On the Species of the Subfamilies Apaniinae and Dicosmoecinae from Japan

(Trichoptera, Limnephilidae)

Mineo KOBAYASHI

Apataniinae と Dicosmoecinae (毛翅目，エグリトビケラ科) の種について

Apataiinae と Dicosmoecinae に属する種は，主に東洋区に棲息する。わが国からもその棲息が知られており，SCHMID (1955) は12種をあげている。しかし，その後の研究によって興味ある幾つかの種が棲息することが明らかになったので，既知種の検当も含めて，ここに報告する。

The species of Apataniinae and Dicosmoecinae occurs mainly in the Oriental Region, and nineteen species have been known to belong to those two subfamilies from Japan. SCHMID in 1955 published the catalog of those family Limnephilidae in the world; he listed twelve species to belong to those subfamilies from Japan. Since ten species have been described by SCHMID (1946) and KOBAYASHI (1959, 1965, 1968, 1971, 1974).

In this study twelve species were examined. Among the known species ten species were not examined because the materials of those species were not available. In this paper one species is newly described.

General features of Family Limnephilidae

Antennae as long as, or slightly shorter than wings, moderately stout, basal joint bulbose. Ocelli always present. Maxillary palpi of the male three-jointed, those of the feamle five-jointed. Labiel palpi small, terminal joint often concaved. Legs with the tibial spurs varing according to genus; anterior legs with never than three spurs; tibiae and tarsi usually armed with strong spines.

Anterior wings mostly broad, generally with scanty pubescence, but sometimes densely clothed; discoidal cell always closed, median cell absent, cellula thyridii long and narrow; apical forks nos. 1, 2, 3 and 5 present; posterior wings alway much broader than the anterior and less pubescent, often iridescent, apical forsk nos, 1, 2, 3 and 5 present; discoidal cell closed (except in the apataniinae); the neuration is generally similar in the two sexes, but in certain genera there is a long pencil of hairs towards the base of the posterior wing in the male only; the pencil of hairs, when present, is contained in a fold of the wing membrane.

Genitalia of the male fairly constant in character. There are generally a pair

of small preanal appendages and a pair of elongate clasper. Penis usually short and acompanied by a pair of sheaths, often pectinate in form or heavily fringed. In the female there is a vulvar scale consisting of a pair of sidelobe with a central tongue of varing length.

Subfamily **Apataniinae** ULMER

Apataniinae ULMER, 1903, Abh. Ver. Naturw. Hamburg, 18: 74.
Apataniinae: SCHMID, 1953, Tijdschr. v. Entom., 96: 111-112.
Apataniinae: SCHMID, 1955, Mitt. Schweiz. Ent. Ges., 28: 74.

Antennae slender, basal segment as long as the head. Spurs varing according to genus. The first tarsal segment of the fore legs longer than the second one. Fore wings long and narrow, but little windened distally. Venation well shown, especially R_1; cell M_2 of both apirs of the wings generally pedicellate. Preanal appendage either not visible, or long and branched; the tenth segment in the form of a long beanch, curved ventrally; clasper two-segmented, sometimes very long; no ventral teeth on the abdomen.

Two genera which belong to the subfamily Apataniinae have been recorded from Japan.

Key to genera

1. Front wings Sc ending in a short, straight, oblique cross-vein. spurs 1, 2, 4 ..... *Apatania*
-. Front wings Sc not ending in a oblique cross-vein. Spure 1, 3, 4·····*Moropsyche*

Genus ***Apatania*** KOLENAT

Type species: *Apatania wallengreni* MCLACHLAN 1848

Apatania KOLENATI, 1848, Gen. Et. Spec. Trichop., 2: 75.
Apatania; MCLACHLAN, 1876, A Monographic revision and synopsis of the Trichoptera of the european fauna., 209.
Apatania: ULMER, 1907, Gen. Insect. 60a., 75.
Apatania: BETTEN, 1934, N. Y. State Mus. Bull., 292: 378.
Apatania: TSUDA, 1942, Mem. Coll. Sci. Kyoto Imp, Univ. (B)., 17: 320.
Apatania: SCHMID, 1953, Tijdschr. v. Entom., 96: 145.
Apatania: SCHMID, 1955, Mitt. Schweiz. Ent. Ges., 28: 80.

Diagnosis: Body small, finenss. Both wings grey, clothed with pubescence. Head relatively long, with three pairs of warts; ocelli small. Antennae slender, slightly shorter than the anterior wings: basal segment as long as the head. Maxillary palpi development but generally meagerness; basal segment much shorter than the remaining segments, the second segment as long as the apical one. Spurs 1, 2, 4.

Anterior wings Sc ending in a short, straight, oblique cross-vein; discoidal cell always closed; median cell absent; thyridial cell long and narrow; apical forks nos.

1, 2, 3 and 5 present. Posterior wings nearly as wide as anterior wings and less pubescent; apical forks nos. 1, 2, 3 and 5 present; discoidal cell open. The neuration is similar in both sexes.

Nine species which belong to the genus Apatania have been recorded from Japan. Among the known species fore species were not examined.

Key to species

1. Internal branch of the tenth tergites elongate ·····2
-. Internal branch of the tenth tergites short, stout·····6
2. Apical segment of clasper slender, as long as basal segment ·····3
-. Apical segment of clasper much shorter than basal segment ·····4
3. The ninth sterntie with long ventral process ·····*kyotoensis*
-. The ninth sternite with short ventral process·····*tsudai*
4. Apical segment of clasper thin, gyratoin-shaped·····*nikkoensis*
-. Apical segment of clasper short, stout ·····5
5. The ninth sternite with ventral process ·····*aberrans*
-. The ninth sternite without ventral procese ·····*crassa*
6. Internal lobe of the tenth tergites very short, triangle·····*momoyamaensis*
-. Internal lobe of the tenth tergites long, wide; apical margin concaved at the middle portion·····7
7. Ventral margin of aedeagus with a few long bristles·····*shirahatai*
-. Distal portion of aedeagus with a few long bristles·····8
8. Apical margin of aedeagus with a few long bristles·····*ishikawai*
-. Apical and ventral margin of aedeagus long bristles ·····*chyokaiensis*

Apatania kyotoensis Tsuda

(Fig. 1)

Apatania kyotoensis Tsuda, 1939, Annot. Zool. Japonenses, 18: 291.
Apatania kyotoensis: Tsuda, 1942, Mem. Coll. Sci. Kyoto Imp. Univ. (B)., 17:322.
Apatania kyotoensis: Schmid, 1954, Tijdschr. v. Entom., 97: 18-19.
Apatania kyotoensis: Schmid, 1955, Mitt. Schwiz. Ent. Ges., 28: 82.

The original description of this species was based on males from Kyoto. I was unable to examien this species, but juding from the figures given by Tsuda and Schmid (1954), this species can be distinguished from other species by the shape of the ginitalia of the male.

Distribution: Kyoto, Saitama Prefectures.

Apatania aberrans (Martynov)

(Pl. 1, 2)

Apatelia aberrans Martynov, 1933, Annot. Zool. Japonenses. 14: 153-156.
Apatelia aberrans: Tsuda, 1939, Annot. Zool. Japonenses. 18: 291.
Apatelia aberrans: Tsuda, 1942, Mem. Coll. Sci. Kyoto Imp. Univ. (B)., 17: 322.

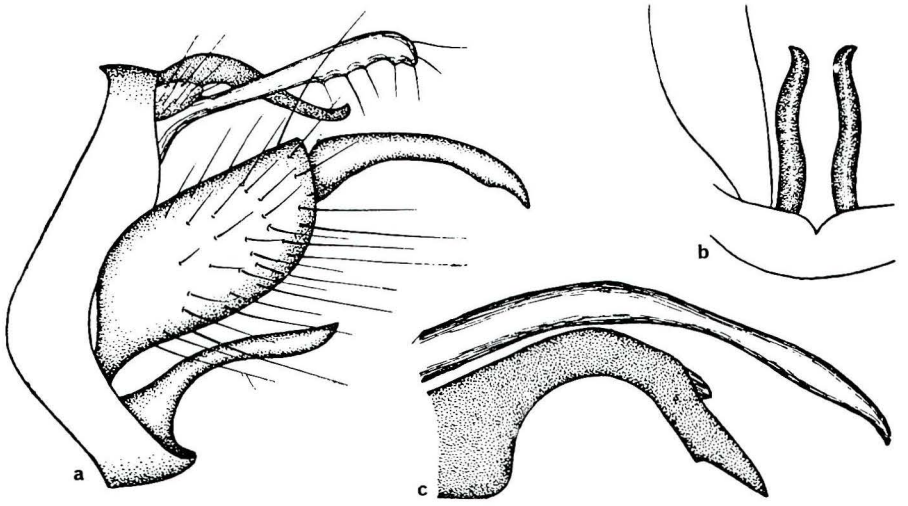

Fig. 1. Male genitalia of *Apatania kyotoensis*. a, lateral aspect; b, ventral process, dorsal aspect; c, aedeagus, lateral aspect, by Schmid (1954).

Apatania aberrans: SCHMID, 1953, Tijdschr. v. Entom., 96: 161-163.
Apatania aberrans: SCHMID, 1955. Mett. Schweiz. Ent. Ges. 28: 81.

The original description of this species were on four males and one female from Matsumoto, Nagano Prefecture.

Male: Length 8.0 mm. Color almost entirely brown. General structre typical for genus. Anterior wings fulvous; costal area and pterostigma brownish; pterostigma very broad and distinct, nearly triangular; discoidal cell curved backwardlly. Posterior wings light grey. Venation of both wings as in Plate. Genitalia as in Plate. The ninth sternite long projected. Internal branch of the tenth segment elongate, pointed at its apex. External branch of the tenth segment finger-shaped, shorter than the internal branch. Preanal appendage short, finger-shaped. The basal segment of clasper stout; apical segment shorter and narrower than the basal segment, acuted at apex. Aedeagus long; middle portion with long bristles of a pair and many short bristles; apical margin incised, with a few long bristles.

Female: Length 8.0 mm. General structre typical for male. Genitalia as in Plate. The eighth segment broad, subdivided at side by pleural stripes into dorsal and ventral portion; the ninth tergites trianularly projected backwardly; the ninth longer sternite with a long process. The tenth segment divided into twolobes; upper lobes and larger than the lower lobes, rounded at its apex; the lower lobes narrow, short, rounded at its apex. finger-shaped.

Specimens examined: 1♂, Niitsu-shi, Niigata Pref., April 20, 1958 (R. SATO): 2♂♂1♀, same locality, April 13, 1960 (R. SATO).

Distribution: Nagano (TSUDA, 1942), Tochigi (TSUDA, 1942), Niigata Prefectures.

Apatanta nikkoensis Tsuda

(Fig. 2)

Apatania nikkoensis Tsuda, 1939, Annot. Zool. Japonenses. 18: 290.

Apatania nikkoensis: Tsuda, 1942 Mem. Coll. Sci. Kyoto Imp. Univ. (B)., 17:322.

Apatania kyotoensis: Schmid, 1954, Tijidschr. v. Entom. 97 : 21.

Apatania nikkoensis: Schmid, 1955, Mitt. Schweiz. Ent. Ges., 28 : 82.

The holotype of this species was originally described in 1939 of the basis of male taken from Nikko, Tachigi Proefecture. I was unable to examine this species, but juding from the figures given by Tsuda (1939) and Schmid (1954), this species can be distinguished from other species by the shape of genitalia of male.

Distribution: Tochigi Prefecture.

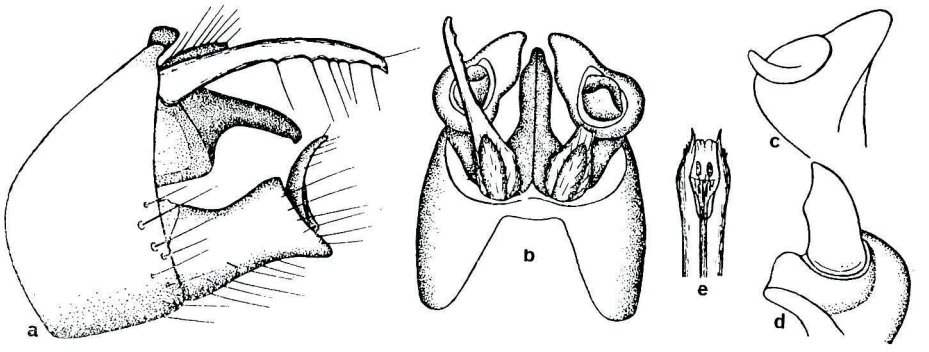

Fig. 2. Male genitalia of *Apatania nikkoensis*. a, lateral aspect: b, dorsal aspect; c and d, apex of inferior process; e, aedeagus, dorsal aspect, by Schmid (1954).

Apatania momoyaensis Kobayashi

(Pl. 3)

Apatania momoyaensis Kobayashi, 1973, Bull. Kanagawa Pref., Mus. (Nat. Hist.), 6: 34-35.

The original description of this species was based on a single male from Chyoakimura, Akita Prefecture.

Male: Length 5.0 mm. Color almost brown. General structure typical for genus. Anterior wings fulvous; costal area and pterostigma brownish; pterostigma very broad and distinct; discoidal cell elongate, curved backwardly. Posterior wings lighter than the anterior wings. Venation of both wings as in Plate. Genitalia as in Plate. Internal branch of the tenth segment short, nearly triangular. Preanal appendage absent. External branch of the tenth segment short; distal margin with swelling, rounded at apex. Clasper as in Plate; besal segment broaded at its base, narrowing towards the apex to leave a distinct angle on the distal margin; apical margin much shorter and narrower than the basal segment. Aedeagus elongate; apical portion with a few bristles; lateral lobes of aedeagus with a few short bristles; apical portion swollen in dorsal aspect; distal margin divided into two lobes, lateral margin bearing many long blistles.

Specimens examined: 1♂, Kawaba-mura, Tone-gun, Gunma pref., Oct. 14, 1956, (M. INOUE); 1♂, Momoya, Chyokai-mura, Yuri-gun, Akita Pref., Oct. 24, 1970, (K. SHIRAHATA).

Distribution: Gunma, Akita Prefectures.

Apatania crassa SCHMID

(Fig. 3)

Apatania crassa SCHMID, 1953, Tijdschr. v. Entom., 96: 166.

