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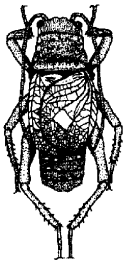

Дальневосточный энтомолог

Journal published by
Far East Branch of the
Russian Entomological Society
and Laboratory of Entomology
Institute of Biology and Pedology,
Vladivostok

Number 6: 1-20 January 1995

A REVIEW OF PALAEARCTIC AND ORIENTAL SPECIES OF GENUS *NEMKA* LELEJ WITH DESCRIPTION OF ORIENTAL GENUS *MICKELOMYRME* GEN. N. (HYMENOPTERA, MUTILLIDAE)

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Thirteen species of genus *Nemka* are reviewed and key to the species is given. New species *N. pagdeni* sp. n. from South China (Yunnan) and hitherto unknown female of *N. aurantiaca* (Skor.) are described. New synonymy is proposed for *Nemka* Lelej, 1985, stat. n. = *Horaia* Tsuneki, 1993, syn. n. and *N. wotani* (Zav., 1913) = *Smicromyrme yasumatsui* Mickel, 1936, syn. n. Mating flight and most probable host of *N. aurantiaca* are recorded. New genus *Mickelomyrme* gen. n. (type species *Mutilla hageni* Zav.) close to *Nemka* and including 8 known Oriental species, is described.

KEY WORDS: Mutillidae, Palearctic, Oriental region, taxonomy.

А.С.Лелей. Обзор палеарктических и ориентальных видов рода *Nemka* Lelej с описанием ориентального рода *Mickelomyrme* gen. n. (Hymenoptera, Mutillidae) // Дальневосточный энтомолог. 1995. № 6. С. 1-20.

Даны обзор 13 палеарктических и ориентальных видов рода *Nemka* и определительная таблица видов. Описываются новый для науки вид *N. pagdeni* sp. n. из Южного Китая (Юннань) и неизвестная ранее самка *N. aurantiaca* (Skor.). Предложена новая синонимия:

Nemka Lelej, 1985, stat. n. = *Horaia* Tsuneki, 1993, syn. n. и *N. wotani* (Zav., 1913) = *Smicromyrme yasumatsui* Mickel, 1936, syn. n. Сообщаются данные о поведении и наиболее вероятном хозяине *N. aurantiaca*. Описывается новый род *Mickelomyrme* gen. n. (типовой вид *Mutilla hageni* Zav.), который наиболее близок к роду *Nemka* и включает 8 известных ориентальных видов.

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INTRODUCTION

Mutillid fauna of Oriental region includes 441 described species in 28 genera. Most of these taxa belong to subfamily Mutillinae (379 species); genus *Mutilla* Linnaeus, 1756 includes 279 unsorted species, described by oldest taxonomists. It should be expected that diversity of Oriental mutillid wasps will be no less than of Afrotropical one (1116 species in 55 genera) (Lelej, 1993). Oriental Mutillinae includes (besides *Mutilla* and *Ctenotilla* Bischoff, 1920) tribe Trogaspidiini (*Glossotilla* Bischoff, 1920; *Indratilla* Lelej, 1993; *Petersenidia* Lelej, 1992; *Taiwanomyrme* Tsuneki, 1993, stat. n.; *Trogaspidia* Ashmead, 1899; *Zavatilla* Tsuneki, 1993, stat. n.; *Zeugomutilla* Chen, 1957) and tribe Smicromyrmini (*Ephutomma* Ashmead, 1899; *Nemka* Lelej, 1985, stat. n.; *Promecilla* Andre, 1903; *Smicromyrme* Thomson, 1870; *Mickelomyrme* gen. n.).

SOURCES OF MATERIAL. Natural history data of *Nemka aurantiaca* is obtained during my visit to Turkmenistan in 1990. Taxonomic data is based on large mutillid collection in Zoological Institute, Sankt-Petersburg and specimens collected by various specialists during Soviet-Chinese expeditions 1956-1957, supplemented by material from other collections as noted in the Acknowledgments. Many specimens were collected by Drs. N. Kurzenko, V. Kazenas and me in Soviet Middle Asia from 1966 through 1990 and during visits to Japan in 1991, 1993.

MATERIAL DEPOSITORIES. Institutional collections in which the material examined is deposited are abbreviated in the text as follows. IBP - Institute of Biology and Pedology, Vladivostok; NSMT - National Science Museum (Nat. Hist.), Tokyo; ZIS - Zoological Institute, Sankt-Petersburg; ZMMU - Zoological Museum of Moscow University.

Tribe Smicromyrmini Bischoff, 1920

Genus Nemka Lelej, 1985, stat. n.

Nemka Lelej, 1985: 240 (*Smicromyrme* subg.; type species *Mutilla viduata* Pallas, 1773, by original designation).

Horaia Tsuneki, 1993: 43 (*Smicromyrme* subg.; type species *Smicromyrme (Horaia) chihpenchia* Tsuneki, 1993, male), **syn. n.**

GENERIC DIAGNOSIS. Male. Head not elevated posterad, frons and vertex usually punctate, not longitudinally striate. Mandibles robust tridentate at the apex, deeply excised beneath forming large tooth beneath near the base (Figs. 5, 6). Clypeus depressed below the mandibles. Ocelli not enlarged. Scape obscurely bicarinate beneath. Midcoxae somewhat moved off. Mesopleurae beneath with one or two pairs of denticles or tubercles. Tegulae rounded posterad, not ever or slightly protruding behind scuto- scutellar suture. Wing dark fuscous, pterostigma slightly shorter than distance between it and base of RS on vein Sc+R (Figs. 2, 3). Gaster usually with some segments red or yellowish-red. First astral tergum shorter than half of 2nd one (Fig. 11). 2nd gastral segment with shorter lateral felt lines on sternum and longer ones on tergum. Volsella of genitalia with long narrow cuspis, the latter with long setae, basivolsella with rounded lobe outside, external margin of latter with extremely long curved setae (Figs. 13-15).

Female. Foretarsi with long flatten spines, apical spine of 1st tarsal segment 1.5 times as length of 2nd tarsal segment. 2nd gastral tergum with one basal and one apical pale spots, very often with pale band posterad more or less widened medially (Figs. 8-10). 3rd tergum always with wide pale band. Pygidial area short oval, carinated laterally, longitudinally rugoso- striated throughout or with apical one-seventh glabrous.

