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REVIEW OF THE MUTILLID WASPS (HYMENOPTERA, MUTILLIDAE) OF KOREA

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The list of twelve recorded and three expected species in Korea is given. *Cystomutilla teranishii* Mickel, *Smicromyrme bidenticulata* Chen and *Nemka wotani* (Zavattari) are newly recorded for Korea.

KEY WORDS: Mutillidae, mutillid wasps, Korea.

А. С. Лелей[1], Д. Ё. Чой[2], П. Трипотин[3]. Обзор мутиллид (Hymenoptera, Mutillidae) Кореи // Дальневосточный энтомолог. 2001. N. 96. С. 1-15.

Приведен список 12 известных и 3 вероятно встречающихся видов из Кореи. *Cystomutilla teranishii* Mickel, *Smicromyrme bidenticulata* Chen и *Nemka wotani* (Zavattari) впервые указаны для Кореи.

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INTRODUCTION

Up to present the mutillid fauna of Korea was poorly known. The Mutillidae were recorded firstly for Korea by Uchida (1925). He mentioned two species: *Stenomutilla petulans* (Smith) [currently *Neotrogaspidia pustulata* (Smith)] and *Mutilla europaea* L. (currently *M. mikado* Cameron). Later Yasumatsu (1938) recorded five mutillid species. Kim (1963, 1970) catalogued the records and added *Squamulotilla ardescens strangulata* (Smith). Two species, *Myrmosa eos* Lelej and *Squamulotilla exilipunctata* Chen, have been added by Lelej and Yamane (1992). There are seven species listed by Kim et al. (1994): *Dasylabris maura* Linnaeus [currently *D. siberica* (Christ)], *D. rubrosignata* Radoszkowski [currently *D. siberica* (Christ)], *Mutilla cameroni* Yano (currently *Smicromyrme lewisi* Mickel), *Mutilla europaea mikado* Cameron (currently *Mutilla mikado* Cameron), *Smicromyrme rufipes lewisi* Mickel (currently *S. lewisi* Mickel), *Squamulotilla ardescens* Smith and *Trogaspidia pustulata* Smith [currently *Neotrogaspidia pustulata* (Smith)]. The oldest Korean mutillid specimens (*D. intermedia* Skor.) have been collected by P. Schmidt in 1900. Before the World War II the mutillids were collected by Japanese entomologists T. Uchida, K. Okazaki, M. Yamada, K. Sato, Y. Hasegawa and S. Maruta. This paper based on 227 specimens: 106 specimens deposited in National Institute of Agricultural Science and Technology [NIAST, Suwon, Republic of Korea], mainly collected by J. Y. Choi in different provinces of Republic of Korea, 96 specimens collected by P. Tripotin in 1994-2000 mostly in Central Korea (Chungcheongnam-do), five old specimens of NIAST collected by Japanese entomologists, two old specimens of Zoological Institute in St. Petersburg [ZISP, Russia], one from Institute of Biology and Soil Sciences [IBPV, Vladivostok, Russia], eleven specimens loaned from Seoul National University [SNU] , five from Hannam University [HAN, Daejeon, Republic of Korea], and one of Prof. Sk. Yamane [Kagoshima University, Japan].

Next abbreviations are used in the material: CCRI - Cheju Citrus Research Institute, NHRI - National Horticultural Research Institute; MT - Malaise trap; the provinces of Korea (from north to south): GG - Gyeonggi-do, GW - Gangwon-do, CN - Chungcheongnam-do, JN - Jeollanam-do, GB - Gyeongsangbuk-do, GN - Gyeongsangnam-do, JJ - Jeju-do. Because of the recent change of Romanized Korean rule, there are many ambiguity in the text; if the name is expressed differently from the old rule, new one is added in bracket.

MAIN COLLECTING PLACES

1. *Pyeongchang, Gangwon-do*. (Fig. 1). This is in the northeastern high mountainous part of Republic of Korea. Its flora is mainly composed of *Pinus densiflora*. Malaise trap was constructed by J. Y. Choi in the shade of forest.

2. *Mt. Yeogi, Suwon*. This is a small mountain (altitude 105 m) just behind NIAST. It is covered by *Pinus rigida* and *Pinus koraiensis*, the latter were planted

