.27	0.26	0.20	0.20	0.20	0.21	0.22	0.21	0.24	0.24
PL	0.46	0.48	0.42	0.42	0.42	0.46	0.47	0.48	0.40	0.40
PW	0.22	0.23	0.17	0.17	0.17	0.17	0.18	0.18	0.22	0.22
PPH	0.35	0.28	0.28	0.20	0.21	0.21	0.23	0.23	0.23	0.23
PPL	0.29	0.33	0.26	0.26	0.27	0.28	0.33	0.32	0.27	0.27
PPW		0.28	0.22	0.22	0.23	0.21	0.25	0.24	0.27	0.27
SI	85.09%	86.11%	96.55%	86.36	89.13%	91.01%	88.73%	88.68%	87.28%	87.28%
SL	0.75	0.78	0.61	0.61	0.65	0.67	0.72	0.72	0.60	0.60
TL	4.50	4.53	3.62	3.62	3.70	3.80	4.12	3.85	3.53	3.53

of propodeal spines; wide, approximately 4X as wide as deep, depth decreasing towards anterior. A large pit is present at the posterior ventral edge of the pronotum and is lined with microsetae. A similar pit is present between the bases of the meso- and meta-coxae; it is not lined with microsetae. Propodeal plates approximately the same length as (or slightly shorter than) propodeal spines, directed posteriorly. Anterior subpetiolar process convex and slightly reduced. Petiole pedunculate: stalk approximately 1/2 the length of petiole, node rising gradually. Anterior subpost-petiolar process typical for *Stenamma* workers, posterior subpostpetiolar process reduced. Head rugose (most similar to the sculpture of *S. ussuriense* and *S. debile*) except as follows: frontal area smooth with small carinulae (especially near clypeal emargin-

Table 2. *Stenamma koreanensis* measurements. Worker.

Measurement	n=	Minimum	Maximum	Mean	Standard	Standard Deviation of Mean	Median Error
AI	31	45.45%	50.00%	47.94%	2.235	0.401	47.96
AL	31	1.23	1.35	1.28	0.057	0.010	1.25
CI	31	84.34%	90.00%	87.21%	2.373%	0.426%	86.25%
EL	31	0.09	0.13	0.11	0.011	0.002	0.11
HL	31	0.98	1.05	1.01	0.025	0.005	1.01
HW	31	0.85	0.90	0.88	0.025	0.004	0.88
OI	31	9.25%	13.27%	11.13%	1.036%	0.186%	11.19%
PRW	31	0.60	0.63	0.61	0.020	0.004	0.60
PH	31	0.25	0.28	0.27	0.013	0.002	0.26
PL	31	0.43	0.48	0.46	0.022	0.004	0.48
PW	31	0.20	0.25	0.22	0.018	0.003	0.23
PPH	31	0.26	0.30	0.28	0.013	0.002	0.28
PPL	31	0.34	0.35	0.35	0.025	0.005	0.33
PPW	31	0.27	0.30	0.29	0.015	0.003	0.28
SI	31	80.56%	88.57%	85.09%	4.253%	0.764%	86.11%
SL	31	0.73	0.78	0.75	0.036	0.006	0.78
TL	31	4.36	4.69	4.50	0.150	0.027	4.53

Table 3. *Stenamma koreanensis* measurements. Gyne.

Measurement	n=	Observed Value
AI	1	46.46%
AL	1	1.59
CI	1	92.19%
EL	1	0.26
HL	1	1.03
HW	1	0.95
OI	1	25.00%
PRW	1	0.74
PH	1	0.31
PL	1	0.53
PW	1	0.23
PPH	1	0.31
PPL	1	0.40
PPW	1	0.32
SI	1	83.05%
SL	1	0.79
TL	1	5.18

nally carinate to smooth; femora with faint longitudinal carinae; remainder of legs glassy-smooth with scattered piligerous punctures. Propodeal dorsum with rugose, glassy-smooth declivitous face. Petiolar node dorsum rugose; remaining surfaces heavily punctulate. Postpetiolar node dorsum rugose; remaining surfaces heavily punctulate. First