Apatania crassa: SCHMID, 1955, Mitt. Schweiz. Ent. Ges., 28: 81.

The original description of this species was based on a single male from Sappor, Hokkaido. I was unable to examine this species, but juding from the figure given

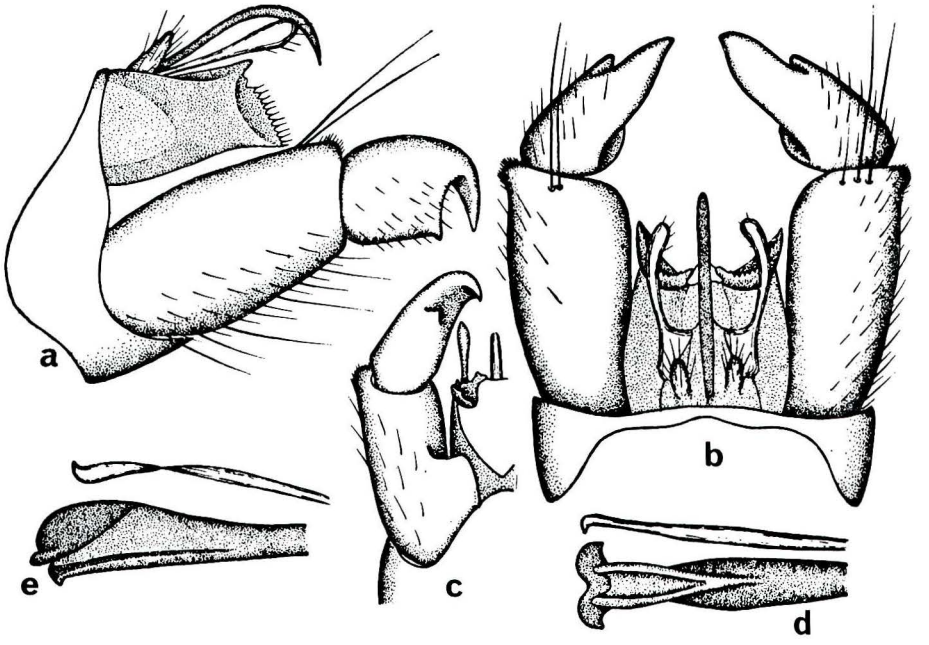

Fig. 3. Male genitalia of *Apatania crassa*. a, lateral aspect; b, dorsal aspect; c, ventral aspect; d, aedeagus, dorsal aspect; e, aedeagus, lateral aspect, by SCHMID (1953).

by SCHMID (1954), this species can be distinguished for other species by the shape of the ginitalia of the male.

Distribution: Hokkaido.

Apatania shirahatai KOBAYASHI

(Pl. 4)

Apatania shirahatai KOBAYASHI, 1973, Bull. Kanagawa Pref., (Nat. Hist.), 6: 35-37.

The original description of this species was based on a single male from Chyokai National Park, Yamagata Prefecture.

Male: Length 8.0 mm. Color almost entrirely fuscous. General structure for genus. Anterior wings fulvous; costal area and pterostigma brownish; pterostigma

very broad and distinct. Costa of pterostigma portion projeced forewardly. Posterior wings lighter than anterior wings. Venation of both wings as in Plate. Genitalia as in Plate. Preanal appendage elongate. Internal branch of the tenth segment elongate, nearly wedge-shaped; the ninth sternite divided into two lobes; each lobes broad, almost triangular. External branch of the tenth segment horseshoe-shaped. See from dorsal and ventral view, apical portion of the external branch clown-shaped, with notched margin; basal margin of clasper elongate, nearly paralled-sided; apical segment shorter and narrower than the basal segment, finger-shaped. Aedeagus elongate: ventral portion with stout and short bristles. Apical margin of aedeagus deeply incised.

Specimens examined: 3♂♂, Senjogahara, Mt. Chyokai, Yamagata Pref., May 26, 1969 (K. SHIRAHATA).

Distribution: Yamagata Prefecture.

Apatania ishikawai SCHMID

(Fig. 4)

Apatania ishikawai SCHMID, 1964, Canad. Entom., 96: 830-832.

The original description of this species was based on a single male from Isedaki, Nagano Prefecture. I was unable to examine this species, but juding from the figure given by SCHMID (1964), this species can be distinguished from other species by the shape of the ginitalia.

Distribution: Nagano (SCHMID, 1964) Prefecture.

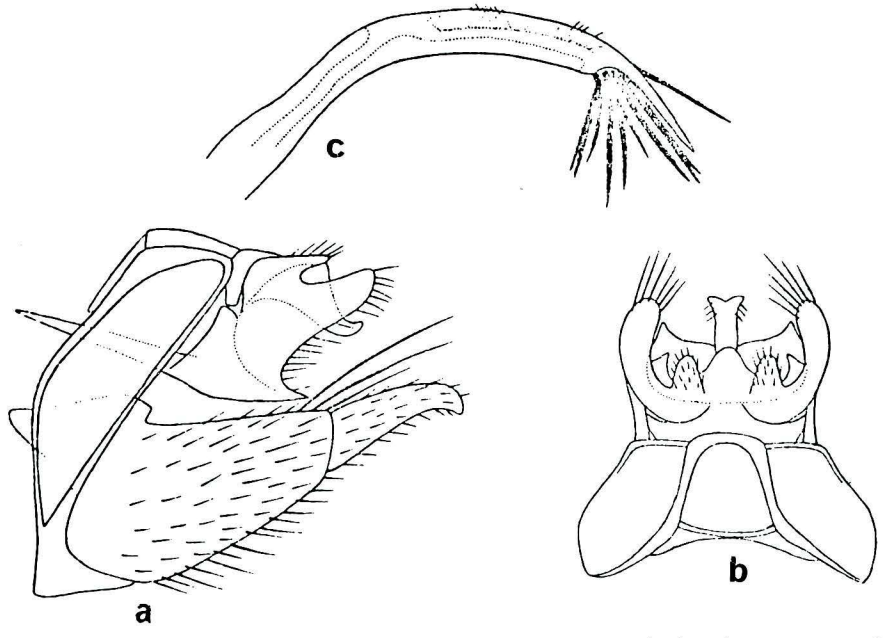

Fig. 4. Male genitalia of *Apatania ishikawai*. a, lateral aspect; b, dorsal aspect; c, aedeagus, lateral aspect, by SCHMID (1964).

Apatania chyokaiensis KOBAYASHI

(Pl. 5)

Apatania chyokaiensis KOBAYASHI, 1973, Bull. Kanagawa Pref., Mus. (Nat. Hist), 6 : 33-34.

The original description of this species was based an a single male from Chyokai National Park in Yamagata Prefecture.

Male : Length 7.0mm. Color almost fulvous. General structure for genus. Anterior wings fulvous; costal area and pterostigma brownish; pterostigma broad and distinct, nearly triangular. Posterior wings lighter than the anterior wings. Venation of both wings as in Plate. Genitalia as in Plate. Preanal appendage of the tenth segment short, stout, nearly thumb-shaped. Internal branch of the tenth segment broad; apical portion divided into two lobes; each lobes nearly leave-shaped. External branch of the tenth segments tout, long; lower margin with serrates; basal segment of clasper broad, nearly parallel-sided; apical segment elongate, as long as the basal segment, broaded at basal portion. Aedeagus elongate; apical portion with a few long bristles. See from dorsal view, apical margin of aedeagus deeply incised; the apex of each lobes with two long bristles.

Specimens examined : 1♂, Senjogahara, Mt. Chyokai, Yamagata Pref., May 26, 1969 (K. SHIRAHATA); 2♂♂, Mt. Ninotadake, Chyokai-mura, Akita Pref., July 9, 1977 (K. SHIRAHATA).

Distribution : Yamagata, Akita Prefectures.

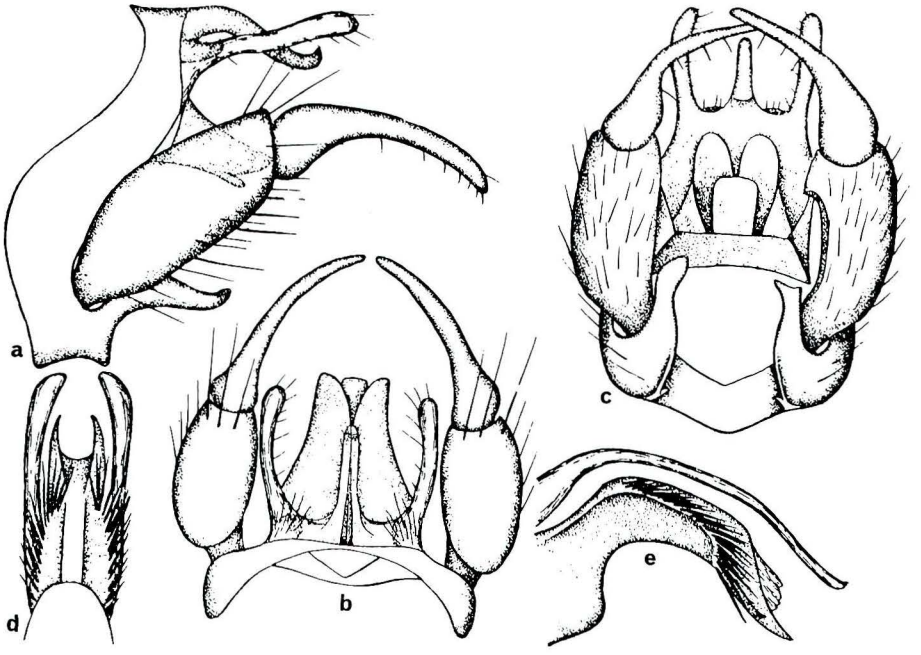

Fig. 5. Male genitalia of *Apatania tsudai*. a, lateral aspect; b, dorsal aspect; c, ventral aspect; d, aedeagus, dorsal aspect; e, aedeagus, lateral aspect, by SCHMID (1954).

Apatania tsudai Schmid

(Fig. 5)

Apatania tsudai Schmid, 1954, Tijdshr. v. Entom., 97: 16-18,

Apatania tsudai: Schmid, 1955, Mitt. Schweiz. Ent. Ges. 28: 82.

The original description of this species was based on a single male from Minamiazumi, Nagano Prefecture. I had no chane to examine this species, but juding from the figures given by Schmid (1954), this species can be distinguished from other species by the shape of the ginitalia of the male.

Distribution: Nagano Prefecture.

Genus *Moropsyche* Banks

Type species: *Moropsyche parvula* Banks 1906

Moropsyche Banks, 1906, Proc. Ent. Soc. Wash., 7: 108.

Moropsyche: Ulmer, 1907, Gen. Ins., 60a: 75.

Moropsyche: Schmid, 1954, Tijdschr. v. Entom., 97: 65.

Moropsyche: Schmid, 1955, Mitt. Schweiz. Ent. Ges., 28: 86.

Diagnosis: Body small, finenss. Both wings grey, clothed with pubescence. Head long, with three pairs of warts. Ocelli small. Antennae slender, slightly shorter than the anterior wings; basal segment as long as head. Maxillary palpi development; basal segment much shorter than the second and third segments; the second segment as long as the third one. Spurs 1, 3, 4.

Anterior wings Sc not ending in a ablique cross-vein; discoidal cell closed; median cell absent; thyridial cell long and broaded at apical portion; apical forks nos. 1, 2, 3 and 5 present. Posterior wings nearly as wide as front wings and less pubescent; apical forks nos. 1, 2, 4 and 5 present; discoidal cell open. The neuration is similar in both sexes. Clasper two-segmented; apical segment very slender, divided into two lobes.

Four species which belong to the genus *Morpsyche* have been recorded from Japan. Among the known species two species were not examined.

Key to species

1. Tenth tergites divided into two lobes (dorsal aspect)·····2
-. Tenth tergites divided into two plates (dorsal aspect) ·····3
2. External branch with lateral aspect nearly triangular, with many small warts ····· *higoana*
-. External branch broad, with lateral aspect broad, truncate apical margin ····· *yugawarana* sp. nov.
3. Terminal segment of clasper divided into two lobes; inner lobes much shorter than the external lobe ····· *parvula*
   Terminal segment of clasper divided into two lobes; inner lobes slightly shorter than the external lobe····· *parvissima*

Moropsychi parvula BANKS

(Fig. 6)

Moropsyche parvula BANKS, 1906, Proc. Ent. Soc. Wash., 8: 108.
Moropsyche parvula: TSUDA, 1942, Mitt. Coll. Sci Kyoto Imp. Univ. (B), 17: 322.
Moropsyche parvula: SCHMID, 1954, Tijdschr. v. Entom., 79: 66.
Moropsyche parvula: SCHMID, 1955, Mittl. Schweiz. Ent. Ges., 28: 87.

The original description of this species was based on a single male from Hiko-san, Fukuoka Prefecture. I had no chance to examine this species, but juding from figures given by SCHMID (1954), this species can be distinguished from other spe-

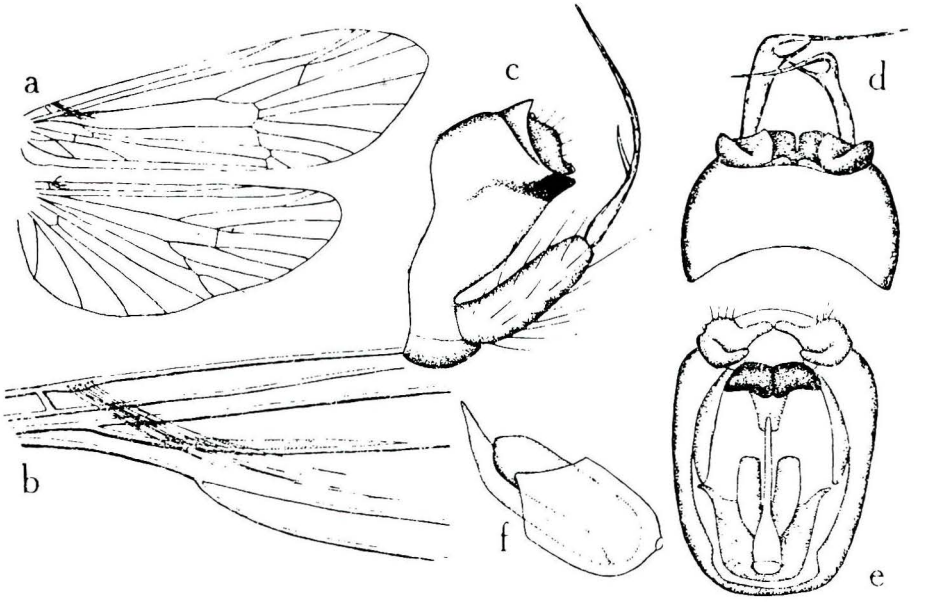

Fig. 6. Male wings and genitalia of *Moropsyche parvula*. a, wings; b, base of anterior wing. c–f, genitalia; c, lateral aspect; d, dorsal aspect; e, caudal aspect; f. aedeagus, lateral aspect, by SCHMID (1954).

sies by the shape of the ginitalia of the male.