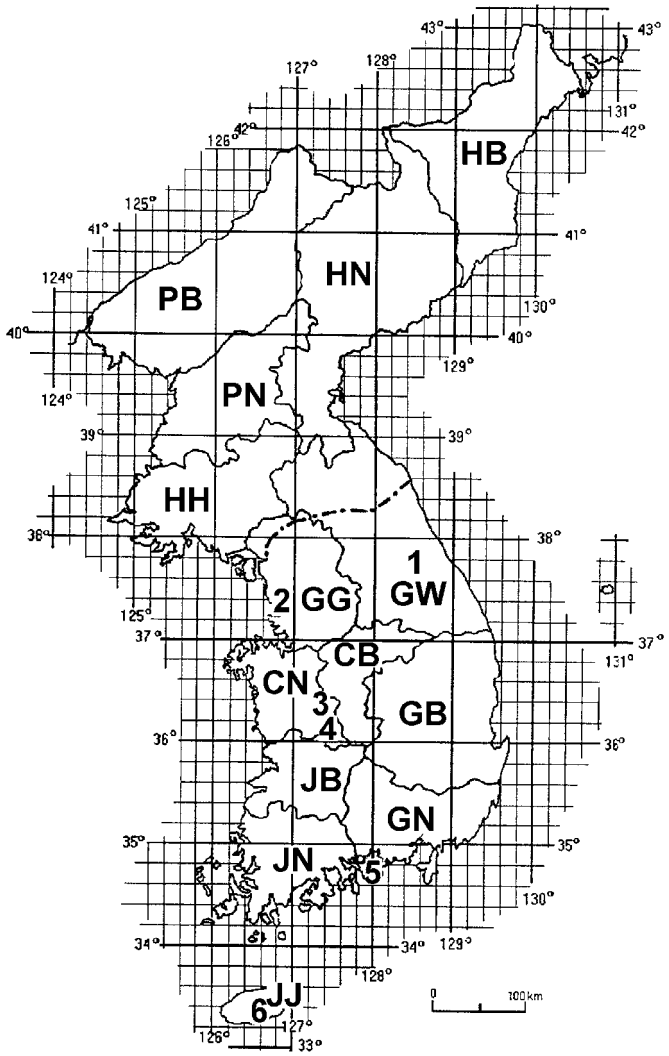

Fig. 1. Map of Korea with main collecting sites. Provinces (from north to south): **HB** - Hamgyeongbuk-do, **HN** - Hamgyeongnam-do, **PB** - Pyeong-anbuk-do, **PN** - Pyeong-annam-do, **HH** - Hwanghae-do, **GG** - Gyeonggi-do, **GW** - Gangwon-do, **CB** - Chungcheongbuk-do, **CN** - Chungcheongnam-do, **JB** - Jeollabuk-do, **JN** - Jeollanam-do, **GB** - Gyeongsangbuk-do, **GN** - Gueongsangnam-do, **JJ** - Jeju-do. Demilitarized Zone divide Korea in Republic of Korea (South Korea) and Democratic People's Republic of Korea (North Korea). Collecting sites: **1**- Pyeongchang, Gangwon-do; **2** - Suwon, Mt. Yeogi; **3** - Daejeon, Jang-dong; **4** - Sanan 2-ri, Geumsan; **5** - NHRI, Namhae, Idong; **6** - Citrus Research Institute, Seogwipo.

artificially, and *Quercus dentata*. One Malaise trap was constructed by J. Y. Choi near the peak, and the other in the more shade in small valley. In both cases, traps were under the *Pinus* trees.

3. *Changdong [Jang-dong] 2-gu, Taejon [Daejeon]*. Six species of mutillids, including 2 new records, have been collected in this site, actively prospected by P. Tripotin between 1994 and 1996. Collecting place is a group of old tombs near the village, on low hills facing south. Tombs form a small arid place without dense vegetation, surrounded by densely forested areas (mostly small oaks and pine trees). This site appeared to be very rich in ground-nesting Apoidea and Sphecidae. Female mutillids are seen crawling on the ground and can be abundant, entering every hole they found, in search of host. Several species are often collected together. This type of biotope is common in Korea, where sunny tombs are the easiest collecting places for mutillids. Human influence is important there, but it is very favorable to hymenopteran populations in general in maintaining open areas. Mutillids are also present in the shady or more humid places, but in much smaller number.

4. *Sanan 2-ri, Keumsan [Geumsan]*. This collecting place is very small sandy area (ancient sand quarry) isolated on large forested hills (young deciduous trees, altitude 400 m). The ground-nesting Sphecidae are abundant on the site, where the three species of mutillids have been collected in 1996-1997 by P. Tripotin.

5. *Namhae, Gyeongsangnam-do*. This is in an island in the southern coast of Korea. Malaise trap was constructed by J. Y. Choi in the orchard for yuja, *Citrus junos*. The soil surface of the orchard is not covered with grass usually, so it is shiny and dry well.

6. *Citrus Research Institute, Jeju-do*. It is in Seogwipo, south of Jeju-do, an island in the southern part of Korea. Malaise trap was constructed by J. Y. Choi and settled inside the citrus orchard. There are big trees, *Cryptomeria japonica*, planted in a row for protecting citrus trees from strong wind. The surface condition was almost the same with that of Namhae, Gyeongsangnam-do.

KEY TO THE KOREAN SPECIES

Males, alates (unknown for *Squamulotilla strangulata*)

1. Gastral tergum 2 or sternum 2 without lateral felt lines. The eyes with short setae. Forewing venation touch the apical wing margin. Hypopygium with lateral lobes. (Subfamily Myrmosinae). – Gastral tergum 7 without lateral preapical dent or lobe, with dorsal medial elongate fovea. (Genus *Myrmosa* Latreille) 2

– Gastral tergum 2 or sternum 2 with lateral felt lines. The eyes not setose. Forewing venation not touch the apical wing margin. Hypopygium without lateral lobes . . 3

2. Gastral tergum 7 apically with deep emargination. Ratio POL : OOL = 0.5-0.6. Anterior part of radial cell 2.3-2.4 times as wide as pterostigma. Forewings with weakly infuscated apical half. 5.0-13.0 mm . . . . . 2. ***Myrmosa mogolica***

– Gastral tergum 7 apically without emargination. Ratio POL : OOL = 0.75. Anterior part of radial cell 1.9 times as wide as pterostigma. Forewings strongly darkened. 10.2-14.0 mm . . . . . 1. ***Myrmosa eos***

3. Inner eye margin without notches 4

– Inner eye margin with notches. - Posterolateral scutellar angles neither produced nor dentate. (Subfamily Mutillinae) 7

4. Gastral segment 1 not nodose posteriorly. (Subfamily Myrmillinae). - Tegulae small scale–like, convex, smooth and shiny. (Genus *Squamulotilla* Bischoff). Gastral sternum 2 with highly elevated longitudinal median carina. Sternum 8 (hypopygium) with two longitudinal lateral carinae. Male mesosoma from red with brownish tegulae (in smaller specimens) to red with dark brown pronotum, mesonotum, tegulae and mesopleurae (in largest specimens). 5.0-8.0 mm . . . . . 3. ***Squamulotilla exilipunctata***

– Gastral segment 1 nodose posteriorly 5

5. Eyes hemispherical. Gonostyli narrow, strongly curved apically. (Subfamily Sphaeropthalminae). (Genus *Cystomutilla* André). 7.5-12.0 mm . . . . . 10. ***Cystomutilla teranishii***

– Eyes weakly convex, oval. Gonostyli wider, straight or slightly curved apically. (Subfamily Dasylabrinae). - Lateral felt lines located on the gastral tergum 2. (Genus *Dasylabris* Radoszkowski) 6

