



Title	Descriptions of three new species of the genus <i>Notiphila</i> Fallén from Japan, with other notes (Dipt., Ephydriidae)
Author(s)	Miyagi, Ichiro
Citation	<i>Insecta matsumurana</i> , 28(2), 121-126
Issue Date	1966-03
Doc URL	http://hdl.handle.net/2115/9734
Type	bulletin (article)
File Information	28(2)_p121-126.pdf



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DESCRIPTIONS OF THREE NEW SPECIES
OF THE GENUS *NOTIPHILA* FALLÉN FROM JAPAN,
WITH OTHER NOTES
(DIPT., EPHYDRIDAE)

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Although the genus *Notiphila* Fallén is one of the largest and most widely distributed genera of the Ephydriidae, only a single species, *Notiphila (Agrolimna) sekiyai* Koizumi, 1949, has been known to occur in Japan. In this paper are added to the fauna of Japan four other species, of which three are new to science and the rest new to Japan. The holotypes of the new species are preserved in the collection of the Entomological Institute, Hokkaido University, Sapporo.

I wish to express my sincere gratitude to Prof. C. Watanabe for his kind guidance and continuous encouragement. I am also indebted to Dr. R. Dahl of the Zoological Institute, Lund, Sweden, and Mr. N. Fukuhara of the National Institute of Agricultural Sciences, Nishigahara, Tokyo, for their kindness in offering valuable material.

Subfamily **Notiphilinae**

Genus ***Notiphila*** Fallén

Notiphila Fallén, Acta Holm. Kgl. Vetensk. Akad. Handl. 250, 1813 (Type-species: *Notiphila cinerea* Fallén, 1813).

Notiphilacantha Hendel, Suppl. Ent. 3: 103, 1914 (Type-species: *Notiphila dorsopunctata* Wiedemann, 1830).

Agrolimna Cresson, Trans. Amer. Ent. Soc. 43: 48, 1917 (Type-species: *Notiphila scalaris* Loew, 1862).

This genus is distinctive by the following features:

Costa extending to or slightly beyond tip of third vein; one presutural dorsocentral present; mid tibiae with three or four distinct erect dorsal bristles; arista with many long hairs dorsally.

Notiphila watanabei, sp. nov.

Male: Frons dark brown; antennae blackish-brown; third segment reddish or light brown ventrally; face and cheeks brown or grayish-brown; palpi yellow or light brown. Mesonotum and scutellum concolorous with frons; one to three grayish mesonotal stripes, the lateral two often obscure; meso- and sternopleura concolorous with cheeks, each with an inconspicuous brown spot; halteres yellow. Abdomen grayish-brown; each tergite with four blackish-brown dull spots. Legs blackish-brown; femora with grayish pollen, basal half of mid and hind tibiae brownish-yellow, tarsi uniformly yellow to

[Insecta Matsumurana, Vol. 28, No. 2, March, 1966]

brownish-yellow, fore tarsi sometimes blackish-brown. Wings brownish hyaline; veins yellowish-brown.

Two strong and two moderate verticals; occiput and postcheeks with many weak setae; ocellars and fronto-orbital strong. Antennae of normal form; second segment with two strong spines and several weak bristles dorsally; arista with eight to ten hairs. Two or three facials somewhat hair-like, as strong as or slightly weaker than vibrissa. Head width, height, length as 29:22:18. Head index 4.3:1. Two dorsocentrals (1:1), one prescutellar, no acrostichal, one humeral, one presutural, three supar-alars (including intra-alar), two notopleurals, all these bristles being strong. Abdomen: five tergites visible, the fifth being slightly longer than the fourth, with six to eight moderate submarginal bristles. Fore legs: femora with posterodorsal row of seven to nine well-developed hair-like bristles, and with one strong and two moderate bristles on dorsal part; apical half of femora with anteroventral row of many short spines. Mid legs (Plate XXIX, Fig. 9): femora with one strong and two or three moderate anterodorsal bristles and with an antero- and a poteroventral row of numerous strong setae; tibiae with three normal bristles and with two strong and three or four short apical spurs, ventral ciliation absent or very weak. Hind legs: femora with numerous dorsal bristles, the apical two being well developed; tibiae with two or three dorsal bristles well developed; tarsi with many hair-like dorsal bristles. Wings (Plate XXIX, Fig. 5): costa reaching third vein; costal index 2.0:1. Genitalia (Plate XXX, Fig. 11 & Plate XXXI, Fig. 20): ventral processes of epandrium slender, strongly chitinized, and pointed at apex.

