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## Taxonomic Study of the Genus *Psila* MEIGEN (Diptera, Psilidae) from Japan, Sakhalin and the Kurile Islands<sup>1)</sup>

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**Abstract** Seventeen species of the genus *Psila* MEIGEN from Japan, Sakhalin and the Kurile Islands are reviewed. Of these, seven species, namely *P. (Psila) fulviseta*, *P. (P.) japonica*, *P. (Synaphopsila) pullata*, *P. (Freyopsila) kanmiyai*, *P. (F.) nigriseta*, *P. (F.) nitida*, *P. (F.) sanguinolenta*, are new to science. Nine species including two economically important pests, *P. (P.) rosae* FABRICIUS and *P. (P.) nigricornis* MEIGEN, are newly recorded in Japan. A key to the Japanese species is also presented.

**Key words:** *Psila*; taxonomy; new species; Japan; Sakhalin and Kuriles.

### Introduction

Flies belonging to the genus *Psila* MEIGEN are distributed in the Holarctic, Oriental and Afrotropical Regions and are well represented in the Palaearctic Region (SHEWELL, 1965; COGAN, 1977, 1980; Soós, 1984). The larvae are known to be phytophagous and some species are known as agricultural and horticultural pests. The Palaearctic species have been studied by HENNIG (1941), COLLIN (1944, 1959), WAKERLEY (1959), LYNEBORG (1964), Soós (1974, 1984, 1985) and SHATALKIN (1983, 1986, 1989). However, there has been no record of the genus *Psila* in Japan up to the present. In the present paper, seventeen species of the genus *Psila* are reviewed with descriptions of seven new species from Japan, Sakhalin and the Kurile Islands.

### Genus *Psila* MEIGEN

*Psila* MEIGEN, 1803, Mag. Insektenk., 2: 278.

Type species: *Musca fimetaria* LINNAEUS, 1761, by designation of WESTWOOD (1840: 146) for *Psilomyia* LATREILLE.

The generic classification of *Psila* and related genera is one of the most difficult problems in the family. In the sense of HENNIG (1941), the genus-group of *Psila* comprises 4 independent genera (*Psila*, *Oxypsila*, *Synaphopsila* and

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*Chamaepsila*) which are closely related to each other, but these genera were classified on the basis of very subtle characteristics such as the existence and number of setae on the head and thorax. Soós (1974) treated the genus *Chamaepsila* as the subgenus of *Psila*. In the recent review of the east Palaearctic flies of *Psila*, SHATALKIN (1986) revised the genus-group of *Psila* to one genus (*Psila*) comprising five subgenera (*Psila*, *Synaphopsila*, *Freyopsila*, *Pseudopsila* and *Psilosoma*). In the course of the study of the Japanese genus-group *Psila*, I came to the conclusion that SHATALKIN's classification is appropriate. So, the characteristics of the genus *Psila* are redefined as follows: occiput not concave; length of 3rd antennal segment never exceed 5 times the width; 0-2 *or*, 1 *oc*, 2-3 *vt*, 0-1 *pvt*, 0-1 *n*, 0-1 *sa*, 1 *pa*, 0-2 *dc*, 1-2 *sc*; setae on head and thorax light brown to black; thorax and abdomen yellow to black; cubital cross vein straight; legs yellow to brown.

**Key to the species of the genus *Psila* from Japan (♂♀)**

1. Scutellar setae 2 pairs ..... 2
- Scutellar setae 1 pair ..... 3
2. Mesonotum completely yellow .....  
     ..... *Psila (Pseudopsila) tetrachaeta* SHATALKIN
- Mesonotum yellow with 2 longitudinal black stripes .....  
     ..... *Psila (Pseudopsila) nemoralis arbustorum* SHATALKIN
3. *n* absent ..... 4
- *n* present ..... 5
4. *dc* and *sa* present ..... *Psila (Synaphopsila) nartshukae* SHATALKIN
- *dc* and *sa* absent ..... *Psila (Synaphopsila) pullata* n. sp.
5. *pvt* absent or vestigial ..... 6
- *pvt* present ..... 11
6. Abdomen yellow to light brown ..... *Psila (Psila) nigripalpis* SHATALKIN
- Abdomen black ..... 7
7. Mesonotum yellow with a longitudinal dark stripe .....  
     ..... *Psila (Freyopsila) kanmiyai* n. sp.
- Mesonotum wholly black or dark brown ..... 8
8. Face with a longitudinal black stripe ..... 9
- Face without a longitudinal black stripe ..... 10
9. Setae on head and thorax black; body length 4.0-5.0 mm .....  
     ..... *Psila (Freyopsila) nigriseta* n. sp.
- Setae on head and thorax brownish yellow; body length 2.8-3.3 mm .....  
     ..... *Psila (Freyopsila) sibirica femoralis* FREY
10. Notopleuron and posterior callus black ..... *Psila (Freyopsila) nitida* n. sp.
- Notopleuron and posterior callus yellow .....  
     ..... *Psila (Freyopsila) sanguinolenta* n. sp.

11. Thorax and abdomen yellow to light brown ..... 12
- Thorax and abdomen black ..... 13
12. Mesonotum with 2 longitudinal black stripes .....  
..... *Psila (Psila) fenestralis* SHATALKIN
- Mesonotum without black stripes ..... *Psila (Psila) magna* SHATALKIN
13. 2 *vt* ..... 14
- 3 *vt* ..... 15
14. Fore femora yellow ..... *Psila (Psila) fulviseta* n. sp.
- Fore femora brown ..... *Psila (Psila) japonica* n. sp.
15. Body length 5.0–6.0 mm; innerside of male epandrial process fringed .....  
..... *Psila (Psila) sonora* SHATALKIN
- Body length 3.5–4.0 mm; innerside of male epandrial process not fringed  
..... 16
16. 3rd antennal segment black ..... *Psila (Psila) nigricornis* MEIGEN
- 3rd antennal segment yellow with dark area antero-dorsally .....  
..... *Psila (Psila) rosae* (FABRICIUS)

#### Subgenus *Psila* MEIGEN

Length of 3rd antennal segment about 1.5–2 times its breadth at base; thorax and abdomen from yellow to black; 1 *oc*, 0–2 *or*, 2–3 *vt*, *pvt* present or absent; 1 *n*, 1 *sa*, 1 *pa*, 1 *dc*, 1 *sc*; setae on head and thorax light brown to black; male aedeagus not protruded from epandrium.

*Distribution.* Palearctic, Oriental and Afrotropical Regions.

#### 1. *Psila (Psila) magna* (SHATALKIN, 1983)

[Japanese name: O-haneorebae]

(Figs. 1–2)