6. Head height less than its width. Propodeum with black hairs, narrower than pronotum. 8.5-12.0 mm . . . . . 12. ***Dasylabris* (*Dasylabris*) *siberica***

– Head height equal to its width. Propodeum with white hairs, wider than pronotum. 11.0-14.0 mm . . . . . 11. ***Dasylabris* (*Dasylabris*) *intermedia***

7. Tegulae long, protruded over the scuto-scutellar suture. Mandibles without basal lower tooth. Gastral segment 1 transversal. Gastral terga with bluish or violet lustre. (Genus *Mutilla* Linnaeus). 10.0-15.0 mm . . . . . 5. ***Mutilla mikado***

– Tegulae shorter, sometimes touch the scuto-scutellar suture but never protrude over it. Mandibles with basal lower tooth. Gastral segment 1 campanulate, not transversal. Gastral terga without bluish or violet lustre 8

8. Distance between origin of *RS* on vein *SC* and the base of stigmatic cell more or less equal to length of stigmatic cell and almost equal to first abscissa of *RS*. Genitalia with asymmetrical penial valvae. - Gastral sternum 8 usually with a pair of strong lateral carinae. Scutellum with median smooth line. (Genus *Neotrogaspidia* Lelej). Gastral segments 1 and 2 ferruginous, tergum 3 and 4 with an apical band of moderately thick pale pubescence. Pronotum without appressed pale pubescence. 8.3–11.5 mm . . . . . 9. ***Neotrogaspidia pustulata***

– Distance between origin of *RS* on vein *SC* and the base of stigmatic cell almost equal to twice the length of stigmatic cell and greater more than twice of first abscissa of *RS*. Genitalia with symmetrical penial valvae 9

9. Genital volsella with basal external lobe and long narrow cuspis. Basivolsella with very long setae. - Mandible tridentate apically. Mesopleurae beneath with one or two pair of precoxal denticles or tubercles. (Genus *Nemka* Lelej). Gaster

red with four distal segments black. Pronotum dorsally, scutellum and medial part of metanotum clothed with long raised pale hairs. Propodeal dorsum with median longitudinal closed area and two rounded large basal cells laterad of it. 9.5–15.0 mm . . . . . 8. ***Nemka wotani***

– Genital volsella without basal external lobe, cuspis shorter and wider. Basivolsella at most with short setae. - Antennal segment 3 is equal to its maximal width and being 0.6 as long as antennal segment 4. (Genus *Smicromyrme* Thomson) 10

10. Mandibles bidentate apically. Clypeus more or less flat with two preapical teeth. - Thorax always with black propodeum. 6.0–12.0 mm . . . . . 6. ***Smicromyrme* (*Smicromyrme*) *lewisi***

– Mandible tridentate apically. Clypeus concave shiny, without preapical teeth. 6.0-11.0 mm . . . . . 7. ***Smicromyrme* (*Erimyrme*) *bidenticulata***

Females, apterous

1. Ocelli developed. Thoracic pronotum and mesonotum of thorax divided by distinct suture. (Subfamily Myrmosinae). - Gastral tergum 1 with apical brownish–red cuticular band. (Genus *Myrmosa* Latreille) 2

– Ocelli not developed. Thoracic pronotum and mesonotum without distinct suture . . 3

2. Gastral tergum 2 laterally with dense punctures, the distance between them less than their diameter. 4.6-6.5 mm . . . . . 1. ***Myrmosa eos***

– Gastral tergum 2 laterally with sparse punctures, the distance between them more than their diameter. 4.0-6.5 mm . . . . . 2. ***Myrmosa mongolica***

3. Mesothorax concaved laterally, not wider than propodeum 4

– Mesothorax swollen laterally, wider than propodeum 10

4. Mesopleurae with a very prominent, vertical, lamelliform projection just above the middle coxae. Mesopleural suture runs to the medial mesonotal tubercle. (Subfamily Myrmillinae). - Propodeum with a transverse row of teeth or tubercles. (Genus *Squamulotilla* Bischoff) 5

– Mesopleurae without vertical, lamelliform projection above the middle coxae. Mesopleural suture runs to the anterior spiracle. (Subfamily Mutillinae) . . . 6

5. Lateral propodeal face with fine sparse punctures. Hind tibia length 2.0 times basitarsus length. 5.0-9.0 mm . . . . . 3. ***Squamulotilla exilipunctata***

– Lateral propodeal face with dense punctures. Hind tibia length 2.2 times basitarsus length. 7.9-8.2 mm . . . . . 4. ***Squamulotilla strangulata***

6. Gastral tergum 2 in basal half without pale spots, apically with pale band divided in two spots. (Genus *Mutilla* Linnaeus). 9.0-14.0 mm . . . . . 5. ***Mutilla mikado***

– Gastral tergum 2 in basal half with pale spots 7

7. Gastral tergum 2 ornamented with a pair of anterior pale pubescent spots transversely arranged. - Thorax broadest in propodeum. Pygidial area irregularly rugose in basal half and smooth apically. Pale spots on gastral tergum 2 small or feebly visible, the distance between spots being 1.0–2.0 spot diameters. (Genus *Neotrogaspidia* Lelej). 5.6–9.0 mm . . . . . 9. ***Neotrogaspidia pustulata***

– Gastral tergum 2 ornamented with one or three anterior pale pubescent spots . . . 8

8. Pygidial area short oval. (Genus *Nemka* Lelej). - Posterior band of gastral tergum 2 weakly triangularly widened medially, almost equal to the band on tergum 3. Head black, sometimes with brownish–red spot on vertex. Scutellar scale at most 2 times as wide as its length. Pygidial area shiny apically. 6.0–8.5 mm . . . . . 8. ***Nemka wotani***

– Pygidial area elongated with parallel sides or widened basally. - Scutellar scale slightly wider than its length. (Genus *Smicromyrme* Thomson) 9

