A review of the East Asian species of Anoplius Dufour (Hymenoptera, Pompilidae)

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A review of the East Asian species of *Anoplius* Dufour (Hymenoptera, Pompilidae)[1)]

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Abstract

Thirty spider wasp species of the genus *Anoplius* belonging to four subgenera are recorded from Japan (19 spp.), Far East Russia (12 spp.), and China (9 spp.). *A. sachalinensis* sp. nov. from Far East Russia and Hokkaido, *A. saigusai* sp. nov. from Far East Russia and Kyûshû, and hitherto unknown male of *A. iwatai* Yasum. are described. *A. aberrans* Guss. is newly recorded from Japan; *A. ryukyuensis* Tsun., stat. nov., *A. infuscatus* (Vander Linden) and *A. iwatai* Yasum. are newly recorded from Far East Russia; *A. ryukyuensis* Tsun. is newly recorded from China. New synonymy in five species is given; lectotypes of four species are designated.

Key words: Pompilidae, *Anoplius*, new species, Japan, Far East Russia, China.

Introduction

Anoplius Dufour is one of the largest genera of the tribe Pompilini which shows cosmopolitan distribution. Some papers have been published with revisions of and keys to *Anoplius* species of different parts of the world (e. g., Day, 1974; Tsuneki, 1990). In this paper we follow Day (1974) in recognizing four subgenera in East Asia.

As was mentioned in our previous paper (Lelej and Yamane, 1992), wasps of *Anoplius* are most abundant in Japan including the Ryukyus, and it has been needed to prepare a special review of this genus not only of Japan but also of its neighboring regions.

In this paper we enumerate 30 species of which some are new to science. This study is based on the materials in the following collections: Department of Biology, Kagoshima University, Kagoshima (KU), Entomological Laboratory, Kyushu University, Fukuoka (KUF), Institute of Biology and Pedology, Vladivostok (IBPV), Zoological Institute, Sankt-Peterburg (ZIS). Asterisks show new localities.

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Genus *Anoplius* Dufour, 1834

Type species: *Sphex nigerrimus* Scopoli, 1763, by subsequent designation (van der Vecht and Menke, 1968) (Ratified by I.C.Z.N. Opinion 997, 1973).

Diagnosis (from Day, 1974, with slight modifications). Body length 4-25 mm. Body predominantly black in color; some species with gaster partly reddish and a few males (subgenus *Orientanoplius*) with whitish posterior margin of pronotum and gastral tergite 7. Gastral tergite 6 of female with at least a few stiff, backward-directed bristles (bristles often dense). Mandible with one or two teeth on inner margin. Antenna elongate; segment 3 in the female at least three times as long as wide. Front tarsus of the female with or without a comb of spines; apical tarsal segment usually spined beneath but not always so. Claws of the female usually dentate, occasionally bifid with a strong tooth subequal in length to the claw, and occasionally dentate with a small but truncate tooth. Inner claw of male front tarsus either modified or not. Pulvillar comb strong. Fore wing with 3 radio-medial cells. Male venter with or without tufts of hairs. Male genitalia with a single basal hooklet (sometimes absent); aedeagus simple and without spines or setae.

Key to the subgenera of *Anoplius* occurring in East Asia (from Day, 1974, with some modifications)

1. Females. 2
- Males. 5
2. Fore tarsus with a comb of short or fairly long spines; *i. e.*, second tarsal segment bearing an additional spine which is in length at least equal to that borne distally on outer side of the segment. 3
- Fore tarsus without a comb; *i. e.*, second tarsal segment without such spine on its outer side. ..... *Anoplius*
3. Posterior margin of pronotum arcuate. Head, thorax and abdomen with abundant erect hairs. Anterior margin of clypeus with distinct median emargination. ..... *Lophopomlilus*
- Posterior margin of pronotum angulate, or rarely arcuate; if arcuate, body without abundant erect hairs. Anterior margin of clypeus without median emargination. 4
4. Ultimate tarsal segment with spines beneath. ..... *Arachnophroctonus*
- Ultimate tarsal segment without spines beneath. ..... *Orientanoplius*
5. First gastral tergite with red or yellow band (occasionally reduced to one or two pairs of small spots). 6
- Gastral tergites without red or yellow bands, frequently with grey or silvery pubescence 7
6. Subgenital plate (hypopygium) with a large plumose process at base, which projects from emargination of the preceding sternite. ..... *Lophopompilus*

- Subgenital plate without such a plumose process. ..... *Arachnophroctonus*

7. Body and appendages without whitish mark. Gastral venter often with brushes of hairs. ..... *Anoplius*
- As a rule antennal segment 1 in front, posterior margin of pronotum, gastral tergite 7, and mid and hind spurs whitish. Gastral venter without brushes of hairs. ..... *Orientanoplius*

Subgenus *Lophopompilus* Radoszkowski, 1887

Type species: *Pompilus grandis* Eversmann, 1849=*Sphex samariensis* Pallas, 1771, by subsequent designation (Ashmead, 1902). Includes six species of which five have been described from North America.

1. *Anoplius* (*Lophopompilus*) *samariensis* (Pallas, 1771)

Specimens examined. **Russia**−1♀1♂, Astrakhan region; 1♀1♂, Transbaykalia; 1♀1♂, Amur region; 19♀4♂, Primorskij Krai; 19♀4♂, South Sakhalin. **Ukraina**−5♀1♂. **Kazakhstan**−3♀. **Mongolia**−1♀. **Japan**−2♀, Kanegasaki, Iwate-ken, 3-5 Aug. 1987, Sk. Yamane; 1♂, Ori-kizama, Kimitsu-shi, Chiba-ken, 13 July 1992, V. Kuznetsov; 1♀, Kyôto-shi, 9 Aug. 1980, V. Kuznetsov; 1♀, Mt. Unzen, Nagasaki-ken, 28 July 1907, A. Tshersky; 9♀1♂, Yamada, Kitakyûshû-shi, 4 Aug. 1991, A. Lelej & N. Kurzenko; 1♀4♂, Handa-kôgen, Mts. Kujû (900 m alt.), 6 Aug. 1991, A Lelej; 2♀, Kyûsuikei, Kokonoe-machi (600 m alt.), 6 Aug. 1991, A. Lelej; 3♀1♂, Seiwa-mura, Kyûshû-sanchi, 7 Aug. 1991, A. Lelej; 1♀, Momiki, Gokanoshô (700m alt.), 8 Aug. 1991, A. Lelej; 1♀, Kinpô-zan, Satsuma Pen., 10 Aug. 1991, A. Lelej; 1♂, Issô, Yaku-shima, N. Ryukyus, 30 July 1988, Sk. Yamane; 1♂, Kuchinoerabu-jima, 16-17 May 1982, Sk. Yamane.

