

NINE NEW SPECIES OF THE GENUS STYLOPS
(STREPSIPTERA : STYLOPIDAE) PARASITIC ON THE
GENUS ANDRENA (HYMENOPTERA : ANDRENIDAE) OF
JAPAN (Studies on the Japanese Strepsiptera X)

Kifune, Teiji

Hirashima, Yoshihiro

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NINE NEW SPECIES OF THE GENUS *STYLOPS* (STREPSIPTERA :
 STYLOPIDAE) PARASITIC ON THE GENUS *ANDRENA*
 (HYMENOPTERA : ANDRENIDAE) OF JAPAN
 (Studies on the Japanese Strepsiptera X)*

TEI JI KIFUNE

Department of Parasitology, School of Medicine,
 Fukuoka University, Fukuoka 814-01, Japan

and

YOSHIHIRO HIRASHIMA

Entomological Laboratory, Faculty of Agriculture,
 Kyushu University, Fukuoka 812, Japan

Abstract

Nine new species of the genus *Stylops* (Strepsiptera : Stylopidae) are described from 10 species of the Japanese *Andrena* (Hymenoptera : Andrenidae). Those are : *S. japonicus* sp. n. from *A. (Andrena) benefica*, *S. truncatus* sp. n. from *A. (A.) maukensis*, *S. oblongulus* sp. n. from *A. (A.) longitibialis*, *S. truncatoides* sp. n. from *A. (A.) shirozui*, *S. circularis* sp. n. from *A. (Gymnandrena) sasakii*, *S. yamatonis* sp. n. from *A. (Simandrena) yamato*, *S. kaguyae* sp. n. from *A. (Micrandrena) kaguya* and *A. (M.) minutula*, *S. borealis* sp. n. from *A. (Taeniandrena) ezoensis*, and *S. valerianae* sp. n. from *A. (Holandrena) valeriana*. All of these are described from females excepting only *S. borealis* which is known by both sexes.

Although not a few papers have been published on the Strepsiptera of Japan, no one has been contributable to the taxonomy of the genus *Stylops*, the largest and best known one amongst the order of the world. Only Hirashima (1962) recorded 3 stylopized *Andrena* and Maeta (1963) briefly stated the occurrence of this genus in Japan but no taxonomical informations were given. Examining the collection of the Japanese andrenid bees from various localities in the Entomological Laboratory, Faculty of Agriculture, Kyushu University, we discovered several stylopized specimens, all of which were pinned in dry condition (Table 1). Two out of these 12 host species, *A. (A.) nawai* and *A. (M.) komachi*, however, are excluded from the present study because only empty male puparia were found on them (Those are shown with an

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asterisk in the table). The abdomers of the remaining bee specimens were cut off and dissected after KOH softening to extract the parasites which were then mounted. Almost all of them were the females except a single male which was encapsulated in its puparium and just before emergence. Based on these adult specimens, the taxonomical studies were performed and 9 species are described here as new. Unless otherwise stated, the specimens examined are preserved in the Kyushu University collection.

STYLOPIDAE

STYLOPINAE

1. *Stylops japonicus* sp. nov.

(Nom. Jap. : Nippon-himehanabachi-nejirebane)

(Figs. 1 & 11)

Female (Figs. 1 & 11)

Size : Cephalothorax 1.05 mm in length, 0.95 mm in maximum breadth at the spiracular level ; basal breadth at the constricted junction to abdomen 0.71 mm ; distance between mandibles 0.14 mm. Length of abdomen about 4 mm.

Structure : Cephalothorax subtriangular, angles rounded ; mouth transverse, elliptical ; mandible with a short tooth at the dorsal side of antero-interior angle ; spiracles located laterally, slightly protruded from the lateral margins ; anterior margin of basal pigmented band almost straight ; lateral portions of cephalothorax also pigmented, paler than basal band ; posterior margin of abdominal pigmented band medially protruded. Lateral extremities of opening of brood chamber located near lateral margins ; opening remarkably arcuate.

Host : *Andrena* (*Andrena*) *benefica* Hirashima

TYPE MATERIAL : Holotype ♀* (type No. 2522, Kyushu Univ.), gravid, extracted from a female host (4M[†]), Mt. Hikosan, Kyushu, 10. v. 1951, Y. Hirashima leg.

REMARKS. Only a single stylopidized host was examined. This stylopidized specimen was already recorded by Hirashima (1962). The present new species is allied to *S. nitidae* Pasteels, 1954, from *A. (Melandrena) nitida* of Europe but differs from it by smaller size and larger basal band as well as the host preference.

2. *Stylops truncatus* sp. nov.

(Nom. Jap. : Hirazu-himehanabachi-nejirebane)

(Figs. 2 & 12)

Female (Figs. 2 & 12)

Size : Cephalothorax 1.20 mm in length, 1.13 mm in maximum breadth at the

* The symbols, ♂ and ♀, are used for the parasites only in the text.