Distribution: Fukuoka Prefecture.

Moropsyche parvissima SCHMID

(Fig. 7)

Moropsyche parvissima SCHMID, 1954, Tijdshr. v. Entom., 97: 67.
Moropsyche parvissima: SCHMID, 1955, Mitt. Schweiz. Ent. Ges., 28: 87.

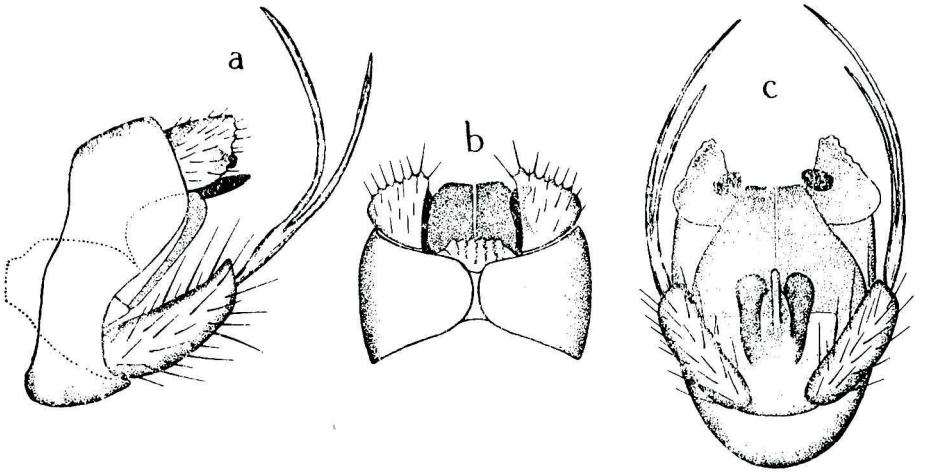

Fig. 7. Male genitalia of *Moropsyche parvissima*. a, lateral aspect; b, dorsal aspect; c, caudal aspect, by SCHMID (1954).

The original description of this species were based on three males from Hirasan, Shiga Preftecture. I was unable to examine this species, but juding from the figures SCHMID (1954), this spesies can be distinguished from other species by the shape of the ginitalia of the male.

Distribution: Shiga Prefecture.

Moropsyche higoana KOBAYASHI

(Pl. 6)

Moropsyche higoana KOBAYASHI, 1971, Bull. Kanagawa Pref. Mus, (Nat. Hist.), 4: 5.

The original description of this species was based on a single male from Tanzawa Mountain mass, Kanagawa Prefecture.

Male: Length 5 mm. Color almost brown, Head with three pairs of warts. General structure typical for genus. Genitalia as in Plate. The ninth segments blackish brown; apical margin deeply concaved at middle portion. The tenth tergites blackish brown. divided into two lobes. External branch trianglar, with many warts; lateral aspect with trianglar. Clasper two-segmented; apical segment slender, divided into two slender lobes; inner lobe much shorter than the external lobe.

Female: Length 6.0 mm. General structure as in the male. Tenth tergites with lateral nearly triangular. Tenth sternite triangularly projected.

Specimens examined: 1♂. Higonosawa, Tanzawa Mountain mass, Kanagawa Pref., May 24, 1968 (M. KOBAYASHI); 1♂, Asahi-mura, Iwafune-gun, Niigata Pref., Sept. 25, 1968 (M. KOBAYASHI); 2♂♂, Mt. Narumi, Iwafune-gun, Niigata Pref., June 4, 1970 (K. BABA); 4♂♂. Kawarabo. Mt. Hayachine, Iwate Pref., July 4, 1973 (M. KOBAYASHI).

Distribution: Kanagawa, Niigata, Iwata Prefectures.

Moropsyche yugawarana sp. nov.
(Pl. 7, 8)

Male: Length 5.0 mm. Color almost brown except for indefinite areas on antennae and legs which are a slightly shade. General structure typical for genus. The basal portion of anterior wings with senseorgan (?). Spurs 1, 3, 4. Genitalia as in Plate. The ninth tergites with lateral aspect broad; apical margin cosely produced. The tenth tergites divided into two lobes; each lobes rounded at its apex. External branch broad, with lateral aspect broad, apical margin truncated. Clasper two-segmented; basal segment nearly rectangular; terminal segment longer than the basal one, chitinized; apical portion divided into two lobes; each lobes spine-shaped; external lobe longer than the inner lobe. Aedeagus branched into two processes; upper process talon-shaped; lower process elongate, stick-shaped.

Female unknown.

Holotype. Male: Niizaki River, Yugawara-machi, Kanagawa Pref., May 18, 1981 (M. KOBAYASHI).

Paratype. 2♂♂: Kamiange, Hachioji-shi, Tokyo, May 31, 1973 (M. KOBAYASHI).

This species is most elosely related to *higoana* KOBAYASHI, differing from it in the structure of the genitalia of the male.

Distribution: Kanagawa, Tokyo Prefectures.

Subfamily **Dicosmoecinae** SCHMID

Type genus: *Dicosmoecus* MCLACHLAN 1875

Dicosmoecinae SCHMID, 1955, Mitt. Schweiz. Ent. Ges., 28: 29-32.

Antennae as long as, slightly longer than the fore wings; basal segment shorter than the head. Ocelli present. Maxillary palpi of male three-segmented, female five-segmented. Legs with many black spines, but terminal segment of tarsus without spine. Spurs 1, 2, 2 or 1, 3, 4. Anterior wings broadly rounded, membranem or less granulate, pubescent generally dense; discoidal cell narrow, longer than the peidcel; apical forks nos. 1, 2, 3 and 5 present; none of the apical forks pedicellate. Posterior wings slightly broader than the anterior wings, rounded at its apex; the discoidal cell narrow, longer than the pedicel; apical forks nos, 1, 2, 3 and 5 present. Genitalia of male is very developmented.

Two genera which belong to the subfamily Disosmoecinae have been recorded from Japan.

Key to genera

-. Maxillary palpi very long; the second joint nearly as long as the length of hind tibiae. Spurs 1, 2, 2 ..... *Nothopsyche*

-. Maxillary palpi normal. Spure 2, 3, 4 ..... *Dicosmoecus*

Genus ***Dicosmoecus*** McLachlan

Type species: *Dicosmoecus palatus* McLachlan 1872

Dicosmoecus McLachlan, 1975, Rev. and Syn. Tricho., 112.
Anabolia Banks, 1897, Trans. Ent. Soc., 24: 27.
Asynarchus: Banks, 1900, Trans. Ent. Soc., 26: 254.
Dicosmoecus: Ulmer, 1907, Gen. Ins., 60a: 60.
Dicosmoecus: Banks, 1943, Bull. Mus. Comp. Zool. Harw. Univ., 92: 356.
Dicosmoecus: Schmid, 1955, Mitt. Schweiz. Ent. Ges. 28: 33.
Kogurea Kobayashi, 1965, Bull. Nat. Sci. Mus. (Tokyo), 6: 115.

Diagnosis: Color mostly brown. Antennae slender, hardly as lnog as anterior wings;basal segment shorter than the head, other segments serrate. Ocelli present. Maxillary palpi of male three-segmented; basal segment much shorter than other segments; the second segment slightly shorter than the terminal one. Legs with many black spines, but terminal segment of tarsus without spine. Spurs 1, 3, 4. Anterior wings broadly rounded; membrane more or less granulate; R_1 but little or not at all arched toward the tip, discoidal cell in the both wings narrow, longer than the pedicel; none of the apical forks pedicelate.

Two species which belong to this genus *Dicosmoecus* have been recorded from Japan. Among the known species one species was not examined.

Dicosmoecus jozankeanus (Matsumura)

Stenophylax jozankeanus Matsumura, 1931, Illustrated Insects of Japan Empire: 1126.
Dicosmoecus jozagankeanus: Schmid, 1955, Mitt. Schweiz. Ent. Ges., 28: 36.

The original description of this species was based on a single male from Jozankai, Sapporo, Hokkaido. Matsumura's original description and figure have failed to show its general characteristics only giveing its color patterns and a external form.

Distribution: Hokkaido.

Dicosmoecus ezoensis (Kobayashi)

(Pl. 9)

Kogurea ezoensis Kobayashi, 1962, Bull. Not. Sci. Mus. (Tokyo), 6: 116.

Male: Length 18.0mm. Color modrately light brown. General structure typical for genus. Genitalia as in Plate. The ninth segment short; sternite with ventral process. From dorsal, distal margin of the tenth segment divided into two paris lobes; inner lobes stouter and longer than the outer lobes, finger-shaped; outer lobes slender, stick-shaped. Clasper two-segmented, hook-shaped; basal segment very broad, shorter than the terminal segment; Terminal segment curved inwardly, sharply acuted at its apex. Aedeagus are elongate; divided into three lobes; outer lobes rounded at apex; middle lobe slender, acuted at apex, apical portion is

armed with a few long seta.

Female: Length 20.0 mm. General structure typical for the male. Genitalia as in Plate. From lateral, the tenth segment stout, long; apical margin concaved at middle portion; from dorsal, each branch with rounded at apex. Abdominal plate of the ninth sternite as in Plate.

Specimens examined: 1♂, Yoshii-machi, Ukiba-gun, Fukuoka Pref., May 21, 1957 (N. GYOTOKU); 1♂1♀, Nukabira, Hokkaido, Aug. 14, 1961 (K. KOGURE); 7♂♂, same locality, July 22, 1974 (O. YAMANOUCHI).

Distribution: Fukuoka, Hokkaido Prefectures.

Genus ***Nothopsyche*** BANKS

Type species: *Nothopsyche pallipes* BANKS

Nothopsyche BANKS, 1906, Proc. Ent. Soc. Wash., 7: 107.
Nothopsyche: ULMER, 1907, Gen. In., 60a: 70.
Nothopsyche: TSUDA, 1942, Mem. Coll. Sci. Kyoto Imp. Univ. (B), 17: 321.
Nothopsyche: SCHMID, 1952, Arch. f. Hydrobiol., 27: 138.
Nothopsyche: SCHMID, 1955, Mitt. Schweiz. Ent. Ges., 28: 55.

Diagnosis: Color mostly brown. Antennae slender, as long as anterior wings; basal segment shorter than the head, other segments not serrate. Ocelli present. Maxillary palpi very long; basal segment much shorter than the other segment; the second segment longer than the apical segment, as long as tibia of the fore legs. Legs with many black spines, but terminal segment of tarsus without spine. Spurs 1, 2, 3. Anterior wing broadly rounded; membrane with granulate; discoidal cell in both wings narrow, longer than the pedicel; none of the apical forks pedicelate. Clasper one or two-segment, short stout, Cerci broad, bean-shaped.

Eighth species which belong to this genus have been recorded from Japan. Among the known species two species were not examined.

Key to species

1. The ninth tergites projectd backwardly. Clasper two-segmented 2
–. The ninth tergites normal. Clasper one-segmented 4
2. Basal segment of clasper stout, very short ..... *ruficallis*
–. Basal segment of clasper elongated 3
3. Apical segment of clasper with wart, acuted at its apex ..... *babai*
–. Apical segment of clasper stout, truncated at its apex ..... *yamagataensis*
4. Clasper rounded at its apex ..... *ulmeri*
–. Clasper truncated at its apex 5
5. Cerci projected backwardly, bean-shaped ..... *pallipes*
–. Cerci wart-shaped, with rugged surface ..... *speciosa*

Nothopsyche ruficollis (Ulmer)

(Fig. 8)

Chilostigma ruficollis Ulmer, 1905, Sett. Ent. Zeit., 66: 14.
Nothopsyche ruficollis: Banks, 1906, Proc. Ent. Soc. Wash., 7: 107.
Nothopsyche ruficollis: Ulmer, 1907, Catal. Coll. Zool. Selys., 6 (L): 29.
Nothopsyche ruficollis: Tsuda, 1942, Mem. Coll. Sci. Kyoto Imp. Univ. (B). 17:321.
Nothopsyche ruficollis: Schmid, 1952, Arch. f. Hydrobiol., 47: 147.
Nothopsyche ruficollis: Schmid, 1955, Mitt. Schweiz. Ent. Ges., 28: 67.

The original description of this species was based on a single male from Japan. I had no chance to examine this species, but juding from the figures given by Schmid (1652), this species can be distinguished from other species by the shaped of the ginitalia of the male.

Distribution: Kyoto, Shiga. Hyogo, Saitama Prefectures (Tsuda, 1942).

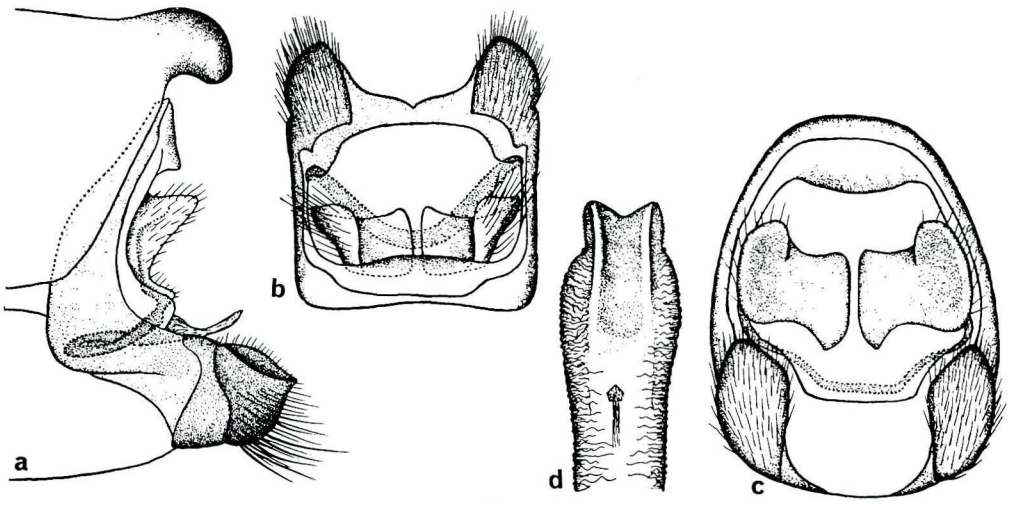

Fig. 8. Male genitalia of *Nothopsyche ruficollis*. a, lateral aspect: b, dorsal aspect; c, caudal aspect; d, aedeagus, dorsal aspect, by Schmid, 1952.