Distribution. Russia (southern part of European Russia, Transbaykalia, southern part of Far East), Ukraina, South Europe, Asia Minor, Caucasus, Kazakhstan, Middle Asia, Mongolia, China (Qinghai, Northeast part), Japan (Hokkaidô, Honshû, Shikoku, Kyûshû, Tsushima, Tanega-shima, Yaku-shima*, Kuchinoerabu-jima*).

Remarks. In Primorskij Krai and South Sakhalin the specimens were collected at sandy dunes on seashore. In Primorskij Krai they fly from July to mid-October.

Subgenus *Arachnophroctonus* Howard, 1901

Arachnophroctonus Howard, 1901 [type species: *Sphex tropicus* Linnaeus sensu Fabricius, 1775=*Psammochares marginalis* Banks, 1910, by subsequent designation (Pate, 1946)].

Pompilinus Ashmead, 1902 (type species: *Pompilus cylindricus* Cresson, 1867, by monotypy).

Anoplinellus Banks, 1934 (type species: *Pompilus clotho* Smith, 1879, by monotypy).

2. *Anoplius* (*Arachnophroctonus*) *viaticus* (Linnaeus, 1758)

Pompilus propinguus Smith, 1879: 150, ♀ [type locality: 'North Japan' (Honshû)].

Pompilus ogumae Matsumura, 1911: 98, ♀ (holotype: ♀, Galkinowroskoe, South Sakhalin),

syn. nov.

Anoplius (*Pompilinus*) *viaticus mongolopaganus* Wolf et Moczar, 1972: 429, ♀ [holotype: ♀, 23 km NNE Chisching-ondor (1300 m alt.), Bulgan aimak, Mongolia, 15 June - 23 July 1968, Z. Kaszab], **syn. nov.**

Specimens examined. **Russia** − 1♀, Vologda region; 2♀, Irkutsk region; 12♀6♂, Transbaykalia; 9♀25♂, Amur region; 12♀6♂, Khabarovskij Krai; 14♀2♂, Primorskij Krai; 70♀84♂, Sakhalin. **Belorussia** − 6♀9♂. **Ukraina** − 8♀19♂. **Kazakhstan** − 6♀1♂. **Turkmeniya** − 2♀.

Distribution. Widely distributed in the Palaearctic region. In East Asia recorded from the following countries: Russia (Transbaykalia, Far East), Mongolia, Japan (Honshû: Ishikawa, 1958; Kyûshû: Yasumatsu, 1950).

Remarks. We think that *A. viaticus mongolopaganus* described by Wolf and Moczar (1972) from Mongolia and Vladivostok represents a paler variant of this species. Although gastral tergites 1-3 and distal half of hind femora (♀) are paler in color, we did not find any difference in male genitalia between specimens of *mongolopaganus* and *viaticus* specimens from other localities with darker coloration.

3. *Anoplius* (*Arachnophroctonus*) *infuscatus* (Vander Linden, 1827)

Pompilus dispar Dahlbom, 1843, nec Latreille, 1809.

Anoplius (*Arachnophroctonus*) *infuscatus mongolinfuscatus* Wolf, 1981: 195, ♂ [holotype: ♂, 25 km S Bogd (300 m alt), Ichbogd, Bajanchongor aimak, Mongolia, 24 July 1979, M. Dorn], **syn. nov.**

Specimens examined. **Russia** − 14♀8♂, Irkutsk region; 1♀, Amur region; 3♀1♂, Khabarovsk; 3♀, Primorskij Krai; 23♀4♂, Sakhalin; 32♀20♂, Kunashiri Is. **Belorussia** − 5♀1♂. **Ukraina** − 6♀.

Distribution. Widely distributed in the Palaearctic region. New to Far East Russia.

Remarks. In Sakhalin and Kunashiri Is. this species was collected on sandy dunes on seashore. Gastral tergite 1 is generally reddish, but the color of tergite 2 may be variable, ranging from ferruginous red to nearly black. In any case the structure of male genitalia and hypopigium is faily constant among the specimens of different colorations.

4. *Anoplius* (*Arachnophroctonus*) *reflexus* (Smith, 1873)

Anoplius (*Pompilinus*) *esakii* Ishikawa, 1958: 112, ♀ (holotype: ♀, Tamagawa, by Noborito, Kawasaki City, Honshû, Japan, 18 Aug. 1955, R. Ishikawa, examined), **syn. nov.**

Specimens examined. **Japan** − 1♀, Inagawa, by Itami-shi, Hyôgo-ken, 1 Sept. 1954, S. Ueno & R. Ishikawa (paratype of *A. esakii*); 1♀, Kawamoto-machi, Osato-gun, Saitama-ken, 8 Sept. 1986, A. Shimizu; 2♀, Ichiki, Kagoshima-ken, 8 May 1984, A. Nagatomi; 3♀4♂, Hamada, Tanega-shima, N. Ryukyus, 11 July 1983, Sk. Yamane.

Distribution. Japan (Hokkaidô, Honshû, Kyûsyû, Tanega-shima).

Remarks. We have studied three females of *A. reflexus* from Japan but could not find any difference between them and the females of *A. infuscatus*. However, we have found

constant differences in the structure of gastral strnite 7 between these species (Fig. 8 *vs.* 7).

Subgenus *Anoplius* Dufour, 1834

This is the largest subgenus mainly comprising black species usually without reddish or yellowish markings in East Asia.

5. *Anoplius* (*Anoplius*) *aberrans* Gussakovskij, 1932

Anoplius aberrans Gussakovskij, 1932: 45, Fig. 15, ♀ non ♂ [lectotype designated here: ♀, Sedanka, Vladivostok, 22 June 1930, R. Malaise (ZIS)].

Anoplius (*Anoplius*) *luzonicus* Tsuneki, 1988: 38, ♀ ♂ (holotype: ♀, Bontoc, 850 m alt., Mount. Prov., Luzon, 29-30 Dec. 1979, T. Murota), **syn. nov.**; Tsuneki, 1989: 130, ♀ ♂.