† Parasitic position is indicated by the number of the metasomal tergite which covers the parasite. For example, 4M means that the stylopid is located between the 4th and the 5th metasomal segments on the midline of the dorsal side. L and R denote left and right, respectively.

protruded spiracles ; basal breadth at the abdominal junction 0.85 mm ; distance between mandibles 0.17 mm. Abdomen 4.6 mm in length, 2.5 mm in maximum breadth. Total length about 5.7 mm.

Structure : Cephalothorax subtrapezoidal, anterior margin truncated, straight, lateral margins slightly sinuate ; mouth elliptical ; mandible with a short tooth on the dorsal side at the antero-interior angle, anterior margins of mandibles sinuate ; spiracles protruded laterally ; anterior margin of basal band sinuate ; two transverse pigmented markings visible near midline at the spiracular level ; lateral extremities of opening of brood chamber slightly remote from the lateral margins ; opening remarkably arcuate ; median portion of posterior margin of abdominal pigmented band expanded posteriorly in triangle-form.

Host : *Andrena* (***Andrena***) ***maukensis*** Matsumura

TYPE MATERIAL : Holotype ♀ (Type No. 2523, Kyushu Univ.), gravid, extracted from a female (4R), Nukabira, Tokachi, Hokkaido, 1-4. viii. 1953, Y. Hirashima leg.

REMARKS. This host bee was also noted to be stylopized by Hirashima (*loc.cit.*). The present new parasite allies to *S. nassonowi* Pierce, 1909, from *A. (Plastandrena) carbonaria* of the Palaearctic Region but is separable by smaller size of cephalothorax and difference of host preference.

3. *Stylops oblongulus* sp. nov.

(Nom. Jap. : Nagazu-himehanabachi-nejirebane)

(Figs. 3 & 13)

Female (Figs. 3 & 13)

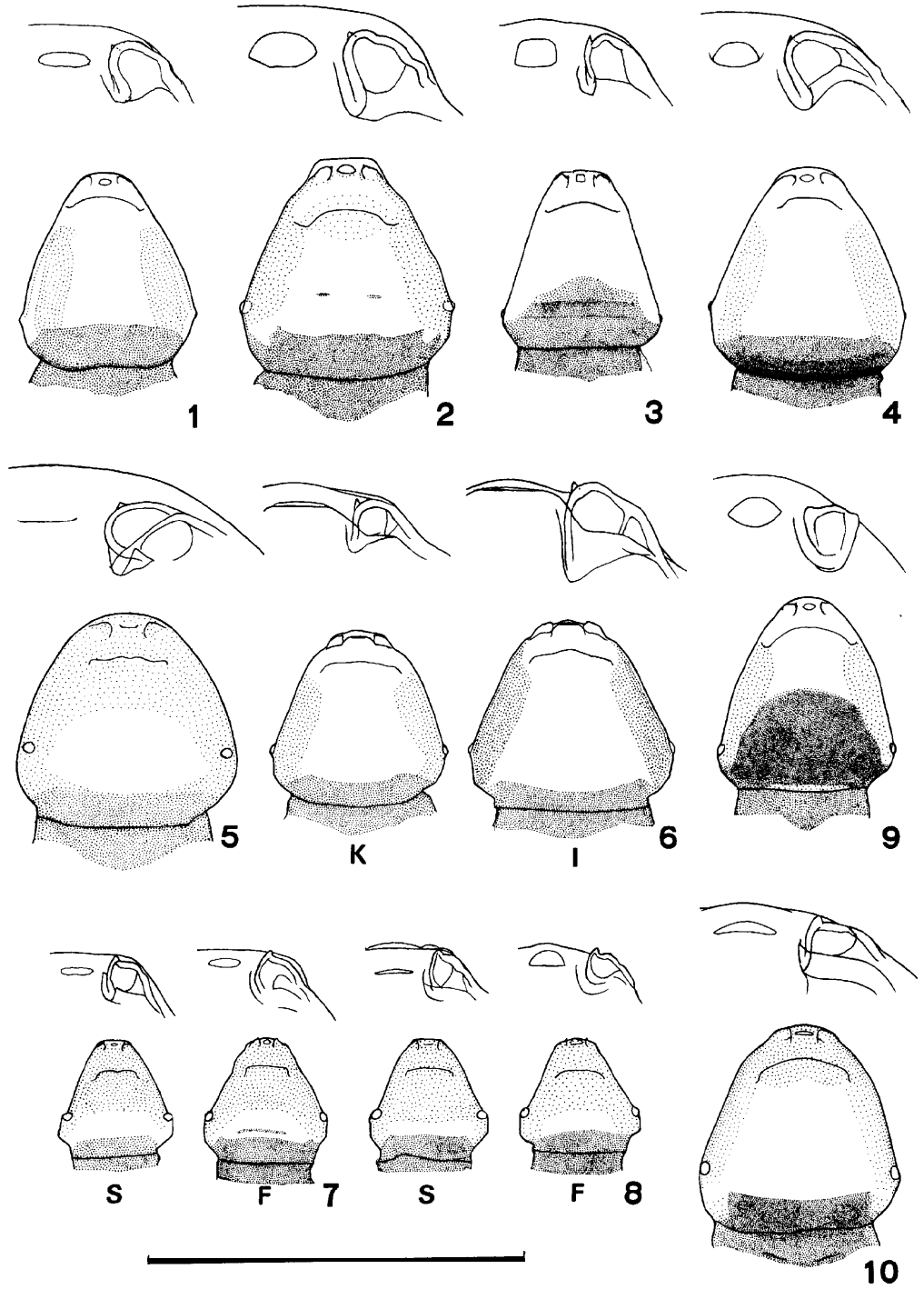
Size: Cephalothorax 0.98 mm in length, 0.83 mm in maximum breadth at the spiracular level ; basal breadth at the abdominal junction 0.63 mm ; distance between mandibles 1.3 mm. Abdomen 4.6 mm in length, 1.6 mm in breadth. Total length about 5.6 mm.