9. Pygidial area with parallel longitudinal grooves throughout. Gastral tergum 2 with one anterior pale spot. Thoracic dorsum with brownish cuticular spot on pronotum and around scutellar scale. 3.5–8.0 mm . . . . . 6. ***Smicromyrme* (*Smicromyrme*) *lewisi***

– Pygidial area apically smooth and shiny, other part with longitudinal grooves. Gastral tergum 2 with three anterior pale spots, sometimes lateral ones weakly visible. 4.0-6.2 mm . . . . . **7. *Smicromyrme* (*Erimyrme*) *bidenticulata***

10. Eyes hemispherical. (Subfamily Sphaeropthalminae). (Genus *Cystomutilla* André). 7.5-12.0 mm . . . . . 10. ***Cystomutilla teranishii***

– Eyes weakly convex, oval. - Gastral segment 1 narrow, more or less petiolate. (Subfamily Dasylabrinae). Lateral felt lines located on gastral tergum 2. (Genus *Dasylabris* Radoszkowski) 11

11. Frons with black hairs only. Gastral tergum 3 without medial pale spot, rare with a few sparse pale hairs. 7.0-10.5 mm . . . 12. ***Dasylabris* (*Dasylabris*) *siberica***

– Frons with transversal pale spot. Gastral tergum 3 with medial pale spot. 8.0-15.0 mm . . . . . 11. ***Dasylabris* (*Dasylabris*) *intermedia***

LIST OF THE SPECIES

1. *Myrmosa eos* Lelej, 1981

= *Myrmosa eos* Lelej, 1981: 102 [holotype - ♂, Primorskii krai, Khanka Lake, Novokatshalinsk, 14.VIII 1977, A. Lelej [ZISP], examined]; Lelej, 1985: 55, ♂; Lelej & Yamane, 1992: 625, ♀, ♂ [Korea, Suwon].

SPECIMENS EXAMINED (13 ♂, 3 ♀). CN: Taejon [Daejeon], Changdong [Jang-dong] 2-gu, 5, 8.IX 1996, 3 ♀ (P. Tripotin); Sanan 2-ri, Keumsan [Geumsan], 24.VII 1997, 4-8.VIII 1998, 3 ♂ (P. Tripotin); GN: Namhae NHRI, 25.IX 1998, MT, 1 ♂ (J. Y. Choi); Namhae Idong, 19.VI 1997, 18.VI, 10, 31.VII, 14, 21.VIII, 16.X 1998, MT, 8 ♂ (J. Y. Choi); JJ: CCRI, 5.VIII 1996, MT, 1 ♂ (J. Y. Choi).

DISTRIBUTION. Korea (Fig. 3): Chungcheongnam-do, Gyeongsangnam-do, Jeju-do; Russia: Primorskii krai.

REMARKS. The specimens from Korea have been compared directly with the female and male collected *in copula* in Primorskii krai. In Korea this species occurs from mid June to mid October.

2. *Myrmosa mongolica* Suárez, 1974

= *Myrmosa mongolica*: Lelej, 1985: 55, ♀, ♂.

SPECIMENS EXAMINED (58 ♂). GG: Suwon, Mt. Yeogi, 4.IV, 10, 30.VI, 17.VII, 18.IX 1995, 18.VI, 17, 22, 29.VII, 21.VII, 18. VIII, 1.IX 1996, 11.VI, 11.VIII, 1.IX 1997, 7-14.VI 1999, MT, 22 ♂ (J. Y. Choi); Mt. Gwanggyo, 29. VI 1995, 1 ♂ (J. Y. Choi); GW: Pyeongchang, Alpine Experimental Station, 21.VII-2.VIII 1997, MT, 7 ♂ (J. Y. Choi); GB: Gimcheon, 1.IX 1995, 1 ♂ (J. Y. Choi); JJ: Jeju, 5.XI 1996, 2 ♂ (J. Y. Choi); CCRI, 1.V, 12, 26.VI, 25, 29.VII, 5.VIII, 16.IX 1996, MT, 25 ♂ (J. Y. Choi).

DISTRIBUTION. Korea (Fig. 3): Gyeonggi-do, Gangwon-do, Gyeongsangbuk-do, Jeju-do; Russia: Irkutsk region, Transbaicalia, Amur region, south part of Khabarovskii krai, Primorskii krai, Sakhalin; Japan: Honshu; North-East China; Mongolia.

REMARKS. This species occurs in Korea from early April to early November.

3. *Squamulotilla exilipunctata* Chen, 1957

= *Squamulotilla exilipunctata* Chen, 1957: 141, 146 (holotype - ♀, Nanking, Jiangsu, 14.VIII 1934); Lelej & Yamane, 1992: 626, ♀, ♂ (Korea, Suwon).

SPECIMENS EXAMINED (14 ♂, 27 ♀). Koryo [Korea], 10.IV 1923, 1 ♀ (Y. Hasegawa) [NIAST]; GG: Suwon, Mt. Yeogi, 18.IX 1995, 11, 25.VIII 1997, MT, 3 ♂ (J. Y. Choi); GW: Gesseiji [Woljeongsa], 13.VII 1923, 1 ♀ (Y. Hasegawa & S. Maruta) [NIAST]; CN: Taejon, Changdong 2-gu: 12.IX 1994, 1 ♂, 2 ♀; 15, 27.VI, 1, 4, 29.VII 1995, 9 ♀; 18.V, 9, 12, 15.VI, 24.VII 1996, 9 ♀; 23, 25.IX 1996, MT, 3 ♂ (P. Tripotin); Sanan 2-ri, Keumsan, 18.V, 21.VI, 15.VII 1997, 4 ♀ (P. Tripotin); Posok-sa [Boseoksa], Keumsan, 14-18.IX 1998, MT, 1 ♂(P. Tripotin); JN: Suncheon, Mt. Bibong, 5.VII 1998, 1 ♀ (G. Lafer); JJ: Jeju, CCRI, NHRI, 16, 23.IX 1996, MT, 4 ♂ (J. Y. Choi); CCRI, 29.VII, 5.VIII 1996, MT, 2 ♂ (J. Y. Choi).