Length, 3.5 mm., wing, 3.6 mm.

Female: Similar to the male, but fifth tergite shorter than the fourth.

Holotype (♂): Moiwa-yama, Sapporo, Hokkaido, 20-vi-61*. Paratypes: Hokkaido (20 ♀♀ and 20 ♂♂)—Utonai, 30-vi-64; Sapporo, 6-vii-63; Okoppe, 16-vii-62; Wakkanai, 5-viii-61; Numata, 14-viii-61; Toyotomi, 3-vii-61. Honshu (7 ♀♀ and 7 ♂♂)—Ogawanauma, 22-viii-62; Wajima, 28-vii-63; Haruyama, 25-viii-62; Oga, 1-ix-63; Izu, 20-vii-63; Kyoto, 1-viii-62; Wakayama, 19-vii-63. Shikoku (5 ♀♀ and 5 ♂♂)—Matsuyama, 4-ix-61; Karihana, 11-ix-62; Imabari, 12-v-63 (S. Takagi leg.). Kyushu (7 ♀♀ and 7 ♂♂)—Wakasugi, 3-v-63 (S. Takagi leg.); Kagoshima, 6-viii-63; Yakushima, 13-viii-63.

Distribution: Japan (Hokkaido; Honshu; Shikoku; Kyushu).

Remarks: This is one of the commonest species in Japan. It is closely related to *Notiphila riparia* Meigen, 1930, from Europe, being quite similar externally. After comparing the present specimens with those of *riparia* identified by Dr. Dahl, however, I am convinced that the two are distinct species, being separable by the genital characters.

Notiphila ezoensis, sp. nov.

Male: Frons, face and cheeks uniformly yellowish-brown; antennae and palpi orange-yellow. Mesonotum light brownish-gray, without stripes and irrorations; scutellum gray. Pleura grayish-brown, without spots; halteres lemon-yellow. Abdomen dull greenish-brown, without spots and stripes, if present inconspicuous. Femora black, with grayish pollen dorsally; fore and hind tibiae black except for basal and apical parts which are yellow; mid tibiae yellow, somewhat brown apically; tarsi yellow. Wings brownish-yellow hyaline; veins yellow.

Chaetotaxy of mesonotum, scutellum, and head similar to the preceding species

* Specimens without stating collectors are taken by myself, I. Miyagi.

watanabei, but arista with 10 or 11 long dorsal hairs. Three facials moderate and weaker than vibrissa; postcheeks and occiput with many weak setae; palpi with five to seven weak setae ventroapically. Head index 3.0:1. Head width, height, length as 25:18:15. Abdomen with five tergites visible; these tergites subequal in length, each with several strong or moderate submarginal bristles. Legs long and slender; chaetotaxy of legs similar to *watanabei*, but three dorsal bristles of hind tibiae stronger. Wings (Plate XXIX, Figs. 1 & 3): costa reaching third vein; first costal section with two spine-like bristles well developed apically; third section without conspicuous setae; costal index 3.6:1. Genitalia (Plate XXX, Fig. 16 & XXXI, Fig. 18): ventral processes of epandrium gradually narrowed towards rounded apex.

Length, 4.0 mm., wing, 4.4 mm.

Female: Similar to the male, but fifth tergite short and three or four facials stronger.

Holotype (♂) and paratypes (5 ♀♀ and 5 ♂♂): Utonai, Hokkaido, 30-v-64.

Distribution: Japan (Hokkaido).

Remarks: This species is very similar to *watanabei*, from which it differs by the larger body, by the uniformly yellow antennae and by the yellowish-brown frons and mesonotum.

Notiphila canescens, sp. nov.