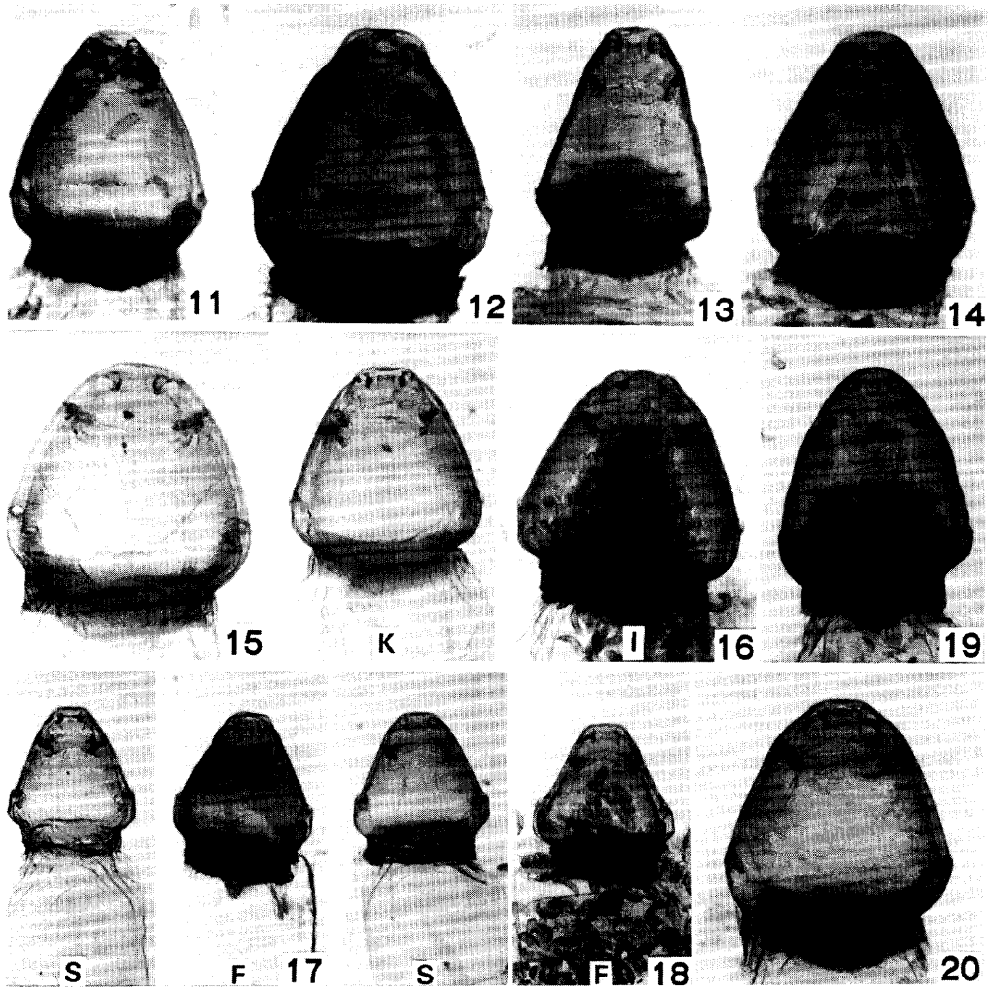
Structure : Cephalothorax oblong, trapezoidal, lateral margins almost straight, postspiracular margins curved ; mouth rather quadrilateral ; mandible with a short tooth at the antero-interior angle ; spiracles slightly protruded laterally ; anterior margin of basal band triangularly expanded near the midpoint of cephalothorax ; lateral extremities of opening of brood chamber located near the lateral margins, opening gently curved ; posterior margin of abdominal pigmented band slightly expanded posteriorly.

Host : *Andrena* (***Andrena***) ***longitibialis*** Hirashima

TYPE MATERIAL : Holotype ♀ (Type No. 2524, Kyushu Univ.), ungravid, extracted from a male (4L), Hodosan, Saitama, Honshu, 14. iv. 1974, T. Nambu leg.