SPECIES INCLUDED. 13 Palaearctic and Oriental species in two groups: *viduata* group: *N. viduata* (Pallas), *N. tenasserimica* (Magr.), *N. curvisquamata* (Chen), *N. wotani* (Zav.), *N. chihpenchia* (Tsuneki), *N. limi* (Chen), *N. pagdeni* sp. n., *N. kellyi* (Pagden), *N. taiwanensis* (Mickel); *aurantiaca* group: *N. aurantiaca* (Skor.), *N. orientalis* (Mickel), *N. pondicherensis* (Sich. et Rad.), *N. horai* (Hammer).

SPECIES EXCLUDED. Next Palaearctic species must be excluded from this genus: *Smicromyrme elongata* (Rad.), *S. radoszkovskii* Skor., *S. pliginskiji* Lelej, *S. transcaucasica* Lelej, *S. pallipes* Lelej, *S. turanica* (Mor.). Most probably that these species must be regarded as a separate genus.

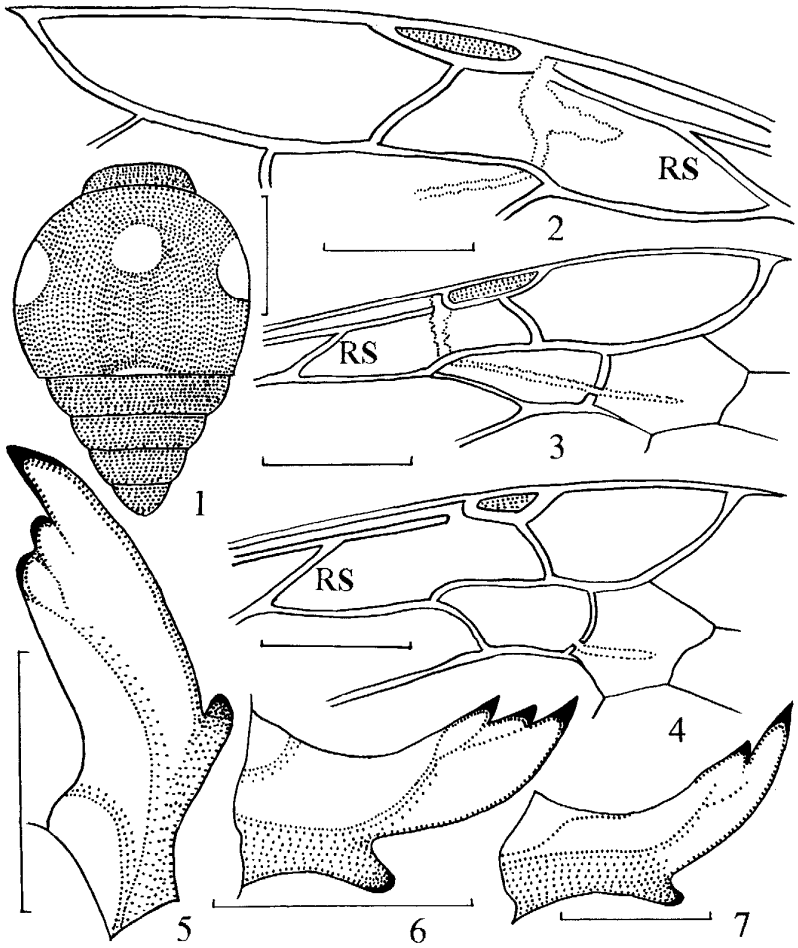
RANGE. Oriental, south Palaearctic and probably Afrotropical regions.

HOST. Ground-nesting sphecid wasps *Bembecinus, Bembix, Gorytes* and ground-burrowing megachilid bee *Megachile*.

DISCUSSION. The males of Nemka are similar to those of Mickelomyrme gen. n. by the genitalia structure, but differ from them in having tridentate mandibles (Figs. 5, 6 vs. Fig. 7) and one or two pairs of precoxal denticles or tubercles on mesopleurae beneath (in Mickelomyrme mandibles bidentate and mesopleurae beneath without denticles or tubercles). The females of Nemka differ from those of Mickelomyrme in having short oval pygidial area and one basal median pale spot on 2nd gastral tergum (Figs. 8-10 vs. Fig. 1) (in *Mickelomyrme* pygidial area elongated and 2nd gastral tergum with 3 basal pale spots).

Key to Palearctic and Oriental species of *Nemka*

1. Males (unknown for *N. pondicherensis, N. horai, N. curvisquamata, N. limi, N. tenasserimica*) 2
- Females (unknown for *N. chihpenchia, N, taiwanensis, N. orientalis;* and *N. horai* not included) 9
2. Clypeus with basal and subbasal denticles and two weak preapical tubercles.. 3
- Clypeus with more or less developed basal denticle, without any subbasal and preapical tubercles 5
3. Four distal gastral segments black. Pronotum dorsally, scutellum, metanotum at middle clothed with long raised pale hairs. 8th sternum (hypopygium) not bilobed apically. Metasternum glabrous 4
- One apical gastral segment black. Pronotum dorsally, scutellum, metanotum at middle clothed with dense appressed and scattered raised golden pubescence ..... 8. *N. kellyi* (Pagden)
4. Propodeal dorsum with median longitudinal closed area and two rounded large basal cells laterad of it. 9.5-15.0 mm ..... 4. *N. wotani* (Zav.)
- Propodeal dorsum without enlarged closed basal cells. 10.0 mm..... ..... 5. *N. chihpenchia* (Tsun.)
5. Gaster with bands of dense yellowish pubescence in terga 3 and 4; at most 2nd segment ferruginous-red. Second gastral segment except the apex ferruginous-red (*N. v. viduata* Pall.) or brownish to black (other subspecies). 5.0-19.0 mm ..... 1. *N. viduata* (Pallas)
- Gaster without pale bands on terga (do not mixed with fascia); at least segments 2 and 3 ferruginous-red 6
6. Gaster ferruginous- or yellowish-red except base of tergum 1 7
- Three or four distal gastral segments black 8
7. Propodeum posterad with distinct median carina from apex of closed area to gastral base. Tegulae not protruded beyond mesonotum hindmargin. Mesosternum with pair of conical denticles and pair of blunt tubercles before midcoxae. 9.0-12.0 mm ..... 10. *N. aurantiaca* (Skor.)
- Propodeum posterad without median longitudinal carina. Tegulae protruded beyond mesonotum hindmargin in one quarter its length. Mesosternum with pair of blunt tubercles before midcoxae. 12.0 mm .. 11. *N. orientalis* (Mickel)
8. Scutellum with sparse long raised pale hairs only. Propodeum with coarse confluent cells. 2nd gastral sternum with large contiguous punctures. Long narrow process of volsellar cuspis with short apical hairs not protruded beyond the apex of gonostyli. Distal gastral 3 segments black. 10.5-18.0 .... 9. *N. taiwanensis* (Chen)
- Scutellum with dense short recumbent and sparse long raised pale pubescence. Propodeum with less coarse sculpture. 2nd gastral sternum with large sparse punctures. Long narrow process of volsellar cuspis with long apical hairs