Male: Grayish-brown; antennae brownish-yellow, with first segment and dorsoapical part of the third blackish-brown; face yellowish-gray; cheeks gray; palpi yellow. Mesonotum and scutellum grayish-brown, the former with a whitish-gray median stripe; mesonotal irrorations and spots obscure; basal area of mesonotal and abdominal macrobristles somewhat tinged with brownish-black, but not so conspicuous as in *N. dorso-punctata* Wied.; mesopleura and sternopleura brownish-gray, the former with clear blackish-brown spot. Each abdominal segment with two brown dorsal spots, the spots on first and second tergites somewhat grayish and not so distinct as those on third to fifth tergites. Halteres yellow. Femora black, with blackish-gray pollen; fore tarsi dark brown. Wings hyaline.

Chaetotaxy of frons, mesonotum, scutellum and pleura similar to *watanabei*. Head index 4.6:1. Head width, height, length as 25:18:14. Third vertical as strong as inner vertical; postocellars and proclimates fronto-orbital weak; three well-developed facials as strong as vibrissa, with weak setae around; arista with nine or ten hairs. Abdomen with five tergites visible, these tergites being subequal in length, each with several well-developed submarginal bristles; apical tergite with six strong and many weak setae marginally. Chaetotaxy of legs similar to *watanabei*, but ventral ciliation of mid femora weak, less conspicuous (Plate XXIX, Fig. 10); dorsal bristles of hind tibiae absent; ventral ciliation of mid femora not so conspicuous as in *watanabei*. Wings (Plate XXIX, Fig. 7): costa reaching third vein; third costal section without conspicuous bristles; costal index 2.2:1. Genitalia (Plate XXX, Fig. 12 & XXXI, Fig. 19): ventral processes of epandrium short and stout, round at apex.

Length, 3.5-3.9 mm., wing, 3.4-3.8 mm.

Female: Similar to the male, but fifth tergite shorter than the fourth, with strong submarginal bristles.

Holotype (♂): Iriomote-jima, Ryukyu Is. 16-vi-62. Paratypes: Ryukyu Is. (5 ♀♀

and 5 ♂♂)—Oku, Okinawa-honto, 13-v-62; Nago, Okinawa-honto, 2-v-62; Kin, Okinawa-honto, 11-v-62; Iriomote-jima, 16-vi-62.

Distribution: Ryukyu Is. (Okinawa-honto; Iriomote-jima).

Remarks: This species is easily distinguished from any other known species by the structures of the male genitalia.

***Notiphila dorsopunctata* Wiedemann**

Notiphila dorsopunctata Wiedemann, Anal. Ent. 58, 1824; Van der Wulp, Tijds. v. Ent. 34: 215, 1891; Meijere, Tijds. v. Ent. 51: 163, 1903.

Notiphilacantha dorsopunctata: Hendel, suppl. Ent. 3: 103, 1914; Cresson, Arch. f. Hydrob. Suppl. 9: 585, 1931.

Notiphila (Notiphilacantha) dorsopunctata: Cresson, Trans. Amer. Ent. Soc. 74: 16, 1948.

Specimens examined: Ryukyu Is. (4 ♀♀ and 3 ♂♂)—Oku, Okinawa-honto, 13-v-62; Iriomote-jima, 16-iv-62.

This species was originally described from India, being widely distributed in the Oriental region. On the basis of the present specimens a redescription of this species will be given below:—

Male and female: Grayish-brown; face and cheeks brownish-gray; antennae brown or brownish-black; palpi light brown. Mesonotum and scutellum grayish-brown, with black or brownish-black spots at bases of macrobristles; halteres yellow. Mesopleura grayish brown, with a brownish-black spot. Abdominal brown markings dulled with gray. Femora black, with grayish pollen on anterodorsal area; tibiae and tarsi yellow or brownish-yellow. Wings hyaline.