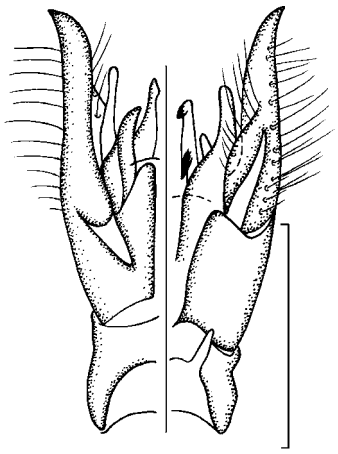

Fig. 2. *Squamulotilla exilipunctata*, ♂, genitalia, ventral aspect at right, dorsal at left. Scale line = 1 mm.

DISTRIBUTION. Korea (Fig. 4): Gyeonggi-do, Gangwon-do, Chungcheongnam-do, Jeollanam-do, Jeju-do; China: Hebei, Jiansu, Zhejiang, Fujian.

REMARKS. This species collected in three different sites near Taejon is widely present in the prospected area, commonly in dry sites, except one specimen taken in a humid and densely forested biotope near Keumsan. Though females and males have been

collected in one site (near Taejon), there is no pair *in copula*, we think that they are the opposite sexes of the same species. For male genitalia, see Fig. 2. Male mesosoma from red with brownish tegulae (in smaller specimens) to red with dark brown pronotum, mesonotum, tegulae and mesopleurae (in largest specimen). Body length ♂ 5.0-8.0 mm, ♀ 5.0-9.0 mm. In Korea, this species occurs from mid May to late September.

4. *Squamulotilla strangulata* (Smith, 1879)

= *Mutilla strangulata* Smith, 1879: 200, ♀ (holotype - ♀, North China).
= *Squamulotilla strangulata*: Mickel, 1933: 296, ♀.
= *Squamulotilla ardescens strangulata*: Kim, 1970: 792 (Korea).
= *Squamulotilla ardescens*: Kim *et al.*, 1994: 255.

DISTRIBUTION. ? Korea (Kim, 1970); China: Jiangsu, Anhui, Jiangxi, Fujian.

REMARKS. *S. exilipunctata* and *S. strangulata* are very close species (see differences: Chen, 1957; Lelej & Yamane, 1992 and key above) and probably the record of *S. strangulata* from Korea (Kim, 1970) belongs to *S. exilipunctata*, as we can see after the study of old specimens of *S. exilipunctata* collected by Japanese entomologists.

5. *Mutilla mikado* Cameron, 1900

= *Mutilla mikado* Cameron, 1900: 75, ♀ (holotype - ♀, Japan); Lelej, 1985: 161, ♀, ♂; Lee et al., 1985: 435 (Mt. Halla [JJ]); Lelej, 2000: 615.
= *Mutilla europaea*: Uchida, 1925: 334 (Central Korea); Yasumatsu, 1938: 87.
= *Mutilla europaea mikado*: Kim, 1963: 340 (Sam-Bang, Hwa-San); Kim, 1970: 793 (Korea); Kim et al., 1974: 235 (Hyangro-bong [GW]); Kim & Kim, 1974: 115 (Mt. Baek-yang [JN]); Paik, 1994: 199 (Jeju-do); Paik, 1995: 447 (Jeju-do); Kim et al., 1994: 255.

SPECIMENS EXAMINED (10♀). GG: Singal, 24.VI 1992, 1 ♀ (J. I. Kang) [SNU]; Suwon, 2.VI 1990, 1 ♀ (U. T. Lim) [SNU]; Gwanggyo, 23.V 1986, 1 ♀ (S. M. Hwang); 23.V 1990, 2 ♀ (D.S. Ha) [SNU]; CN: Donghaksa, 25.V 1983, 4 ♀ (Y.B. Cho) [HAN]; Mt. Gyeryong, 10.VI 1979, 1 ♀ (M. J. Yu) [HAN].

DISTRIBUTION. Korea (Fig. 4): Gyeonggi-do, Gangwon-do, Chungcheongnam-do, Jeollanam-do, Jeju-do; Russia: south of East Siberia, Transbaicalia, Amur region, Khabarovskii krai, Primorskii krai; Japan: Hokkaido, Honshu, Kyushu; China; Jilin, Nei Mongol, Shanxi, Zhejiang.

REMARKS. All previous records for Korea belong to *M. mikado*, a single *Mutilla* species in Eastern Palaearctic. This species is known as a parasite of bumble-bee, *Bombus ardens* Smith, 1879 (Taniguchi, 1955), which is also distributed in Korea (Kim & Ito, 1987).

6. *Smicromyrme* (*Smicromyrme*) *lewisi* Mickel, 1935

= *Smicromyrme lewisi lewisi*: Yasumatsu, 1938: 85, ♀ (Chuseinando [Chungcheongnam-do], Taiden [Daejeon]); Kim, 1963: 341 (Dae-Jeun [Daejeon]); Kim, 1970: 793 (Korea).

= *Smicromyrme lewisi yanoi*: Yasumatsu, 1938: 85, ♂ (Keikido [Gyeonggi-do], Dainammen); Kim, 1963: 341 (Kyeung-Ki-Do [Gyeonggi-do]); Kim, 1970: 793 (Korea).
= *Smicromyrme* (*Smicromyrme*) *lewisi*: Lelej, 1985: 232, ♀, ♂.
= *Mutilla cameroni*: Kim et al., 1994: 255.
= *Smicromyrme rufipes lewisi*: Kim et al., 1994: 255.