REMARKS. This new species is allied to *S. melittae* Kirby, 1802, from *A. (Melandrena) nigroaenea* of West Europe but distinguishable by slightly smaller cephalothorax and anteriorly expanded basal band. It is much interesting that this species is remarkably different from the above-described two new species and the following one which is parasitic on the same subgenus *Andrena*.





Figs. 1-20 Female cephalothoraces of *Stylops* of Japan, ventral view.—1 & 11. *S. japonicus* sp. nov. from *Andrena* (*Andrena*) *benefica*. 2 & 12. *S. truncatus* sp. nov. from *A.* (*A.*) *maukensis* 3 & 13. *S. oblongulus* sp. nov. from *A.* (*A.*) *longitibialis*. 4 & 14. *S. truncatoides* sp. nov. from *A.* (*A.*) *shirozui*. 5 & 15. *S. circularis* sp. nov. from *A.* (*Gymnandrena*) *sasakii*. 6 & 16. *S. yamatonis* sp. nov. from *A.* (*Simandrena*) *yamato*. 7 & 17. *S. kaguyae* sp. nov. from *A.* (*Micrandrena*) *kaguya*. 8 & 18. Ditto from *A.* (*M.*) *minutula*. 9 & 19. *S. borealis* sp. nov. from *A.* (*Taeniandrena*) *ezoensis*. 10 & 20. *S. valeriana* sp. nov. from *A.* (*Holandrena*) *valeriana*.

Top : Enlargement of oral and mandibular portion. Bottom : Total view. F, I, K, & S : Collected in Fukuoka (Kyushu), Iwate (Honshu), Kagoshima (Kyushu), & Saitama (Honshu) Prefectures, respectively.

Scale : 2 mm for the bottom rows, 0.5 mm for the top rows.

4. *Stylops truncatoides* sp. nov.

(Nom. Jap. : Kohirazu-himehanabachi-nejirebane)

(Figs. 4 & 14)

Female (Figs. 4 & 14)

Size : Cephalothorax 1.13 mm in length, 1.05 mm in maximum breadth at the level of slightly pointed spiracles ; basal breadth at the abdominal junction 7.9 mm ; distance between mandibles 1.2 mm. Abdomen 5.1 mm in length, 2.7 mm in breadth. Total length about 6.1 mm.

Structure : Cephalothorax subtriangular, angles rounded ; apical margin rounded, lateral margins slightly curved, posterior margin gently curved ; mouth transversely oblong; mandible with a short tooth at the dorsal side of antero-interior angle ; spiracles located laterally, slightly protruded from lateral margins ; anterior margin of basal band almost straight ; lateral portions of cephalothorax also longitudinally pigmented, paler than basal band ; posterior margin of abdominal pigmented band medially expanded. Lateral extremities of opening of brood chamber located far from lateral margins, opening simply curved.

Host : *Andrena* (***Andrena***) *shirozui* Hirashima

TYPE MATERIAL : Holotype ♀ (Type No. 2525, Kyushu Univ.), gravid, extracted from a female (4R), Nukabira, Tokachi, Hokkaido, 4-5. vii. 1957, R. Ishikawa leg.

REMARKS. This host specimen was also recorded as stylopized by Hirashima (*loc. cit.*). The present new species is closely allied to *S. japonicus* sp. nov. but differs from it by the narrow opening of brood chamber and rounded mouth.

5. *Stylops circularis* sp. nov.

(Nom. Jap. : Maruzu-himehanabachi-nejirebane)

(Figs. 5 & 15)

Female (Figs. 5 & 15)

Size : Cephalothorax 1.18 mm in length and maximum breadth at a little posterior to the spiracular level ; basal breadth at the abdominal junction 9.2 mm ; distance between mandibles 1.5 mm. Abdomen about 5 mm in length. Total length about 6.1 mm.

Structure : Cephalothorax almost circular, margin strongly curved at apex and postspiracular angles ; mouth directed anteriorly, its anterior margin obscure, transverse ; mandible with rounded anterior margin, with a short tooth at the antero-interior angle ; spiracles circular, located entirely inside from lateral margins ; opening of brood chamber waving, its lateral extremities located far from lateral margins ; anterior margin of basal pigmented band transversely straight ; anterior half and lateral portions also brown in color, but paler than basal band ; posterior margin of abdominal pigmented band waving, its median portion posteriorly expanded in triangle-form.

Host : *Andrena* (*Gymnandrena*) ***sasaki*** Cockerell

TYPE MATERIAL : Holotype ♀ (Type No. 2526, Kyushu Univ.), ungravid, extracted from a male (4L), Akui, Tokushima, Shikoku, 15. iv. 1960, T. Kobayashi leg.

Specimen examined other than type material : 1♂ empty puparium extracted from a female (4R), Shomachi, Tokushima, Shikoku, 23. iv. 1960, T. Kobayashi leg.