Chaetotaxy similar to *watanabei*, but macrobristles very strong; third vertical as strong as other verticals; arista with 11 long hairs. Head index 4.6:1. Head width, height, length as 21:16:9. Fifth tergite shorter than the fourth; bristles and setae of abdomen strong. Fore legs: dorsal area of femora with five to seven long bristles and many moderate bristles, anteroventral row of spines absent or very fine; tibiae with numerous black, short and stout setae on ventroapical area. Mid legs: apical half of femora with five long anterodorsal bristles, and with an antero- and a posteroventral row of numerous fine setae not so conspicuous as in *watanabei*; tibiae with three dorsal bristles and four or five stout apical spurs, without ventral ciliation. Hind legs: dorsal bristles of tibiae absent or very weak; metatarsi with a moderate ventral ciliation. Wings (Plate XXIX, Figs. 2 & 4): second costal section with a row of about 11 spine-like setae, the apical seta being strong; third costal section with five or six spine-like setae which are a little longer than costal ciliation, in some specimens such setae lacking; costa reaching third vein; costal index 2.9:1. Genitalia as in Plate XXX, Fig. 14 and Plate XXXI, Fig. 17.

Length, 5.0–5.3 mm., wing, 4.3–4.5 mm.

Distribution: Ryukyu Is. (Okinawa-honto; Iriomote-jima); Thailand; Java; India; Ceylon; China; Formosa.

***Notiphila sekiyai* Koizumi**

Notiphila (Agrolimna) sekiyai Koizumi, Matsumushi, 3: 91, 1949.

Specimens examined: 1 ♀ and 1 ♂, Toyama-ken, Honshu, 22-vii-47, H. Sekiya leg.

On the basis of the two specimens of *sekiyai* at hand a redescription will be given below:—

Male and female: Frons dark brown, with frontal triangle and fronto-orbital area grayish-brown; face golden yellow; cheeks whitish-gray; palpi yellow. Mesonotum brownish-gray, with faint three dark brown stripes. Scutellum uniformly brownish-gray. Meso- and sternopleura gray, dorsal half of femora tinged with dark brown; halteres light yellow. Basal segment of abdomen uniformly dark brown; second to fourth segments dark brown basally and whitish-gray apically; fifth segment in male grayish-white, with blackish-brown lateral spots. Legs reddish-yellow; femora brown, with grayish pollen dorsally. Wings hyaline, with veins yellow.

Chaetotaxy of head, mesonotum, scutellum, and pleura similar to *watanabei*, but arista with 13 to 15 long hairs; six facials weak, hair-like, situated above mid height of the face. Cheeks narrow, with a strong vibrissa. Head index 9:1. Head width, height, length as 27:21:16. Three mesopleurals, the mid one being strongest. Abdomen with numerous bristles and setae variable in length; third and fourth segments with six submarginal bristles; fifth segment in male becoming a cylindrical tubercle, with two stout upcurved bristles apically. Fore legs: femora with four hair-like dorsal bristles; apical half of mid femora with two anterodorsal bristles, the basal one being stronger. Mid legs (Plate XXIX, Fig. 8): femora without ciliation; tibiae with four dorsal bristles. Wings (Plate XXIX, Fig. 6): costa reaching third vein, costal index 2.2:1. Genitalia (Plate XXX, Figs. 13 & 15): ventral processes of epandrium slender, gradually narrowed towards apex, without conspicuous hairs and bristles.

Length, 3.0 mm., wing, 3.5 mm.

Distribution: Japan (Honshu).

In conclusion, the four Japanese species mentioned above are easily distinguishable by the following key:—

Key to the Japanese species of the genus *Notiphila*

- 1. Mid tibiae with four extensor bristles; several facial bristles weak and hair-like; fifth tergite in male in a cylindrical tubercle, with two stout upcurved apical bristles. *N. sekiyai* Koizumi
- Mid tibiae with three extensor bristles; facial bristles moderate to strong; fifth tergite of normal form, without strong upcurved bristles. 2
- 2. Costa with several well-developed setae; mesonotum distinctly marked with a round blackish spot at base of each macrobristle. *N. dorsopunctata* Wied.
- Costa without conspicuous setae; mesonotum without black spots. 3
- 3. Larger species, at least 4.0 mm. in length; mesonotum and abdomen without irrorations or spots; antennae uniformly yellow. Head index 3.0:1. *N. exoensis*, sp. nov.
- Smaller species, less than 4.0 mm. in length; mesonotum and abdomen with more or less distinct irrorations and stripes; antennae light brown or reddish-brown. 4
- 4. Tibiae and fore tarsi blackish-brown, mid femora with numerous conspicuous bristles and setae on antero- and posteroventral areas; three facials moderate, somewhat hair-like. Head index 4.3:1. *N. watanabei*, sp. nov.
- Tibiae and tarsi all yellow, mid femora with many inconspicuous setae on antero- and posteroventral areas; three facials stronger. Head index 4.6:1 *N. canescens*, sp. nov.