SPECIMENS EXAMINED (26 ♂, 27 ♀). GG: Gwangju, Mt. Taehwa, 19.IX 1998, 1 ♂ (J. Y. Choi); Yeoncheon, Mt. Jonghyun, 14,VII 2000, MT, 1 ♂ (H. S. Lee & S. W. Park) [SNU]; GW: Hwachon, Hongcheon, 13.VI 1996, 2 ♂ (H. Y. Kim); CN: Taejon, Changdong 2-gu: 27, 28.VI, 15.VIII 1995, 4 ♂, 4 ♀; 7, 9.X 1995, 3 ♀; 19, 21.VI, 2.VII 1996, 5 ♂; 7, 11.VIII 1996, 2 ♀; 2, 5, 8, 12, 25, 29.IX 1996, 6 ♀, 1 ♂ (P. Tripotin); Sanan 2-ri near Keumsan: 30.V, 8, 16.VI 1997, MT, 3 ♂; 15, 21.VII 1997, 4 ♀; 17.VII 1997, MT, 1 ♂; 3.X 1997, 2 ♀ (P. Tripotin); Posok-sa, Keumsan, 18.VII 1999, 1 ♀ (P. Tripotin); JN: Mt. Baekun, 25.VI 1995, 1 ♂ (J. Y. Choi); GB: Mt. Ilwol (alt. 900 m), Yeongyang, 6.VIII 1998, 4 ♀ (P. Tripotin); Kimcheon [Gimcheon], Mt. Myowang, 2,VII 2000, 1 ♀ (P. Tripotin); GN: Namhae Idong, 29.V 1997, 24.VII 1998, MT, 3 ♂ (J. Y. Choi); JJ: CCRI, 29.VII, 5.VIII 1996, MT, 4 ♂ (J. Y. Choi).

DISTRIBUTION. Korea (Fig. 5): Gyeonggi-do, Gangwon-do, Chungcheongnam-do, Jeollanam-do, Gyeongsangbuk-do, Gyeongsangnam-do, Jeju-do; Russia: Irkutsk region, Transbaicalia, Amur region, Khabarovskii krai, Primorskii krai, Sakhalin, Kuril Islands (Kunashir); Japan: Hokkaido, Honshu, Kyushu, Tsushima, Tanegashima; North-East and East China; Mongolia.

REMARKS. This species collected in different sites seems to be widely spreaded and abundant in Korea. In Mt. Ilwol, collecting site was a clearing on the densely forested hills (altitude 900 m) where a concentration of ground-nesting *Cerceris* sp. (Sphecidae) was also observed. This sphecid was likely to be the host in this site. On another occasion (Changdong 2-gu, 6.IX 1996), we observed a female entering in solitary bee nest and staying there for 20 minutes. In Korea, this species occurs from late May to early October.

7. *Smicromyme* (*Erimyrme*) *bidenticulata* Chen, 1957

= *Smicromyrme bidenticulata* Chen, 1957: 199 (holotype - ♂, Shantung, Tsinan, Longtong, 500-700 m [Shandong]).
= *Smicromyrme* (*Erimyrme*) *bidenticulata*: Lelej, 1985: 239, ♀, ♂; Lelej, 2000: 615.

SPECIMENS EXAMINED (4 ♂, 4 ♀). GG: Yeoncheon, Mt. Jonghyun, MT, 14,VII 2000, 1 ♂ (H. S. Lee & S. W. Park) [SNU]; CN: Taejon, Changdong 2-gu: 15.VIII 1995, 1 ♀; 8.X 1995, 1 ♀; 15.VI 1996, 1 ♀; 2.VII 1996, MT, 1 ♂; 12.IX 1996, 1 ♀; 29.IX 1996, MT, 1 ♂ (P. Tripotin); Sanan 2-ri near Keumsan, 27-30.VII 1998, MT, 1 ♂ (P. Tripotin).

DISTRIBUTION. Korea (Fig. 5; new record): Gyeonggi-do, Chungcheongnam-do; Russia: Primorskii krai; China: Nei Mongol, Shandong, Jiangsu.

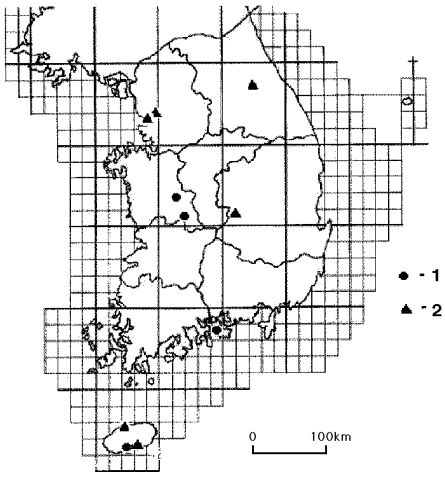

Fig. 3. Distribution in Korea:
1 - Myrmosa eos,
2 - M. mongolica.

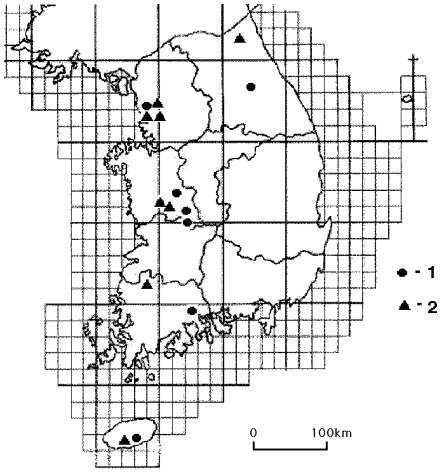

Fig. 4. Distribution in Korea:
1 - Squamulotilla exilipunctata,
2 - Mutilla mikado.

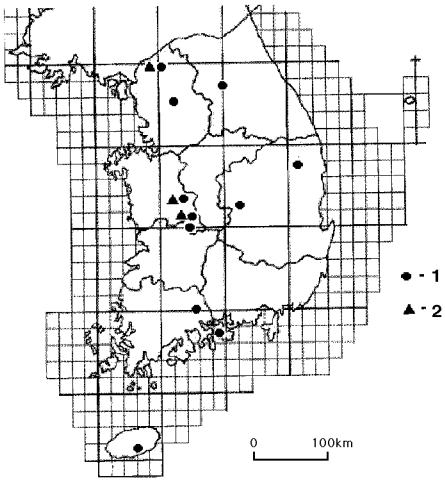

Fig. 5. Distribution in Korea:
1 - Smicromyrme lewisi,
2 - S. bidenticulata.