Figs. 1-7. 1) *Mickelomyrme hageni*, female gaster; 2) *Nemka wotani*, part of male forewing; 3) do. *N.aurantiaca;* 4) do. *M. hageni;* 5) *N. wotani*, male mandible; 6) do. *N.aurantiaca;* 7) do. *M. exacta*. Scale line = 1 mm.

evidently protruded beyond the apex of gonostyli. Distal gastral 3-4 segments lack. 7.0-9.5 mm ..... 7. *N.pagdeni* sp. n.

9. Posterior margin of 2nd gastral tergum with pale fascia and band widened arcuately or triangularly medially 10
- Posterior margin of 2nd gastral tergum with median pale spot and pale fascia or without of the latter 16

10. Frons with pale spot. Last gastral tergum with black lateral setae. - Posterior band on tergum 2 triangularly widened at middle. Meso- and metapleurae below without short dense recumbent argent pubescence. Pygidial area longitudinally striate, striae slightly divergent to apex. Thorax red with sparse golden pubescence on dorsum (*N. v. viduata* Pall.) or brownish to black with more or less dense pale pubescence on dorsum (other subspecies). 6.0-15.0 mm ..... 1. *N. viduata* (Pallas)

- Frons with black pubescence. Last gastral tergum with pale lateral setae 11

11. Striae of pygidial area more or less parallel and reach the apex 12

- Striae of pygidial area not reach the apex, 1/6-1/7 apical part smooth and shining 13

12. Meso- and metapleurae below with large spot of dense short recumbent yellowish pubescence. Posterior band of 2nd gastral tergum broad, arcuately widened at middle and very narrow laterally. Scutellar scale slightly wider than its length. Antennae brown, reddish-brown below; legs brown. 5.0-6.0 mm ... . 2. *N. tenasserimica* (Magr.)

- Meso- and metapleurae below without spot of pale recumbent pubescence. Posterior band of 2nd gastral tergum less broad, triangularly widened at middle. Scutellar scale 4 times as wide as its length. Antennae and legs black. 12.0-13.0 mm ..... 3. *N. curvisquamata* (Chen)

13. Vertex with golden pubescence. Larger: 9.0-14.0 mm. Basal spot and posterior band of 2nd gastral tergum golden-yellow (*N. l. limi* Chen) or whitish (*N. l. nanhai* Chen) ..... 6. *N. limi* (Chen)

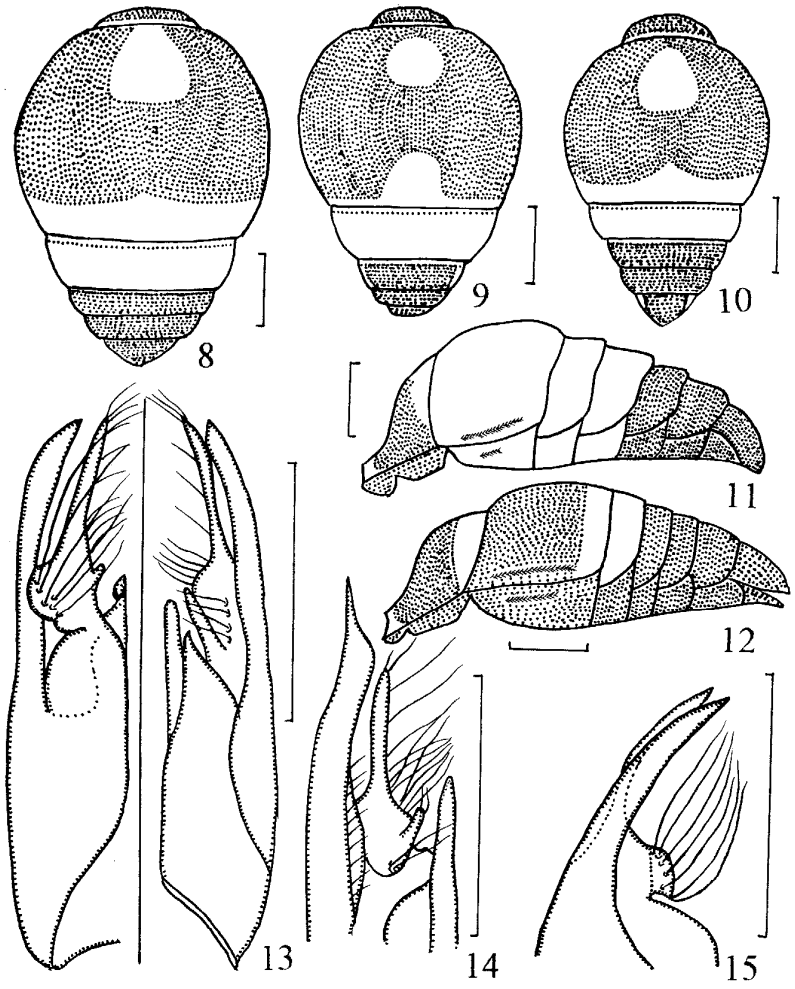
- Vertex with black pubescence. Smaller: 6.0-8.5 mm 14

14. Frons and vertex with dense confluent punctures. Posterior band of 2nd gastral tergum triangularly widened at middle and narrowed laterally. Long eye diameter is 2.1 times as distance between lower eye margin and base of mandible 15

- Frons and vertex with separated punctures with distance between them less than their diameter. Posterior band of 2nd gastral tergum more or less equal width not shorter or slightly shorter than one on 3rd tergum, weakly triangularly widened at middle. Long eye diameter is 2.6-2.7 times as distance between lower eye margin and base of mandible. - Head black, sometimes with brownish-red spot on vertex. Scutellar scale at most 2 times as wide as its length. Pygidial area shined apically. Hypostomal carina not curved near mandibles. 6.0-8.5 mm ..... 4. *N. wotani* (Zav.)