REMARKS. This new species is allied to *S. dominiquei* Pierce, 1909, from *A. (Agandrena) agilissima* of West Europe but differs from it by smaller size and the completely rounded apex of the cephalothorax. This is the first record of the Strepsiptera from Shikoku, Japan.

6. *Stylops yamatonis* sp. nov.

(Nom. Jap. : Yamato-himehanabachi-nejirebane)

(Figs. 6 & 16)

Female (Figs. 6 & 16)

Size : Cephalothorax 0.95-1.00 mm in length, 0.93-1.08 mm in maximum breadth at the spiracular level ; basal breadth at the abdominal junction 0.69-0.81 mm ; distance between mandibles 0.14-0.15 mm. Abdomen about 3.4 mm in length. Total length about 4.3 mm.

Structure : Cephalothorax trapezoidal, apical margin rounded, lateral margins almost straight, postspiracular margins curved ; mouth directed anteriorly, slit-like in ventral view, more or less protruded anteriorly ; mandible with a tooth at the antero-interior angle, its anterior margin sometimes surpassing the apical margin of cephalothorax ; spiracles slightly protruded from lateral margins ; lateral extremities of opening of brood chamber located far from lateral margins, opening slightly curved ; anterior margin of basal band concave ; internal margin of lateral pigmented band parallel to lateral margins, paler than basal band ; posterior margin of abdominal band waving, its median portion expanded posteriorly.

Host : *Andrena (Simandrena) yamato* Tadauchi et Hirashima

TYPE MATERIAL : Holotype ♀ (Type No. 2527, Kyushu Univ.), ungravid, extracted from a male (4L), Miyanojo, Kagoshima, Kyushu, 29. iii. 1959, Y. Maeta leg. ; paratype ♀, gravid, extracted from a female (4L), Kuriyagawa, Morioka, Iwate, Honshu, 27. v. 1964, Y. Maeta leg.

REMARKS. The holotype is taken from the host bee specimen collected in Kyushu. The type locality of the host bee is also in Kyushu. It is slightly smaller than the paratype from a female bee taken in Honshu. This new species is characteristic by the apical portion of the cephalothorax remarkably protruded.

7. *Stylops kaguyae* sp. nov.

(Nom. Jap. : Kaguya-himehanabachi-nejirebane)

(Figs. 7, 8, 17, 18, & 30)

Female (Figs. 7, 8, 17, & 18)

Size : Cephalothorax 0.61-0.74 mm in length, 0.60-0.69 mm in maximum breadth at

the spiracular level or a little posteriorly ; basal breadth at the abdominal junction 0.47-0.58 mm distance between mandibles 0.08-0.14 mm. Abdomen about 2.0-3.0 mm in length, 1.0-1.8 mm in breadth. Total length about 2.6-3.3 mm.

Structure : Cephalothorax subtriangular, apical margin usually straight, sometimes slightly curved, lateral margins slightly curved, anterior half of postspiracular margins parallel, its posterior half curved or straightly approaching to each other ; mouth more or less directed anteriorly, slit-like to elliptical ; mandible with a short tooth at the antero-interior angle, sometimes protruding from cephalothoracic margin ; spiracles lateral, slightly protruded from the lateral margins ; opening of brood chamber straight or waving, not so broad, its lateral extremities directed posteriorly, located at a certain distance from the lateral margins ; anterior margin of basal band curved or waving ; posterior margin of abdominal band almost straight.

Male cephalotheca (Fig. 30)

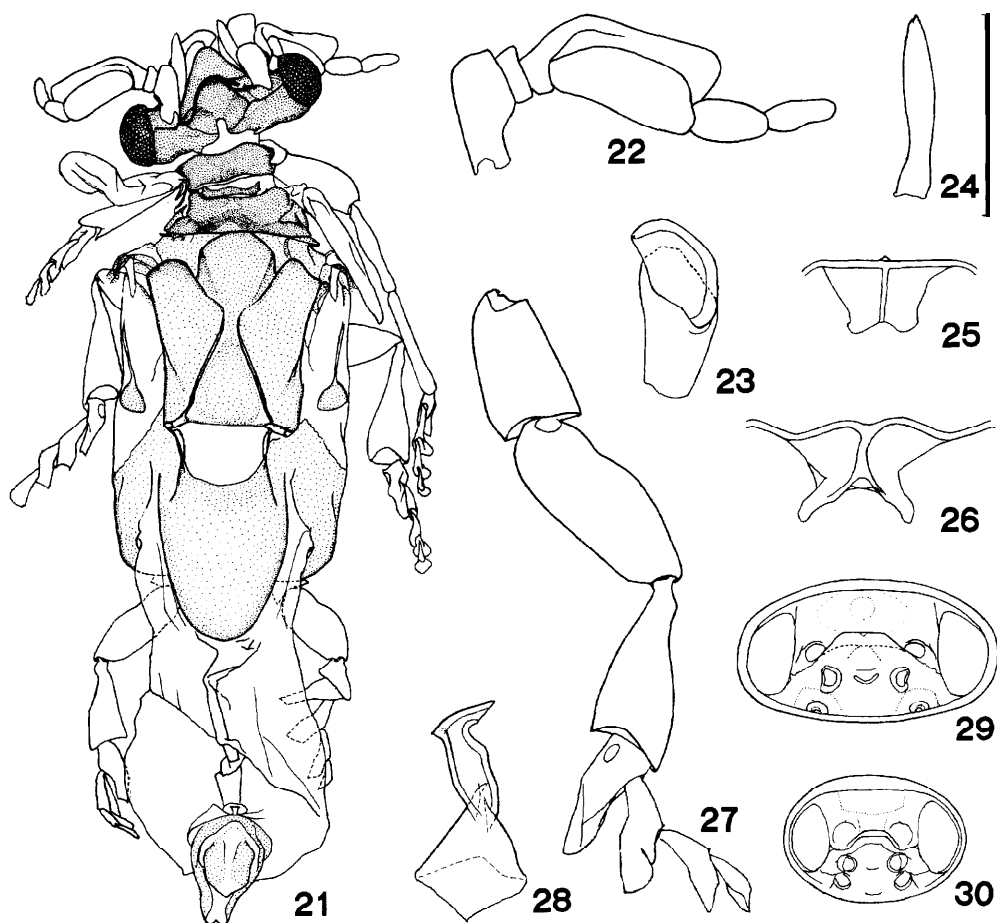
Elliptical in shape ; longitudinal and transverse lengths 0.66 mm and 0.92 mm, respectively, in a mounted specimen ; ratio of both lengths 1 : 1.39.

