Description of Stegopterina nukabirana n. sp. from Japan (Diptera, Simuliidae)\textsuperscript{1)}

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Abstract: Stegopterina nukabirana n. sp. is described based on the specimens taken from the streams in the forest at the Eastern Daisetsu National Park, Hokkaido. The species seems to be closely related to Stegopterina sp. (nec. mutata MALLOCH) of Honshu, but differs from it in the structure of genitalia and mouth parts in female.

During from July 29 to August 2, 1973, the author collected great many females of a Stegopterina species at the highland of Goshigahara (1,700-1,800 m in altitude) and at the forest near Kutchanbetsu stream (1,100 m) in the Daisetsu National Park in Hokkaido. During the period from June to July in 1974-1976, many larvae and pupae of this species were collected from slowly running streams in the forest at Nukabira, Eastern Daisetsu National Park (about 800-1,000 m in altitude). The reared adults, associated pupal skins and larvae are alleid to those of the following five species, \textit{i.e.:} Stegopterina sp. (nec. mutata MALLOCH) of the central Honshu mountain region of Japan, \textit{S. duodecimata} (RUBTSOV, 1940) and \textit{S. asema} RUBTSOV, 1956 of Eastern Siberia, \textit{S. richteri} ENDERLEIN, 1930 of Europe and \textit{S. mutata} (MALLOCH, 1955) (s. str.) of Canada and America. However, the present specimens can be distinguished from them by several taxonomic characters, representing a new species as described in this paper.

**DESCRIPTION**

\textit{Stegopterina nukabirana} ONO n. sp.

Figs. 1-28

[Daisetsu-haru-buyu]

**Female.** Length: body, 2.6–2.8 mm; wing, 2.4–2.5 mm. General body colour dark grey; legs dull brown.

Head (Fig. 6) dark grey, slightly narrower than thorax; posterior and underside densely covered with long and pale yellow hairs; a row of stout, erect pale hairs present along posterior and lateral margins of eye. Frons grey, moderately broad, diverging above and covered with decumbent white hairs. Clypeus oval, greyish brown and darker than the frons, longer than width, densely covered with fine and pale grey hairs. Antenna (Fig. 2) short but longer than that of the male, consisting of 11 segments; scape and pedicel brown with long dark hairs; flagellum uniformly dark brown, covered with short and pale grey hairs; flagellum about 2.5 times as long as scape and pedicel combined; pedicel considerably larger than the other segments. Maxillary palp (Fig. 4) black, covered with fine and pale grey hairs and some coarser black hairs; segment V slightly longer than segment III. Sensory vesicle (Fig. 5) globular, small, about 1/4 as long as its segment and proximally situated; neck of vesicle broad, very short and expanding distally into an enlarged mouth which is round to slightly ovate in shape. Mandible (Fig. 8) with 36-37 (23-24 inner teeth and 13 outer ones) fine serrations. Blade of maxilla (Fig. 7) with 21-22 (13-14 inner teeth and 8 outer ones) retrorse teeth. Median distal space of cibarium (Fig. 9) broad and shallow; dorsolateral arms broad and sclerotized at the inner
margin.

Thorax dull black, faintly white pollinose. Pronotum and prescutum dull brown with long white pile. Scutum greyish black, gently rounded, covered with short, fine and recumbent white pile; the pile somewhat longer, darker and more erect postero-medianally; scutum often lighter dull brown on the humeral areas and posterior region, margins tinged with grey, especially posteriorly; scutum with pale grey, straight median vitta and slightly curved submedian vittae; those three vittae terminated at the humeral areas anteriorly and fade into the pale region posteriorly, in living examples and seen oblique dorsally. Scutellum black, covered with long, coarse and erect black hairs. Postscutellum concolorous with scutum, bare and half shining. Pleuron and katepisternum dark grey, pleural membrane dark brown, bare; mesepimeral tuft pale yellow. Wing membrane hyaline; veins yellow; hairs and well developed spinules on the stem vein dark brown; fringe of calypter and alar lobe pale yellow; small basal cell present. Supra-alaris brown. Halter yellowish brown; stem with short white hairs. Legs (Fig. 11) dull brown; segments covered with short pale grey hairs; hind tibiae with a fringe made of long black hairs on their hind margins; calcipala minute, pedisulcus absent or vestigial (Fig. 13); hind basitarsus 7 times as long as the greatest width, side nearly parallel; second hind tarsal segment about 2.5 times as long as the width. Claws long and slender, with a small and thumb-like basal projection (Fig. 12).

Abdomen dorsally black, ventral surface dull brown; median areas of tergites half shining; tergites densely covered with white pile; pleural regions with dense, matted and white pile; sternites I–VII membranous, VIII strongly sclerotized. Basal fringe pale yellow, longer laterally. Genitalia as shown in Fig. 14. Anal lobe narrow dorsally, broadly rounded on the anteroventral margin, and with a notch on the posteroverentral margin, produced posteriorly beneath cercus; moderately setose. Cercus rounded on the posterior margin, inner margin with irregular serrations; longer than the width, moderately setose. Ovipositor flaps short, posterior margin straight, inner margins slightly dented and lightly sclerotized; flaps scanty setose. Stem of genital fork long, slender and heavily sclerotized; arms widely divergent, broad and expanding distally into large subrectangular plates; each plate with a large, strongly sclerotized tooth and several small irregular teeth on the proximally surface. Spermatheca normal size, subelliptical and moderately sclerotized with a loose reticulate pattern.