Nothopsyche yamagataensis Kobayashi

(Pl. 10)

Nothopsyche yamagataensis Kobayashi, 1973, Bull, Kanagawa Pref., Mus. (6): 37.

The original description of this species were based on two males taken from Senjogahara, Chyokai National Park, Yamagata Prefecture.

Male: Langth 12.0 mm. Color mostly brown. General structure typical for genus. Genitalia as in Plate. The eighth abdominal segment very short. The ninth tergites divided into three lobes in dorsal aspect; middle plate broad, rounded at apex; external plate narrow, acuted at apex; from lateral aspect, dorsal portion projected backwardly, rounded at apex. The ninth sternite nearly triangle in lateral aspect. Cerci short, very broad in lateral aspect. Clasper two-segmented; basal

segment stouter and longer than the apical segment, upper and lower margin swelled in lateral aspect; apical segment short, slightly concaved inwardly; from ventral aspect, clasper nearly triagnle, inner margin serrate. Aedeagus large, two-segmented; basal segment divided into two long lobes; apical segment with slender apical portion, almostly membranous.

Female unkown.

Specimens examined: 1♂, Mt. Azuma, Higashiokitama-gun, Yamagata Pref., Sept. 18, 1969 (K. SHIRAHATA); 1♂, same locality, Oct. 26, 1970 (K. SHIRAHATA).

Distribution: Yamagata Prefecture.

Nothopsyche longicornis NAKAHARA

Nothopsyche longicornis NAKAHARA, 1915, Cana. Entom. 47: 95.

Nothopsyche longicornis: TSUDA, 1942. Mem. Coll. Sci. Kyoto Imp. Univ. (B), 17: 322.

Nothopsyche longicornis: SCHMID, 1952, Arch. f. Hydrobiol. 47: 159.

Nothopsyche longicornis: SCHMID, 1955, Mitt. Schweiz. Ent. Ges. 28: 68.

The original description of this species was based on a male taken from Shiga Prefecture. I had no chance to examine this species, but juding from the figure given by Nakahara, this specis can not distinguished from other species.

Distribution: Shiga Prefecture (NAKAHARA, 1915).

Nothopsyche babai KOBAYASHI

(Pl. 11)

Nothopsyche babai KOBAYASHI, 1968, Pull. Kanagawa Pref. Mus. (N. Hist.), 1: 5.

The original description of this species was based on a single male from Kurokawa-mura. Niigata Prefecture.

Male: Length 7.5 mm. Head and thorax blackish brown, abdominal segments mostly brown. General structure typical for genus. Genitalia as in Palte. The eighth abdominal segment short. The apical margin of the ninth tergites long, projected backwardly, rounded at apex. Cerci finger-shaped in lateral and caudal aspect; inner margin serrate. Clasper two-segmented; basal segment stouter than the apical one; apical segment black, nearly triangular, with a large wart. Aedeagus divided into two lobes; upper lobe spatulat-shaped in lateral aspect, clothed with short bristles; lower lobe finger-shaped in lateral aspect, clothed with short bristles.

Female: Length 8.0mm. General strcture typical for male. Genitalis as in Plate. The ninth tergiets with short bristles. The tenth tergties short, rounded at apex, apical margin aeeply concaved at middle portion in dorsal and ventral aspect. The abdominal plate of the ninth sternite as in Plate.

Specimens examined: 1♂, Kurokawa-mura, Kitakanbara-gun, Niigata Pref., Nov. 18, 1955 (K. BABA); 1♂, Yahata, Sawada-machi, Sado-gun, Niigata Pref., Nov. 23,

1955 (K. Baba); 4♂♂1♀, Maoroshi, Murakami-shi, Niigata Pref., July 27, 1966 (K. Baba); 2♂♂, Ohota, Shinjo-shi Yamagata Pref., Nov. 18, 1969 (K. Shirahata).

Distribution: Niigata, Yamagata Prefectures.

Nothopsyche ulmeri Schmid

(Pl. 12)

Nothopsyche pallipes Ulmer, 1907, Cot. Coll. Selzs, 6: 29–30.

Nothopsyche ulmeri: Schmid, 1952, Arch. f. Hydrobiol., 47: 152–154.

Nothopsyche ulmeri: Schmid, 1955, Mitt. Schweiz. Ent. Ges., 28: 68.

Nothopsyche pallipes: Kobayashi, 1973, Bull. Kanagawa Pref. Mus. (Nat. Hist.), 6: 37.

The original description of this species was based on a single male from Japan.

Male: Length 11.2mm. Color mostly brown. General structure typical for genus. Genitalia as in Palte. The eighth abdominal segment long. Apical margin of the ninth tergites normal, with a figer-like process in lateral aspect. Cerci rearl bean-shaped in lateral aspect, with rugged surface. Inner branch divided into two lobes in dorsal aspect; inner lobes slender, acuted at its apex, curved outwardly; external lobe short, acuted at apex with a short lobe. Clasper one-segmented, long, stout, nearly swolling at middle portion in lateral aspect, indented at apical portion. Aedeagus divided into external and middle lobes; apical portion of the middle lobe divided into two lobes; external lobes acuted at apex.

Female: Length 12.0mm. General structure as in the male. Apical portion of the ninth tergites with lateral aspect wart-shaped, clothed with many short bristles; apical margin concaved at middle portion in ventral aspect. The tenth sternite with a long fossa. Abdominal plate of the ninth sterinte as in Plate.

Specimens examined: 1♀, Korokawa-mura, Kitakanbara-gun, Niigata Pref., Oct. 25, 1953 (K. Baba); 6♂♂2♀♀, Niita-machi, Niita-gun, Shimane Pref., Sept. 25, 1964 (H. Kadowaki); 1♂4♀♀, Tsukiyamashizu, Asahi-mura, Togawa-gun, Yamagata Pref., Dec. 16, 1969 (K. Shirahata).

Distribution: Shimane, Niigata, Yamagata Prefectures.

Nothopsyche pallipes Banks.

(Pl. 13)

Nothopsyche pallipes Banks, 1906, Proc. Ent. Soc. Wash., 7: 107–108.

Nothopsyche Pallipes: Matsumura. 1907, Syst. Ent., 1: 190.

Nothopsyche pallipes: Nakahara, 1914, Zool. Mag., 26: 355.

Nothopsyche pallipes: Nakahara, 1915, Gana. Ent., 47: 95.

Nothopsyche pallipes: Kuwayama, 1924, Trans. Sapporo Nat. Hist. Soc., 9: 33.

Pltyphylex fulvipes Martynov, 1930, Proc. Zool. Soc. London, 104–105.

Nothopsyche pallipes: Tsuda, 1942, Mem. Coll. Sci. Kyoto Imp. Univ. (B)., 17: 321.

Nothopsyche pallipes: Schmid, 1952. Arch. f. Hydrobiol., 47: 154–156.

Nothopsyche pallipes: SCHMID, 1955. Mitt. Schweiz. Ent. Ges., 28: 68.

Nothopsyche pallipes: KOBAYASHI, 1973. Bull. Kanagawa Pref., Mus. (Nat. Hist.), 6: 37.

The original description of this species was based on a single male from taken Gifu Prefecture, Japan.

Male: Length 14.0mm. Color mostly brown. General structure typical for genus. Genitalia as in Plate. The ninth sternite short, apical margin slightly concaved at middle portion in lateral aspect. Cerci stout, round, bud-shaped in lateral aspect. Inner branch divided into two lobes in dorsal aspect: inner lobe slender, its apex curved outwardly; external lobe stout, rounded at apex, finger-shaped. Clasper one-segmented, stout, elonmgate, truncated at apical margin in lateral aspect. Aedeagus long, basal portion stout, middle portion divided into lobes: middle lobes pot-shaped, basal portion stout, apical portion slender, branched at apex: external lobes slightly shorter than the middle lobe, acuted at its apex, curved inwardly.

Female: Length 16.0mm. General structure typical for male. Genitalia as in Plate. The ninth tergites projected backwardly in lateral aspect. The tenth abdominal segment long, stout, apical margin slightly indented at middle portion in lateral aspect. The tenth sternites with membranous portion. Abdominal plate of the ninth sternite as in Plate.

Specimens examined: 1♂, Nanokamachi, Niitsu-shi, Niigata Pref., Oct. 15, 1965 (S. SAKURAI); 1♂4♀♀, Tsukiyamashizu, Asahi-mura, Higashitagawa-gun, Yamagata Pref., Dec. 1969 (K. SHIRAHATA); 1♂1♀, same locality, Oct. 1, 1970 (K. SHIRAHATA); 1♂, Momoya, Chyokai-mura, Akita Pref., Oct. 24. 1970 (K. SHIRAHATA); 1♂, Niitakayu, Mt. Azuma, Yamagata Pref., Oct. 26, 1970 (K. SHIRAHATA).

Distribution: Kyoto (TSUDA, 1942), Shiga (TSUDA, 1942), Osaka (TSUDA, 1942), Tochigi (TSUDA, 1942), Niigata, Yamagata Prefectures.

Nothopsyche speciosa KOBAYASHI

(Pl. 14, fig. 9)

Nothopsyche speciosa KOBAYASHI, 1959, Bull. Nat. Sci. Mus. (Tokyo). 44:351-353.

The original description of this species were based on seven males from Yoshii-machi, Fukuoka Prefecture.

Male: Length 13.0mm. Color mostly brown. General structure typical for genus. Genitalia as in Plate. The eighth tergites short in dorsal aspect; apical margin projected at middle portion. The ninth abdominal segment long in lateral aspect, projected backwardly; apical margin rounded. Cerci short, wart-shaped in lateral aspect, with rugged surface. The tenth abdominal segment long, membranous in lateral aspect, clothed with hairs; upper margin projected upwardly. Inner branch elongated in dorsal aspect, stouted at basal portion; a apex narrow, curved inwardly, Clasper long, stout in lateral aspect, truncated at its apex; upper and lower margin

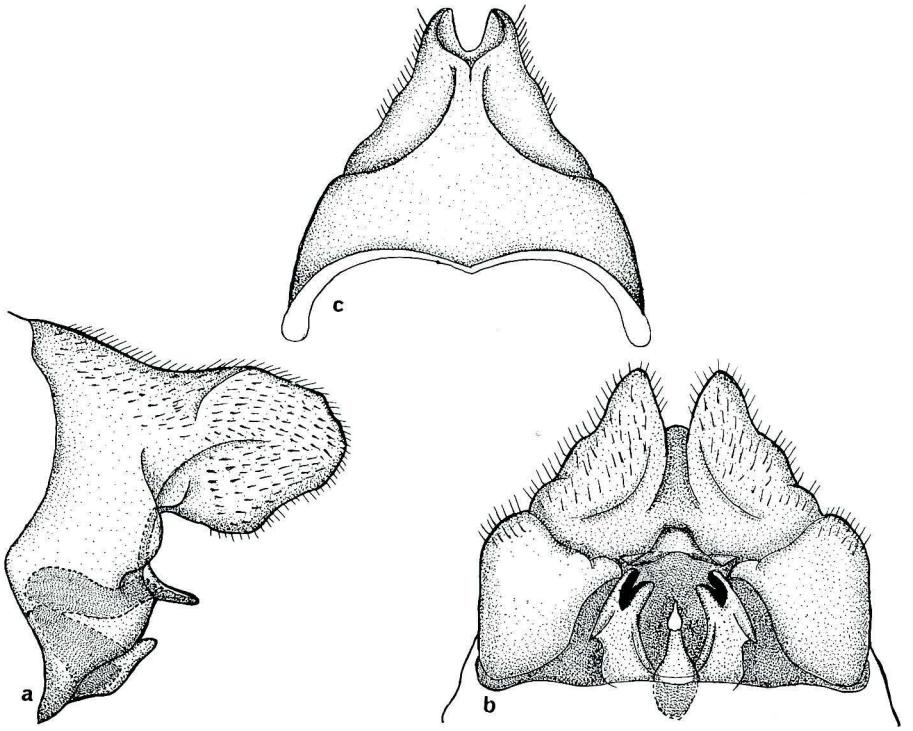

Fig. 9. Female genitalia of *Nothopsyche speciosa*. a, lateral aspect; b, dorsal aspect; c, ventral aspect.

serrated. Aedeagus long, pot-shaped in dorsal aspect; middle portion with a pair external lobes; apical margin concaved at middle portion. External lobe shorter than the length of aedeagus in leteral aspect, its apex rounded, curved inwardly.

Female: Length 14.0mm. General structure typical for the male. Genitalia as in Plate. The ninth tergites projected backwardly, apical margin slightly curved at middle portion. The tenth abdominal segment long, very stout in lateral aspect, rounded at apex; apical margin of the tenth sternites deeply concaved at middle portion in ventral aspect. Abdominal plate of the ninth sternites as in Palte.

Distribution: Fukuoka Prefecture

Specimens examined: 6♂♂2♀♀, Yoshii-machi, Ukiba-gun, Fukuoka Pref., Oct. 26, 1957 (N. Gyotoku); 1♀, same loaclity, Oct. 28, 1957 (N. Gyotoku); 1♂1♀, same locality, Oct. 28, 1957 (N. Gyotoku); 3♂♂, same locality, Nov. 13, 1957 (N. Gyotoku).