Specimens examined. **Russia**—2♀, Irkutsk region; 11♀2♂, Amur region; 41♀46♂, Primorskij Krai; 26♀5♂, Sakhalin; 12♀3♂, Kunashiri Is. **Japan**—1♂, Orikizama, Kimitsu-shi, Chiba-ken, 13 July 1992, V. Kuznetsov; 1♀1♂, Hido, Kanukawa-mura, Kodama-gun, Saitama-ken, 15 June 1986, A. Shimizu; 1♀, Bank of Chikuma-gawa, Saku-shi, Nagano-ken, 7-8 Aug. 1985, A. Shimizu. **China**—2♀, Chebaling, Guangdong Prov., 20 June 1990, A. Lelej.

Distribution. Russia (Irkutsk region, Far East), Japan* (Honshû), China (Guangdong*), Taiwan, Philippines (Luzon).

Remarks. In the syntypes of *A. aberrans* two different species are included. We designated as the lectotype a female which has bifid claws. After examining one male (paralectotype) (ZIS) we found that it actually belongs to another species here described as *A. saigusai* sp. nov. The figure of male gastral apex given by Gussakovskij (1932, Fig. 16) coincides to that of *A. saigusai*.

After careful study of the detailed description of *A. luzonicus* from the Philippines and Taiwan (Tsuneki, 1988, 1989) we regarded *A. luzonicus* to be a synonym of *A. aberrans* Guss., because we found no noticeable difference in the most important characters, *e. g.*, ratios of A3 to VW and MxIOD to head width (Tab. 1). The ratio of A3 to aW differs between *A. aberrans* (4.9-5.6) and a specimen of *A. luzonicus* from type locality (6.3), but a female of '*A. luzonicus*' from Taiwan is said to have A3 : aW ratio of 5.5 (Tsuneki, 1989). It must be kept in mind that measurements of antennal segments considerably depend on the direction from which measuring is done. Finally the problem of *A. luzonicus* will be solved after studying the male from the type locality.

6. *Anoplius* (*Anoplius*) *liukiu* (Dalla Torre, 1897)

Pompilus fragilis Smith 1873: 186, ♀, nom. preocc., nec Smith, 1864 (type locality: Hyôgo, Japan).

Pompilius liukiu Dalla Torre, 1897: 298, new name for *fragilis* Smith, 1873.

Anoplius marginipennis Yasumatsu, 1936: 27, ♀ ♂ (holotype: ♂, Ikeda, 28 Aug. 1932, K. Iwata).

Anoplius bakeri okinawanus Tsuneki, 1990: 45, ♀ ♂ (holotype: ♀, Inaba, Iriomote I., 26 July 1969, T. Tano), **syn. nov.**

Table 1. Body length and ratios between some body parts in the female of *A. luzonicus* (1, 2) and *A. aberrans* (3-9).

No.	Locality	Length	A3 : VW	MxIOD : HW	A3 : aW	POL : OOL	LS : T1
1*	Luzon	8.0	0.96	-	6.3	-	-
2*	Taiwan	10.0	1.02	0.55	5.5	0.58	0.51
3.	Nagano	6.5	0.88	0.56	5.5	0.83	0.60
4.	Ussuri Res.	10.2	1.0	0.43	5.4	0.85	0.60
5.	Prim. Krai	7.5	0.81	0.55	5.1	0.73	0.53
6.	Prim. Krai	7.0	0.76	0.59	4.9	0.72	0.63
7.	Vladivostok	10.3	0.96	0.53	5.3	0.81	0.64
8.	Guangdong	10.0	0.94	0.52	5.6	0.76	0.58
9.	Guangdong	10.5	1.0	0.51	5.6	0.77	0.58

* From Tsuneki (1988, 1989). Others: present study.
A3, length of antennal segment 3; aW, apical width of antennal segment 3; HW, head width; MxIOD, maximum interocular distance; LS, hind tibial longer spur; T1, hind tarsal segment 1; VW, vertex width.

Anoplius liukiu: Ishikawa, 1962: 332.

Anoplius bakeri (nec Banks, 1934): Tsuneki, 1988: 36, ♀♂; Tsuneki, 1989: 131, ♀♂.

Specimens examined. **Japan**—1♀1♂, Ichinokawa, Higashimatsuyama-shi, Saitama-ken, 5 Sept. - 1 Oct. 1989, A. Shimizu; 1♀, Yorii, Saitama-ken, 10 Oct. 1984, T. Nambu; 1♂, Shakujii Park, Nerima-ku, Tôkyô, 5 Sept. 1955, R. Ishikawa; 1♀, Jiganji, Kagoshima-shi, 12 July 1987, Sk. Yamane; 1♀, Fukugawa, Okinawa-jima, C. Ryukyus, 17 July 1984, Sk. Yamane; 1♂, Yona, Kunigami-chô, Okinawa-jima, 14 Aug. 1991, A. Lelej; 1♀, Otomi, Iriomote-jima, S. Ryukyus, 25 July 1985, A. Nagatomi; 1♂, Amitori, Iriomote-jima, 1 Aug. 1985, A. Nagatomi. **China**—1♀, Chebaling, Guangdong Prov., 20 June 1990, A. Lelej.

Distribution. Japan (Honshû, Amami-ôshima, Okinawa-jima*, Ishigaki-jima, Iriomote-jima), China* (Guangdong), Taiwan, Philippines (Luzon, Palawan).

Remarks. We follow Ishikawa's (1962) view about the status of *Pompilus liukiu* Dalla Torre and support the synonymy of *Anoplius marginipennis* Yasum. with this species. We have studied very carefully the redescription of the holotype of *Anoplius bakeri* Banks from Luzon (Tsuneki, 1990), and arrived at the conclusion that the extraordinarily short antennal segment 3 (less than vertex width) well separates the true *A. bakeri* from the material from the Philippines, Taiwan and Ryukyus which were treated by Tsuneki (1988, 1989, 1990) as *A. bakeri*. We regard these specimens including our own ones from Ryukyus and China as *A. liukiu*.