15. Posterior face of propodeum strongly denticulate dorsally. Pygidial area granulated apically. Thoracic dorsum with scattered erect and sparse appressed brown or reddish pubescence. 4th and 5th gastral terga with a few long raised pale hairs. - Scutellar scale not wider its length. Hypostomal carina curved near mandibles. 6.5-7.5 mm ..... 7. *N. pagdeni* sp.n.

- Posterior face of propodeum coarsely reticulately punctate dorsally. Pygidial



Figs. 8-16. 8) *Nemka wotani,* female gaster; 9) do. *N.aurantiaca*; 10) do. *N. pagdeni,* paratype; 11) *N. pagdeni* (paratype), male gaster; 12) do. *Mickelomyrme exacta;* 13, 15) *N. pagdeni* (holotype), male genitalia (13 - ventral aspect at left, dorsal at right; 15 - lateral aspect); 14) do. *N. wotani,* dorsal aspect. Scale line = 1 mm.

area subrugulose apically. Thoracic dorsum with scattered erect and sparse appressed black pubescence. 4th and 5th gastral terga with lateral patch of golden pubescense. 7.7 mm ..... 8. *N. kellyi* Pagden

16. Second gastral sternum with sparse punctures, in lateroposterior corner the distance between punctures is 2-3 times as puncture diameter. Antennae and legs black. Posterior margin of 2nd gastral tergum with pale fascia. 6.5-8.0 mm ..... 10. *N. aurantiaca* (Skor.)
- Second gastral sternum with dense punctures, in lateroposterior corner the distance between punctures less than puncture diameter. Antennae below and legs brown. Posterior margin of 2nd gastral tergum with pale patches laterally. 8.0- 11.0 mm ..... 12. *N. pondicherensis* (Sich. et Rad.)

1a. *Nemka viduata viduata* (Pallas, 1773), comb. n.

Mutilla viduata Pallas, 1773: 730, male [type locality - river Shulba (East Kazakhstan near Semipalatinsk)].

Smicromyrme viduata viduata: Lelej, 1985: 242, female, male (part.); Petersen, 1988: 218, female, male.

SYNONYMY. *Tiphia stridula* Rossi, 1790; *Mutilla coronata* Rossi, 1792; *M. coronata* Fabricius, 1793; *M. paedemontana* Fabricius, 1794; *M. macquarti* Lepeletier, 1845; *M. sungora* Pallas, 1773 (female non male). I consider *M. macquarti* Lep. (male without dense pale pubescence on pronotum and scutellum) only as a form of *N. v. viduata* Pall.

MATERIAL (175 males, 454 females). Russia: Orenburg region (5 males, 2 female), Samara region (2 females), Volgograd region (12 males, 62 females), Astrachan' region (2 females), Dagestan (20 males, 6 females), Stavropol' Territory (2 males); Mongolia (1 male, 2 females); Kazakhstan (52 males, 57 females); Azerbaijan (1 male); Armenia (4 males, 4 females); Georgia (1 female); Ukraine (70 males, 312 females); Yugoslavia: Montenegro (1 female); Greece (8 males, 2 females). Specimens deposited in ZIS and IBP.

RANGE. Mongolia, Russia, Kazakhstan northward of Mangyshlak -Aral See -Balkhash Lake, Azerbaijan, Armenia, Georgia, Ukraine, Slovakia, Hungary, Austria, South Germany, Romania, Bulgaria, Yugoslavia, Albania, Greece, Italy, South France, Spain (Gerona, Baleares), Turkey, Syria.

HOST. Ground-burrowing sphecid wasps *Bembecinus tridens* (F.) (Grandi, 1961) and *Gorytes sp.* (Andre, 1899).

1b. *Nemka viduata tunensis* (Fabricius, 1804), comb. n.

Mutilla tunensis Fabricius, 1804: 433, female [lectotype (designated by Petersen, 1988) - female, Algeria & Tanger Mus. S:&T:L *Mutilla tunensis* Fabr. (Zool. Mus. Copenhagen)].

Smicromyrme viduata tunensis: Lelej, 1985: 247, female, male (part.); Petersen, 1988: 195, female, male.

MATERIAL (2 males, 2 females). 2 males, Morocco, 1900 Vaucher [ZIS]. 2 females, Algeria [ZIS].

RANGE. Morocco, Algeria, Tunisia.

1c. *Nemka viduata andalusiana* (Skorikov, 1935), comb. n.

Smicromyrme viduata var. *andalusiana* Skorikov, 1935: 319, female [lectotype (here designated) - female, "Andalusia (South Spain), Staudinger" [ZIS].

Smicromyrme viduata andalusiana: Petersen, 1988: 195, female, male (Iberian Pen.).

MATERIAL (13 males, 5 females). Spain: 1 female (paralectotype of andalusiana Skor.), 8 males, Andalusia (Staudinger) [ZIS]; 1 female, 1 male, Madrid, Robledo de Chavela, 2, 20-25 Aug. 1973 (F. Fernandez) [IBP]; 1 male, Ciudad Real, Ruidera, 22 July 1971 (J. Suarez) [IBP]; 2 females, Almeria, Gergal, 10 July 1963 (J. Suarez) and El Alqulan, 23 May 1974 (J. Suarez) [IBP]. Portugal: 1 male, Lusitania [ZIS].

RANGE. Spain (except Gergona and Baleares), Portugal.

HOST. Ground-burrowing sphecid wasps *Bembix olivacea* F. (Templado, 1958).

1d. *Nemka viduata luctuosa* (Radoszkowski, 1865), comb. n.

Mutilla luctuosa Radoszkowski, 1865: 453, tab. 8, fig. 5, female [syntypes - Syrdarya river, Kazakhstan (Inst. Syst. Exper. Zool., Krakow)].

SYNONYMY. *Mutilla bartholomaei* Radoszkowski, 1865; *M. bareyi* Radoszkowski, 1893; *Smicromyrme viduata protunensis* Skorikov, 1935; *S. simia* Skorikov, 1935. I consider *M. bareyi* Rad. (male without dense pale pubescence on pronotum and scutellum) only as a form of *N. v. luctuosa* Rad.