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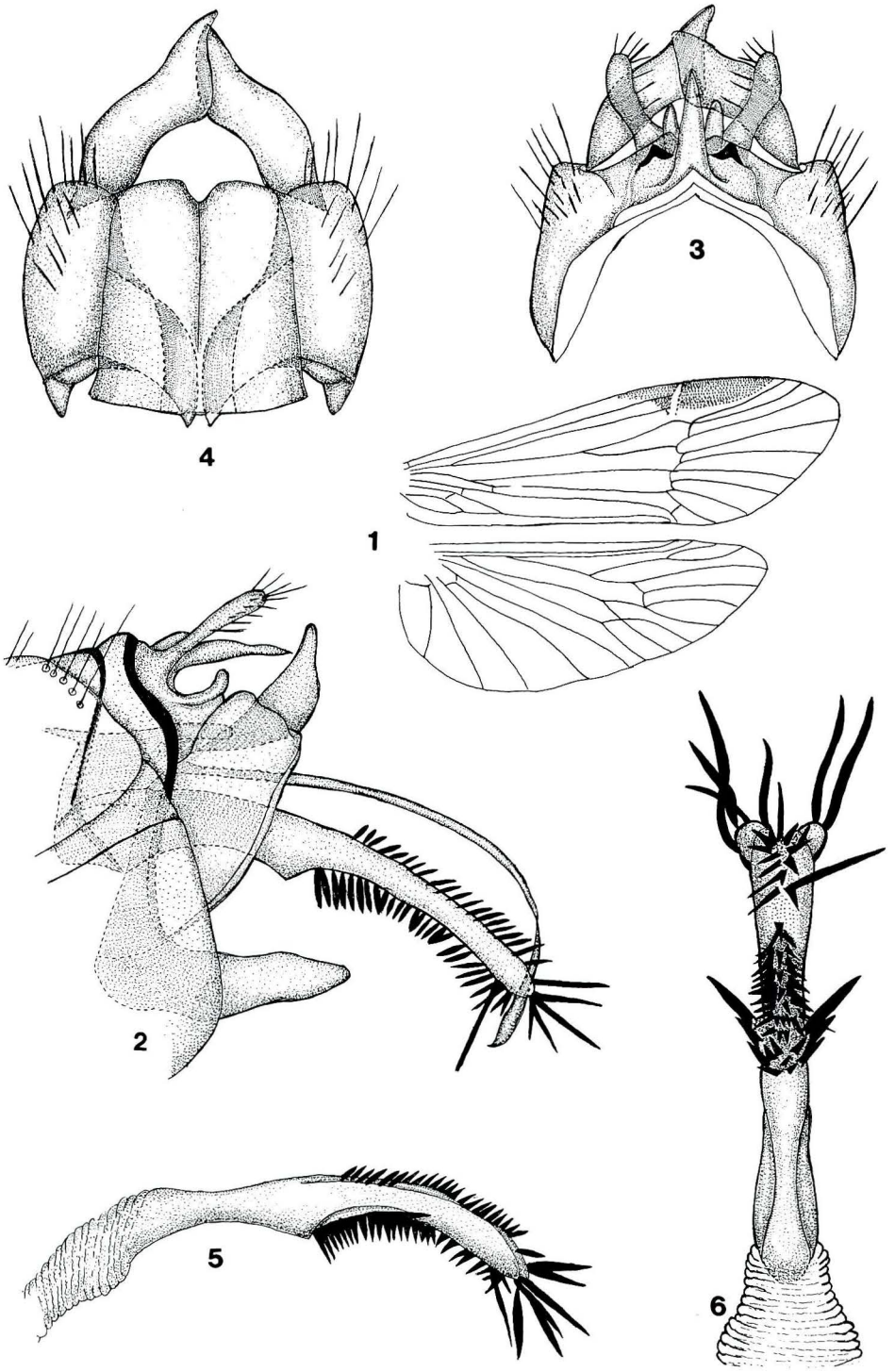

Plate 1. Male wings and genitalia of *Apatania aberrans*.
1, wings. 2-6, genitalia ; 2, lateral aspect ; 3, dorsal aspect ; 4, ventral aspect ; 5, aedeagus, lateral aspect ;6, aedeagus, dorsal aspect.

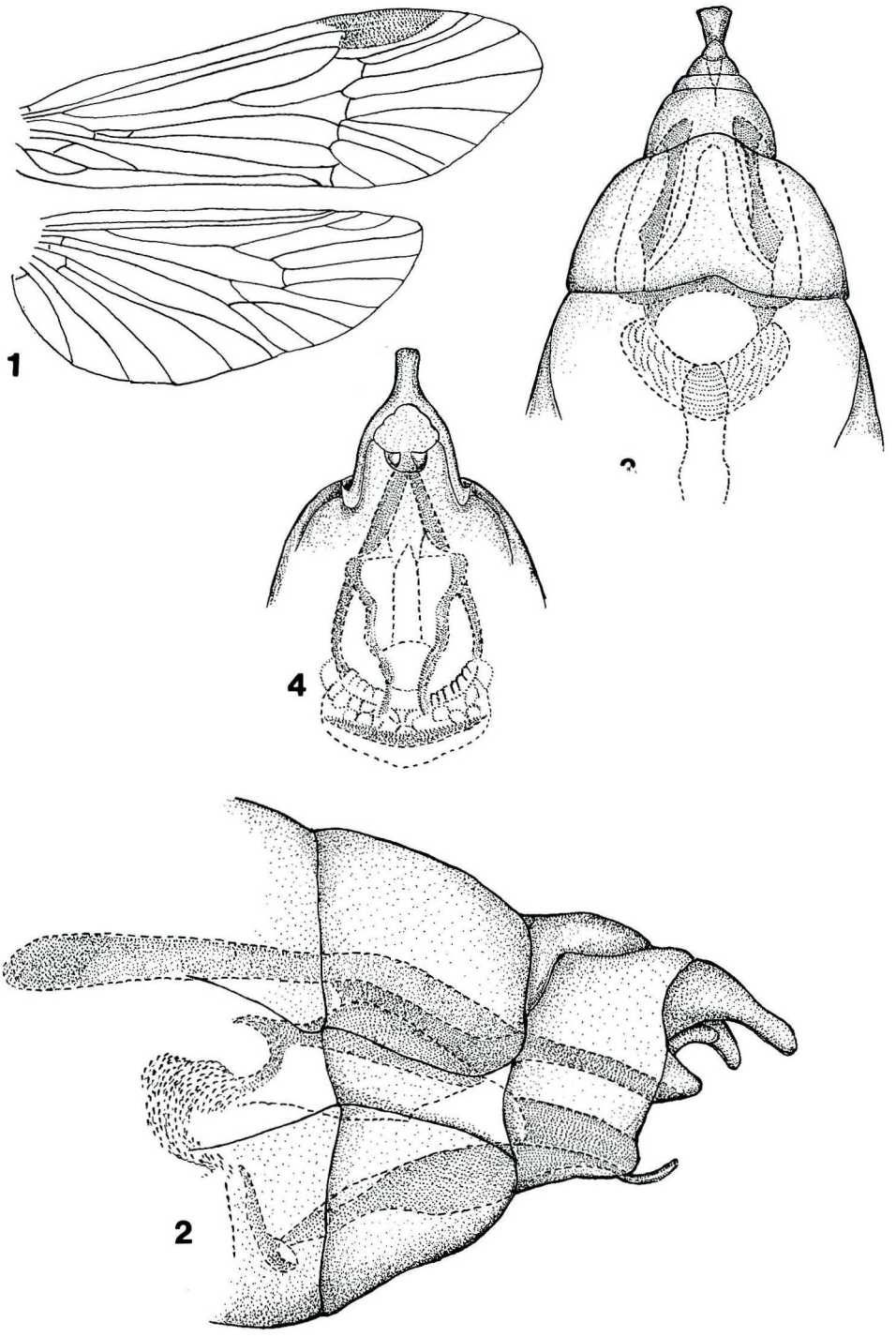

Plate 2. Female wings and genitlaia of *Apatania aberrans*.
1, wings. 2-4, genitalia; 2, lateral aspect; 3, dorsal aspect; 4, ventral aspect.

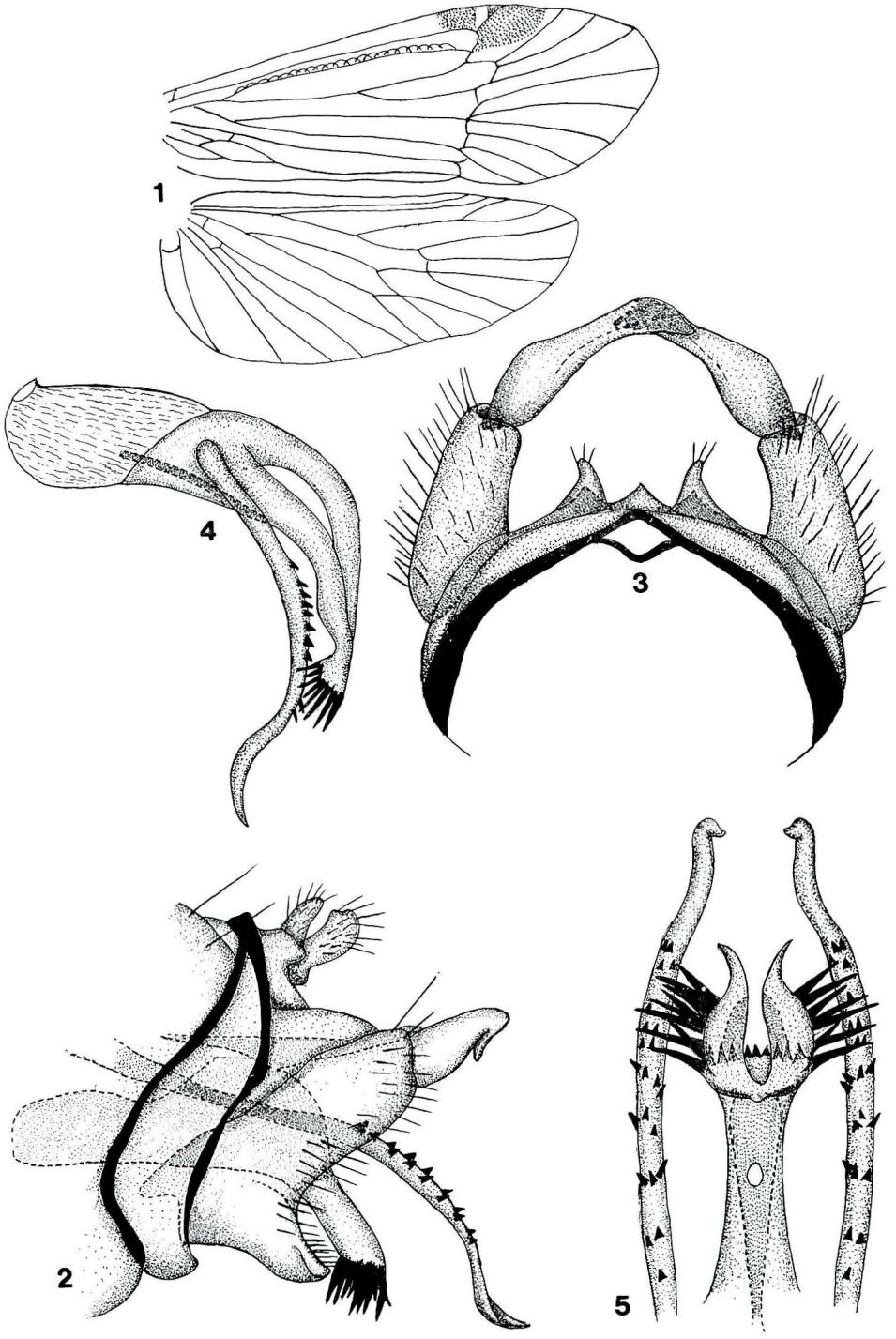

Plate 3. Male wings and genitalia of *Apatania momoyaensis*.
1, wings. 2–5, genitalia; 2, lateral aspect; 3, dorsal aspect; 4, aedeagus, lateral aspect; 5, aedeagus, dorsal aspect.

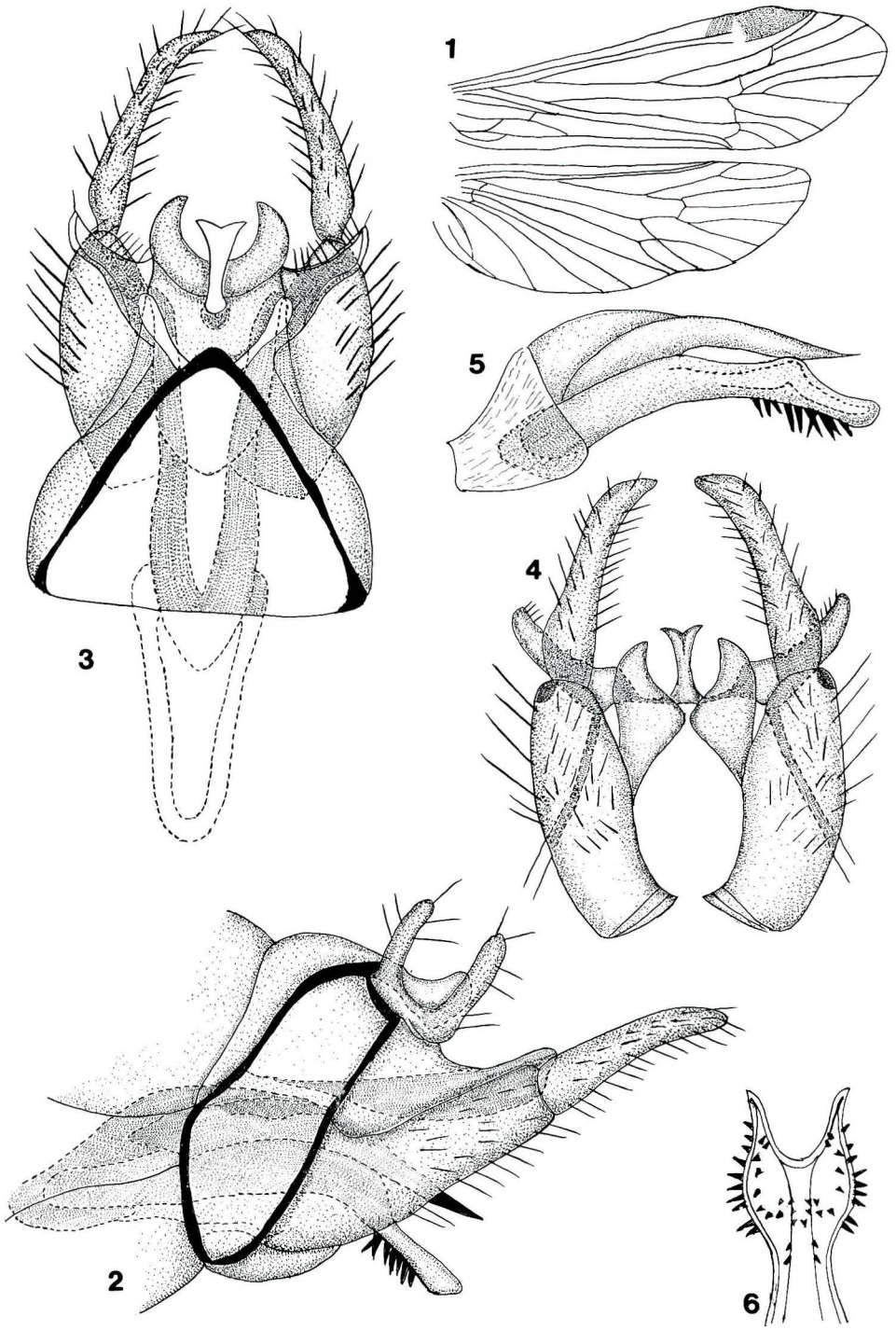

Plate 4. Male wings and genitalia of *Apatania shirahatai*.
1, wings. 2-6, genitalia ; 2, lateral aspect ; 3, dorsal aspect ; 4, ventral aspect ; 5, aedeagus, lateral aspect ; 6, aedeagus, dorsal aspect.