7. *Anoplius* (*Anoplius*) *concinnus* (Dahlbom, 1843)

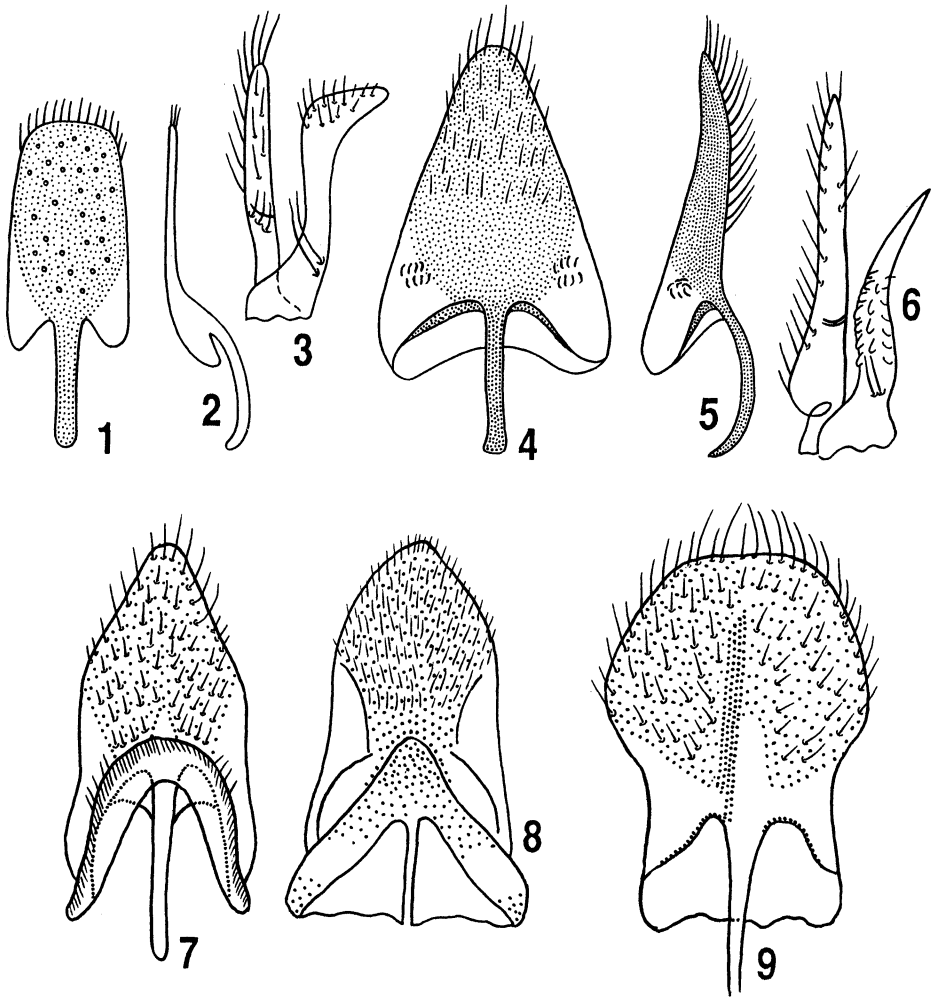
Pompilus bifidus Morawitz, 1891: 190, ♂ [lectotype designated here: ♂, Ryn Peski (western

Kazakhstan) with Morawitz's handwritten '*Pompilus bifidus*, ♂, F. Moraw.' (ZIS)].

Pompilus distinguendus Morawitz, 1891: 191, ♀ [lectotype designated here: ♀, Sarepta (near Volgograd), with Morawitz's handwritten '*distinguendus* F. Mor., ♀', (ZIS)].

Specimens examined. **Russia**—2♀8♂, Irkutsk region; 2♀2♂, Amur region; 9♀19♂, Khabarovskij Krai; 11♀6♂, Primorskij Krai. **Ukraina**—5♀7♂. **Belorussia**—1♀.

Distribution. Widely distributed in the Palaearctic region from the middle part of Western Europe to Primorskij Krai in the east.



Figs. 1-9. 1-3, *Anoplius sachalinensis* sp. nov.; 4-6, *A. iwatai* Yasum.; 7, *A. infuscatus* (Vander Linden); 8, *A. reflexus* (Smith); 9, *A. eous* Yasum.—1, 2, 4, 5, 7-9, hypopygium (sternite 8) of male (1, 4, 7-9, ventral view; 2, 5, lateral view); 3, 6, gonostylus and volsella of male genitalia. Fig. 8 from Tsuneki, 1989.

8. *Anoplius* (*Anoplius*) *nigerrimus* (Scopoli, 1763)

Specimens examined. **Russia**—3♀, Irkutsk region; 2♂, Buryatiya; 1♀, Yakutiya; 21♀17♂, Amur region; 11♀1♂, Khabarovskij Krai; 7♀13♂, Primorskij Krai; 10♀11♂, Sakhalin; 1♂, Kamtchatka. **Ukraina**—5♂.

Distribution. Widely distributed in the Holarctic region. In East Asia recorded from

Russia (Transbaikalia, Far East except Kuril Is.).

9. *Anoplius* (*Anoplius*) *eous* Yasumatsu, 1936

Anoplius eous Yasumatsu, 1936: 25, ♀♂ [holotype: ♂, Ikeda, Settsu, Honshû, 5 June 1932, K. Iwata (KUF)].

Specimens examined. **Japan**—1♀1♂, Ichinokawa, Higashimatsuyama-shi, Saitama-ken, 20 July - 21 Sept. 1989, A. Shimizu.

Distribution. Japan (Honshû, Kyûshû).

10. *Anoplius* (*Anoplius*) *petiolaris* Gussakovskij, 1932

Anoplius petiolaris Gussakovskij, 1932, ♀♂ [lectotype designated here: ♂ Vladivostok, Suchan, 15 July 1930, R. Malaise (ZIS)].

Specimens examined. **Russia**—1♂, Khabarovskij Krai; 24♀43♂, Primorskij Krai; 5♀10♂, Sakhalin; 74♀73♂, Kunashiri I.; 1♀, Shikotan I.

Distribution. Russia (Khabarovskij Krai*, Primorskij Krai, Sakhalin*, Kunashiri I.*, Shikotan I.*).

Remarks. This species has been recorded also from Mongolia (Wolf, 1981), but his figures of the male hypopygium and genitalia seem to be more similar to those of *A. piliventris* (Mor.).

11. *Anoplius* (*Anoplius*) *pacificus* Yasumatsu, 1943

Anoplius pacificus Yasumatsu, 1943: 451, ♀ [holotype: ♀, Hikosan, Buzen, Kyûshû, 19 Aug. 1935, T. Esaki (KUF), examined].

Anoplius (*Anoplius*) *petiolaris*: Tsuneki, 1989: 122, ♀♂; Tsuneki, 1990: 43, Figs. 116, 119, 120, ♂.