ation), carinulae diverging towards posterior; central 1/3 of frontal area (between antennal sockets) glassy-smooth; venter of head rugose; occipital area rugose. Interstices glassy-smooth throughout with scattered small piligerous punctures. Thoracic dorsum rugose; rugae with slight longitudinal orientation. Thoracic pleura rugose. Neck of pronotum punctulate. Metanotal impression weakly scrobiculate with surrounding sculpture blending into sculpture of impression. Mesopleuron with weakly scrobiculate median area. Procoxae transversely carinate, meso- and meta-coxae longitudi-

Fig. 2. *Stenamma koreanensis* sp. n., head full face view. SEM photograph by senior author.

gastral tergite base carinate with numerous carinae diverging towards posterior; majority of carinae 1/4 to 1/5 length of postpetiole. First gastral sternite base glassy-smooth with almost no trace of carinae. Remainder of gaster glassy-smooth, with scattered piligerous punctures. Setae on head erect to appressed. Setae on clypeus erect, setae on mandible decumbent to appressed. Setae on scape and funiculus appressed. Setae on alitrunk erect to suberect, setae on legs mostly decumbent to appressed with a few suberect setae on coxae. Setae on anterior surface of petiolar node appressed, setae on dorsum, posterior surface and side decumbent to suberect. Setae of venter of petiole absent. Setae on postpetiole erect to decumbent on all surfaces, becoming more decumbent on anterior surface of node. Setae on gaster suberect to decumbent. Color predominantly brown with alitrunk dark brown and appendages yellowish brown, Tip of gaster also yellowish brown, Compound eyes black. Setae yellow.

Gyne Measurements (n = 1). Measurements are listed in Table 3, key measurements are presented herein. All measurements are in millimeters. TL 5.18; HL 1.03; HW 0.95; CI 92.19%; SL 0.79; SI 83.05%; AL 1.59; PRW 0.74; PL 0.53; PH 0.31.

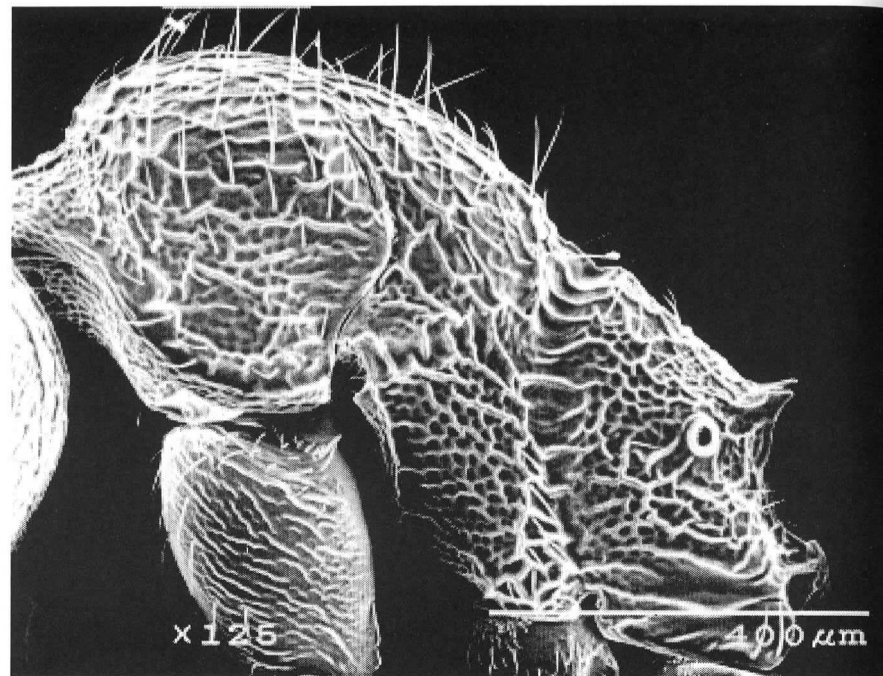


Fig. 3. *Stenamma koreanensis* sp. n., alitrunk lateral view. SEM photograph by senior author.