MATERIAL (119 males, 105 females). North-West China (1 female); Kazakhstan (61 males, 79 females); Kyrgyzstan (4 males, 4 females); Turkmenistan (4 females); North Iran (1 male, 7 females); Azerbaijan (24 males, 2 females); Armenia (5 males, 6 females); Georgia (1 male, 3 females) and forma bareyi: southwest Turkmenistan (7 males), Armenia (16 males). Specimens deposited in ZIS and IBP.

RANGE. North-West China, Kazakhstan southward of Mangyshlak - Aral Sea - Balkhash Lake, Kyrgyzstan, Turkmenistan, North Iran, Azerbaijan, Armenia, Georgia, Turkey.

HOST. According to Marikovskaya (1968) this subspecies is parasitoid of ground-burrowing colonial megachilid bee *Megachile leucomalla* Gerst.

2. *Nemka tenasserimica* (Magretti, 1892), comb. n.

Mutilla tenasserimica Magretti, 1892: 214, female [type locality - Tenasserim (Myanmar)]; Bingham, 1897: 20, female.

MATERIAL (1 female). Thailand: 1 female, Sam Ngao at Bhumipol Dam, 6-8 Nov. 1979 (Zool. Mus. Copenhagen Exped.), identified as Smicromyrme tenasserimica (Magr.) by B. Petersen [IBP].

RANGE. Myanmar, Thailand (new record).

3. *Nemka curvisquamata* (Chen, 1957), comb. n.

Smicromyrme curvisquamata Chen, 1957: 183, 214, female [holotype female - Taiwan, Taitung Prov., Chipon, 1 July 1927 (S. Issiki) in Taiwan Agric. Res. Inst., Taipei].

MATERIAL. No specimens examined.

RANGE. China (Taiwan).

4. *Nemka wotani* (Zavattari, 1913), comb. n.
Figs. 2, 5, 8, 14

Mutilla wotani Zavattari, 1913: 27, female [lectotype - female, "Formosa, Tainan, Aug. 1909 (H. Sauter)", designated by Mickel, 1933b) (Deutsch. Entomol. Inst.)]; Sonan, 1931: 7, female (Pescadores) [Penghuliedao].

Smicromyrme wotani: Mickel, 1933b: 420, female (Taiwan); 1935: 291, female (Taiwan); Yasumatsu, 1938: 85, female (Liaoning); 1951: 70, female (Shansi); Chen, 1957: 207, females (Taiwan); Tsuneki, 1972b: 18, female (Taiwan); Lelej, Yamane, 1992: 631, female, male (Tanega-shima); Tsuneki, 1993: 40, female (Taiwan).

Smicromyrme yasumatsui Mickel, 1936: 52, female [holotype - female, Fukuoka, Chikuzen, Kyushu, 3 Sept. 1930 (K. Yasumatsu) (University of Minnesota)], **syn. n.**; Tsuneki, 1972a: 17, female (Honshu).

MATERIAL. (2 male, 3 females). Japan, Honshu: male, female, Fukui-ken, Fukui-shi, Sanri-hama, 28 July 1993 (A. Lelej, H. Kurokawa) [IBP]. Taiwan: 1 female, Chipon, 18 Aug. 1936 [NSMT]; 1 male, Chipon, 15 Aug. 1936 [NSMT]. North Vietnam: 2 females, Prov. Quang Ninh, Il. Phong Vong, 10 Oct. 1990 (V. Kuznetsov) [IBP].

RANGE. Japan (Honshu, Kyushu, Tanega-shima), China (Liaoning Shansi, Taiwan), Vietnam (new record).

REMARKS. Male and female caught by me were collected on sandy beach at the same place and time on Honshu. Based on these as well as on other specimens of male and 7 females, collected on Tanega-shima (Lelej, Yamane, 1992), I consider ones as the opposite sexes of the same species. Moreover there

is only one species of *Nemka* in Japan: *N. wotani*. Detail description of *Smicromyrme yasumatsui* from Kyushu (Mickel, 1936) quite agree with female specimens of *N. wotani*, from Honshu and Taiwan and so I regard *S. yasumatsui* as a junior synonym of *N. wotani*.

5. *Nemka chihpenchia* (Tsuneki, 1993), comb. n.

Smicromyrme (Horaia) chihpenchia Tsuneki, 1993: 43, male [holotype - male, Taiwan, Taitung Pref., Chihpenchi, 12 Aug. 1976 (T. Murota) (coll. Tsuneki), institution unknown].

MATERIAL. No specimens examined.

RANGE. China (Taiwan).

REMARKS. Based on detail description of *S. chihpenchia* I regard this species to be *Nemka*. I could find the only feature (see key above) for differentiation of *N. chihpenchia* male from one of *N. wotani*. May be the absence of usual closed areas on propodeal dorsum of *N. chihpenchia* is an aberration only.

6. *Nemka limi* (Chen, 1957), comb. n.

Smicromyrme limi limi Chen, 1957: 183, 215, female [holotype - female, China, Zhejiang, 20 Aug. 1931 (O. Piel) in Muse Heude, Shanghai].

MATERIAL. No specimens examined.

RANGE. China (Zhejiang, Jiangsu, Hainan); subspecies *N. limi nanhai* Chen known from Hainan.

7. *Nemka pagdeni* Lelej, sp. n.
Figs. 10, 11, 13, 15

TYPE MATERIAL (4 males and 2 females). Holotype - male, China, Yunnan Prov., 30 km SW Jinping, 400 m, 28 Apr. 1956 (Huang Ke-ren et al.) [ZMMU]. Paratypes: 2 males with the same labels as holotype; China, Yunnan Prov.: 2 females, N "1235 3", "1271 Б" [South-East Yunnan, May-June 1956 (D. Panfilov) [ZMMU]; 1 male, Kunmin, 1900 m, 25 March 1955 (V. Popov) [ZMMU]; 2 males, 30 km SW Jinping, 400 m, 28 Apr. 1956 (Huang Ke-ren et al.) [ZMMU].

DESCRIPTION. Male. Length 7.0-9.5 mm. Black, gaster except one basal and three-four distal segments yellowish-red; wings strongly infuscated; mandibles brownish-red preapically; scape, antennal tubercles, forelegs, tegulae, mid- and hindtarsi brown; spures of mid- and hindlegs white.