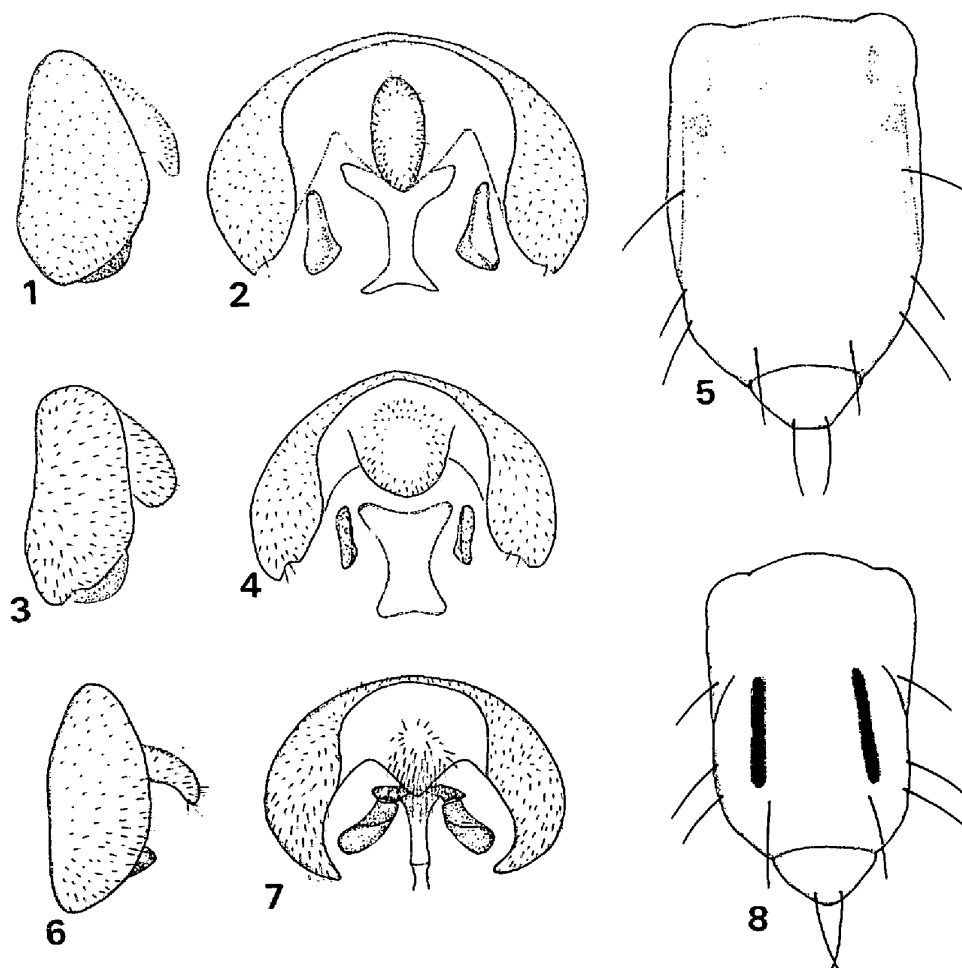
*Chamaepsila magna* SHATALKIN, 1983, Ent. Obozr., 62: 362.

*Psila (Psila) magna*: SHATALKIN, 1986, Proc. zool. Inst., 146: 35.

♂♀. Head wholly yellow; 1st and 3rd segments of antenna yellow, 2nd segment black; arista yellow and short-haired; palpi basally yellow and apically dark brown; 1 *oc*, 2 *or* (vestigial), 1 *pvt*, 2 *vt*. Thorax wholly brownish yellow; 1 *n*, 1 *sa*, 1 *pa*, 1 *dc*, 1 *sc*; halteres yellow. Legs wholly yellow. Abdomen brown; male genitalia as shown in Figs. 1–2. Body length: ♂♀, 8–9.5 mm; wing length, 7 mm.

*Specimens examined.* [Kuriles]—1 ♂, Kunashiri, 29 July 1935, T. UCHIDA. [Hokkaido]—2 ♂, 1 ♀, Sapporo, 9 June 1916, S. MATSUMURA; 1 ♂, Sapporo, 12 July 1963, S. TAKAGI; 1 ♂, Sapporo, 18 July 1961, S. TAKAGI; 1 ♂, Sapporo, 25 June 1967, M. SUWA; 1 ♂, Sapporo, 1 July 1960, S. UEDA; 1 ♂, Sapporo, 22

June 1966, M. SUWA; 2 ♂, Sapporo, 30 June 1962, S. TAKAGI; 1 ♂, Toikanbetsu, 12 Aug. 1965, T. KUMATA & K. KUSIGEMATI; 1 ♂, 2 ♀, Toyotomi, 21 June 1961, S. TAKAGI; 1 ♂, Shari, Abashiri, 31 July 1967, A. NAKANISHI; 1 ♂, 1 ♀, Shimamatsu, 12 June 1967, K. KUSIGEMATI; 1 ♂, Sarobetsu, 11–12 July 1968, T. NAKASHIMA; 1 ♂, Touya, 8 July 1967, T. KOCHA; 1 ♂, Nakasatsunai, 8 Aug. 1968, H. TORIKURA; 2 ♂, 1 ♀, Horokanai, 29–30 July 1958, S. TAKAGI; 1 ♂, 2 ♀, same locality and date, S. UEDA; 1 ♂, Okushiri, 17 July 1940, UCHIDA & SAWADA; 4, Tomakomai, 23 June 1959, S. UEDA; 2 ♀, Tomakomai, 19 Aug. 1977, M. SUWA; 2 ♀, Apoi-dake, 10 July 1966, M. SUWA; 1 ♀, Syokanbetsu, 21 July 1964, I. MIYAGI; 1 ♀, Rishiri Is., 14–15 July 1968, H. TAKIZAWA; 1 ♀, Daisetsu-zan, 22–26 July 1957, T. UCHIDA; 2 ♀, Horokanai, 29 July 1958, S. UEDA; 2 ♀, Jōzankei,



Figs. 1–8. — 1–2. *Psila (Psila) magna* (SHATALKIN); 1, male genitalia, lateral view (left); 2, ditto, posterior view. — 3–5. *Psila (Psila) nigripalpis* SHATALKIN; 3, male genitalia, lateral view (left); 4, ditto, posterior view; 5, thorax, dorsal view. — 6–8. *Psila (Psila) fenestralis* (SHATALKIN); 6, male genitalia, lateral view (left); 7, ditto, posterior view; 8, thorax, dorsal view.

16 July 1988, A. IWASAKI; [Honshu]—3 ♂, 1 ♀, Akka, Iwaizumi, Iwate, 19 June 1971, S. SHINONAGA; 1 ♂, 1 ♀, Mt. Myōkō, Niigata, 11–12 July 1970, R. KANO & S. SHINONAGA; 1 ♂, 3 ♀, Mt. Hakusan, Kaga, Ishikawa, 25 June 1974, H. KURAHASHI; 1 ♀, same locality, 3 July 1970, I. TOGASHI; 1 ♀, Tateyama, Toyama, 16–26 July 1952, K. HORI; 2 ♂, Ozegahara, Gunma, 9–13 July 1979, H. KURAHASHI; 1 ♀, Mt. Myoko, Nagano, 16–18 July 1973, K. NISHIDA; 1 ♀, Yanagawa, Yamanashi, 25 May 1973, H. KURAHASHI; 1 ♀, Shirakaba-ko, Nagano, K. KANMIYA; 1 ♂, Mt. Daisen, Tottori, 12–18 July 1934, ?; 1 ♀, Okukinu, Tochigi, 24 July 1969, T. KOCHA.

*Distribution.* Kuriles (Kunashiri Is.) and Japan (Hokkaido and Honshu). New to Japan.

*Remarks.* This species is closely related to *Psila fimetaria* (LINNAEUS) and *P. merdaria* (COLLIN), but differs from them by having *pvt* and the black 2nd antennal segment.

## 2. *Psila (Psila) nigripalpis* SHATALKIN, 1983

[Japanese name: Kihiro-haneorebae]

(Figs. 3–5)

*Psila nigripalpis*, SHATALKIN, 1983, Ent. Obozr., 62: 360.

*Psila (Psila) nigripalpis*: SHATALKIN, 1986, Proc. zool. Inst., 146: 35.

♂♀. Head yellow; ocellar triangle black; 1st and 3rd segments of antennae yellow, 2nd segment black; palpi basally yellow and apically dark brown; 1 *oc*, 2 *vt*; *or* and *pvt* absent. Thorax wholly yellow; mesonotum with brownish pattern (Fig. 5); pteropleuron glabrous; 1 *n*, 1 *sa*, 1 *pa*, 1 *dc*, 1 *sc*; halteres yellow. Legs wholly yellow. Abdomen brown; male genitalia as shown in Figs. 3–4. Body length: ♂♀, 6–7 mm; wing length, 5–5.5 mm.