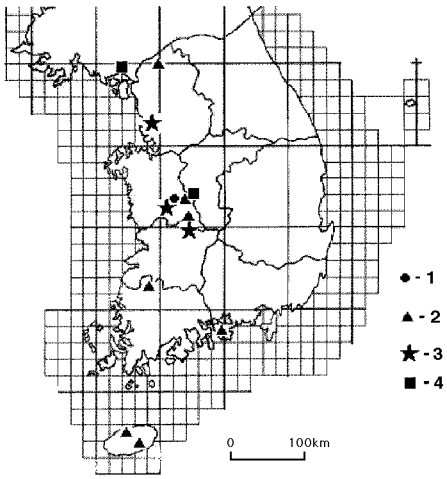

Fig. 6. Distribution in Korea:
1- Nemka wotani,
2 - Neotrogaspidia pustulata,
3 - Cystomutilla teranishii,
4 - Dasylabris siberica.

8. *Nemka wotani* (Zavattari, 1913)

= *Mutilla wotani* Zavattari, 1913: 27 [lectotype - ♀, Formosa, Tainan, Aug. 1909 (H. Sauter), designated by Mickel, 1933].

= *Nemka wotani*: Lelej, 1995: 10, ♀, ♂.

SPECIMEN EXAMINED. CN: Taejon, Changdong 2-gu, 7.VIII 1996, 1♀ (P.Tripotin).

DISTRIBUTION. Korea (Fig. 6; new record): Chungcheongnam-do; Japan: Honshu, Kyushu, Tanega-shima; China: Liaoning, Shanxi, Taiwan; Vietnam: Quang Ninh.

9. *Neotrogaspidia pustulata* (Smith, 1873)

= *Mutilla pustulata* Smith, 1873: 182, ♂ (type locality - Japan).

= *Stenomutilla petulans*: Uchida, 1925: 334 (Central Korea).

= *Timulla* (*Trogaspidia*) *pustulata*: Yasumatsu, 1938: 84, ♂ (Chuseinando [Chungcheon-gnam-do], Taiden [Daejeon]).

= *Timulla pustulata*: Kim, 1963: 340 (Soo-Won [Suwon], Dae-Jeun [Daejeon]); Kim, 1970: 792 (Korea).

= *Trogaspidia pustulata*: Kim et al., 1994: 255.

= *Neotrogaspidia pustulata*: Lelej, 1996: 21, ♀, ♂.

SPECIMENS EXAMINED (28 ♂, 6 ♀). Koryo [Korea], 10.IV 1923, 2 ♀ (H. Hasegawa) [NIAST]; GG: Yeoncheon, Mt. Jonghyun, MT, 14.VII 2000, 4 ♂ (H. S. Lee & S. W. Park) [SNU]; CN: Taejon, Changdong 2-gu, 8, 9.X 1995, 1♂, 1♀; 3, 13, 14.VIII, 29.IX 1996, MT, 4 ♂ (P. Tripotin); Sanan 2-ri near Keumsan: 17.VII 1997, 1 ♀; 12.VIII, 19.X 1997, MT, 2 ♂; 27.VII 1998, 1 ♀ (P. Tripotin); JN: Hakishoji [Baekyangsa], VIII 1924, 1 ♀ (H. Hasegawa & S. Maruta) [NIAST]; GN: Namhae Idong, 18.VI, 7, 18, 24, 28.VII, 14, 21.VIII 1998, MT, 14 ♂ (J. Y. Choi); JJ: Cheju [Jeju], 5.XI 1996, 1 ♂ (J. Y. Choi); CCRI, 5.VIII 1996, MT, 2 ♂ (J. Y. Choi).

DISTRIBUTION. Korea (Fig. 6): Gyeonggi-do, Chungcheongnam-do, Jeollanam-do, Gyeongsangnam-do, Jeju-do; Japan: Honshu, Kyushu, Tsushima, Yaku-shima, Tanega-shima, Amami-Oshima, Bonin Is.; China: Sichuan, Jiangsu, Anhui, Zhejiang, Jiangxi, Hunan, Fujiang, Guangdong, Taiwan.

REMARKS. The species was found in two sites near Taejon in open areas, but one specimen was found in a shady biotope near a small mountain stream. In Korea this species occurs from April to October.

10. *Cystomutilla teranishii* Mickel, 1935

= *Cystomutilla teranishii* Mickel, 1935: 196, ♀ [holotype - ♀, Japan, Jozankei, Hokkaido, 4.VIII 1922 (C. Teranishi)].

SPECIMENS EXAMINED (2 ♂, 2 ♀). GG: Balan, 13.IX 1984, 1 ♀ (S. B. Ahn); CN: Mt. Gyeryong, 11.VI 1997, 1 ♀ (Sk. Yamane); Posok-sa, Keumsan, 18-21.V, 4-10.VI 1998, MT, 2 ♂ (P. Tripotin).

DISTRIBUTION. Korea (Fig. 6; new record): Gyeonggi-do, Chungcheongnam-do; Japan: Hokkaido, Honshu.

11. *Dasylabris* (*Dasylabris*) *intermedia* Skorikov, 1935
= *Dasylabris intermedia*: Lelej, 1985: 131, ♀, ♂.

SPECIMENS EXAMINED (2 ♀). Korea, Palmak, 29.VI 1900, 2 ♀ (P. Schmidt) [ZISP]. Collector visited 29.VI 1900 Chongjon-Palmak [?Jangjeon], between Thongch-on [Tongcheon] and Koson [Goseong] in province Gangwon-do (Schmidt,1900).

DISTRIBUTION. Korea: Gangwon-do; Russia: southern Buryatia; Mongolia; China: Nei Mongol, Hebei, Shandong, Jiangsu, Fujian, Zhejiang; Afghanistan.