Clypeus laterally, scape, frons, occiput, genae, mandibles basally clothed with appressed short and scattered long raised pale pubescence, appressed

pubescence on frons is denser; vertex with scattered black or brown pubescence. Pronotum dorsally, scutellum and metanotum medially with dense appressed short and scattered raised long whitish pubescence; pronotum laterally, meso-, metapleurae, propodeum and legs with scattered long whitish pubescence; scutum, axillae, scutellum anterad and tegulae with scattered black pubescence; propodeal dorsum basally with appressed pale microsetae not clothed the sculpture. Firstfifth gastral terga and 1st-8th gastral sterna with scattered short recumbent and long raised yellowish pubescence, 6th and 7th terga with black one; 1st-5th terga with golden ringes, 2nd-6th sterna with whitish and 6th tergum with black ones.

Relative width of head and thorax including tegulae 7.8 : 9.7. Mandibles robust, broad and tridentate at the apex, deeply emarginate and toothed beneath near the base. Clypeus with straight midpart anterad and smooth shining triangle main part, depressed conspicuously below the dorsal margin of the mandibles, elevated medially posterad into a conspicuous acute tooth between the antennal tubercles. Scape obscurely bicarinated beneath. Ocelli not enlarged, ocello-ocular distance is 1.8 times as hind ocellar distance. Frons with longitudinal median sulcus. 3rd antennal segment is 1.4 times 2nd one and 0.7 times 4th one, the latter equal 5th antennal segment. Antennal tubercles strongly carinate above, the carina continued along the outer margin of the antennal tubercles and curved to the eyes. Frons confluently punctate, vertex and genae more distinctly punctate.

Mesonotum with notauli reaching its foremargin, short parapsidal lines and well developed raised parascutal (=parategular) carinae. Scutellum simple without longitudinal median furrow anterad; prescutellar transverse fovea deep and shining. Propodeal dorsum with median triangle closed area, propodeal posterior face with well developed median longitudinal carina. Pronotum dorsally, scutum and mesopleurae densely not confluently punctate; lateral pronotal lobes longitudinally striate posterad and micropunctate anterad with vertical anterior carina. Mesosternum with two conical tubercles anterad and two transverse blunt precoxal tubercles. Midcoxae moved off, metasternum longitudinally striate. Hindcoxae carinate inside. Tegulae slightly protruding behind scuto-scutellar suture, smooth and shining, shallowly punctate inside. Forewing venation is similar to one of N. aurantiaca (Fig. 3).

First gastral segment rather short, carinate beneath; 2nd gastral sternum with short lateral felt line, distinctly punctate; 2nd gastral tergum with long lateral felt lines and moderate distinct punctures, close at the base and sides, sparse medially. Last tergum convex with moderately large close somewhat confluent punctures and median impunctate line; 7th sternum strongly depressed posterad; 8th sternum (hypopygium) with deep round median fovea not extending to the posterior margin, the latter glabrous. Genitalia and volsella as Figs.13,15.

Female. Length 6.5-7.5 mm. Head, legs and gaster black; thorax ferruginous-red, scutellar scale somewhat darker; forelegs, midand hindtarsi

brownish; basal half of mandibles ferruginous-red, antennal tubercles, scape and palps reddish-brown.

Frons and vertex with scattered black pubescence, on vertex with recumbent reddish one, other head parts with scattered pale pubescence. Thorax dorsally with sparse short recumbent and long raised hairs. Mesopleurae with vertical row of long raised pale setae. Pronotum anterad and propodeum posterad with scattered long raised pale setae. Meso- and metapleurae beneath with moderately dense appressed pale micropubescence. Legs with sparse subappressed and raised pale pubescence. 1st gastral tergum with pale fringe posterad. 2nd gastral tergum with basal median spot and posterior apical band, triangularly widened medially, of appresed yellowish pubescence, the distance between spot and band slightly less than spot diameter. 3rd tergum with broad entire band of pale pubescence. 1st tergum, 2nd tergum laterally and gastral sterna with scattered pale pubescence; 2nd-5th sterna with pale fringe posterad. 4th and 5th terga with a few lateral pale setae. 6th tergum with pale pygidial fringes. Other parts of gastral terga with black pubescence.

The relation of longitudinal eye diameter to distance between eye and mandible base is 2.1. Clypeus without any tubercle on anterior margin, strongly elevated basally with transverse concave preapical glabrous furrow limited above by transverse arched carina and longitudinal median carina, the latter with blunt tubercle anterad. 2nd antennal segment as long as wide, 3rd antennal segment 2.0 times as 2nd one and 1.3 times as 4th one, 5th antennal segment as long as wide. Frons and vertex densely not confluently punctate.

Scutellar scale as long as wide, hindcoxae carinate inside; thoracic dorsum anterad of scutellar scale coarsely reticulately punctate; metanoto-propodeal suture with row of denticles; propodeum dorsally and its posterior upper part strongly denticulate. Thorax laterally glabrous and microsculptured. First gastral sternum longitudinally carinate. Pygidial area short oval, strongly carinate laterally, irregularly longitudinally and divergently striate; apical third subglabrous not shining. 2nd gastral sternum with sparse punctures, finely punctate marginally.

RANGE. Tropical zone of South China (Yunnan).

DISCUSSION. Male of *N. pagdeni* has resemblance to that of *N. kellyi* but differs from the latter by smaller ocelli (in kellyi OOD:POD=1.0), by absence of subbasal clypeal tubercle, by not bilobed last sternum. Female of *N. pagdeni* is similar to that of *N. kellyi* in having the same body color and pale gastral design. The differences between both these species are given in the key above. Male and female of new species are close to those of *N. kellyi* correspondently and may be the opposite sexes of the same species *(N. pagdeni)*. Both sexes of *N. pagdeni* collected in south Yunnan, where discovered one species of *Nemka*. Additional evidences of sex combination are needed.

ETYMOLOGY. This species is dedicated to H. T. Pagden, who studied the mutillid wasps of South-East Asia.

8. *Nemka kellyi* (Pagden, 1934), comb. n.

Smicromyrme kellyi Pagden, 1934: 439, figs 12-14, male, female [holotype - male, Bukit Panchor, Kedah (Malaysia), 10 July 1929 in British Museum (Nat. Hist.)] (Malay Pen.); 1949: 218, female, male (Malay Pen.).