*Specimens examined.* [Hokkaido]—2 ♂, 2 ♀, Mt. Apoi, 21 June 1959, T. KUMATA & S. UEDA; 1 ♂, Yamabe, 28 June 1960, S. TAKAGI; 1 ♂, same locality, 3 July 1960, S. TAKAGI; 1 ♂, Tomakomai, 24 June 1959, K. KAMIJŌ; 2 ♀, Tomakomai, 23 June 1959, S. UEDA; 2 ♂, 1 ♀, Rebun Is., 1 Aug. 1958, K. KAMIJŌ; 1 ♀, same data, S. TAKAGI; 1 ♀, same data, T. KUMATA; 1 ♀, Usappu, Hidaka, 3 July 1942, UCHIDA; 1 ♀, Nukabira, 12 July 1959, K. KAMIJŌ. [Honshu]—1 ♂, Mt. Nyugasa, Nagano, 27 July 1971, S. SHINONAGA.

*Distribution.* USSR (Far East) and Japan (Hokkaido and Honshu). New to Japan.

*Remarks.* This species is closely related to *Psila (Psila) magna* (SHATALKIN) and *Psila (Psila) rufa* MEIGEN, but differs from them in the absence of *pvt* on the head.

3. *Psila (Psila) fenestralis* (SHATALKIN, 1983)

[Japanese name: Kurosui-kiro-haneorebae]

(Figs. 6–8)

*Chamaepsila fenestralis* SHATALKIN, 1983, Ent. Obozr., 62: 361.*Psila (Psila) fenestralis*: SHATALKIN, 1986, Proc. zool. Inst., 146: 34.

♂♀. Head wholly yellow; 1st and 3rd segments of antenna light brown, 2nd segment dark brown; palpi dark brown; 1 *oc*, 2–3 *vt*, 1 *pvt*, *or* vestigial. Thorax wholly yellow; mesonotum with 2 longitudinal stripes in parallel (Fig. 8); mesopleuron immediately behind prothoracic spiracles with black macula; 1 *n*, 1 *sa*, 1 *pa*, 1 *dc*, 1 *sc*; halteres whitish yellow. Legs wholly yellow. Abdomen dark brown to black; male genitalia as shown in Figs. 6–7. Body length: ♂♀, 6–7 mm; wing length, 6–7 mm.

*Specimens examined.* 2 ♂, 1 ♀, Mt. Komagadake, Kiso, Honshu, 27 July 1970, M. SUWA; 2 ♀, Mt. Hayachine, Iwate, Honshu, 17–18 June 1971, S. SHINONAGA.

*Distribution.* USSR (Far East) and Japan (Honshu). New to Japan.

*Remarks.* This species is closely related to *Psila rufa* MEIGEN and *Psila (Psila) nigripalpis* SHATALKIN, but differs from them by having 2 longitudinal black stripes on the mesonotum.

4. *Psila (Psila) rosae* (FABRICIUS, 1794)

[Japanese name: Ninjin-sabibae]

(Figs. 9–10)

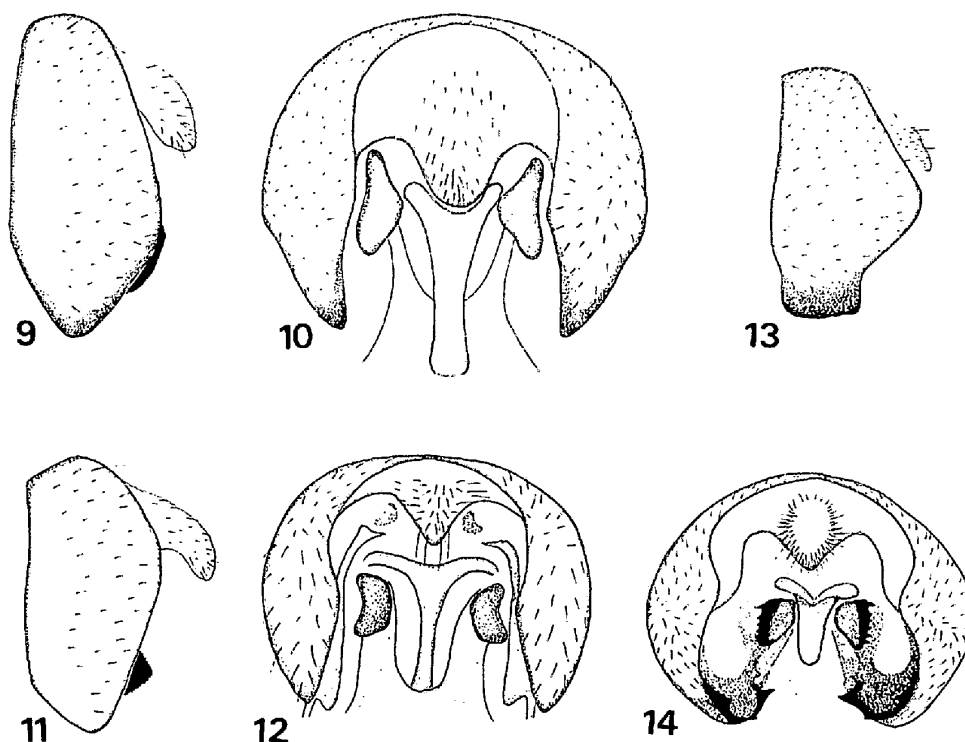
*Musca rosae* FABRICIUS, 1794, Ent. syst., 4: 356.*Chamaepsila rosae*: HENNIG, 1941, Flieg. palaearkt. Reg., 5(1): 3.*Psila (Psila) rosae*: SHATALKIN, 1986, Proc. zool. Inst., 146: 37.

♂♀. Frons light brown; face, facial orbit and gena yellow; occiput dark brown; 1st to 3rd segment of antenna yellow to light brown, antero-dorsal margin of 3rd segment dark brown; palpi yellow, apically light brown; 1 *oc*, 2 *or*, 3 *vt*, 1 *pvt* (these setae light brown). Thorax wholly black and shiny; 1 *n*, 1 *sa*, 1 *pa*, 2 *dc*, 1 *sc* (these setae brown). Legs wholly yellow. Abdomen wholly black and shiny; male epandrium apically not rounded (Figs. 9–10). Body length, ♂♀ 3.5–4.0 mm; wing length, 4 mm.

*Specimens examined.* [Sakhalin]—2 ♂, 5 ♀, Shisuka, 22 Aug. 1914, ADACHI and ISSHIKI; 1 ♂, 1 ♀, Haga, Shimizu, 7 July 1932, H. KÔNO. [Hokkaido]—1 ♂, Rebun Is., 21 July 1972, H. HIGUCHI.

*Distribution.* Palearctic Region, Sakhalin and Japan (Rebun Is., Hokkaido). New to Japan.

*Remarks.* This species is known to be an economically important pest of



Figs. 9–14. — 9–10. *Psila* (*Psila*) *rosae* (FABRICIUS); 9, male genitalia, lateral view (left); 10, ditto, posterior view. — 11–12. *Psila nigricornis* MEIGEN; 11, male genitalia, lateral view (left); 12, ditto, posterior view. — 13–14. *Psila* (*Psila*) *sonora* SHATALKIN; 13, male genitalia, lateral view (left); 14, ditto, posterior view.

umbelliferous plants in Europe and North America.

##### 5. *Psila* (*Psila*) *nigricornis* MEIGEN, 1826

[Japanese name: Kikunone-haneorebae]

(Figs. 11–12)

*Psila nigricornis* MEIGEN, 1826, Syst. Besch., 5: 359.