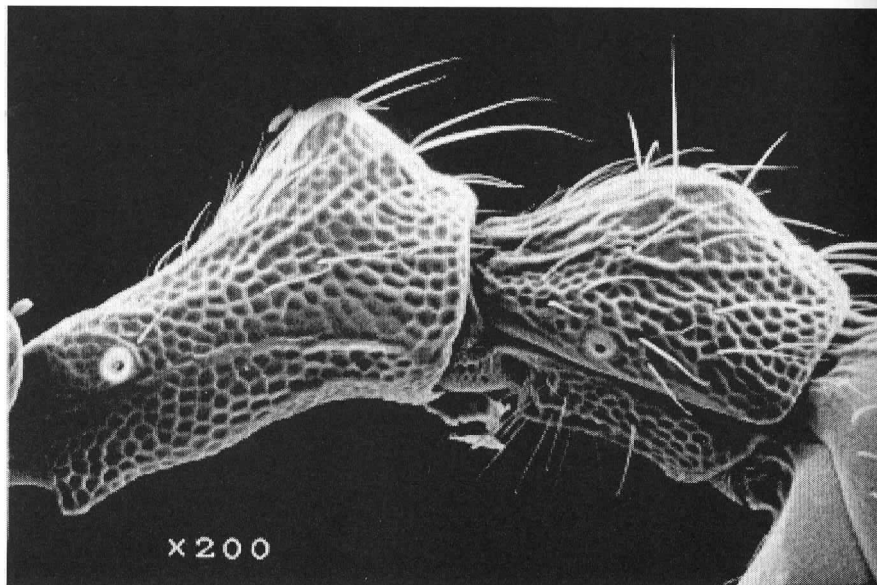


Fig. 4. *Stenamma koreanensis* sp. n., petiole and postpetiole lateral view. SEM photograph by senior author.