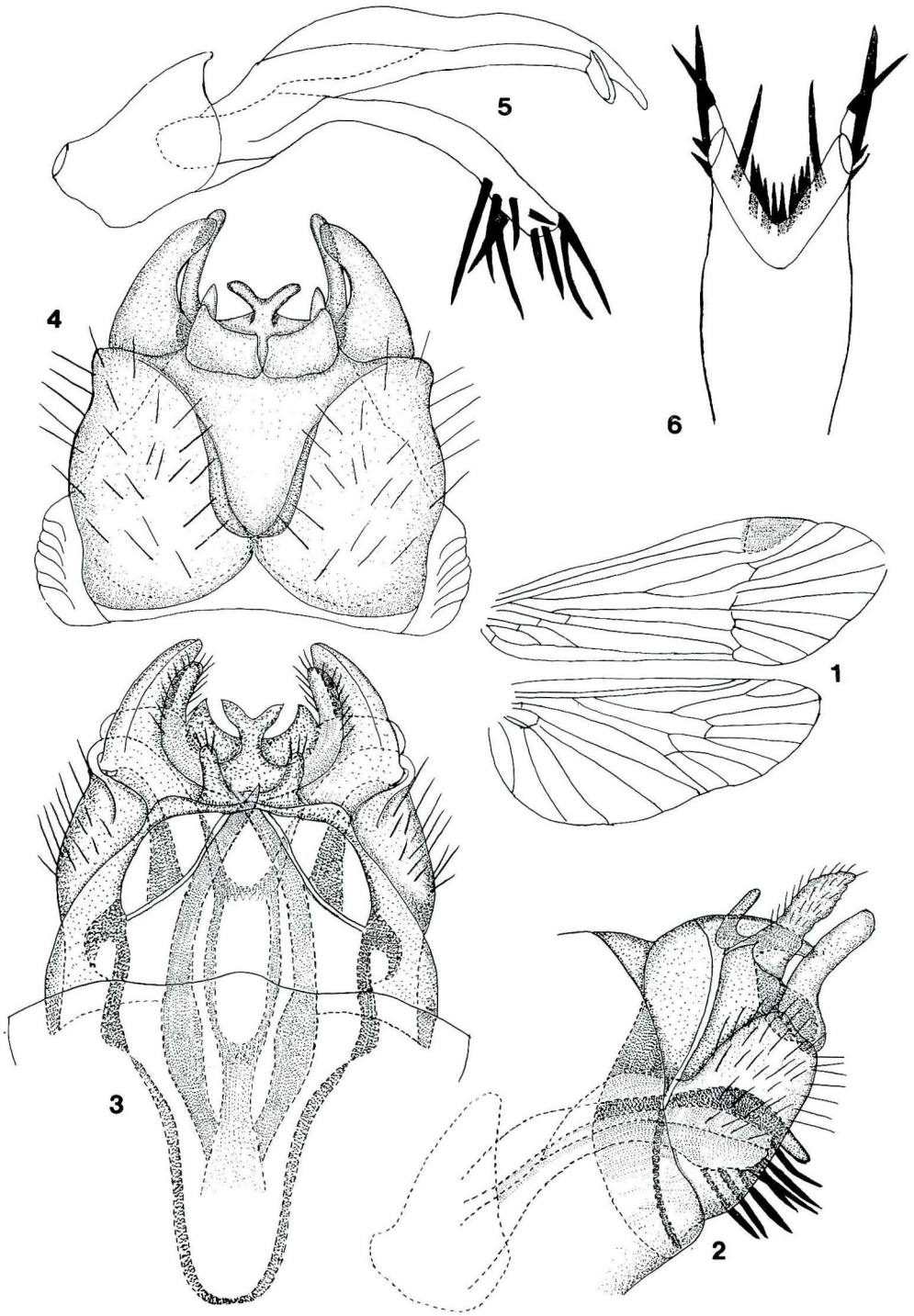

Plate 5. Male wings and genitalia of *Apatania chyokaiensis*.
1, wings. 2-6, genitalia; 2, lateral aspect; 3, dorsal aspect; 4, ventral aspect; 5, aedeagus, lateral aspect; 6, aedeagus, dorsal aspect.

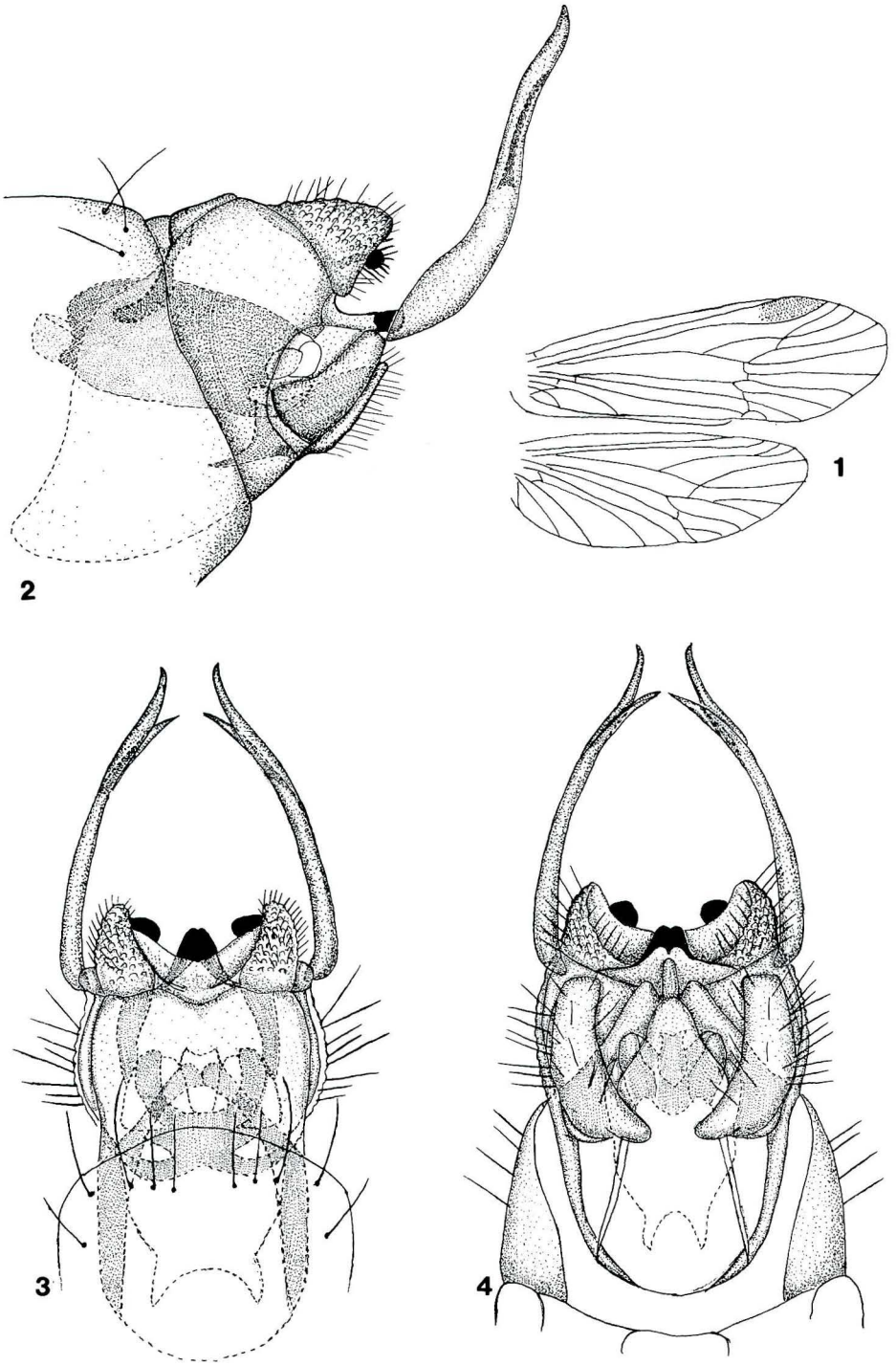

Plate 6. Male wings and genitalia of *Moropsyche higoana*.
1, wings. 2–4, genitalia ; 2, lateral aspect ; 3, dorsal aspect ; 4, ventral aspect.

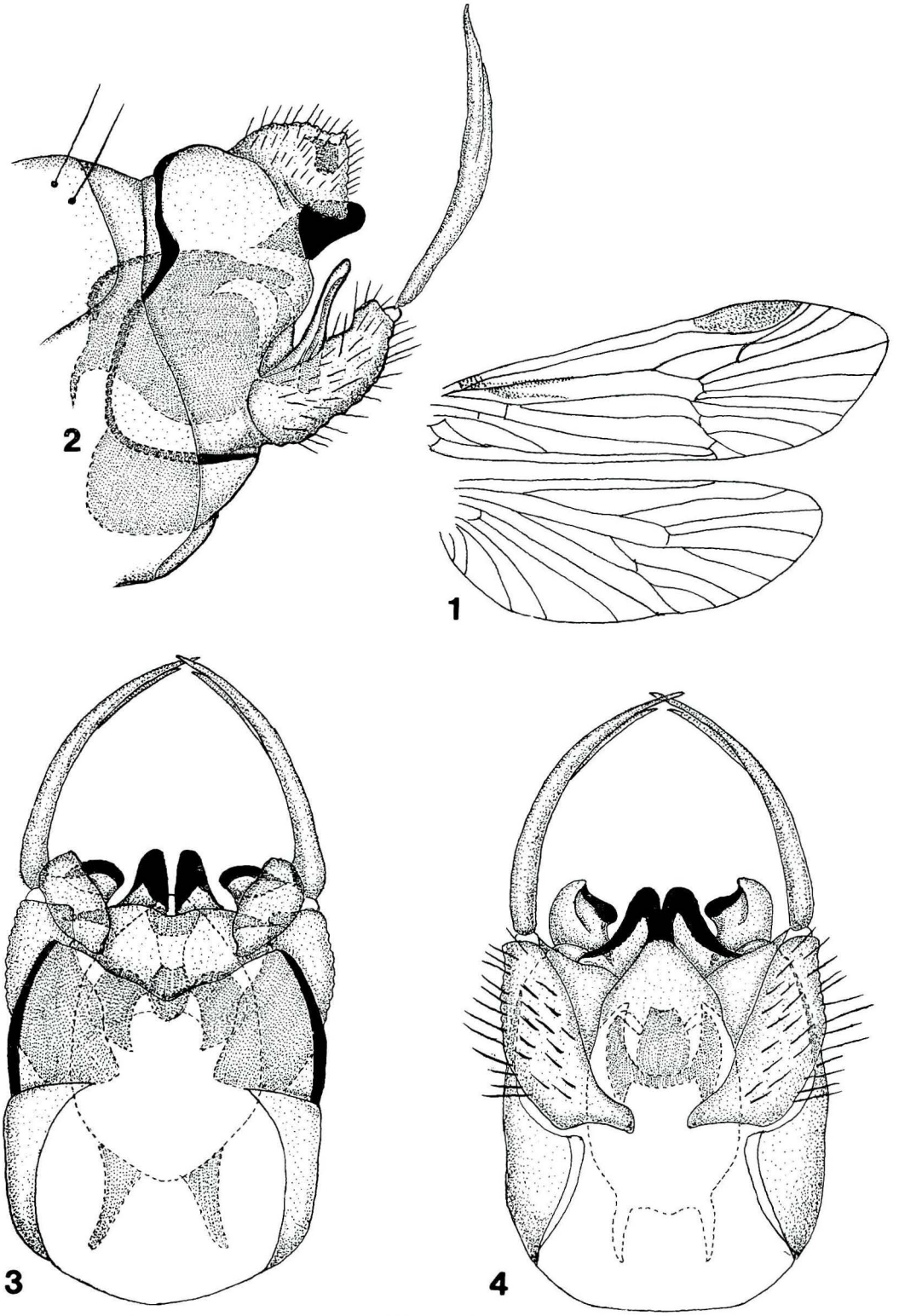

Plate 7. Male wings and genitalia of *Moropsyche yugawarana* sp. nov.
1, wings. 2–4, genitalia; 2, lateral aspect; 3, dorsal aspect; 4. ventral aspect.