*Chamaepsila nigricornis*: HENNIG, 1941, Flieg. palaearkt. Reg., 5(1): 1.

*Psila* (*Psila*) *nigricornis*: SHATALKIN, 1986, Proc. zool. Inst., 146: 35.

Body length: ♂♀, 3.5–4.0 mm; wing length, ca. 4 mm.

Specimens examined: 3 ♂, 5 ♀, Kobe, 10 Apr. 1988, M. KANEDA.

*Distribution.* Europe, North America, USSR and Japan (Honshu). New to Japan.

*Remarks.* This species closely resembles *Psila* (*Psila*) *rosae* (FABRICIUS), but differs from it in having the black 3rd antennal segment and in shape of the male epandrium. The larvae of this species are known to injure the roots of chrysan-

themums in Europe.

# 6. *Psila (Psila) sonora* SHATALKIN, 1986

[Japanese name: Kiashi-kurotsuya-haneorebae]

(Figs. 13–14)

*Psila (Psila) sonora* SHATALKIN, 1986, Proc. zool. Inst., 146: 37.

♂♀. Frons brown; ocellar triangle black; face and gena light brown; occiput dark brown; 1st to 3rd segments of antennae light brown, only marginal upper part of 3rd segment dark brown; arista yellow and short-haired; palpi brown; 1 *oc*, 1 *or*, 3 *vt*, 1 *pvt* (these setae light brown). Thorax wholly black; 1 *n*, 1 *sa*, 1 *pa*, 2 *dc*, 1 *sc* (these setae brown). Wings hyaline, tinged with light brown; halteres whitish yellow. Legs wholly yellow. Abdomen wholly black and shiny; male genitalia as shown in Figs. 13 and 14. Body length: ♂♀, 5.0–6.0 mm; wing length 5–5.5 mm.

*Specimens examined.* [Hokkaido]—3 ♂, 10 ♀, Memuro, 12 June 1988, A. IWASAKI; 1 ♂, 1 ♀, Yamabe, 28 June 1960, S. TAKAGI; 2 ♀, Sapporo, 25 June 1931, OKADA; 1 ♀, Horoka, 13 July 1959, K. KAMIJÔ; 1 ♀, Nakashibetsu, 30 June 1987, M. IWASA.

*Distribution.* USSR and Japan (Hokkaido). New to Japan.

*Remarks.* This species is closely related to *Psila rosae* (FABRICIUS) and *Psila nigricornis* MEIGEN, but can be easily distinguished from them by the larger body size and shape of the male genitalia.

# 7. *Psila (Psila) fulviseta* n. sp.

[Japanese name: Chibi-haneorebae]

(Figs. 15–16)

♂♀. Head: eyes brown; frons anteriorly light brown and posteriorly dark brown; ocellar triangle dark brown; face brown; facial orbit and gena yellow; occiput dark brown; 1st to 3rd segment of antenna light brown, dorsal margin of 3rd segment dark brown; arista light brown and short-haired; palpi light brown to brown; 1 *oc*, 2 *or*, 2 *vt*, 1 *pvt* (these setae brown).

Thorax: wholly black and shiny; mesonotum clothed with hairs; mesopleuron and sternopleuron sparsely with hairs; pteropleuron, hypopleuron and metanotum glossy; metapleuron slightly pruinose; 1 *n*, 1 *sa*, 1 *pa*, 2 *dc*, 1 *sc* (these setae brown).

Wing: hyaline, tinged with light brown; veins light brown; halteres whitish, basally yellow.

Legs: wholly yellow; middle tibia with an *av* apical seta; tarsal segments without any distinct setae.

Abdomen: wholly black and shiny; tergites clothed with short hairs; male epandrium rounded and hypandrium developed (Fig. 15); male gonapoda triangular shaped and aedeagus not protruded from epandrium (Fig. 16).

Body length: ♂♀, 3–4 mm; wing length 3.5–4.0 mm.

Holotype: ♂, Bibai, Hokkaido, 26 May 1961, I. MIYAGI (preserved in Entomological Institute, Hokkaido University). Paratypes: [Hokkaido]—1 ♂, 3 ♀, Obihiro, 16 May 1987, A. IWASAKI; 1 ♀, Obihiro, 12 June 1988, A. IWASAKI; 2 ♀, Obihiro, 8 June 1988, A. IWASAKI; 1 ♀, Takikawa, 12 June 1988, A. IWASAKI; 1 ♂, 1 ♀, Eniwa, 25 May 1966, M. SUWA; 3 ♀, Furenai, Hidaka, 3 June 1978, M. IWASA; 1 ♀, Tomakomai, 23 June 1959, K. KAMIJÔ.

*Distribution.* Japan (Hokkaido).

*Remarks.* This species is closely related to *Psila* (*Psila*) *amurensis* SHATALKIN, but differs from it in shape of the aedeagus of the male genitalia.

#### 8. *Psila* (*Psila*) *japonica* n. sp.

[Japanese name: Yamato-haneorebae]

(Figs. 17–18)

♂♀. Head: eyes brown; frons light brown anteriorly and dark brown posteriorly; face brown with a longitudinal yellow stripe which is broad in lower part; facial orbit and gena yellow; occiput dark brown; 1st to 3rd segments of antenna yellow to light brown, dorsal margin of 3rd segment dark brown; arista pubescent; palpi light brown; 1 *oc*, 2 *or*, 2 *vt*, 1 *pvt* (these setae dark brown).

Thorax: wholly black and shiny; mesonotum clothed with hairs; mesopleuron sparsely with hairs; sternopleuron, pteropleuron, hypopleuron and metanotum glossy; metapleuron slightly pruinose; 1 *n*, 1 *sa*, 1 *pa*, 2 *dc*, 1 *sc* (these setae black).

Wing: hyaline, tinged with light brown; veins light brown; halteres whitish, basally yellow.

Legs: all femora brown, apically yellow; all tibiae and tarsi wholly yellow; middle tibia with an *av* seta.

Abdomen: wholly black and shiny; tergites clothed with short hairs; male hypandrium not so developed (Fig. 17) and gonapoda antero-dorsally hook-shaped (Fig. 18).

Body length: ♂♀, 3 mm; wing length, 3 mm.

Holotype: ♂, Kanayama, Yamanashi, Honshu, 28 May 1975, Malaise Trap, Kyushu Univ. (preserved in Biological Laboratory, College of General Education, Kyushu University). Paratypes: 4 ♂, 1 ♀, same data as the holotype; 1 ♀, 2 May 1975, same locality as the holotype.

*Distribution.* Japan (Honshu).