Host : *Andrena* (*Micrandrena*) *kaguya* Hirashima, *A. (M.) minutula* (Kirby).

TYPE MATERIAL : (Host : *A. (M.) kaguya*) Holotype ♀ (Type No. 2528, Kyushu Univ.), ungravid, extracted from a female (4L), Fukuoka, Kyushu, 22. iii. 1952, Y. Hirashima leg. (*ex* the type series of the host bee) ; paratype ♀, gravid, extracted from a female (4L), Hirao, Fukuoka, Kyushu, 26. iv. 1958, Y. Maeta leg. ; paratype ♀, gravid, extracted from a female (4R), Mt. Hikosan, Kyushu, 10. v. 1951, Y. Hirashima leg. ; paratype ♀, gravid, extracted from a female (4L), Miyanojo, Kagoshima, Kyushu, 29. iii. 1959, Y. Maeta leg.

Specimens examined other than type material : (Host : *A. (M.) kaguya*) 1 ♀, ungravid, extracted from a male (4L), Yorii, Saitama, Honshu, 3. iv. 1972, T. Nambu leg. ; 1 ♀, gravid, extracted from a female (4L), Takinoya, Hyogo, Honshu, 22. iv. 1960, R. Morimoto leg. ; 1 ♀, gravid, extracted from a female (4R), Hagi, Yamaguchi, Honshu, 23. iv. 1960, K. Nohara leg. ; 1 female host harboring 1 ♀ (4R), Fukuoka, Kyushu, 16. iv. 1951, Y. Hirashima leg. ; 2 female hosts harboring 1 ♀ each (4L), Mt. Hikosan, 10. v. 1951, Y. Hirashima leg. ; (host : *A. (M.) minutula*) 1 ♀, ungravid, extracted from a female (4R), Yorii, Saitama, Honshu, 18. iii. 1972, T. Nambu leg. ; 1 ♂, immature, extracted from a female (4L), with a cephalotheca, same locality, 3. iv. 1972, T. Nambu leg. ; 1 ♀, ungravid, extracted from a female (4R), Fukuoka, Kyushu, 22. iii. 1952, Y. Hirashima leg. ; 1 ♀, gravid, extracted from a female (4M), Kashii, Fukuoka, Kyushu, 21. iv. 1962, Y. Hirashima leg. ; 2 female hosts harboring 1 ♂ empty puparium (4R) and 1 ♀ (4R), respectively, Yorii, Saitama, Honshu, 31. iii. 1972, T. Nambu leg. ; 1 female host harboring 1 ♂ empty puparium (4R), same locality, 3. iv. 1972, T. Nambu leg.

REMARKS . The holotype of this new species is selected from the specimens attached to the type series of the host andrenid bee. One female from a female host collected in Hagi is provided with its mandibles far from the anterior margin of cephalothorax. This new species is allied to *S. spretus* Perkins, 1918, from *A. (Micrandrena) spreta* of West Europe or to *S. obsoletus* Luna de Carvalho, 1974, from *A.*



Figs. 21-29. *Stylops borealis* sp. nov., holotype, ♂. **Fig. 30.** *S. kaguyae* sp. nov.-21. Dorsal aspect. 22. Right antenna, dorsal view. 23. Right maxillary palpus, ventral view. 24. Left mandible, ventral view. 25. Prosternum, median portion, ventral view. 26. Mesosternum, median portion, ventral view. 27. Right hind leg, dorsal view. 28. Aedeagus, left lateral view. 29 & 30. Cephalotheca, frontal view. Scale: 2 mm for 21, 29 & 30; 0.5 mm for 28, 1 mm for others.