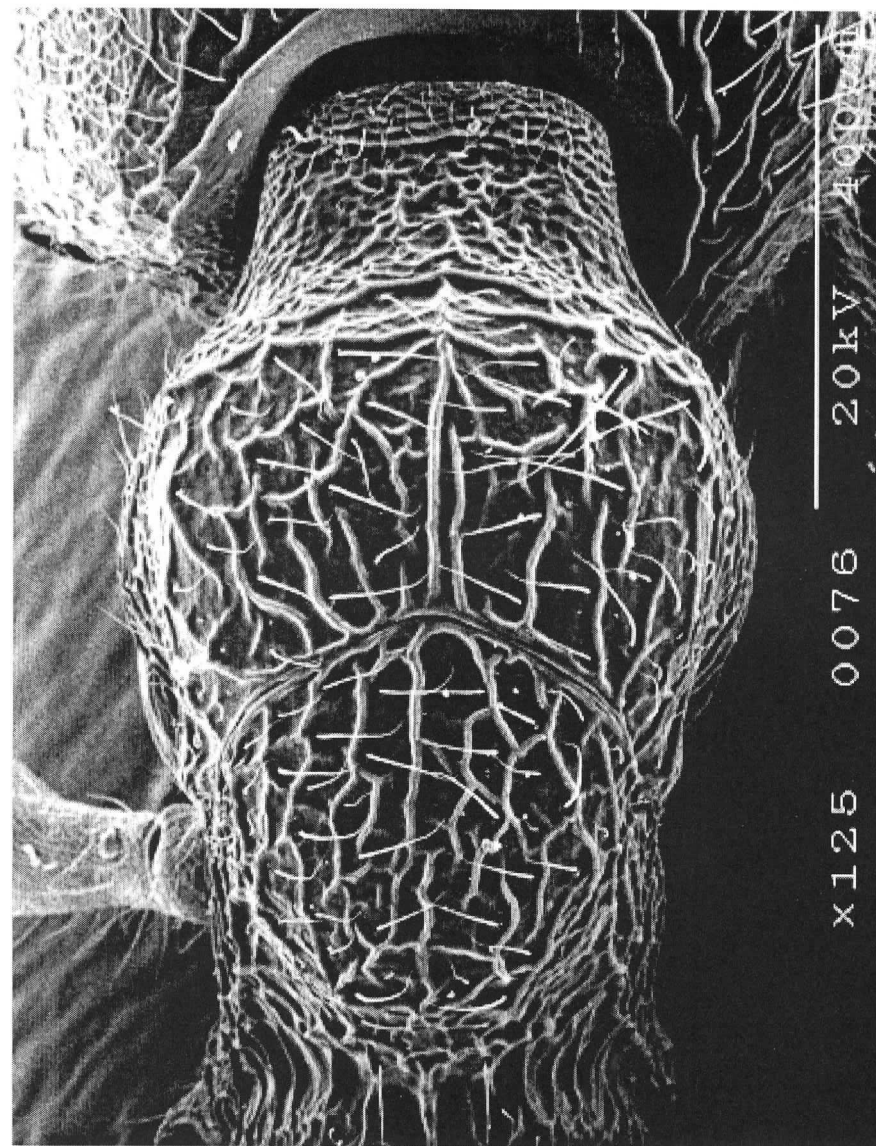


Fig. 5. *Stenamma koreanensis* sp. n., alitrunk dorsal view. SEM photograph by senior author.

Gyne Description.

As described for the worker except for usual morphological changes associated with flight and reproduction except as follows. Mandible with 7 teeth (mandibular teeth worn extensively in this specimen). Compound eye with 14 ommatidia in greatest diameter; 3 ocelli present in