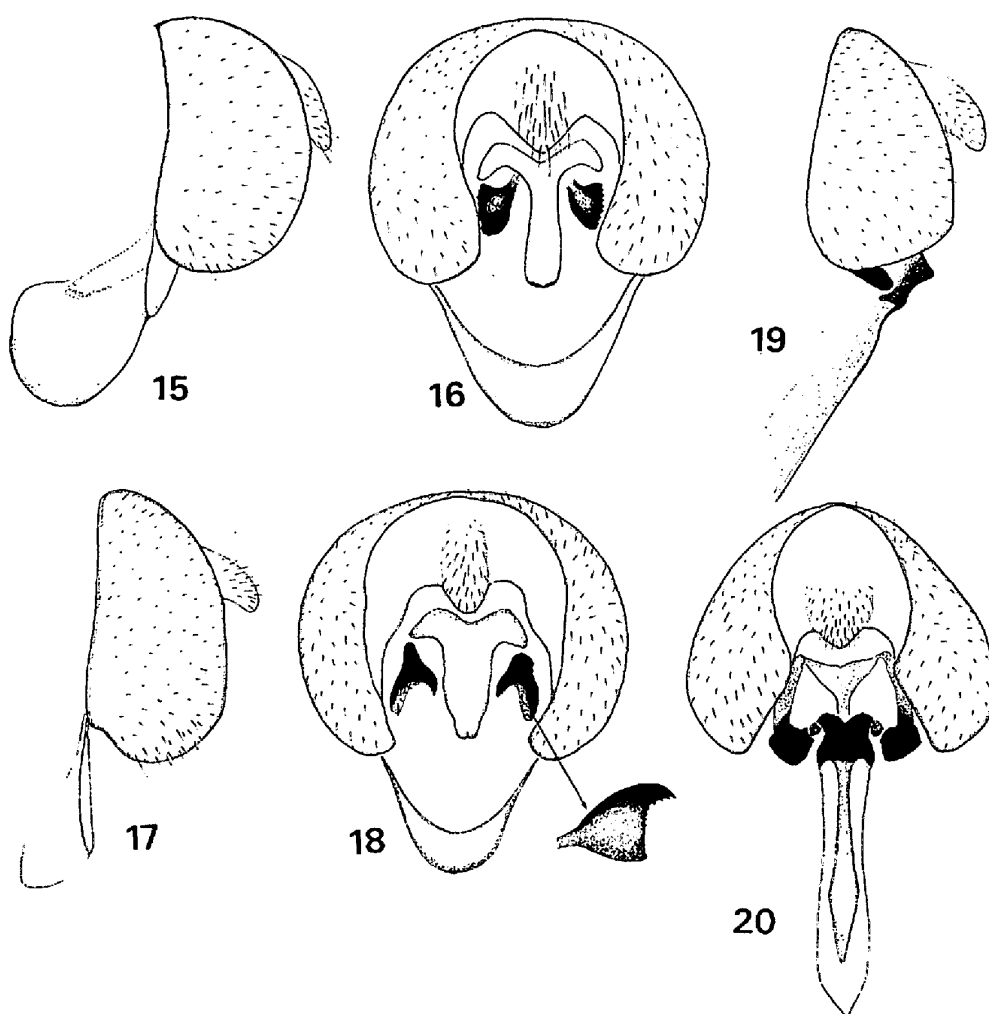
*Remarks.* This species is closely related to *Psila* (*Psila*) *fulviseta* n. sp., but

differs from it in having brown femora and in shape of the gonapoda and hypan-drium of the male genitalia.

### Subgenus *Synaphopsila* HENDEL

The subgenus *Synaphopsila* HENDEL is well defined by the absence of *pvt* and *n* (SHATALKIN, 1986).

*Distribution.* Palearctic Region.



Figs. 15–20. — 15–16. *Psila (Psila) fulviseta* n. sp.; 15, male genitalia, lateral view (left); 16, ditto, posterior view. — 17–18. *Psila (Psila) japonica* n. sp.; 17, male genitalia, lateral view (left); 18, ditto, posterior view. — 19–20. *Psila (Synaphopsila) pullata* n. sp.; 19, male genitalia, lateral view (left); 20, ditto, posterior view.

9. *Psila (Synaphopsila) nartshukae* SHATALKIN, 1986

[Japanese name: Ninjin-haneorebae]

*Psila (Synaphopsila) nartshukae* SHATALKIN, 1986, Proc. zool. Inst., 146: 38.*Phytopsila carota* IWASA, HANADA et KAJINO, 1987, Appl. Ent. Zool., 22: 310. **Syn. n.**

*Phytopsila carota* was described by IWASA et al. (1987) from Japan and differentiated from the genus *Synaphopsila* in the absence of *n*. In SHATALKIN's revision (1986) of the Palaearctic *Psila*-species, however, he pointed out the absence of *n* in *Synaphopsila* and described *Psila (Synaphopsila) nartshukae*. Recently, I received a personal information on *Phytopsila carota* from Dr. SHATALKIN. According to his letter, *Phytopsila carota* is conspecific with *Psila (Synaphopsila) nartshukae* SHATALKIN. Though I didn't examine the type specimen of *nartshukae*, the detailed descriptions of these two species revealed *Phytopsila carota* to be a synonym of *Psila (Synaphopsila) nartshukae*. Body length: ♂♀, 5–6 mm; wing length: 4–4.5 mm.

*Specimens examined.* 4♂, 2♀, Ebetsu, Hokkaido, 20 May 1959, T. KUMATA; 2♀, Jyôzankei, Hokkaido, 12 June 1963, S. TAKAGI; 1♀, Nopporo, Hokkaido, 3 June 1973, M. SUWA; 6♂, 10♀, Akan-chô, Kushiro, Hokkaido, 13 May 1985, M. IWASA.

*Distribution.* USSR and Japan (Hokkaido).

*Remarks.* The larvae of this species are known to injure the root of carrot in Japan.

10. *Psila (Synaphopsila) pullata* n. sp.

[Japanese name: Seguro-haneorebae]

(Figs. 19–20)

♂♀. Head: eyes brown; frons light brown in anterior half and dark brown in posterior half; ocellar triangle developed and dark brown; face and facial orbit yellow; gena and occiput dark brown; 1st and 2nd segments of antennae brown, 3rd segment yellow with antero-dorsally brownish margin; arista whitish yellow and short-haired; palpi dark brown; 1 *oc*, 2 *or*, 2 *vt* (these setae black); *pvt* absent.

Thorax: wholly black and shiny; mesonotum clothed with hairs; all pleuron black and glossy; mesopleuron and sternopleuron sparsely with hairs; 1 *pa*, 1 *sc* (these setae black); *n*, *sa* and *dc* absent.

Wing: hyaline, tinged with light brown; veins light brown; halteres white, darkened basally.

Legs: wholly yellow; middle tibia with an *av* apical seta.

Abdomen: wholly black and shiny; tergites clothed with short hairs; male aedeagus distinct and protruded from epandrium (Figs. 19–20).

Body length: ♂♀, 4–4.5 mm; wing length, 4 mm.

**Holotype:** ♂, Minami-Zaô, Miyagi, 30 June 1979, M. IWASA (preserved in Obihiro University of Agriculture and Veterinary Medicine, Obihiro, Hokkaido). **Paratypes:** 4 ♂, 6 ♀, same data as holotypes; 1 ♀, Sapporo, 15–16 July 1960, S. TAKAGI; 1 ♂, Karuizawa, Nagano, 9 Aug. 1970, R. KANO; 2 ♀, Okukinu, Tochigi, 23 July 1969, T. KOCHA; 1 ♂, Hida-Ontake, Gifu, 7 July 1969, A. NAGATOMI.

**Distribution.** Japan (Hokkaido and Honshu).

**Remarks.** Though *P. (S.) pullata* n. sp. lacks supra-alar setae on the thorax, the other characteristics apparently show that this new species is a member of *Synaphopsila*. This species is closely related to *Psila (Synaphopsila) maritima* SHATALKIN, but differs from it in having the dark genae, in lacking *sa* setae on the thorax and in shape of the epandrium.

#### Subgenus *Freyopsila* SHATALKIN

Length of 3rd antennal segment about 2 times its breadth at base; thorax and abdomen black; 2 *vt*, 1 *n*, 1 *sa*, 1 *pa*, 1 *dc*, 1 *sc*; *pvt* absent; setae on head and thorax brown to black; male aedeagus usually protruded from epandrium.