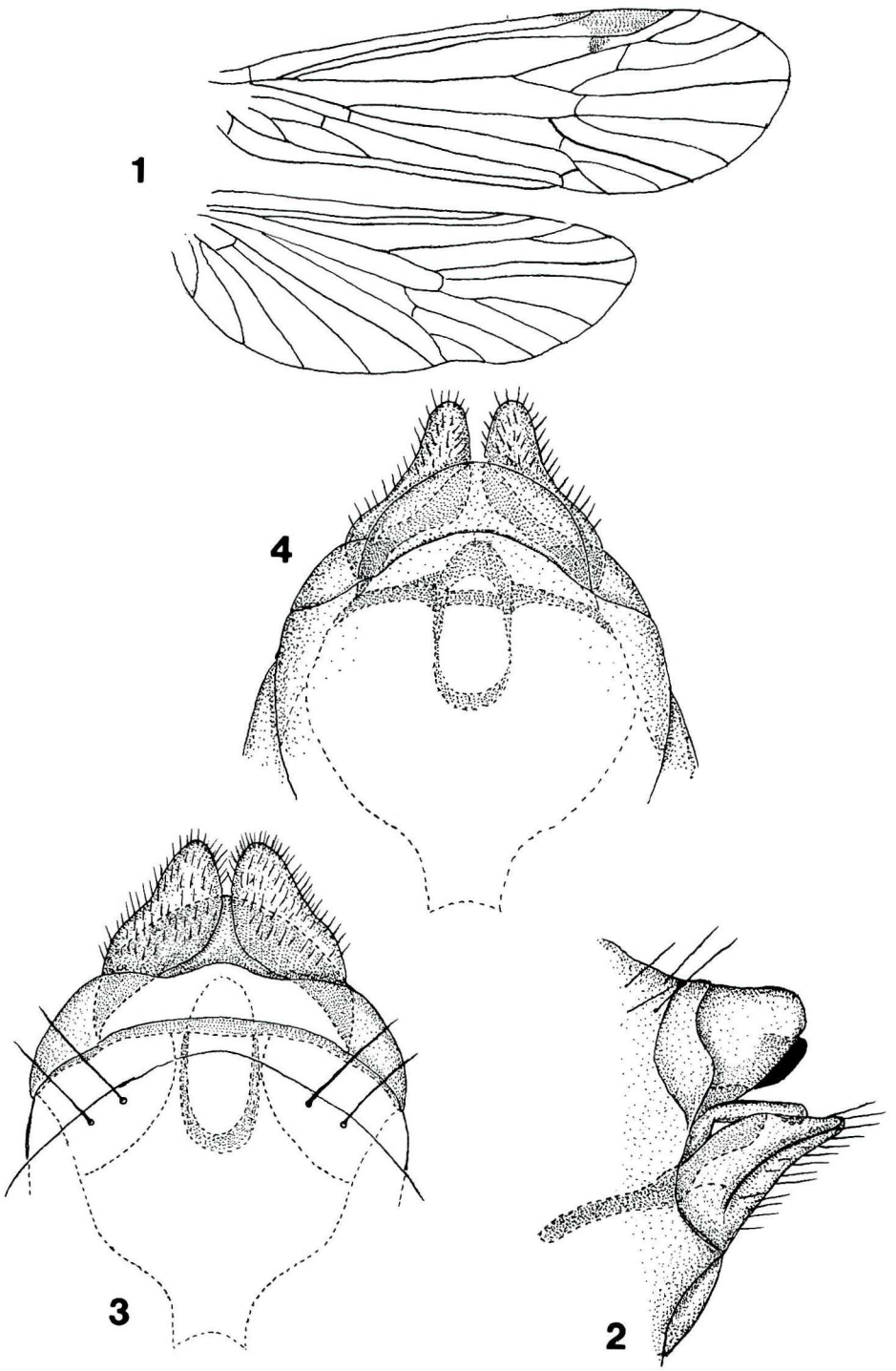

Plate 8. Female wings and genitalia of *Moropsyche yugawarana* sp. nov.
1, wings. 2-4, genitalia ; 2, lateral aspect ; 3, dorsal aspect : 4, ventral aspect.

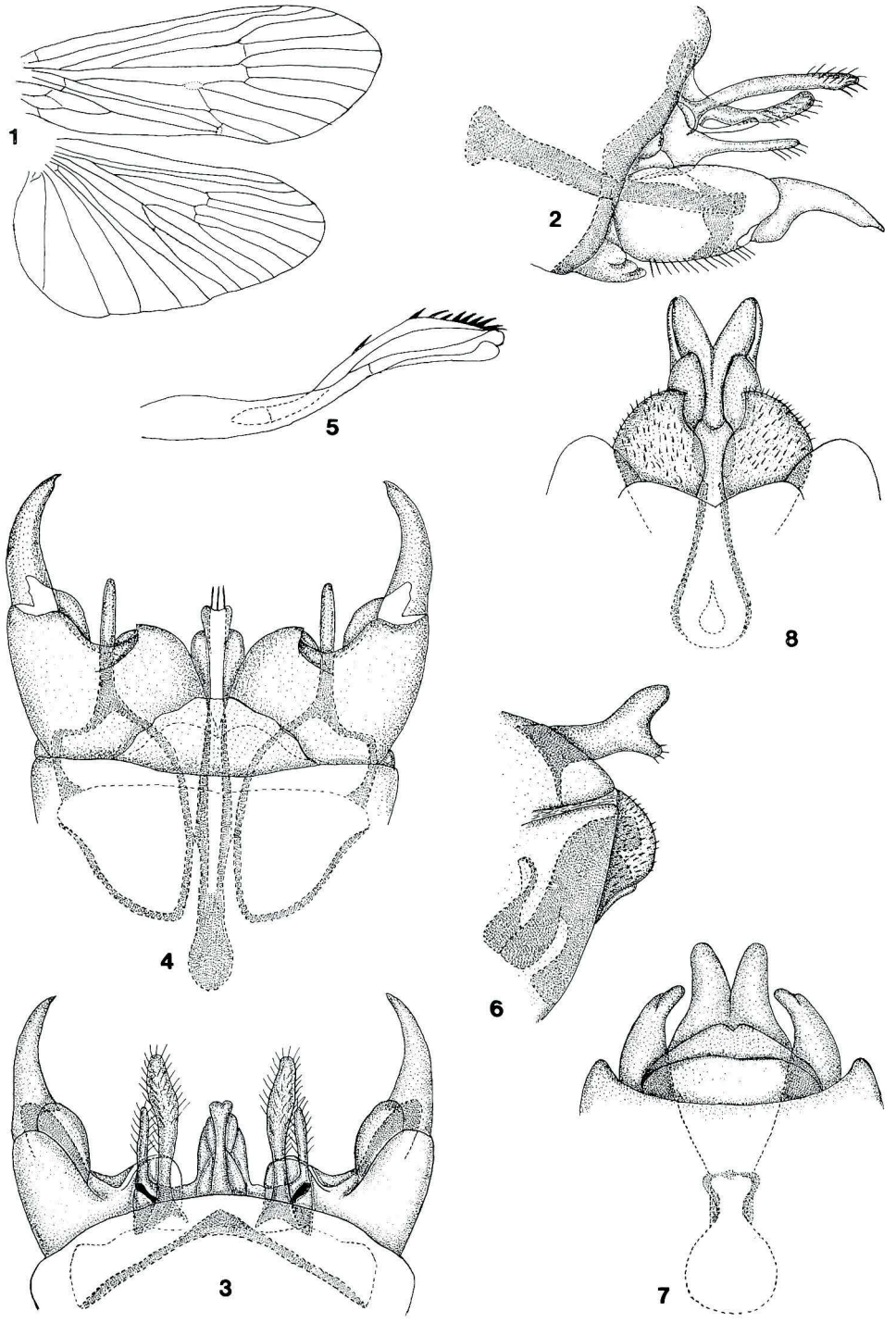

Plate 9. Male wings, and genitalia of both sexes of *Discomoecus ezoensis*.
1, male wings. 2–5, male genitalia; 2, lateral aspect; 3, dorsal aspect; 4, ventral aspect; 5, aedeagus, lateral aspect. 6–8, female genitalia; 6, lateral aspect; 7, dorsal aspect; 8, ventral aspect.

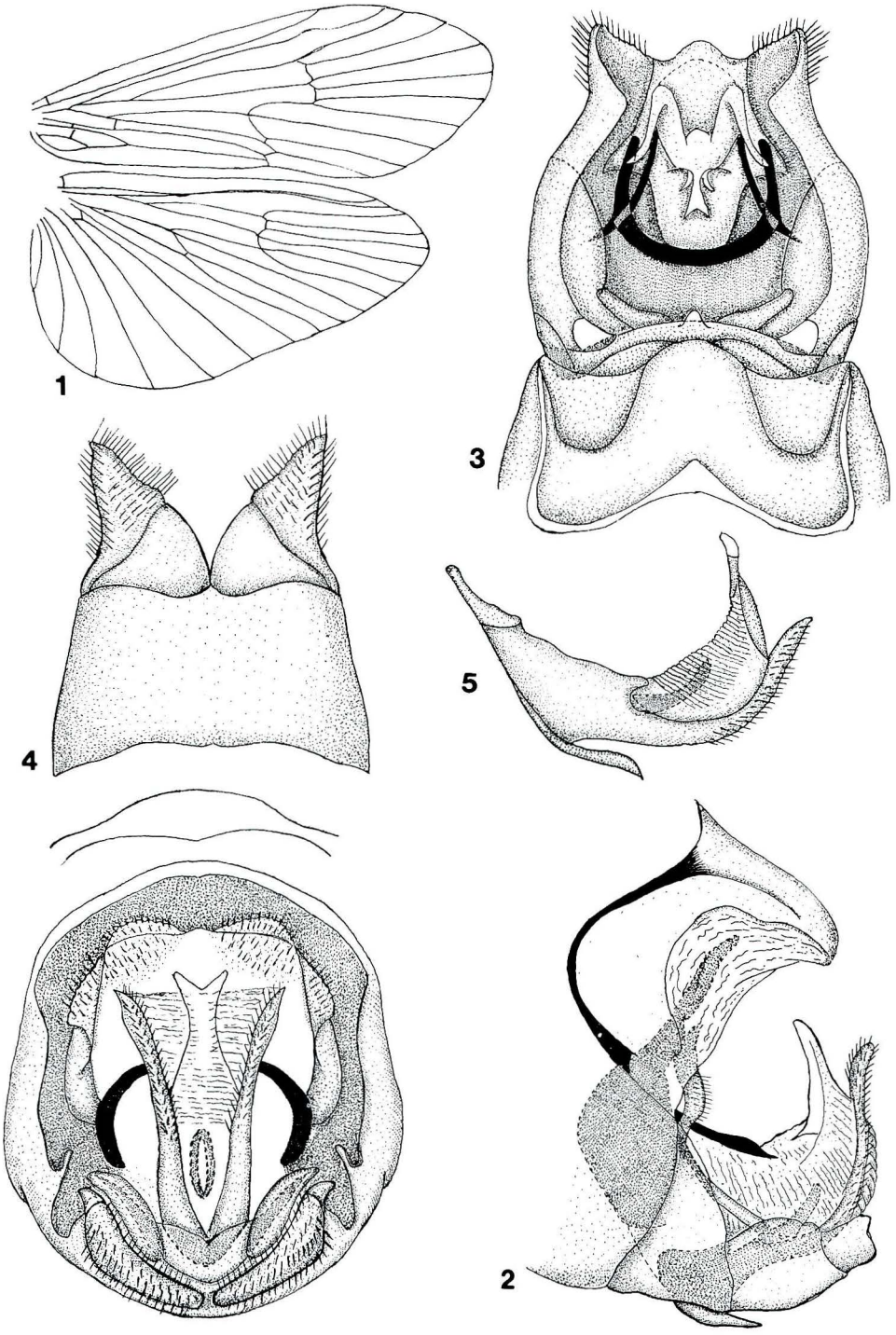

Plate 10. Male wings and genitalia of *Nothopsyche yamagataensis*.
1, wings. 2-6, male gemitalia; 2, lateral aspect; 3, dorsal aspect; 4, ventral aspect; 5, aedeagus, lateral aspect. 6, caudal aspect;

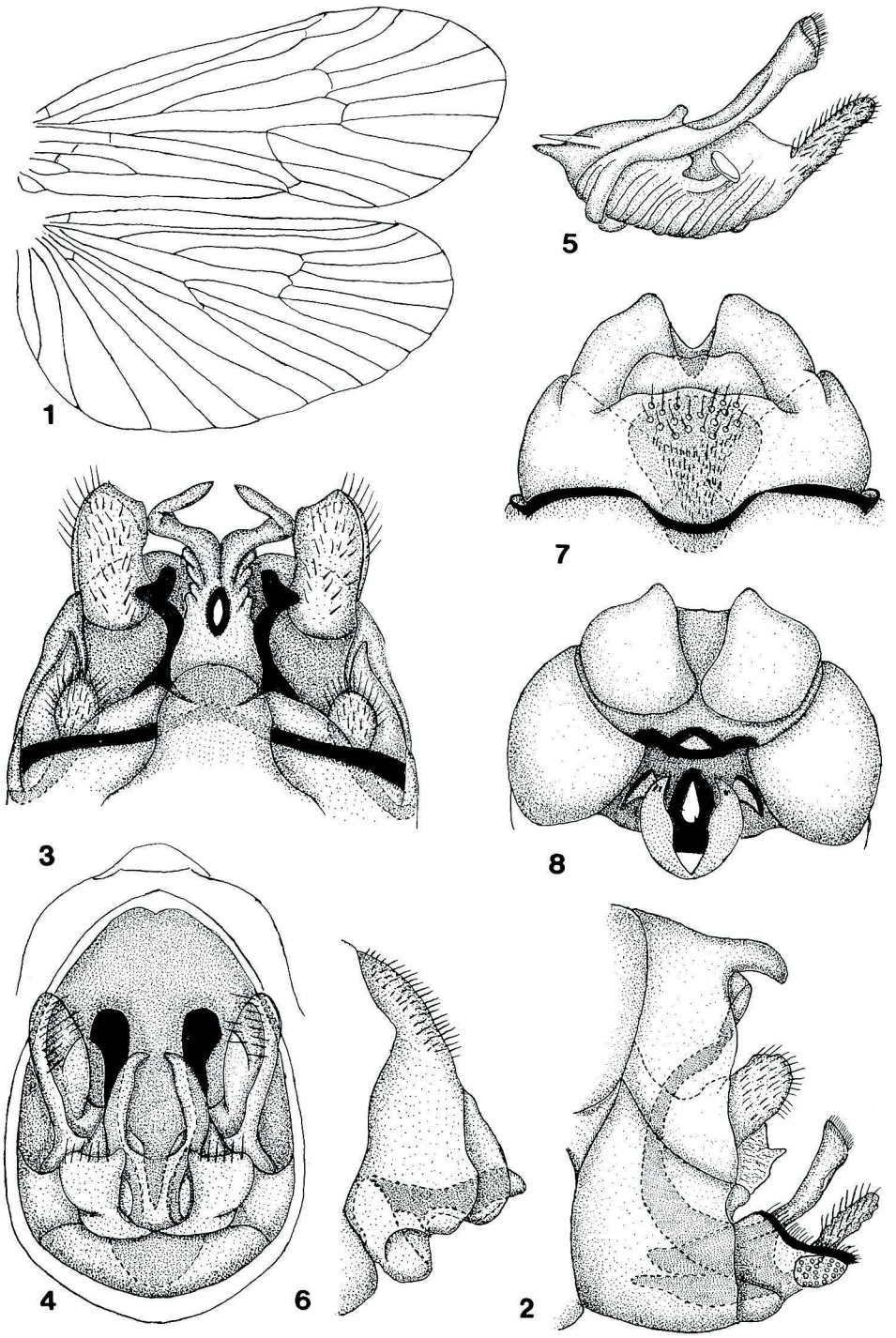

Plate 11. Male wings, and genitalia of both sexes of *Nothopsyche babai*.
1, male wings. 2-5, male genitalia; 2, lateral aspect; 3, dorsal aspect; 4, caudal aspect; 5, aedeagus, lateral aspect. 6-8, female genitalia, 6, lateral aspect; 7, dorsal aspect; 8, ventral aspect.