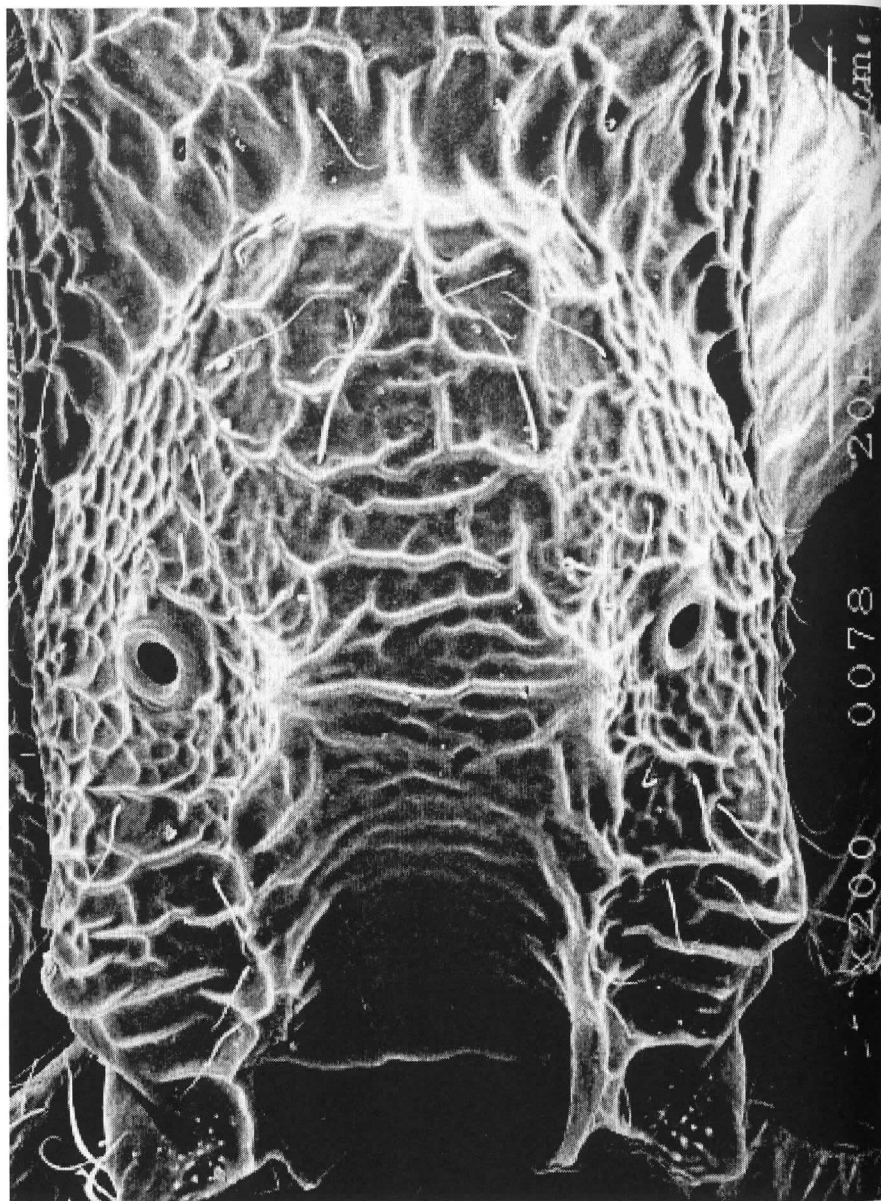


Fig. 6. *Stenamma koreaensis* sp. n., propodeum dorsal view. SEM photograph by senior author.

typical appearance for members of this genus. Thoracic modifications for flight musculature obscure metanotal impression. Wings absent from this specimen, but scars indicate wings were present earlier. Propodeal plates slightly shorter than propodeal spines. Thoracic

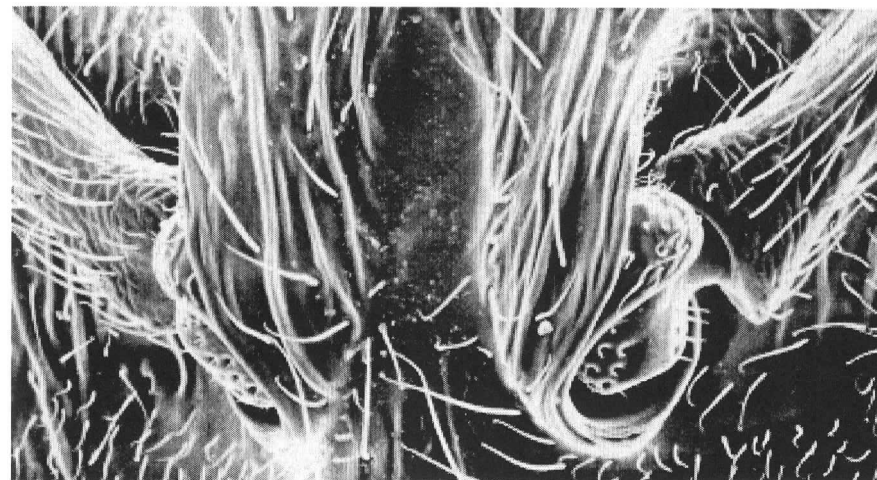


Fig. 7. *Stenamma koreanensis* sp. n., head dorsal view depicting antennal insertions and clypeal carina. SEM photograph by senior author.

dorsum rugose, rugae with decided longitudinal orientation. Thoracic pleura rugose with a longitudinal orientation. Propodeal dorsum with transversely carinate basal face and glassy smooth declivitous face. Lateral surfaces of petiolar and postpetiolar nodes with faint longitudinal rugae (in addition to heavily punctulate surfaces). First gastral tergite base with majority of carinae extending between $1/4$ and $1/3$ length of postpetiole.

Discussion.