**Distribution.** Palaearctic Region.

#### 11. *Psila (Freyopsila) kanmiyai* n. sp.

[Japanese name: Hitosuji-kogata-haneorebae]

(Figs. 21–23)

♂♀. **Head:** eyes and frons dark brown; ocellar triangle black; face brown, centrally with a longitudinal yellow stripe; facial orbit and gena yellow; occiput dark brown; 1st to 2nd antennal segment dark brown and 3rd segment light brown, darkened antero-apically; arista whitish yellow and pubescent; palpi dark brown; 1 *oc*, 1 *or*, 2 *vt* (these setae black); *pvt* absent.

**Thorax:** mesonotum yellow with a dark brownish longitudinal stripe (Fig. 23); humeral callus, upper part of mesopleuron, pteropleuron and metapleuron brown; lower part of mesopleuron, sternopleuron and hypopleuron yellow; scutellum and metanotum almost brown; 1 *n*, 1 *sa*, 1 *pa*, 1 *dc*, 1 *sc* (these setae black).

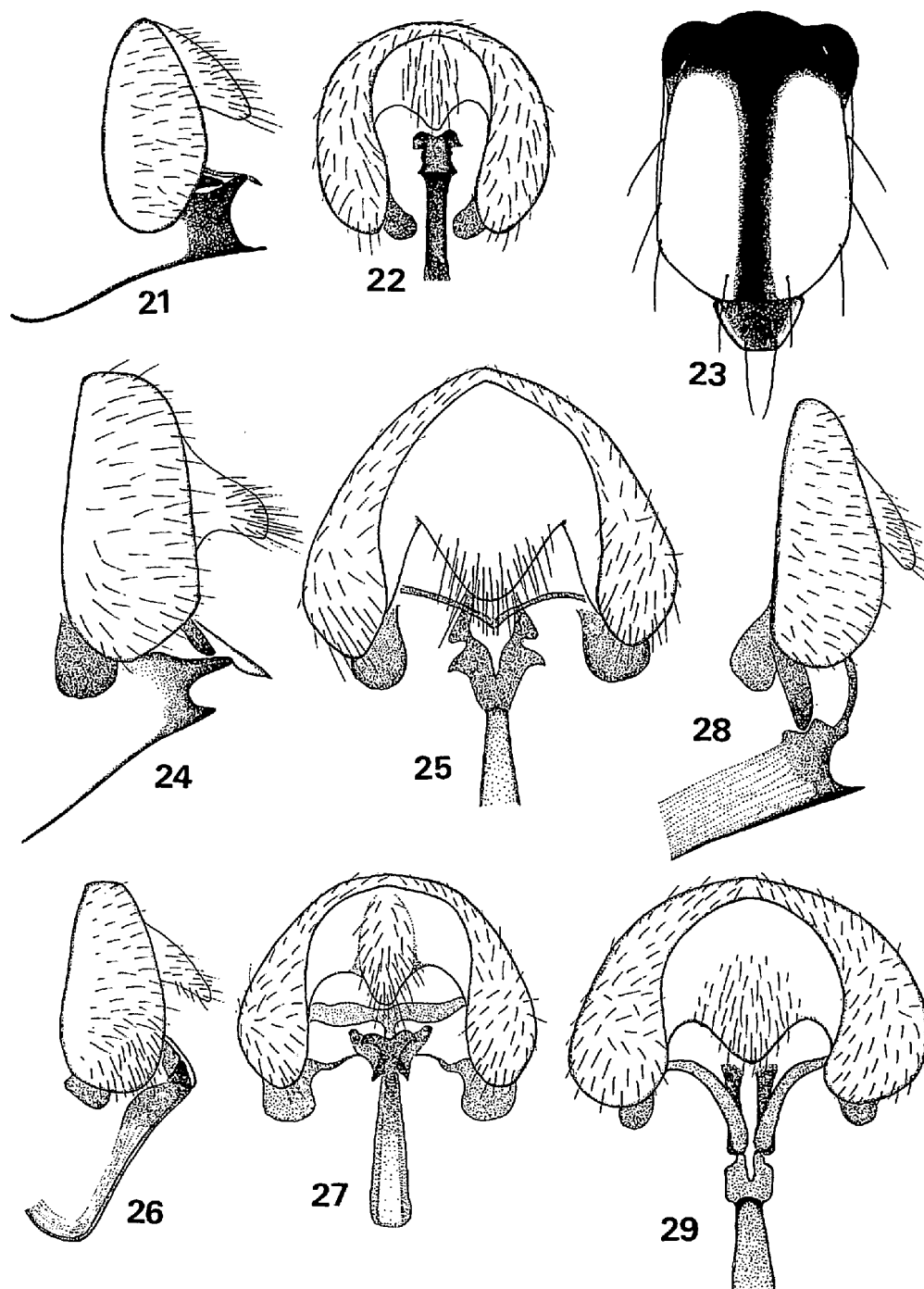
**Wings:** hyaline, tinged with light brown; veins light brown; halteres whitish yellow.

**Legs:** wholly yellow; middle tibia with an *av* apical seta.

**Abdomen:** wholly black and shiny; tergites clothed with short hairs; male genitalia as shown in Figs. 21–22.

**Body length:** ♂♀, 4 mm; wing length, 3.5 mm.

**Holotype:** ♂, Mt. Ariakeyama, Tsushima Is., Nagasaki, Kyushu, 17 Sep. 1972, K. KANMIYA (preserved in Obihiro University of Agriculture and Veterinary Medicine). **Paratype:** 1 ♀, same data as the holotype.



Figs. 21–29. — 21–23. *Psila (Freyopsila) kanmiyai* n. sp.; 21, male genitalia, lateral view (left); 22, ditto, posterior view; 23, thorax, dorsal view. — 24–25. *Psila (Freyopsila) nigriseta* n. sp.; 24, male genitalia, lateral view (left); 25, ditto, posterior view. — 26–27. *Psila (Freyopsila) sibirica femoralis* (FREY); 26, male genitalia, lateral view (left); 27, ditto, posterior view. — 28–29. *Psila (Freyopsila) nitida* n. sp.; 28, male genitalia, lateral view (left); 29, ditto, posterior view.

*Distribution.* Japan (Tsushima Is., Kyushu).

*Remarks.* This species can be distinguished from other *Freyopsila*-species in having a longitudinal dark stripe on the mesonotum in both sexes.

12. *Psila (Freyopsila) nigriseta* n. sp.

[Japanese name: Kuroge-haneorebae]

(Figs. 24–25)

♂♀. Head: eyes brown; frons yellow; ocellar triangle developed and black; face yellow, centrally with a longitudinal black stripe; facial orbit and gena yellow; occiput dark brown; 1st to 3rd segment of antenna yellow, antero-dorsal margin of 3rd segment dark brown; arista whitish yellow and pubescent; palpi light brown; 1 *oc*, 2 *or* (vestigial), 2 *vt* (these setae black); *pvt* absent.

Thorax: wholly black and shiny; mesonotum clothed with hairs; all pleuron black and glossy; mesopleuron sparsely with hairs; 1 *n*, 1 *sa*, 1 *pa*, 1 *dc*, 1 *sc* (these setae black).

Wings: hyaline, tinged with light brown; veins light brown; halteres whitish, basally yellow.

Legs: wholly yellow; middle tibia with an *av* apical setae.

Abdomen: wholly black and shiny; tergites clothed with short hairs; male genitalia as shown in Figs. 24–25.

Body length: ♂♀, 4–5 mm; wing length, 4 mm.

Holotype: ♂, Mt. Takao, Tokyo, 15 Apr. 1971, S. SHINONAGA (preserved in Obihiro University of Agriculture and Veterinary Medicine). Paratypes: [Hokkaido]—1 ♂, Tomakomai, 6 June 1975, T. HATTORI; 1 ♂, Kawayu, Kushiro, 1 June 1966, T. KUMATA; 1 ♀, Nopporo, 14 June 1986, A. IWASAKI; 1 ♀, Jōzankei; 5 July 1951, Y. NISHIJIMA; [Kyushu]—1 ♂, Fukuoka, 23 Apr. 1972, H. MAKIHARA; 1 ♀, Fukuoka, 17 Apr. 1967, M. SUWA; 1 ♂, 3 ♀, Mt. Kōrasan, 14 June 1963, S. IDE; 1 ♀, Kagoshima, 8 Apr. 1968, A. TANAKA.