Specimens examined. **Japan**—3♂, Kanegasaki, Iwate-ken, 3 Aug. 1987, Sk. Yamane; 1♀, Kokezawa, Uratakao, Tôkyô-to, 9 Oct. 1980, A. Shimizu; 1♀, Akahama, Yorii, Saitama-ken, 28 Oct. 1984, A Shimizu; 1♀, Jûniten, Kodama-gun, Saitama-ken, 26 Sept. 1982, A. Shimizu; 1♀, Mikayama, Yorii, Saitama-ken, 19 June 1983, T. Nambu; 1♀1♂, Yamada, Kitakyûshû-shi, 4 Aug. 1991, A. Lelej; 1♂, Kyûsui-kei (600 m alt.), Kokonoe-machi, Oita-ken, 6 Aug. 1991, A. Lelej.

Distribution. Japan (Hokkaidô, Honshû, Kyûshû); Korea.

Remarks. Thanks to Prof. T. Saigusa we have the opportunity to examine the holotype of *A. pacificus*. This species is very similar to *A. petiolaris* but differs from the latter in having a narrower apex of hypopygium of male (Fig. 16 *vs.* Figs. 13, 14) and a longer antennal segment 3 of female (in *A. pacificus* 4.5-5.3 times as long as wide at apex and 1.05-1.20 times as long as vertex width; in *A. petiolaris* 4.24-4.50 and 0.94-0.96 respectively).

12. *Anoplius* (*Anoplius*) *tanoi* Tsuneki, 1990

Anoplius (*Anoplius*) *tanoi* Tsuneki, 1990: 42, ♀♂ (holotype: ♂, Inaba, Iriomote-jima, 26 July 1969, T. Tano).

Specimens examined. **Japan**—1♀, Gusukube, Miyako-jima, S. Ryukyus, 17 July 1987, Sk. Yamane; 1♀, Amitori, Iriomote-jima, 1 Aug. 1985, A. Nagatomi.

Distribution. Japan (Okinawa-jima, Miyako-jima*, Ishigaki-jima, Iriomote-jima).

13. *Anoplius* (*Anoplius*) *ryukyuensis* Tsuneki, 1990, **stat. nov.**

Anoplius (*Anoplius*) *valdezi ryukyuensis* Tsuneki, 1990: 40, ♀♂ (holotype: ♀, Shinmura, Amami-ôshima, 27 July 1967, T. Murota).

Specimens examined. **Russia**—3♀2♂, Amur region; 1♀, Khabarovskij Krai; 38♀32♂, Primorskij Krai; 2♀, Sakhalin. **Japan**—1♂, Sapporo, Hokkaidô, 1 Aug. 1932, H. Yaku; 1♀, Yamada, Kitakyûshû-shi, Fukuoka-ken, 4 Aug. 1991, A. Lelej; 1♂, Kikai-jima, C. Ryukyus, 3 Oct. 1985, Sk. Yamane; 1♂, same loc., 24 Apr. 1986, Sk. Yamane; 10♀3♂, Yona, Kunigami, Okinawa-jima, 12-14 Aug. 1991, A. Lelej; 1♀, Funaura, Iriomote-jima, 20 Aug. 1991, A. Lelej. **China**—2♂, Chebaling, Guangdong Prov., 21 June 1990, A. Lelej.

Distribution. Russia* (Amur region, Khabarovskij Krai, Primorskij Krai, Sakhalin); Japan (Hokkaidô*, Kyûshû*, Kikai-jima*, Amami-ôshima, Okinawa-jima, Kume-jima, Ishigaki-jima, Iriomote-jima); China* (Guangdong).

Remarks. We think that *ryukyuensis* Tsun. and *valdezi* Banks (type loc.: Basilan I., Philippines) are closely related but separate species. They differ in male genitalia as follows: in *A.valdezi* gonostylus is shorter than parapenial valva (Fig. 59 in Tsuneki, 1988), while in *A. ryukyuensis* it is equal to or longer than parapenial valva. Probably, specimens of '*A. valdezi*' from Taiwan (Tsuneki, 1989) also belong to *A. ryukyuensis*.

14. *Anoplius* (*Anoplius*) *iwatai* Yasumatsu, 1939

Anoplius (*Anoplius*) *iwatai* Yasumatsu, 1939: 68, ♀ [holotype: ♀, Etizen, Honshû, 7 July 1935, K. Iwata (KUF), examined]; Yasumatsu, 1943: 455, ♀.

Male (hitherto unknown). Body 7.0-9.5 mm long. Second radio-medial cell of forewing always with more or less developed anterior side. Hypopygium with a longitudinal carina (which is higher at base) and narrow apex, without any basal emargination (Figs. 4, 5). Gonostylus and volsella of genitalia as in Fig. 6. *A. iwatai* belongs to the group of the species which have 4th and 5th gastral sternites without brush of hairs; differs from the related species *A. japonicus* Yasum. and *A. sachalinensis* sp. nov. in having elevated hypopygium (Figs. 4, 5 *vs.* 1, 2) and from *A. nigerrimus* Scop. and *A. eous* Yasum. in having the hypopygium with a narrow apex (Fig. 4 *vs.* 9).

Specimens examined. **Russia**—1♂, Amur region; 29♀8♂, Primorskij Krai; 3♂, Sakhalin; 1♂, Kunashiri I. **Japan**—1♀1♂, Handa-kôgen (900 m alt.), Mts. Kujû, Kyûshû, 6 Aug. 1991, A. Lelej; 1♀, Kyûsui-kei (600 m alt.), Kokonoe-machi, Kyûshû, 6 Aug. 1991, A. Lelej.

Distribution: Russia* (Amur region, Primorskij Krai, Sakhalin, Kunashiri I.); Japan (Honshû, Kyûshû*).

Remarks. Thanks to Prof. R. Ishikawa we have examined the holotype of *A. iwatai*. In Yasumatsu's work (1939) the name *iwatai* is erroneously applied to two species, but in a reprint which we have the name *japonicus* is given to one of the two species probably by

Yasumatsu's handwriting. Later (Yasumatsu, 1943), the two species received different names (*iwatai* and *japonicus*). According to International Code of Zoological Nomenclature, the use of the name *japonicus* in 1943 is a justified emendation (Art. 33b), and in this case the author and date of *japonicus* should be Yasumatsu, 1943.

15. *Anoplius* (*Anoplius*) *piliventris* (Morawitz, 1889)

Pompilus piliventris Morawitz, 1889: 122, ♂ [holotype: ♂, Sun-pan, Gansu, China, 13 Aug. 1885 (ZIS), examined].

Specimen examined. Holotype only.

Distribution. China (Gansu).

16. *Anoplius* (*Anoplius*) *tenuicornis* (Tournier, 1889)

Specimens examined. **Russia** – 4 ♂, Magadan region; 1 ♂, Khabarovskij Krai; 3 ♂, Primorskij Krai.