Specimens collection data: KOREA: Mt. Odae, Kangwon, 18 V 1995, Dong-Pyeo Lyu. This is approximately 128 degrees 35' E by 37 degrees 45' N. The elevation of the collection locality is approximately 500 m. The nest was located about 5 m away from an intermittent stream. It was under a rock (approximate diameter 30 cm, with 15-20 cm buried in the soil). The ant nest side of the stream was somewhat shallow and without flowing water at that time. The nest area was exposed (sunny and not well shaded during most of the day). It was shaded in early morning and late afternoon due to high mountains at both sides of the stream. The majority of the nest structure ran parallel to the stream with chambers for gyne and brood located near the center of the nest. One queen and 31 workers were collected.

Etymology.

This species is named in honor of the peninsula where it was first collected (Korea).



Fig. 8. *Stenamma koreanensis* sp. n., head dorsal view depicting mandibles. SEM photograph by senior author.

Comparisons.

Stenamma koreanensis is most likely to be confused with *Stenamma ussuriense*. Specimens of the latter species have been collected in approximately similar habitats (Primorskiy Kray, Kedrovaya Pad Preserve and Suputinka [32 – 35 km SE Ussuriysk]; we know of no collections of *Stenamma* from the intervening areas (mostly adjacent areas of the Korean peninsula) other than Collingwood (1976) whose specimens we were unable to examine. While it is possible *Stenamma koreanensis* represents the extreme edge of variation of *S. ussuriense*, it is more likely this is a closely related species. The petiole is longer and more pedunculate in *S. ussuriense* than in *S. koreanensis*. In all specimens examined, the apical two teeth (ultimate and penultimate teeth) of the mandible are less pronounced (not as long) as in *S. koreanensis* (Fig. 8). The metanotal impression is deeper in *S. ussuriense* and the thoracic dorsum sculpture is much more longitudinally carinate in this species than in *S. koreanensis*. Finally, *S. koreanensis* has transverse carinae between the propodeal spines (Fig. 6) while *S. ussuriense* lacks these (or they are very faint).

It is possible that this species may also be confused with *S. kurilense*.

The latter species is presently known from only two workers. Comparisons were not made directly with specimens (as they were with the remaining species in this section). However, notes of the second author and the related publication (DuBois 1998) were used to compare this species with *S. koreanensis*. Although the length of the propodeal spines and ratio of length of propodeal spines to propodeal plates is similar for both species, the mandible of known specimens of *S. kurilense* always contain 7 teeth. The propodeal spiracle of *S. koreanensis* is not enlarged (and is more typical of the genus) than what is found in *S. kurilense*. Specimens of *S. koreanensis* have a more rugose thoracic dorsum; the propodeal dorsum and area between the propodeal spines have several transverse carinae. Although the base of the first gastral tergite is carinate, the carinae extend only 1/5 to 1/4 the length of the postpetiole (compared to nearly 1/2 the length of the postpetiole in *S. kurilense*). Although the mesopleuron in *S. koreanensis* is punctate (somewhat like that found in *S. ussuriense* and *S. kurilense*), it approaches rugose in overall sculpture (Fig. 3).

It is also possible that *S. koreanensis* may be confused with *S. nipponense*. However, the compound eyes are smaller than in *S. koreanensis* (Table 1). The length of the propodeal spines is significantly longer in *S. nipponense* and the petiole is more pedunculate (with a proportionally longer stalk in *S. nipponense*). Additionally, the carinae on the base of the first gastral tergite are longer in *S. nipponense* and the sculpture is more scabrous on the thoracic dorsum. The metanotal impression is deeper and the mesopleuron is more rugose (with little evidence of punctures in *S. nipponense*).

It is also remotely possible that *S. koreanensis* may be confused with *S. owstoni*. However, specimens of the latter species are typically larger with larger compound eyes (Table 1). As with *S. nipponense*, the petiole is more pedunculate with a longer stalk in *S. owstoni* than *S. koreanensis*. Similarly, the thoracic dorsum is more scabrous in *S. owstoni*. Although the length of the carinae on the first gastral tergite are similar in size, the apical two mandibular teeth are less pronounced in *S. owstoni*.