Timulla (Trogaspidia) kellyi: Mickel, 1935: 267, male (Malay Pen.).

Smicromyrme kedahensis Mickel, 1935: 274, 290, female [nom. n. pro *Smicromyrme kellyi* Pagden, 1934, female non male; holotype - female, Bukit Panchor, Kedah, 10 July, 1929 in British Museum (Nat. Hist.)]. Synonymized by Pagden, 1949.

MATERIAL. No specimens examined.

RANGE. Malaysia (Malay Pen.).

9. *Nemka taiwanensis* (Mickel, 1933), stat. et comb. n.

Mutilla dimidiata: Zawattari, 1913: 42, male (Taiwan).

Mutilla gribodoi: Zavattari, 1913: 42, male, part. (Taiwan).

Timulla (Trogaspidia) orientalis taiwanensis Mickel, 1933b: 408, male [holotype - male, Taiwan, Taihanroku, 3-10 Aug. 1908 (H. Sauter) (Deutsch. Entomol. Inst.)]; 1935: 267, male (Taiwan).

Smicromyrme orientalis taiwanensis: Chen, 1957: 197, figs. 47, 48 male (Jiangsu, Anhwei, Zhejiang, Jiangsu, Fujian, Taiwan).

MATERIAL. No specimens examined.

RANGE. China (Jiangsu, Anhwei, Zhejiang, Jiangsu, Fujian, Taiwan).

REMARKS. The male of *N. taiwanensis* resembles to that of *N. wotani* but differs by longer volsellar cuspis [Figs. 47, 48 (Chen, 1957) vs. Fig. 14]. The specimens misidentified Tsuneki (1972) as *Smicromyrme orientalis taiwanensis* actually belong to unknown species of *Mickelomyrme*.

10. *Nemka aurantiaca* (Skorikov, 1935), comb. n.
Figs. 3, 6, 9

Smicromyrme viduata var. *aurantiaca* Skorikov, 1935: 310, male [holotype - male, Mountains to south of Bampur, South-East Persia, 20 July 1898 (N. Zarudnyj) (South-East Iran), examined (ZIS)].

Smicromyrme (Smicromyrme) aurantiaca: Lelej, Kabakov, 1981: 153, male (Central Afghanistan).

Smicromyrme (Nemka) aurantiaca: Lelej, 1985: 216, male (key).

MATERIAL (121 males and 32 females). Turkmenistan: 121 males, 32 females (1 male and 1 female in copula), 5 km N Kushka, Morgunovka, 22-23 May 1990 (N. Kurzenko, A. Lelej, P. Lehr) [IBP].

DESCRIPTION. Male. Specimens from Turkmenistan and Afghanistan

differ from holotype by absence of dense recumbent pale pubescence on pronotum and scutellum and smaller size (8.0-9.0 mm vs. 12.0 mm in holotype).

Female (hitherto unknown). Length 6.5-8.0 mm. Head, legs and gaster black; thorax ferruginous-red, scutellar scale somewhat darker; tarsi brown; basal half of mandibles ferruginous-red, palps pale brown.

Frons and vertex with recumbent short whitish pubescence and scattered raised black setae, other head parts and scape with scattered pale pubescence. Thorax dorsally with sparse short recumbent yellowish pubescence and long raised black hairs. Mesopleurae with vertical row of long raised pale setae. Pronotum anterad and propodeum posterad with scattered long raised pale setae. Meso- and metapleurae below with large spot of dense appressed argent hairs. Legs with sparse subappressed and raised pale pubescence. 1st gastral tergum with pale fringe posterad. 2nd gastral tergum with median basal and apical spots and posterior narrow entire apical fringe of appresed argent pubescence, the distance between anterior and posterior spot is equal or slightly more than basal spot diameter. 3rd tergum with broad entire band of argent pubescence. 1st tergum, 2nd tergum laterally and gastral sterna with scattered pale pubescence; 2nd5th sterna with argent fringe posterad. 4th and 5th terga with lateral patches of argent setae and scattered long raised pale setae. 6th tergum with argent pygidial fringes. Other parts of gastral terga with black pubescence.

The relation of longitudinal eye diameter to distance between eye and mandible base is 1.8-2.0. Clypeus without any tubercle on anterior margin, strongly elevated basally with transverse concave preapical glabrous furrow limited above by transverse arched carina and median weak tubercle, . 2nd antennal segment as long as wide, 3rd antennal segment 2.0 times as 2nd one and 1.3 times as 4th one, 5th antennal segment as long as wide. Frons and vertex densely not confluently punctate.

Scutellar scale slightly wider than its length; hindcoxae carinate inside; thoracic dorsum anterad of scutellar scale coarsely reticulately punctate; propodeum dorsally and its posterior upper part strongly denticulate. Thorax laterally glabrous with shallow sparse punctures on pronotal and propodeal lobes.

First gastral sternum longitudinally carinate. Pygidial area short oval, strongly carinate laterally, longitudinally striate till apex; 2nd gastral sternum with rare punctures, finely punctate marginally.

RANGE. Turkmenistan (new record), southeast Iran, Central Afghanistan.

NATURAL HISTORY. All specimens of *N. aurantiaca* were collected in Turkmenistan during the mating fight. The place of flight located in valley of Kushka river was of small size (length - 30-40 m, width - 5-7 m) with alluvial soil mixed with small pebbles and rare grass. This plot was occupied by large colony of groundburrowing sphecid wasps *Bembecinus dentipes* (Guss.) (identified by P.G. Nemkov). This sphecid species is distributed in East Iran,

south Turkmenistan and Armenia is the most probable host of *N. aurantiaca.* In May 22, 1990 the activity of both sexes of *N.aurantiaca* started at 6.30 p.m. and continued till 7.40 p.m. Next morning the first active males and females appeared at 7.00 a.m. (sunrise at 6.00 a.m.); last flying males and running females were seen at 8.30 a.m.). The males were flying for short distance (no more than 5 m) 10-30 cm above the ground. After landing the male ran quickly and searched for the female. I have not seen the copulation on the ground surface but one pair was caught by net in the air. It means that males took the females and flew away from this place. In the evening of May 22 the specimens of *N. aurantiaca* were active after finishing activity of *B. dentipes,* potential host. Next morning the situation was contrary: after finishing activity of *N. aurantiaca,* sphecid wasps *B. dentipes* began to fly.