*Distribution.* Japan (Hokkaido, Honshu and Kyushu).

*Remarks.* This species is closely related to *Psila (Freyopsila) sibirica sibirica* FREY, but differs from it in having black setae on the head and thorax, and the larger body.

13. *Psila (Freyopsila) sibirica femoralis* (FREY, 1925)

[Japanese name: Momoguro-chibi-haneorebae]

(Figs. 26–27)

*Chamaepsila sibirica* var. *femoralis* FREY, 1925, Not. Ent., 5: 48.

*Psila (Freyopsila) sibirica femoralis* FREY: SHATALKIN, 1986, Proc. zool. Inst., 146: 40.

♂♀. Head black, only anterior part of frons yellow; 1st to 3rd segment of

antenna light brown, antero-dorsal margin of 3rd segment blackish; thorax and abdomen completely black; macrochaetae on head and thorax brownish; legs yellow, but middle and hind femora brownish in distal part. Body length: ♂♀, 3–3.7 mm; wing length, ca. 3 mm.

Specimens examined: [Sakhalin]—1 ♂, Haga, Shimizu, 22 July 1932, H. KÔNO; 1 ♀, Odomari, 28 July 1914, ADACHI & ISSHIKI; [Kuriles]—1 ♂, 15 July 1941, H. KÔNO & S. SUMIMIYA; [Hokkaido]—1 ♂, Mt. Rishiri, 3 July 1967, T. SAIGUSA; 1 ♂, Mt. Shokan, 2 July 1971, M. SUWA; 1 ♂, 2 ♀, Mt. Yubari, 16 July 1967, H. SHIMA; 1 ♂, 1 ♀, Mt. Satsunai, 28 July 1967, A. NAKANISHI; 1 ♀, Mt. Kurodake, 30 July 1960, S. TAKAGI; 1 ♀, Aizankei, 16 July 1960, S. TAKAGI; 2 ♂, 1 ♀, Mt. Esaoman-tottabetsu, 31 July 1988, A. IWASAKI; [Honshu]—1 ♂, 1 ♀, Kanayama, Yamanashi, 26 May–1 June 1975, J. EMOTO & A. NAKANISHI; 1 ♂, Mt. Hakusan, Ishikawa, 6 Aug. 1970, K. KANMIYA; 1 ♂, Mt. Chôkai, Akita, S. FUKUSHI; 1 ♂, Chû-zenji, Tochigi, 27 July 1917, E. GALLOIS.

*Distribution.* USSR, Sakhalin, Kuriles and Japan (Hokkaido and Honshu). New to Japan.

*Remarks.* This species can be distinguished from *Psila (Freyopsila) sibirica sibirica* FREY in having distally brownish middle and hind femora. This species is also closely related to *Psila (Freyopsila) nigriseta* n. sp., but differs from it in having brownish macrochaetae on the head and thorax.

#### 14. *Psila (Freyopsila) nitida* n. sp.

[Japanese name: Kurotsuya-haneorebae]

(Figs. 28–29)

♂♀. Head: eyes brown; frons light brown; ocellar triangle dark brown; face, facial orbit and gena yellow; occiput dark brown; 1st to 3rd segment brown, dorsal margin of 3rd segment dark brown; arista yellow and short-haired; palpi dark brown; basal part of palpi dark brown; 1 *oc*, 2 *or*, 2 *vt* (these setae black); *pvt* absent.

Thorax: wholly blackish and shiny; mesonotum clothed with hairs; all pleuron black to dark brown and glossy; 1 *n*, 1 *sa*, 1 *pa*, 1 *dc*, 1 *sc* (these setae black).

Wing: hyaline, tinged with light brown; veins light brown; halteres white, basally yellow.

Legs: wholly yellow; middle tibia with an *av* apical seta.

Abdomen: wholly black and shiny; tergites clothed with short hairs; male genitalia as shown in Figs. 28–29.

Body length: ♂♀, 4–5 mm; wing length, 4 mm.

Holotype: ♂, Sapporo, Hokkaido, 28 May 1959, S. TAKAGI (preserved in Entomological Institute, Hokkaido University). Paratypes: [Hokkaido]—1 ♂, Sapporo, 6 June 1959, S. TAKAGI; 1 ♂, Sapporo, 2 Sep. 1958, S. TAKAGI; 1 ♀,

Sapporo, 24 May 1960, K. KAMIJÔ; 1 ♀, Sapporo, 21 Aug. 1959, K. KAMIJÔ; 1 ♀, Sapporo, 11 May 1959, S. UEDA; 1 ♀, Sapporo, 9 Sep. 1958, S. UEDA; 1 ♀, Sapporo, 12 June 1975, M. SUWA; 1 ♀, Sapporo, 8 June 1958, S. MOMOI; 1 ♀, Maruyama, Sapporo, 22 June 1958, S. MOMOI; 1 ♀, Sapporo, 6 June 1959, T. KUMATA; 1 ♀, Soranuma, Sapporo, 18 June 1963, S. TAKAGI; 1 ♂, 1 ♀, Nopporo, 9 June 1967, M. SUWA; [Honshu]—1 ♀, Mt. Zao, Yamagata, 7 Sep. 1966, M. SUWA; [Kyushu]—1 ♂, 2 ♀, Chôjaboru, Ôita, 10 Oct. 1969, K. KANMIYA; 1 ♀, Ôkôchi, Miyazaki, 24–25 May 1975, K. KANMIYA & H. SHIMA.

*Distribution.* Japan (Hokkaido, Honshu and Kyushu).

*Remarks.* This species is closely related to *Psila (Freyopsila) sibirica flavigena* SHATALKIN, but differs from it in having black macrochaetae on the head and thorax, and in the larger body size.

# 15. *Psila (Freyopsila) sanguinolenta* n. sp.

[Japanese name: Mune-aka-haneorebae]

(Figs. 30–31)

♂♀. Head: eyes brown; frons light brown, anterior small part yellow; ocellar triangle dark brown; face, facial orbit and gena yellow; occiput dark brown; 1st to 3rd segment light brown, dorsal margin of 3rd segment dark brown; arista whitish yellow, short-haired; palpi dark brown; basal part of palpi yellow; 1 *oc*, 2 *or*, 2 *vi* (these setae black); *pvt* absent.

Thorax: mesonotum dark brown, clothed with hairs; notopleuron to posterior callus yellow; mesopleuron and pteropleuron brown in upper half and yellow in lower half; sternopleuron and hypopleuron yellow; metapleuron and metanotum dark brown; 1 *n*, 1 *sa*, 1 *pa*, 1 *dc*, 1 *sc* (these setae black).

Wing: hyaline, tinged with light brown; veins light brown; halteres white, basally yellow.

Legs: wholly yellow; middle tibia with an *av* apical seta.