(*Distandrena*)*obsoleta* of Spain, but differs from the former by the shape of opening of brood chamber and from the latter by the narrow apical margin of cephalothorax.

8. *Stylops borealis* sp. nov.

(Nom. Jap. : Ezo-himehanabachi-nejirebane)

(Figs. 9, 19, & 21-29)

Male (Figs. 21-28)

Description is made on a single unemerged male artificially extracted from its puparium.

Size : Total length of body 4.47 mm ; head breadth 1.07 mm ; breadths of pro-, meso-, and metathorax 0.55, 0.73, and 1.27 mm, respectively ; length of head and thorax together 2.98 mm ; radial length of hind wing about 2.8 mm ; length of aedeagus 0.25 mm.

Structure : Head transverse ; frons triangularly protruded ; antennae 6-segmented, 1st segment rather long, cylindrical, 2nd segment short, disc-like, attached laterally to the exterior side of apical half of 1st segment, 3rd segment short but with broad flabellum, 4th segment subequal to the flabellum in breadth but a little shorter than it, 5th segment narrower than 4th, 6th segment slightly shorter and narrower than 5th ; mandibles slender, sword-like, narrowest at about 1/4 of its length from base, with very minute process at the tip ; maxillary palpi 2-segmented, basal segment trapezoidal, thick and stout, apical segment flabellate, dorsally convex ; eyes elliptical, facets of the ventral side larger in size and less in numbers than those of the dorsal side ; posterior margin of head medianly concave. Pro- and mesonota short ; lateral margins of metathorax almost parallel, scutum and scutellum subequal in length and breadth ; parascuti subtriangular ; postlumbium almost as broad as long, its posterior margin remarkably curved ; postscutellum oval. Legs normal ; abdomen and genital capsule typical of the genus ; aedeagus medianly expanded but not pointed.

Female (Figs. 9 & 19)

Size : Cephalothorax 1.06-1.07 mm in length, 0.93-1.01 mm in maximum breadth at the spiracular level ; basal breadth at the abdominal junction 0.68-0.78 mm ; distance between mandibles 0.13-0.14 mm, Abdomen about 6.5-7.1 mm in length, 3.4 mm in breadth. Total length about 8.7 mm.

Structure : Cephalothorax oval, apical and lateral margins gently curved, posterior margin straight ; mandibles rather cuneiform with blunt tip, without tooth, a minute tubercle-like process present at the antero-interior angle ; spiracles lateral, slightly protruded from lateral margins ; opening of brood chamber strongly curved, its lateral extremities sharply turned anteriorly ; anterior margin of basal band strongly curved and its median portion reaching the midpoint of cephalothorax ; lateral band present but paler than basal band ; median portion of posterior margin of abdominal band triangularly protruded posteriorly, the remaining portion transversely straight,

Male cephalotheca (Fig. 29)

Elliptical in shape ; longitudinal and transverse lengths 0.72 and 1.32 mm, respectively, in a mounted specimen ; ratio of both lengths 1 : 1.83.

Host : *Andrena (Taeniandrena) ezoensis* Hirashima

TYPE MATERIAL : Holotype ♂ (Type No. 2529, Kyushu Univ.), extracted from its puparium on a female (4R), Ashoro, Tokachi, Hokkaido, 21-22. vii. 1955, K. Yasumatsu leg. ; allotype ♀, gravid, extracted from a female (4R), Nishiashoro, Tokachi, Hokkaido, 9. viii. 1953, Y. Hirashima leg. ; paratype ♀, gravid, extracted from the same female (4L) as the allotype.

Specimens examined other than type material : 2 female hosts harboring 1 ♀ each

(4L, 4M), Ashoromura, Tokachi, Hokkaido, 4. viii. 1949, R. Matsuda leg. ; 3 female hosts harboring 1 ♀ each (4L, 4M, 4R), all producing the 1st larvae, same data as the allo- and paratypes ; 2 female hosts harboring 1 ♀ each (4L, 4R), both producing the 1st larvae, same locality as the allo- and paratypes, 8. viii. 1955, Y. Hirashima leg.

REMARKS. This new species is closely allied to *S. thwaiti* Saunders, 1872, from **A.** (*Taeniandrena*) *ovatula* of Europe but differs from it by the short dorsal process of the male aedeagus and the undentate mandibles of the female.

9. *Stylops valerianae* sp. nov.

(Nom. Jap. : Tokachi-himehanabachi-nejirebane)

(Figs. 10 & 20)

Female (Figs. 10 & 20)

Size : Cephalothorax 1.04-1.10 mm in length, 1.08-1.15 mm in maximum breadth at the level just posterior to spiracles ; basal breadth at the abdominal junction 0.84 mm ; distance between mandibles 0.14-0.15 mm.