Distribution. Widespread in the boreal-mountainous area of the Holarctic region. In Far East recorded from Magadan region, Kamchatka, Khabarovskij Krai, and Primorskij Krai.

17. *Anoplius* (*Anoplius*) *sachalinensis* Lelej, **sp. nov.**

Female. Body 7.0-10.0 mm long. Ratio of frons width to head width 0.6. Ratio of maximal eye width to half of frons width (seen in frontal view) 0.6. POL : OOL=0.7-0.9 : 1. Relative lengths of antennal segments 1-4=21 (22): 8 : 31 (32): 26 (25), segment 3 being 3.7-4.1 times as long as wide at apex and 0.7-0.8 times as long as vertex width. Median line on frons scarcely visible. Fore tarsus without comb; tarsal segment 1 without spines on upper margin and with two spines (except apical) on lower margin. Forewing darkened scarcely, with darker apical part; abscissae of *R* from base=10, 15, 12, 25 in relative length; nervulus slightly postfurcal (less than one-third of its length).

Clypeus with about ten long erect hairs. Clypeus, frons, dorsum of alitrunk and gaster with dense brownish pubescence. Upper face of middle and hind coxae with silver pubescence. Body, antennae and legs black.

Male. Body 5.0-7.5 mm long. Ratio of frons width to head width 0.6. POL : OOL=0.6-0.7 : 1. Relative lengths of antennal segments 1-4=22 : 12 : 23 : 23, segment 3 being 2.3-2.5 times as long as wide at apex and 0.4 times as long as vertex width. Clypeus with distinctly emarginate anterior margin. Temple 0.6 times as wide as eye in profile. Forewing with abscissae of *R* from base=13, 20, 13, 35 in relative length. Gastral sternites without brush of hairs. Hypopygium (sternite 8) as in Figs. 1 and 2. Gonostylus of genitalia slightly shorter than parapenial valva; the latter weakly shorter than penial valva. Gonostylus and volsella as in Fig. 3.

Specimens examined. Holotype: ♂, Novoaleksandrovsk, Sakhalin, 13 July 1976, M. Nesterov (IBPV). Paratypes: **Russia** – 2 ♀, same data as holotype (IBPV, KU); 1 ♂, same loc., 7 July 1986, M. Nesterov (IBPV); 1 ♀, Mt. Tshekhov, Susunajskij ridge, Sakhalin, 9 Aug. 1986, M. Nesterov (IBPV); 2 ♀, Lake Ptichje, Sakhalin, 10 Aug. 1974, M. Nesterov (IBPV);

2♀, Ozerskij, Sakhalin, 19 July 1978, A. Lelej (IBPV); 1♀, Novikovo, Sakhalin, 22 July 1978, A. Lelej (IBPV); 1♀, near Yuzhno-Sakhalinsk, Sakhalin, 7 Aug., A. Osytshnyuk (IBPV); 1♀, Komsomolsk-na-Amure, Khabarovskij Krai, 12 June 1984, V. Mutin (IBPV); 1♂, same loc., 25 June 1986, V. Mutin (IBPV); 1♀, River Botshi, Mts. Sikhote-Alin, Khabarovskij Krai, 10 Aug. 1924, Emeliyanov (ZIS); 1♀, River Karaptsha, Kundur, Amur region, 20 July 1988, A. Lelej (IBPV); 1♀, Kundur, 29 June 1989, P. Nemkov (IBPV); 2♀, Dubovoye, Kunashiri I., 30 July 1989, A. Lelej (IBPV). **Japan**－1♀, forest, Kushiro, Hokkaidô, 4 July 1992, V. Kuznetsov (IBPV).

Distribution. Russia (Amur region, Khabarovskij Krai, Sakhalin, Kunashiri I.); Japan (Hokkaidô).

Remarks. The female of this new species is similar to that of *A. eous* Yasum. and *A. japonicus* Yasum. in having a trapeziform 3*rm* cell but differs from *A. eous* in the shorter antennal segment 3 (in *A. eous* 5.4 times as long as wide at apex) and easily distingushed from *A. japonicus* by long black erect hairs densely arising on frons, temple and propleuron. The male of *A. sachalinensis* resembles *A. japonicus* male in having hypopygium without any longitudinal carina, but differs from the latter in the shape of apex of hypopygium (Fig. 1 *vs.* 17) and the length of gonostylus and volsella (Fig. 3 *vs.* 18).

18. *Anoplius* (*Anoplius*) *japonicus* Yasumatsu, 1943

Anoplius iwatai Yasumatsu (with handwritten correction: *japonicus*), 1939: 68, ♀♂ [holotype: ♀, Ikeda, Settsu, Honshû, Aug. 1937, K. Iwata (KUF)].

Specimen examined. **Japan**－1♂ (paratype), Ikeda, Settsu, Aug. 1937, K. Iwata (KUF).

Distribution. Japan (Honshû).

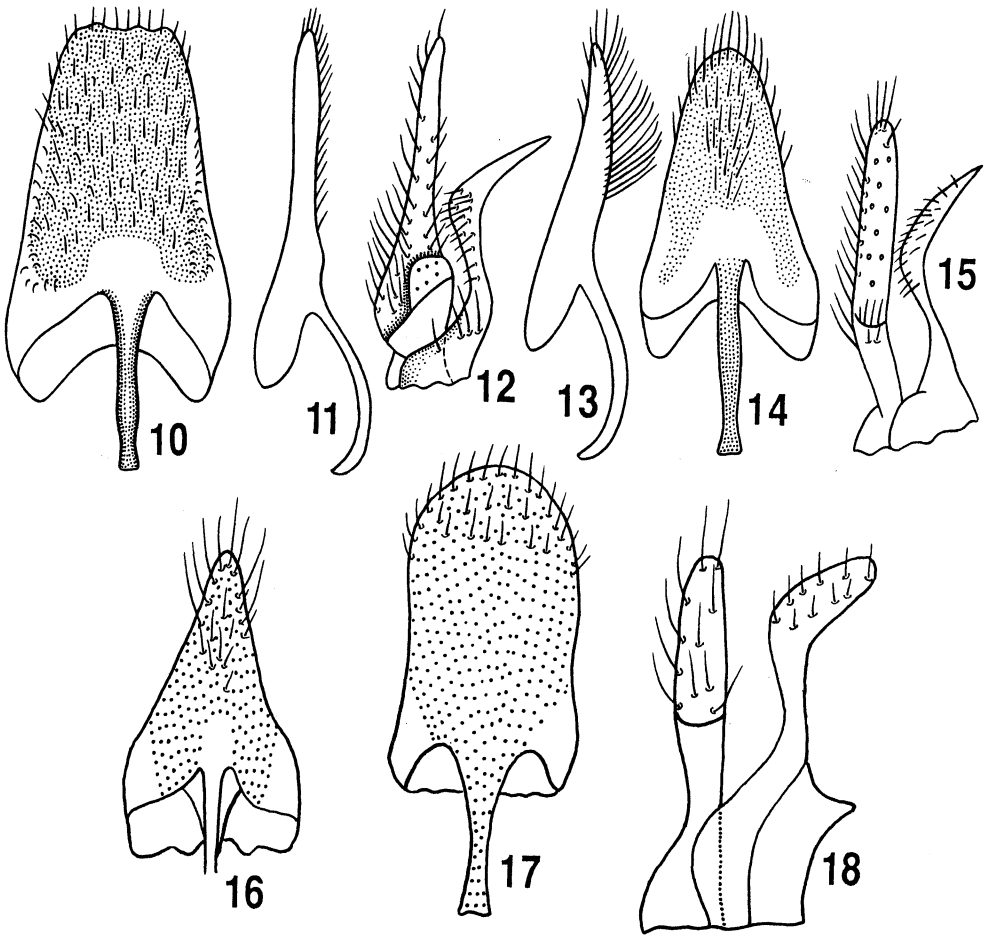
Remarks. Thanks to Prof. R. Ishikawa we could examine the paratype male of this species. Regarding the name *japonicus*, see remarks under *A. iwatai*.