Male. Length: body, 2.5–2.7 mm; wing, 2.3–2.4 mm. General body colour darker than the female, black.

Head dark brown, wider than thorax; posterior and undersurface of head, frons and clypeus with long black hairs. Antenna (Fig. 1) shorter than that of the female, uniformly dark brown; flagellum about 3 times as long as scape and pedicel combined. Maxillary palp (Fig. 3) more slender and longer than that of the female; sensory vesicle spherical, about 1/6 times as long as its own segment.

Pronotum and prescutum concolorous or slightly lighter than scutum with long black hairs. Scutum strongly arched, black and half shining; sparsely covered with short recumbent black pile; scutum often lighter dull brown on the humeral areas and the prescutellum depression. Scutellum, pleural membrane and mesepimeral tuft like as these of female. Postscutellum black, bare with a shining velvety appearance. Supralars black. Wing membrane hyaline; veins like as that of female. Knob of halter yellowish brown, rather larger than that of the female. Legs dark brown; hind basitarsus slightly swollen, sides nearly parallel, 3.5–4.0 times as long as the greatest width; second hind tarsal segment 3 times as long as the width.

Abdomen dark brown dorsally, paler ventrally; tergites sparsely covered with long, erect black hairs; all sternites sclerotized and with long black hairs. Genitalia as shown in Figs. 15–18. Basimere sub-quadrate, greatest width about equal to the length and sparsely setose. Distimere triangular in cross-section, slightly more than twice as long as the width at the base;
slightly curved, narrowed apically and sparsely setose; the apex laterally compressed, margin oblique with two terminal spines. Ventral plate spade-shaped, longer than the width, proportional length and width about 27:25; the external base of basal arm clearly dented; the apical margin slightly projected with a laterally compressed, beak-like ventral projection; basal arms short, slender and bluntly ended. Stem of median sclerite long and slender; Y-shaped distal arms short, sclerotized.

Pupa. Length, 3.0-3.2 mm. Respiratory organ (Fig. 19) 1.2-1.4 mm; consisting of 12 filaments: the base short, pale yellow covered with minute spicules and giving rise 3 long, pale yellow sub-trunks; furcation of filaments on each sub-trunk as shown in Fig. 19; filaments pale yellow, slender and slightly tapering distally, with black granulum and numerous transverse furrows. Head and thorax covered with minute and rounded tubercles; thoracic trichomes long and slender, about four on each side. Female antenna reaching to the hind margin of head; male one reaching slightly over one-half distance to the hind margin of head. Each tergites III, IV with a single row of long, fine, anteriorly directed setae as well as four pale brown setae on the posterior margin of each side; tergites V-VIII each with a single row of short, fine, closely-set and posteriorly directed spines along the posterior margin. Caudal spines brown, long, slender and directed anteriorly; the bases dark brown, swollen and widely separated; the basal area of spine with a moderately long, stout and medially directed seta anteriorly and 2 long, stout and curved setae laterally. Sternite V with two ventral setae, sternites VI, VII with one ventral seta on the posterior margin of each side; other sternites bare. Cocoon (Fig. 21) a fragile, formless sock; covered thinly more than the posterior one-thirds of the pupal abdomen.

Larva. Mature specimens 4.8-5.2 mm long. Body greyish yellow to greyish red. Head capsule (Fig. 23) yellow to brownish yellow; cephalic apotome dark brown postero-medial; head spots blackish brown, usually distinct; pigmentation of posteromedian and posterolateral spots and these surrounding area variable, often become darkened corresponding with the bands of abdominal segments; eye spots large, confined by a closely surrounding clear area with 3 nearby small dark brown spots dorsally; 2 patches posterior to eye usually slightly darkened and distinct. Antenna (Fig. 25) slightly longer than the stalk of cephalic fan; proportional length of the segments I-IV about 10.5:11:18:1. Cephalic fan with 48 rays. Figure 25 shows the form of cephalic apotome immediately after the moulting; head capsule white, cephalic fans reddish yellow. Hypostomium (Fig. 24) heavily sclerotized anteriorly, hypostomial teeth as shown in Fig. 24; lateral teeth distinctly higher and inner lateral tines of the lateral teeth lower than the median tooth. Postgenal cleft (Fig. 22) shallow. 1.5

Figs. 1-9 Stegopterma nakabirana n. sp.
Adults: 1, antenna of male; 2, antenna of female; 3, maxillary palp of male; 4, maxillary palp of female; 5, sensory vesicle of female; 6, head of female; 7, maxilla of female; 8, mandible of female; 9, distal part of cibarium of female.
times as wide as the depth, apex almost truncate and gradually widening posteriorly. Postgenal bridge distinctly longer than the hypostomium. Inner subapical ridge of mandible (Fig. 26) with 3 pigmented comb-teeth, the first and third subequal, broad and longer than the second; inner subapical margin with 10–11 (usually 11) transparent, slender fine serrations, the apical one being more prominent, the lengths of the others being gradually shortened; posterior margin with one large marginal tooth, one small marginal tooth which apex often furcated, and about 10 serrations. Maxillary palp long, 3.2–3.4 times as long as the width at the base. Lateral plate of proleg broad, lightly sclerotized and vertical portion extending to about one-third length of the apical segment. Each abdominal segment with dark greyish band. Ventral papillae small. Rectal setulae minute. Rectal gill (Fig. 28b) composed of three simple lobes. Anterodorsal arms of anal sclerite (Fig. 28a) clearly shorter than posteroventral arms. Posterior circllet consists of 66 rows of 6–9 hooks.