Revised key couplets to oriental *Stenamma* species.

With the description of this new species, the existing key to oriental *Stenamma* species (DuBois 1998) needs to be updated. Specimens of *S. koreanensis* will presently key as follows (key to Oriental species including eastern Russia – DuBois 1998: 215 – 216) couplet 1(b) then couplet 2 (where neither lug is appropriate). The following revised key should help separate species of *S. koreanensis* (numbers correspond to the key found in DuBois 1998: 216).

2 (1) a. Gastral tergite one with basal carinae as long as 1/4 length of

- postpetiole. Compound eye length 0.11 – 0.18 mm. Mandible with 7 - 8 teeth. Thoracic dorsum scabrous. Known from Japan and China *S. owstoni*
- b. Gastral tergite one with basal carinae as long as 1/4 length of postpetiole (or shorter). Compound eye length less than 0.12 mm. Mandible with 8 - 9 teeth. Thoracic dorsum rugose. Known from Korea. *S. koreanensis*
- c. Gastral tergite one with basal carinae as long as 1/2 length of postpetiole. Compound eye length always less than 0.12 mm. Mandible with 7 - 11 teeth. Known from Japan and eastern Russia. 3

Similarly, changes need to be made to the comprehensive key (to Palaearctic and Oriental regions) (DuBois 1998: 219 – 223). In the existing key, specimens will key on either side of couplet 5 (due to some variability in this species, most will key along lug 5 (b)). Thus, couplets 15 and 24 need to be revised (these are the points where one will end depending on which lug of couplet 5 is followed). Again, numbers correspond to DuBois 1998.

- 15 (14) a. Gastral tergite one with basal carinae as long as 1/4 to 1/3 length of postpetiole. Head length 0.84 – 0.85 mm. Scape length 0.61 - 0.63 mm. Postpetiole height 0.23 mm. Known from Kazakhstan and Kirghizia *S. picetjuglandeti*
- b. Gastral tergite one with basal carinae as long as 1/5 to 1/4 length of postpetiole. Head length greater than 0.95 mm. Scape length greater than 0.70 mm. Postpetiole height greater than 0.26 mm. Known from Korea *S. koreanensis*
- c. Gastral tergite one with basal carinae as long as 1/2 length of postpetiole. Remaining combination of characters not matching those listed above for either species *S. ussiurinese*
- 24 (23) a. Petiolar dorsum in lateral view a depressed convex dome. Mandible with 9 - 10 teeth. Propodeal plates 1/3 length of propodeal spines. Gastral tergite one with basal carinae as long as 1/4 to 1/3 length of postpetiole. Known from southern Europe (including Spain and Sardinia) *S. sardoum*
- b. Petiolar dorsum in lateral view high with a sharply rounded dome. Number of mandibular teeth 8. Propodeal plates 1/2 as long as propodeal spines or longer. Gastral tergite one with basal carinae as long as 1/5 to 1/4 length of postpetiole. *S. koreanensis*
- c. Petiolar dorsum in lateral view high with a sharply rounded dome. Number of mandibular teeth variable (usually less than 9). Propodeal plates 1/2 as long as propodeal spines or longer. Gastral tergite one with basal carinae as long as 1/3 to 1/2 length of postpetiole. . 25

Material Examined. Holotype and 30 paratype workers, 1 gyne, distributed as follows: Chungbuk National University, Cheongju, South Korea (CBNU), holotype worker and 20 paratype workers; BMNH 2 paratype workers; MCZ 2 paratype workers; NMNH 2 paratype workers; MBDPC 3 paratype workers, 1 gyne. All museum codens follow those described in DuBois, 1998 except CBNU detailed above. Holotype specimens bears a red, partly handwritten label: *Stenamma koreanensis* Holotype. Paratype workers and gyne bear white, printed labels: *Stenamma koreanensis* Paratype.

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