19. *Anoplius* (*Anoplius*) *saigusai* Lelej, **sp. nov.**

Anoplius aberrans Gussakovskij, 1932: 45, ♂ non ♀.

Female. Body 8.0-9.0 mm long. Ratio of frons width to head width 0.5-0.6. Ratio of maximal eye width to half of frons width (in frontal view) 0.7. POL : OOL=0.9-1.0 : 1. Relative lengths of antennal segments 1-4=29 (19): 8 (7): 38 (37): 29 (33), segment 3 being 4.0-4.5 times as long as wide at apex and 0.8-1.0 times as long as vertex width. Median line is distinctly visible on lower frons. Fore tarsus without comb; tarsal segment 1 without spines on upper edge. Hind tarsal segment 1 with short spines on upper margin; the longest spine shorter than apical spine and slightly longer than width of segment 1 in the middle. Nervulus intersticial or slightly postfurcal. Frons and vertex with black erect hairs sparsely. Clypeus, frons, vertex, dorsum of alitrunk and gaster with dense brownish pubescence; upper face of mid and hind coxae with silver pubescence. Body, antennae, and legs black.

Male. Body 7.5-10.0 mm long. Ratio of frons width to head width 0.6. POL : OOL=0.8-1.0 : 1. Relative lengths of antennal segments 1-4=35 (33) : 13 : 34 (32) : 34 (33), segment



Figs. 10-18. 10-12, *Anoplius saigusai* sp. nov.; 13-15, *A. petiolaris* Guss.; 16, *A. pacificus* Yasum.; 17, 18, *A. japonicus* Yasum., paratype. —10, 11, 13, 14, 16, 17, hypopygium of male (10, 14, 16, 17, ventral view; 11, 13, lateral view); 12, 15, 18, gonostylus and volsella.

3 being 2.1-2.4 times as long as wide at apex and 0.5 times as long as vertex width. Temple 0.5 times as wide as eye in profile. Forewing with trapeziform or triangular 3*rm* cell; abscissae of *R* from base=13, 23, 35 (3*rm* triangular) or 12, 18, 4, 35 (3*rm* trapeziform). Longer spur of hind tibia 5/6 as long as segment 1 of hind tarsus. Gonostylus of genitalia and volsella as in Fig. 12. Gastral tergites 1-3 partly with silver pubescence. Gastral sternites 4 and 5 laterally with long black erect hairs (but not in the middle).

Specimens examined. Holotype: ♂, Anisimovka, Primorskij Krai, 12 July 1984, A. Lelej (IBPV). Paratypes: **Russia** (**Primorskij Krai**)—1♂, Sedanka, Vladivostok, 9 Aug. 1930, R. Malaise (paralectotype of *Anoplius aberrans* Guss.) (ZIS); 2♀, Anisimovka, 4 July 1982, 5 Aug. 1983, A. Lelej (IBPV); 1♀2♂, Evseyevka, 18 June - 17 July 1981, 28 June 1985, A. Lelej (IBPV); 2♀2♂, Barabash-Levada, 29 June - 2 Sept. 1978, A. Lelej & A. Osytshnyuk (IBPV, KU); 1♂, 30 km S Lazo, 18 Aug. 1986, A. Lelej (IBPV); 1♂, 10 km W Preobrazheniye, 16 Aug. 1986, A. Lelej (IBPV); 1♂, Riv. Ussuri near Novomichailovka, 26 July 1986, A. Lelej (IBPV); 2♂, Vysokogorsk, 28 July 1986, 17 July 1987, N. Kurzenko & P.

Lehr (IBPV); 1♂, Riv. Iman, 40 km S Melnitshnoye, 31 July 1986, A. Lelej (IBPV); 2♂, Shtsherbakovka, 26 July 1979, S. Belokobylskij (IBPV); 1♀, Staraya Kamenka, 20 June 1979, A. Romankov (IBPV); 2♂, Kiyevka, 8 June - 27 July 1976, T. Romankova (IBPV); 1♂, Gornotayozhnoye, 25 July 1983, A. Lelej (IBPV); 1♂, Ussurijskij Reserve, 23 July 1983, M. Shalangina (IBPV); 1♂, same loc. 6 Aug. 1987, P. Lehr (IBPV); 1♀, Reserve Kedrovaya Pad, 23 Sept. 1976, A. Berezantsev (IBPV). Russia (**Amur region**)－1♀, Riv. Karaptsha, Kundur, 20 July 1988, A. Lelej (IBPV); 3♂, Kundur, 28-29 June 1989, P. Nemkov & V. Sidorenko (IBPV). Russia (**Khabarovskij Krai**)－1♂, 15 km SW Elabuga, 4 Aug. 1975, A. Lelej (IBPV). **Japan** (Kyûshû)－1♂, Kinpô-zan, Satsuma Pen., Kagosima-ken, 10 Aug. 1991, A. Lelej (KU).

Distribution. Russia (Amur region, Khabarovskij Krai, Primorskij Krai); Japan (Kyûshû).