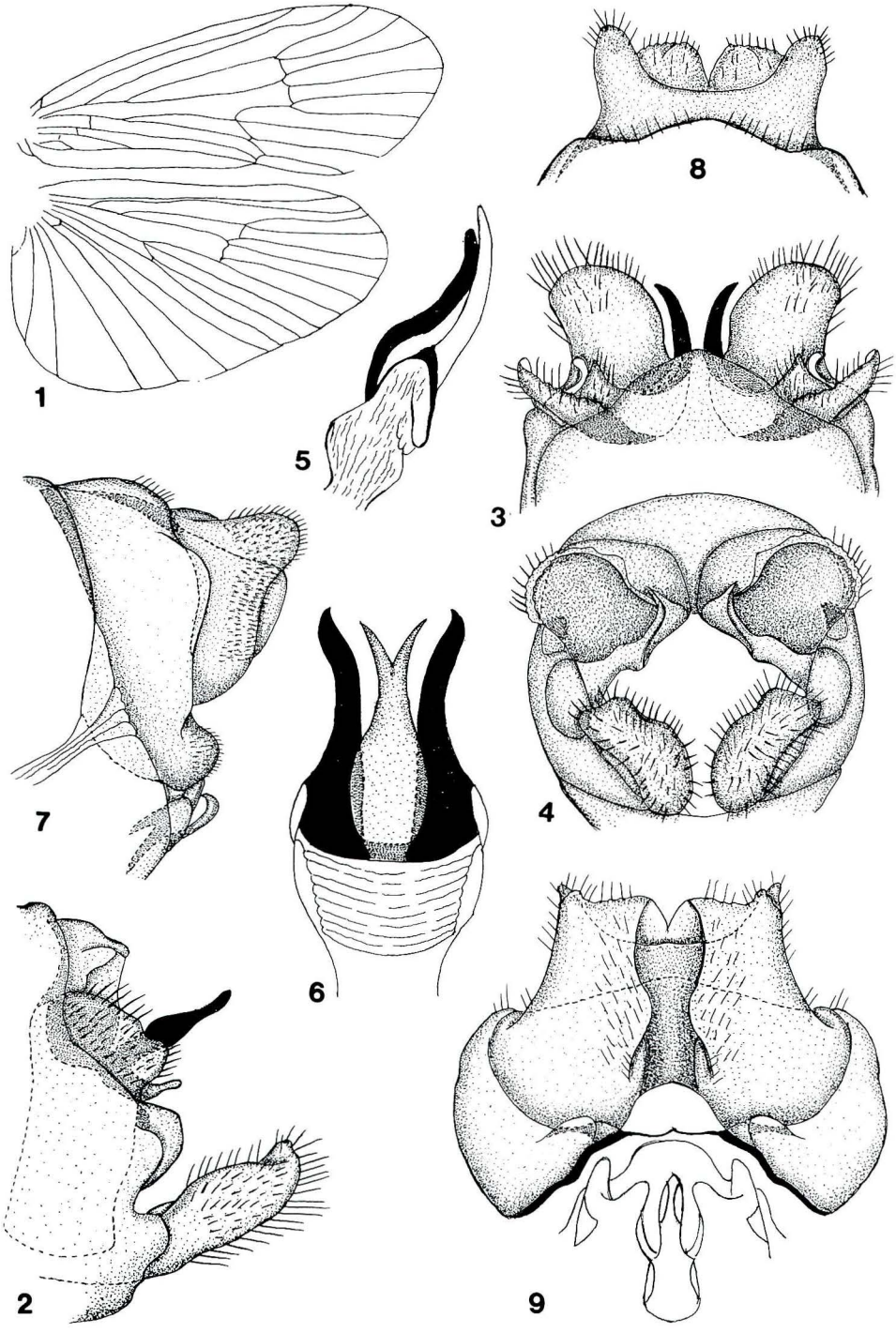

Plate 12. Male wings, and genitalia of both sexes of *Nothopsyche ulmer*.
1, male wings. 2-6, male genitalia; 2, lateral aspect; 3, dorsal aspect; 4, caudal aspect; 5, aedeagus, lateral aspect; 6, aedeagus, dorsal aspect; 7-9, female genitalia; 7, lateral aspect; 8, dorsal aspect; 9, ventral aspect.

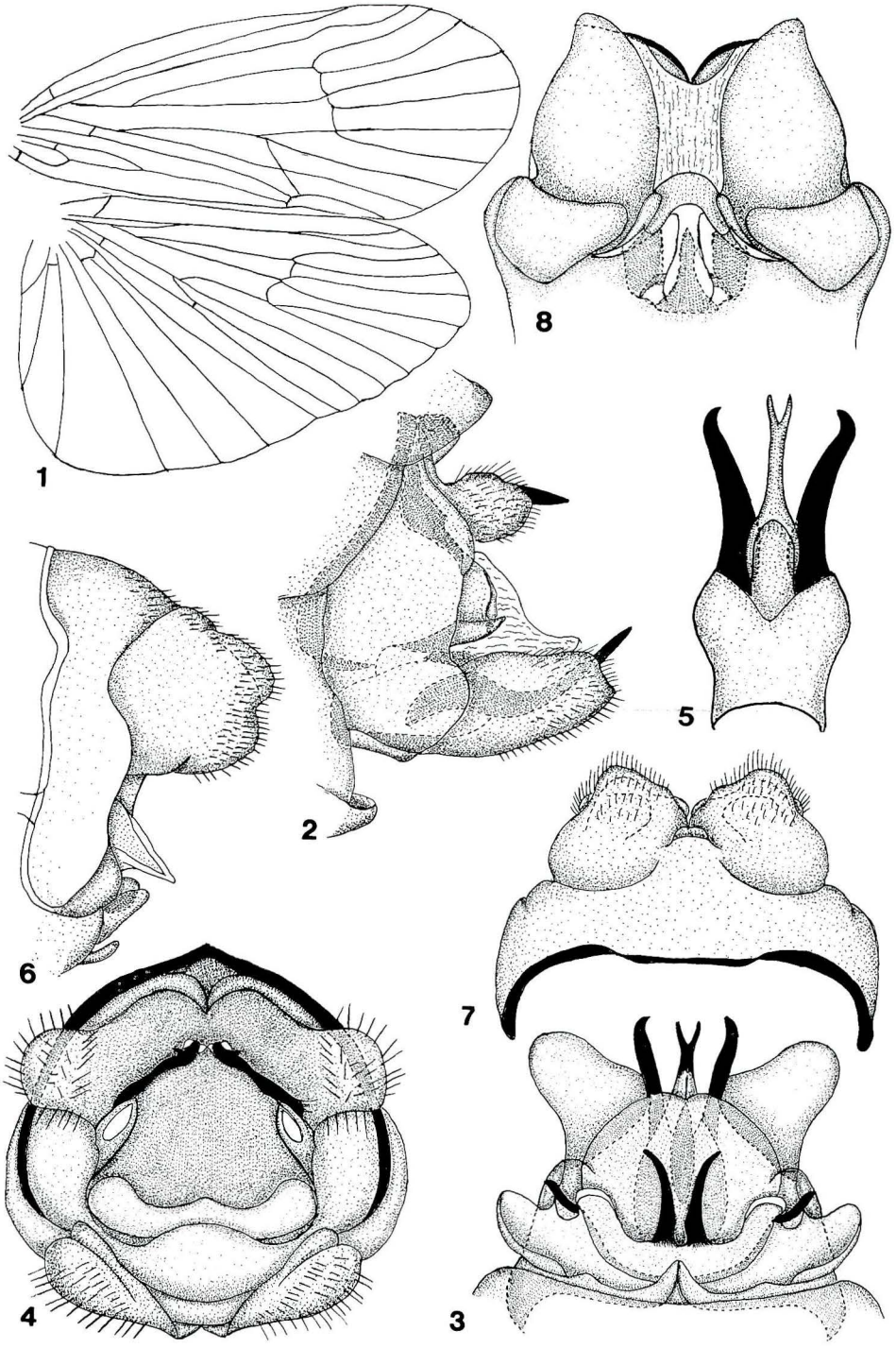

Plate 13. Male wings, and genitalia of both sexes of *Nothopsyche pallipes*.
1, male wings. 2-5, male genitalia; 2, lateral aspect; 3, dorsal aspect; 4, caudal aspect; 5, aedeagus, dorsal aspect. 6-8, female genitalia; 6, lateral aspect; 7, dorsal aspect; 8, ventral aspect.

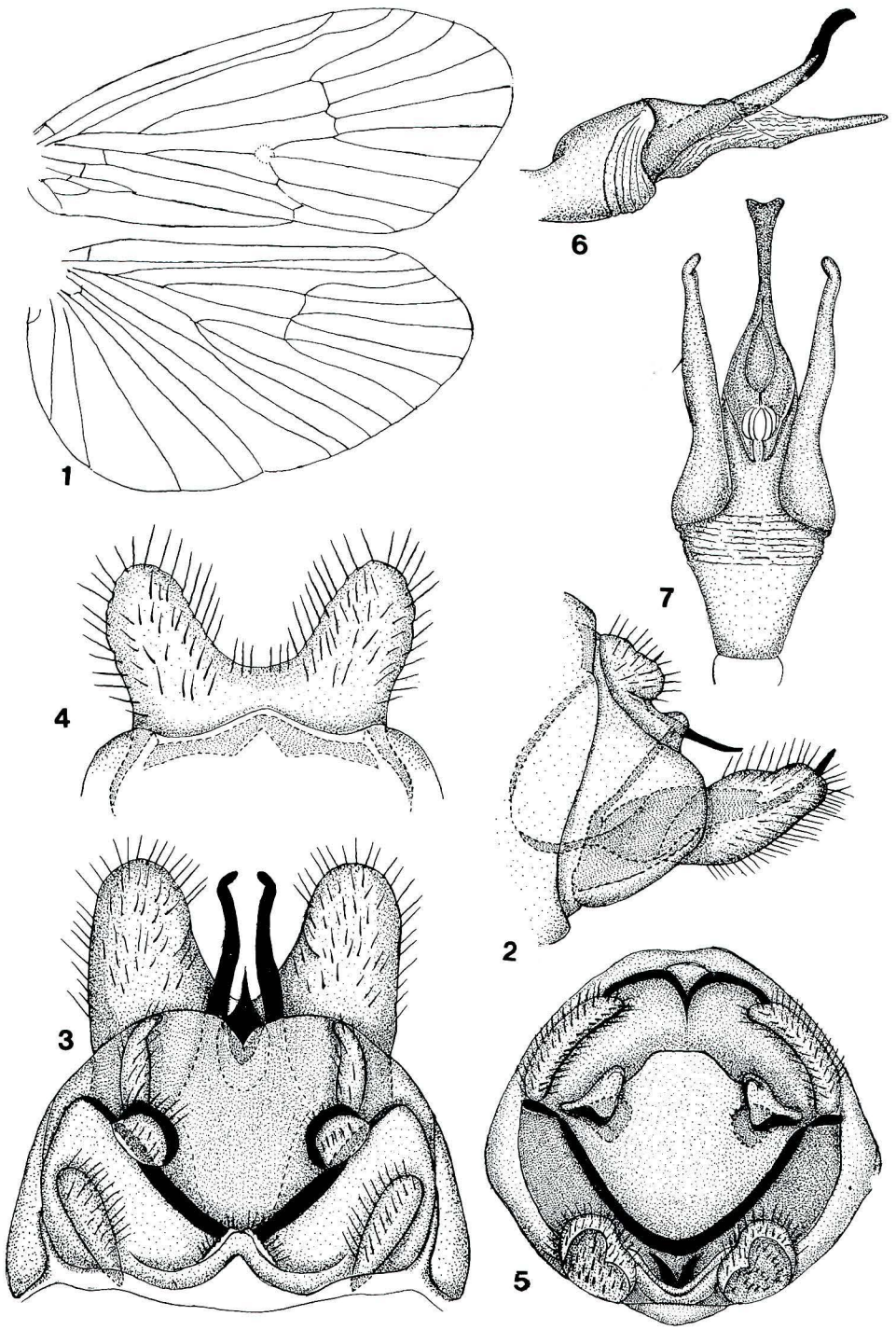

Plate 14. Male wings and genitalia of *Nothopsyche speciosa*.
1, wings, 2-7, genitalia; 2, lateral aspect; 3, dorsal aspect; 4, ventral aspect; 5, caudal aspect; 6, aedeagus, lateral aspect; 7, aedeagus, dorsal aspect.