12. *Dasylabris* (*Dasylabris*) *siberica* (Christ, 1791)
= *Mutilla rubrosignata* Radoszkowski, 1865: 461, ♂ [type locality - «Kiachta, frontiere de China»; synonymized with *D. siberica* by Lelej, 1985].
= *Dasylabris rubrosignata*: Yasumatsu, 1938, ♂ (Keikido [Gyeonggi-do]); Kim, 1963: 340 (Kae-Sung [Gaeseong]); Kim, 1970: 793 (Korea) ; Kim et al., 1994: 255.
= *Dasylabris maura*: Yasumatsu, 1938: 86, ♀ (Chuseinando [Chungcheongnam-do]); Kim, 1963: 340 (Dai-Jeun [Daejeon]); Kim, 1970: 793 (Korea); Kim et al., 1994: 255.
= *Dasylabris* (*Dasylabris*) *siberica*: Lelej, 1985: 131, ♀, ♂.

DISTRIBUTION. Korea (Fig. 6); Russia: Altai, Tuva, south of Krasnoyarskii krai, south of Transbaicalia, Amur region, Primorskii krai; Mongolia; China: Nei Mongol, Shanxi, Hebei, Jiangsu.

REMARKS. The records of *D. siberica* (Christ) (=*M. rubrosignata* Rad.) for Korea are needed in re-identification because it is very close to *D. intermedia* Skor. Most records of *D. rubrosignata* auct. for China and probably for Korea belong to *D. intermedia*. A.S. Lelej collected *D. siberica* in Khasan region, Primorskii krai, Russia (boundary area with Korea) and this species must be found in Korea.

EXPECTED SPECIES

The next species, which were already recorded in the neighboring countries, are expected to be found in Korea.

***Paramyrmosa pulla* (Nylander, 1847)**
= *Paramyrmosa pulla*: Lelej, 1985: 67, ♀, ♂.

DISTRIBUTION. Russia: Chita region, Amur region, Evreyskaya autonomous region, Primorskii krai; Mongolia; North-East China.

REMARKS. This species is distributed in the mainland of East Palaearctic and no reasons for its absence in Korea, at least in little investigated North Korea. This species has been collected in Khasan region (Primorskii krai, Russia), which is boundary with Korea.

***Physetopoda eoa* (Lelej, 1977)**
= *Physetopoda eoa*: Lelej, 1985: 206, ♀, ♂.

DISTRIBUTION. Russia: south of East Siberia, Yakutia, Amur region, Khabarovskii krai, Primorskii krai; Mongolia.

REMARKS. This species is distributed in the mainland of East Palaearctic and no reasons for its absence in Korea, at least in North Korea.

***Physetopoda oratoria* Chen, 1957, comb. n.**

= *Smicromyrme oratoria oratoria* Chen, 1957: 197, ♂ (holotype - ♂, Shantung [Shandong], Tsinan, Longtong, 500-700 m).

DISTRIBUTION. China: Jilin, Nei Mongol, Shandong; ? Eastern Mongolia (Chen, 1957).

REMARKS. This species is distributed in the temperate zone of China (Chen, 1957) and can be found in Korea also. According to original description *Smicromyrme oratoria* undoubtedly belongs to the genus *Physetopoda* Schuster.

ACKNOWLEDGEMENTS

We are grateful to Dr. Y. B. Cho (Hannam University, Republic of Korea), Dr. H. S. Lee (Seoul National University, Republic of Korea), and Prof. Sk. Yamane (Kagoshima University, Japan) for the loan of valuable specimens. A. S. Lelej thanks Dr. J. K. Yoo [NIAST, Suwon, Republic of Korea] for the invitation for study of Hymenoptera collection in NIAST (Suwon). J. Y. Choi would like to express his sincere thanks to Mr. D. H. Kim (CCRI), Mr. S. J. Kim (NHRI in Namhae, now NHRI in Suwon), and Dr. M. Kwon (Alpine Experimental Station, Republic of Korea) for their kind and valuable help in the collecting of specimens by Malaise traps.

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SHORT COMMUNICATION

S. Yu. Storozhenko[1)] & J. Ch. Paik[2)]. *DIANEMOBIUS CSIKII* (BOLIVAR, 1901) NEWLY RECORDED SPECIES OF CRICKETS (ORTOPTERA, GRYLLIDAE) FROM SOUTH KOREA. - Far Eastern Entomologist. 2001. N 96: 16.

С. Ю. Стороженко, Ё. Ч. Пак. *Dianemobius csikii* (Bolivar, 1901) – новый для Южной Кореи вид сверчков (Ortoptera, Gryllidae) // Дальневосточный энтомолог. 2001. N 96. С. 16.

Five specimens of the crickets of the subfamily Nemobiinae (Ortoptera, Gryllidae) from Korea were found in the collections of Institute of Biology and Soil Sciences (Vladivostok) and Sunchon National University (Sunchon).

***Dianemobius csikii* (Bolivar, 1901)**

Dianemobius csikii: Gorochov, 1981: 24, 26; Kwon, 1994: 50.

MATERIAL. Korea: Chungcheongnam-do, vicinity of Taean, sandy beach on seashore, 12.XI 1996, 3 ♂ (A.B. Egorov); Gyeongsangbuk-do, Pohang, 1♂, 1♀ (collecting date and collector unknown).

DISRTIBUTION. Korea (new record). – Russia, Japan, China, SE Asia, India, Sri Lanka.

NOTES. This species was known from Russian Far East and Japan [1] and has been listed from «Korea» without any studied materials [2]. This is a first record of *D. csikii* from Korea based on collected specimens. Undoubtedly this species widely distributed in Korea and inhabits sandy beach on seashore and rivers covered by *Artemisia* spp.

1. Gorochov, A.V. 1981. [Review of the crickets of the subfamily Nemobiinae (Orthoptera, Gryllidae) of the USSR.] – Vestnik zoologii 2: 21-26. (In Russian)

2. Kwon, Y.J. 1994. [Order 14. Orthoptera.] – In: Check List of Insects from Korea. Kok-Kuk University Press, Seoul: 48-53. (In Korean)

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