Remarks. The female of this new species is very similar to that of *A. petiolaris* Guss., but differs from the latter in shorter lateral spines of hind tarsal segment 1 (in *A. petiolaris* the longest one almost 2 times as long as width of tarsal segment 1 in the middle). On the basis of the male characters, this species belongs to the group of species which have the 4th and 5th gastral sternites with a brush of hairs, but is easily distinguished from other species of the group by the almost flat hypopygium (Figs. 10, 11)

The name of the species is dedicated to Prof. Toyohei Saigusa of Kyushu University who much helped us in the trip and collecting wasps.

20. *Anoplius* (*Anoplius*) *sakishimanus* Tsuneki, 1990

Anoplius (*Anoplius*) *sakishimanus* Tsuneki, 1990: 45 (holotype: ♀, Otomi, Iriomote-jima, Ryukyus, 21 Apr. 1989, Y. Haneda).

No specimens examined.

Distribution. Japan (Iriomote-jima).

Remarks. There is a possibility that *A. sakishimanus* (based on the female) is a synonym of *A. ishigakianus* Tsun. or *A. iriomotensis* Tsun. (based on the male).

21. *Anoplius* (*Anoplius*) *surusumi yayeyamanus* Tsuneki, 1990

Anoplius (*Anoplius*) *surusumi yayeyamanus* Tsuneki, 1990: 47, ♀ (holotype: ♀, Omoto-dake, Ishigaki-jima, Ryukyus, 5 June 1983, Y. Haneda).

Specimens examined. **Japan**－2♀, Koza-dake, Iriomote-jima, 7 Aug. 1983, A. Nagatomi (IBPV, KU).

Distribution. Japan (Ishigaki-jima, Iriomote-jima).

Remarks. The male specimen of *A. iriomotensis* (listed below) bears the same data label as the female of *A. surusumi yayeyamanus* here examined. This suggests that these two forms might be conspecific.

22. *Anoplius* (*Anoplius*) *iriomotensis* Tsuneki, 1990

Anoplius (*Anoplius*) *iriomotensis* Tsuneki, 1990: 51, ♂ (holotype: ♂, Otomi, Iriomote-jima,

Ryukyus, 21 Aug. 1989, Y. Haneda).

Specimens examined. **Japan** (Ryukyus)－1 ♂, Koza-dake, Iriomote-jima, 7 Aug. 1983, A. Nagatomi (IBPV); 1 ♂, Banna-dake, Ishigaki-jima, 4 July 1988, Sk. Yamane (KU).

Distribution. Japan (Ishigaki-jima*, Iriomote-jima).

23. *Anoplius* (*Anoplius*) *ishigakianus* Tsuneki, 1990

Anoplius (*Anoplius*) *ishigakianus* Tsuneki, 1990: 48, ♂ (holotype: ♂, Omoto-dake, Ishigaki-jima, Ryukyus, 5 June 1985, Y. Haneda).

No specimen examined.

Distribution. Japan (Ishigaki-jima).

Subgenus *Orientanoplius* Haupt, 1935

Type species: *Pompilus ignobilis* Saussure, 1867=*Pompilus canifrons* Smith, 1855, by original designation.

24. *Anoplius* (*Orientanoplius*) *canifrons* (Smith, 1855)

Anoplius (*Orientanoplius*) *canifrons*: Day, 1974: 382.

Specimens examined. **China**－1 ♀ 1 ♂, Chebaling, Guangdong Prov., 21 June 1990, A. Lelej (IBPV).

Distribution. Widely distributed in the forest areas from India and South China in north to Indonesia and Queensland in South (Day, 1974).

Remarks. According to the original description, *A. fuliginosus* Tsun. from Taiwan on the basis of the female sex alone seems to be very closely related to or even a synonym of this widespread species.

25a. *Anoplius* (*Orientanoplius*) *nozakae nozakae* Tsuneki, 1990

Anoplius (?*Orientanoplius*) *nozakae* Tsuneki, 1990: 53, ♂ [holotype: ♂, Oku (tea field), Okinawa-jima, 16 Aug. 1987, C. Nozaka].

No specimen examined.

Distribution. Japan (Okinawa-jima).

25b. *Anoplius* (*Orientanoplius*) *nozakae miyakonis* Tsuneki, 1990

Anoplius (?*Orientanoplius*) *nozakae miyakonis* Tsuneki, 1990: 55, ♂ (holotype: ♂, Botanical Gardens, Miyako-jima, 31 July 1984, C. Nozaka).

No specimen examined.

Distribution. Japan (Miyako-jima)

26. *Anoplius* (*Orientanoplius*) *yonagunianus* Tsuneki, 1990

Anoplius (?*Orientanoplius*) *yonagunianus* Tsuneki, 1990: 58, ♂ (holotype: ♂, Kubura, Yonaguni-jima, 24 July 1984, C. Nozaka).

Specimens examined. **Japan**－1 ♂, Tarama-jima, S. Ryukyus, 20 July 1987, Sk. Yamane

(KU); 1♂, Koza-dake, Iriomote-jima, 1 Aug. 1983, A. Nagatomi (IBPV).

Distribution. Japan (Tarama-jima*, Ishigaki-jima, Iriomote-jima , Yonaguni-jima).

The following four *Anoplius* species have been known only from type localities (Haupt, 1934, 1938a, b). We did not examine any specimen of these species.

27. *Anoplius* (*Anoplius*) *apicalis* (Haupt, 1938)

Orientanoplius apicalis Haupt, 1938b: 46, ♀ (syntypes: 2♀, Kuling, Kiangsu, China).
Anoplius (*Anoplius*) *apicalis*: Day, 1974: 379.

28. *Anoplius* (*Anoplius*) *hummeli* (Haupt, 1934)

Eopompilus hummeli Haupt, 1934: 16, ♀ [holotype: ♀, Pei Lung Shui (1700 m), Sudkansu, China, 26 June, D. Hummel].
Anoplius hummeli: Ishikawa, 1962: 332.

29. *Anoplius* (*Anoplius*) *niger* (Haupt, 1938)

Orientanoplius niger Haupt, 1938a: 16, ♀ (holotype: ♀, Kiangsu, China).
Anoplius (*Anoplius*) *niger*: Day, 1974: 379.

30. *Anoplius* (*Anoplius*) *obscuratus* (Haupt, 1938)

Orientanoplius obscuratus Haupt, 1938b: 45, ♀ (holotype: ♀, Ihing, Kiangsu, China).
Anoplius (*Anoplius*) *obscuratus*: Day, 1974: 379.

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