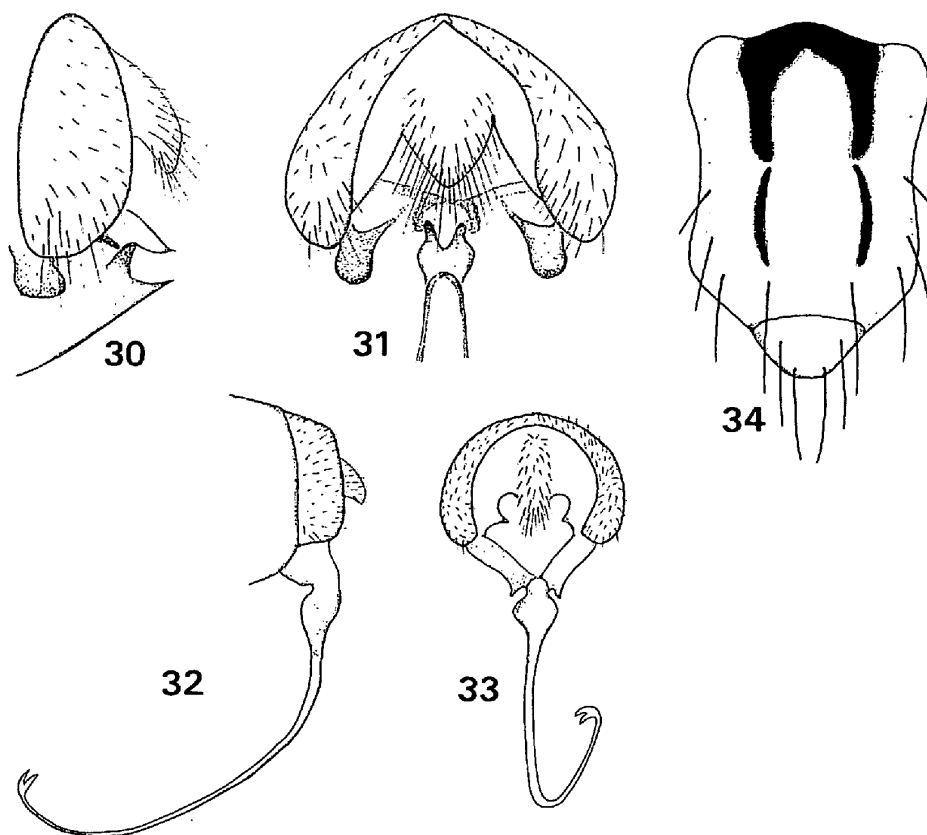
Abdomen: wholly dark brown and shiny; tergites clothed with short hairs; male genitalia as shown in Figs. 30–31.

Body length: ♂♀, 4 mm; wing length, 4 mm.

Holotype: ♂, Mt. Inunaki, Fukuoka, Kyushu, 19 Oct. 1960, M. HONDA (preserved in Obihiro University of Agriculture and Veterinary Medicine). Paratypes: [Kyushu]—1 ♀, same data as the holotype; 1 ♀, Mt. Inunaki, 1 May 1970, M. HONDA; 5 ♀, same locality, 3–5 May 1969, HONMA; 1 ♀, same locality, 28 Apr. 1969, M. HONDA; 1 ♂, Mt. Takakuma, Ôsumi, 25 Mar. 1968, K. KANMIYA; 1 ♀, Yakushima, Kagoshima, 12 May 1974, K. KANMIYA; 1 ♂, Mt. Ariake, Tsushima Is., Nagasaki, 17 Sep. 1972, K. KANMIYA.

*Distribution.* Japan (Kyushu).

*Remarks.* This species is closely related to *Psila (Freyopsila) nitida* n. sp., but can be distinguished from it by the yellowish notopleuron, sternopleuron and



Figs. 30–34. — 30–31. *Psila* (*Freyopsila*) *sanguinolenta* n. sp.; 30, male genitalia, lateral view (left); 31, ditto, posterior view. — 32–34. *Psila* (*Pseudopsila*) *nemoralis arbustorum* SHATALKIN; 32, male genitalia, lateral view (left); 33, ditto, posterior view; 34, thorax, dorsal view.

posterior callus.

#### Subgenus *Pseudopsila* JOHNSON

Length of 3rd antennal segment about 2–4 times as long as its breadth at base; 2 *vt*, 1 *pvt*, 1 *n*, 1 *sa*, 1 *pa*, 1 *dc*, 2 *sc*; setae on head and thorax black; male aedeagus often prominently long and slender. This subgenus differs from other subgenera by having 2 pairs of scutellar setae.

*Distribution.* Palaearctic, Nearctic and Oriental Regions.

#### 16. *Psila* (*Pseudopsila*) *tetrachaeta* SHATALKIN, 1984

[Japanese name: Onaga-haneorebae]

*Chamaepsila tetrachaeta* SHATALKIN, 1983, Ent. Obozr., 62: 362.

*Psila* (*Pseudopsila*) *tetrachaeta*: SHATALKIN, 1986, Proc. zool. Inst., 146: 42.

♂♀. Head yellow, only ocellar tubercle black; 1st and 2nd antennal segments yellow; 3rd segment yellow in basal part, and black in apical part beginning from just above site of attachment of arista; thorax, abdomen and legs completely yellow; male aedeagus unusually long and slender like that of *Psila* (*Pseudopsila*) *nemoralis arbustorum* SHATALKIN. Body length: ♂♀, 4–4.8 mm; wing length, ca. 4 mm.

*Specimens examined.* [Sakhalin]—1 ♂, 1 ♀, Kaibato, 30 July–2 Aug. 1934, C. WATANABE & T. INOUE. [Hokkaido]—1 ♀, Noboribetsu, 18 June ?year, S. MATSUMURA. [Honshu]—1 ♂, Sandankyô, Hiroshima, 14 June 1983, T. SAIGUSA. [Kyushu]—1 ♀, Mt. Kurodake, Ôita, 10 June 1972, K. KANMIYA.

*Distribution.* USSR, Sakhalin, Kuriles and Japan (Hokkaido, Honshu and Kyushu). New to Japan.

# 17. *Psila* (*Pseudopsila*) *nemoralis arbustorum* SHATALKIN, 1986

[Japanese name: Sesuji-onaga-haneorebae]

(Figs. 32–34)

*Psila* (*Pseudopsila*) *nemoralis arbustorum*, SHATALKIN, 1986, Proc. zool. Inst., 146: 42.

♂♀. Frons yellow; frontal triangle distinct and brown; face and gena whitish yellow; occiput dark brown; 1st and 2nd segment of antenna light brown, 3rd segment yellow in basal half and dark brown in distal half; 1 *oc*, 2 *or*, 2 *vt*, 1 *pvt* (these setae black). Mesonotum yellow, with 2 longitudinal black stripes in parallel fused in upper part (Fig. 34); mesopleuron dark brown in upper half and yellow in lower half; sternopleuron dark brown in anterior half and yellow in posterior half; pteropleuron yellow in anterior half and dark brown in posterior half; hypopleuron almost yellow; metapleuron and metanotum dark brown; scutellum yellow; 1 *n*, 1 *sa*, 1 *pa*, 1 *dc*, 2 *sc* (these setae black). Legs whitish yellow. Abdomen black, shiny and clothed with hairs; male aedeagus unusually long and slender (Figs. 32–33).

Body length: ♂♀, 4–4.5 mm; wing length, 4 mm.

*Specimens examined.* [Hokkaido]—1 ♂, Sapporo, 6 July 1958, K. KAMIJÔ; 2 ♀, Sapporo, 5–8 July 1959, K. KAMIJÔ; 1 ♂, Sapporo, 1 July 1958, S. UEDA; 1 ♀, Sapporo, 15 July 1958, S. TAKAGI; 1 ♀, Sapporo, 2 July 1960, S. TAKAGI; 1 ♀, Sapporo, 5 July 1959, T. KUMATA.

*Distribution.* USSR (Far East) and Japan (Hokkaido). New to Japan.

*Remarks.* This subspecies can be distinguished from (*Pseudopsila*) *nemoralis* SHATALKIN in having the yellowish mesopleuron with brown band at upper half.

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