Selected literature

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- Australian Ephydriidae (Diptera). II. The subfamily Notiphilinae and supplement to part I on the subfamily Psilopinae. Trans. Amer. Ent. Soc. 74: 1-28.
- Dahl, R. 1959. Studies on Scandinavian Ephydriidae (Dipt. Brachycera). Opusc. Ent. Suppl. XV, 1-224.
- Dahl, R. 1964. Some Ephydriidae and Canaceidae (Dipt. Brachycera) from Morocco and the Spanish Sahara. Notulae Ent. 44: 101-104.
- Koizumi, K. 1949. Description of a new species of *Notiphila*, a serious pest of rice roots (Diptera, Ephydriidae). Matsumushi, 3: 91-93.

Explanation of plates

Plate XXIX. Male wing (Figs. 1-7); mid leg of male in lateral view (Figs. 8-10). **Plates XXX & XXXI.** Male genitalia (Figs. 11-20); epandrium (Figs. 11-14 & 16); phallic organ (Figs. 15 & 17-20). Figs. 5, 9, 11 & 20: *N. watanabei*; Figs. 1, 3, 16 & 18: *N. exoensis*; Figs. 7, 10, 12 & 19: *N. canescens*; Figs. 2, 4, 14 & 17: *N. dorsopunctata*; Figs. 6, 8, 13 & 15: *N. sekiyai*.

THREE SPECIES OF THE GENUS OCHTHERA LATREILLE OF JAPAN (DIPTERA: EPHYDRIDAE)

By ICHIRO MIYAGI

Ochthera mantis (De Geer)

Musca mantis De Geer, Mem. Serv. Hist. Ins. 6: 61, 1782. *Musca manticata* Fabricius, Ent. Syst. 4: 334, 1794. *Ochthera mantis*: Matsumura, Thousand Ins. Japan, 2: 117, 1905; Becker, Die Fliegen pal. Reg. 56 a: 49, 1926; Sturtevant & Wheeler, Trans. Amer. Ent. Soc. 79: 232, 1953.

Specimens examined: Hokkaido:—2 ♀♀, 2 ♂♂, Nayoro, 7-vii-62; 1 ♂, Sapporo, 10-vi-61. Honshu:—1 ♀, Suigo, Chiba-ken, 27-viii-62; 1 ♀, Taiza, Kyoto, 1-vii-63.

Distribution: Japan (Hokkaido; Honshu); Central Asia; North America; North Africa. This species is very common in Japan.

Ochthera pilimana Becker

Ochthera pilimana Becker, Mitt. Zool. Mus. Berlin, 2: 181, 1903. *Ochthera canescens* Cresson, Ent. News, 42: 168, 1931.

Specimens examined: Kyushu:—1 ♀, Satsumako, Kagoshima-ken; 17-x-61; 1 ♂, Ibusuki, Kagoshima-ken, 17-x-61.

Distribution: Japan (Kyushu); Hungary; Egypt; South Africa; India; Pacific Is. This species is new to Japan. Its distribution seems to be confined to southern part of Japan.

Ochthera circularis Cresson

Ochthera circularis Cresson, Trans. Amer. Ent. Soc. 52: 254, 1926.

Specimens examined: Honshu:—2 ♀♀, 2 ♂♂, Toyama, 25-ix-58; 1 ♀, 1 ♂, Kasagi, Kyoto, 24-viii-63. Shikoku:—2 ♀♀, 3 ♂♂, Nametoko, Ehime-ken, 10-xi-62. Kyushu:—1 ♂, Kagoshima, 16-viii-62; 1 ♂, Yakushima, Kagoshima-ken, 13-viii-63. Ryukyu Is.:—1 ♀, 1 ♂, Kin, Okinawa-honto, 11-v-62; 1 ♀, Miyako-jima, 24-iv-62; 1 ♀, 1 ♂, Ishigaki-jima, 12-iv-62; 1 ♀, 1 ♂, Iriomote-jima, 16-iv-62.

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