11. *Nemka orientalis* (Mickel, 1933), comb. n.

Mutilla dimidiata Lepeletier, 1845: 628, male (nom. preocc., non Latreille, 1792), (East India); Zavattari, 1910: 9, male (Pondichery).

Timulla (Trogaspidia) orientalis Mickel, 1933a: 377, male [holotype - "Indo-Orientale", coll. Serville (Zool. Mus. Univ. Torino)]; 1935: 267, male.

MATERIAL. No specimens examined.

RANGE. East India.

REMARKS. This species may be the opposite sex of *N. pondicherensis.*

12. *Nemka pondicherensis* (Sichel et Radoszkowski, 1870), comb.n.

Mutilla pondicherensis Sichel, Radoszkowski, 1870: 204, female [holotype - female, "Pondichery" (East India) in Naturhis. Mus. Wien]; Bingham, 1897: 18, female.

Smicromyrme pondicherensis: Hammer, 1962: 40, female (listed).

MATERIAL (1 female). Iran: Bandar Abbas, 3 May 1955 (D. Shteinberg) [ZIS].

RANGE. East India, South Iran (new record).

13. *Nemka horai* (Hammer, 1962), comb. n.

Smicromyrme horai Hammer, 1962: 39, female [holotype - female, "Karunagapalli, Trancavore", 4 May 1915 (G. P. Pillai) in Indian Mus. Calcutta].

MATERIAL. No specimens examined.

RANGE. South India (Kerala).

REMARKS. This species is similar to *N. pondicherensis* in the pale gastral

design but differs in having shorter thorax, reddishbrown face of head and smaller size (body length 7.0 mm).

Genus *Mickelomyrme* Lelej, gen. n.

Smicromyrme: Mickel, 1935: 271 (part.); Pagden, 1949: 218 (part.); Chen, 1957; 178 (part.).

Smicromyrme (Nemka): Lelej, Yamane, 1992: 631 (part.).

Type species: *Mutilla hageni* Zavattari, 1913.

GENERIC DIAGNOSIS. Male. Head robust, elevated posterad, frons and vertex longitudinally striate. Mandibles bidentate at apex, deeply excised beneath forming large tooth beneath near the base (Fig. 7). Clypeus weakly convex with protruding midpart of anterior margin. Ocelli not enlarged. Scape distinctly bicarinate beneath. Tegulae protruding behind scuto-scutellar suture one-fourth - one-third its length, very often narrowed apically inside. Parascutal carinae weak. Scutellum simple. Mesopleurae beneath without precoxal tubercles. Midcoxae moved off. Hindcoxae carinate inside. Wing dark fuscous, pterostigma almost 2 times shorter than distance between it and base of RS on vein Sc+R (Fig. 4). Gaster black or some basal segments yellowish-red. First gastral tergum long, two-thirds or even more than 2nd one (Fig. 12). 2nd gastral segment with shorter lateral felt lines on sternum and longer ones on tergum. 7th tergum usually with longitudinal median impunctate line, 8th tergum (hypopygium) simple, without any tubercles or carinae. Volsella of genitalia with long narrow cuspis, the latter with long setae, basivolsella with rounded lobe outside, external margin of latter with extremely long curved setae.

Female. Foretarsi with long flatten spines. 2nd gastral tergum with 3 basal pale spots and at most with median pale patch posterad; sometimes 4th tergum with entire or interrupted pale band; 3rd gastral tergum always with wide pale band (Fig. 1). Pygidial area elongate, not strongly carinate laterally, longitudinally striate with smooth and shining one-fourth or one- fifth apical part.

SPECIES INCLUDED. *M. hageni* (Zavattari, 1913) (=*alberici* Zavattari, 1913) (Ryukyus, Taiwan, Fujian, Guangdung); *M. exacta* (Smith, 1879) (Anhui, Shanghai, Jiangsu, Jiangsi); *M. athalia* (Pagden, 1949) (Malay Peninsula); *M. norna* (Zavattari, 1913) (Taiwan, Jiangsi, Anhui, Fujian, Zhejian); *M. ilanica* (Tsuneki, 1971) (Taiwan), *M. exilodes* (Magretti, 1892) (Myanmar), *M. bakeri* (Mickel, 1934) (Philippines, North Borneo), *M. tanoi* (Tsuneki, 1972) (North Borneo), all are new combination and some undescribed species.

RANGE. Oriental region.

HOST. Unknown, but probably ground-nesting sphecid wasps or bees.

DISCUSSION. The males of *Mickelomyrme* are very similar to those of *Nemka* by the genitalia structure, but differ from them by bidentate mandibles (Fig. 7 vs. Figs. 5, 6) and mesopleurae beneath without precoxal tubercles or denticles. On the other hand males of *Mickelomyrme* resemble to those of *Eremotilla* Lelej, 1985 (*Smicromyrme* subg.) by bidentate mandibles and short lateral felt lines on 2nd gastral sternum, but differ from them by another structure of volsella and absence of two apical clypeal tubercles. Females of new genus are similar to those of *Erimyrme* Lelej, 1985 (*Smicromyrme* subg.) by the pygidial area sculpture and three basal pale spots on 2nd gastral tergum, but differ from them by having very broad scutellar scale and pale basal spots of 2nd gastral tergum disposed in horizontal line, at most pale median patch on 2nd tergum posterad (in *Erimyrme* scutellar scale slightly wider than its length, lateral spots of 2nd gastral tergum disposed behind of median one, 2nd tergum posterad usually with pale band triangularly widened medially).

ETYMOLOGY. This genus is dedicated to Clarence E. Mickel, who studied Oriental mutillid wasps.

ACKNOWLEDGMENTS

I thank Dr. A. Shinohara, National Science Museum (Nat. Hist.), Tokyo, Dr. V. I. Tobias, Zoological Institute, Sankt-Petersburg, Dr. A. Antropov, Zoological Museum of Moscow University for loaning of specimens, Dr. V. Kuznetsov, Institute of Biology and Pedology, Vladivostok for gift of material and Dr. P. Nemkov [IBP] for identification of sphecid wasp. I am much indebted to Dr. B. Petersen, Zoological Museum, Copenhagen who generously provided me with valuable exchange material of the Oriental mutillid wasps and Prof. Sk. Yamane, Kagoshima University, Kagoshima for his kind help during our collection trips in Japan in 1991 and 1993.

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