**Type series.** **Holotype:** Slide-mounted female with associated pupal skin. Reared from a pupa taken from a spring-fed stream in the forest, Nukabira, Kamishihoro, Hokkaido, July 2, 1975 (H. Ono leg.).

**Allotype:** Slide-mounted male with associated pupal skin, the same locality and data as the holotype.

**Paratypes:** Ten females, 2 males dried and pinned, with their associated pupal skins, the same data as above. 10 females, 2 males, 10 pupae and 50 larvae in alcohol, the same data as above.

Holotype and allotype will be deposited in the National Science Museum, Tokyo. Paratypes are preserved in the Laboratory of Entomology, Obihiro University in Hokkaido.


Remarks. The present species can be assigned to the genus Stegopterna ENDERLEIN, by the characters of genitalia in both sexes and by the pupal respiratory organ. This species closely resembles to the following 5 species: Stegopterna sp. (nec. mutata MALLOCH) of Japan, S. duodecimata (RUBTSOV) of Eastern Siberia and Zabaikai, S. asema RUBTSOV of the Far East, USSR, S. richteri ENDERLEIN and those several subspecies of Europe, S. mutata (MALLOCH) (s. str.) of Canada and America; and slightly to: S. brachiata RUBTSOV from Karelia, S. emergens (STONE) from Alaska and Canada, S. sibirica decaflia RUBTSOV from Yakutsk and S. tschukotensis RUBTSOV from Chukot Peninsula. However, this species can be separated from Stegopterna sp. by the structure of genitalia and the mouth parts of the female. Stegopterna sp. of Japan has been confused with S. mutata (MALLOCH) by the several authors (406 MGL, 1955, Ogata, Sasa and Suzuki, 1956), but I believe it can be distinguished from the latter in the characters of female genitalia. This new species can be distinguished from duodecimata, asema,
richteri and mutata by the structure of genitalia in both sexes, mouth parts in the female, hind basitarsus in the male, pupal respiratory organ and larval hypostomal teeth. This species differs from emergens having edentate maxilla in female, from brachiata having 22 filaments in pupal respiratory organ, from sibirica decalitis in having 10 filaments and by the structure of genitalia in both sexes. This species also differs from tschukotensis having dilated hind basitarsus and short distimere with one terminal spine in the male.

Biological notes. The larvae of this species are most common in small, slowly running streams which are fed with spring in the forest or are fed with snow-melted waters in the highland. The larvae are found on the upperside of stones, grass blades and dead blades during the period from April to July. The pupae are found in the clefts of stones and chinks of dead blades which are accumulated at the bottom of streams in mid June to mid July. The first adults appear in late June, and the swarming are found in early July to early August. Females swarm in the morning and evening about 0.5–1.5 m above the ground in a clearing of forest near the stream. This species is thought to be univoltine and probably overwinters in egg stage. Biting habit to man has been recorded (Ono and Iwasa, 1976), but it is not so severe like as that of Simulium japonicum.

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References


北海道産ハルブヌ属 Genus Stegopterna
(Diptera, Simuliiidae) 1 新種の記載

著者は1973年7月29日～8月2日北海道大雪山五色ケ原とクッチャンベツ沢で、多数の Stegopterna 属の蛹を採集したが、雄、蛹、幼虫は得られなかった。1974～1976年6月、7月に上士幌町糠平とその周辺の森林内の細流で多数の幼虫、蛹を採集し、これらを飼育して成虫を羽化させた結果、新種であると認めたのでここに Stegopterna mukahirana として記載する。本種は本州産の Stegopterna sp. に類似しているが、雌の生殖器、口器の形態から別種と見なされる。また S. duodecimata, S. asena, S. richteri, S. mutata とは雌雄の生殖器、雌の口器、雄の後脚第1跗節、蛹の呼吸系、幼虫の hypostomium の形態の差により区別できる。さらに S. emergens は雌の maxilla が長くなく、S. brachiata は蛹の呼吸系が22本であり、S. sibirica decalitis は呼吸系が10本であり、S. tschukotensis は雌の後脚第1跗節が細長し、distimere の terminal spine が1本であるので区別できる。本種は北海道の大雪山の中谷に日高山脈の五色ケ原に産し、年1化と考えられる。その人体吸血性はすでに明らかにされているが、これは Simulium japonicum アシマダラブソのようにはげしくはなく、本種に対してダイセツハルブヌという和名を提唱した。