Structure : Cephalothorax subpentagonal, angles blunted, apical portion slightly protruded anteriorly, lateral margins gently curved in the anterior half but straight in the posterior, postspiracular margin gently curved ; mouth transverse ; mandibles trapezoidal, with a tooth at the antero-interior angle ; spiracles lateral, not protruded from the margins ; opening of brood chamber gently curved, its lateral extremities located far from the margins and bluntly directed postero-exteriorly ; anterior margin of basal band slightly concave ; posterior margin of abdominal band waving.

Host : *Andrena* (*Holandrena*) *valeriana* Hirashima

TYPE MATERIAL : Holotype ♀ (No. 2530, Kyushu Univ.), ungravid, extracted from a paratype male host (4R), Ashoromura, Tokachi, Hokkaido, 4. viii. 1949, R. Matsuda leg. ; paratype ♀, ungravid, extracted from the inside of the abdomen of the same host as the holotype. These two type specimens are mounted together on one slide.

REMARKS. The paratype female has a slightly deformed cephalothorax, the postspiracular region of which is more or less shortened but no remarkable difference is found in its development and size. The present new species is allied to *S. giganteus* Luna de Carvalho, 1974, from **A.** (*Melandrena*) *thoracica* and **A.** (*Zonandrena*) *soror* of Spain but differs from it by the smaller cephalothorax and broad mandibles.

We examined the following andrenid specimens on which unidentifiable male puparia are found (Cf. Table 1).

Andrena (***Andrena***) *nawai* Cockerell

1 male (4L), Sasayama, Tamba (= Hyogo), 24. iii. 1953, S. Taniguchi leg.

Andrena (*Micrandrena*) *komachi* Hirashima

3 males (4L, 4R, & 4R), Sasaguri, Chikuzen (= Fukuoka), Kyushu, 9. iv. 1951, Y. Hirashima leg.

Table 1 A list of stylized *Andrena* of Japan preserved in the Kyushu University collection.

(Subgenus) species	Host	No. of stylized specimens
(<i>Andrena</i>) nawai Cockerell		1♂*
(A.) benefica Hirashima		1♀†
(A.) maukensis Matsumura		1♀†
(A.) longitibialis Hirashima		1♂
(A.) shirozui Hirashima		1♀†
(<i>Gymnandrena</i>) sasakii Cockerell		1♂ 1♀
(<i>Simandrena</i>) yamato Tadauchi et Hirashima		1♂ 1♀
(<i>Micrandrena</i>) kaguya Hirashima		1♂ 9♀♀
(<i>M.</i>) minutula (Kirby)		7♂♂
(<i>M.</i>) komachi Hirashima		3♂♂*
(<i>Taeniandrena</i>) ezoensis Hirashima		9♀♀
(<i>Holandrena</i>) valeriana Hirashima		1♂
Total	12 spp.	39 exx.

* Only empty male puparium was obtained and excluded from the present taxonomical survey.

† Already recorded to be stylized by Hirashima (1962).

KEY TO THE SPECIES (FEMALES) OF *Stylops* OF JAPAN

1. Cephalothorax almost circular ; spiracles remote from the lateral margins of cephalothorax. Host : *Andrena* (*Gymnandrena*) **sasakii** *S. circularis* sp. nov.
- Cephalothorax more or less bluntly angled ; spiracles located near or protruded from the lateral margins of cephalothorax 2
2. Length of cephalothorax less than 0.8 mm. Hosts : *A.* (*Micrandrena*) **kaguya** and *A.* (*M.*) **minutula** *S. kaguyae* sp. nov.
- Length of cephalothorax more than 0.8 mm 3
3. Median portion of basal pigmented band anteriorly protruded, at least occupying the posterior 1/3 of cephalothorax 4
- Anterior margin of basal pigmented band almost transverse, never protruded anteriorly 5
4. Cephalothorax longer than broad ; anterior margin of basal band not reaching the midpoint of cephalothorax ; each mandible with a remarkable tooth. Host : *A.* (*A.*) **longitibialis** *S. oblongulus* sp. nov.
- Cephalothorax as long as broad ; anterior margin of basal band reaching the midpoint of cephalothorax ; mandibles without a tooth. Host : *A.* (*Taeniandrena*) **ezoensis** *S. borealis* sp. nov.
5. Lateral margins of cephalothorax weakly constricted at the level of mandibles; apical margin between this constriction anteriorly expanded 6
- Lateral margins of cephalothorax not constricted at the level of mandibles; apical margin between mandibles continuously curved from lateral margins 8
6. Mandibles not reaching the apical margin of cephalothorax. Host : *A.* (*A.*) **maukensis** *S. truncatus* sp. nov.
- Mandibles reaching or surpassing the apical margin of cephalothorax 7
7. Mouth protruded anteriorly ; mandibles occasionally surpassing the apical margin of cephalothorax. Host : *A.* (*Simandrena*) **yamato** *S. yamatonis* sp. nov.
- Mouth not protruded from the surrounding integument ; mandibles scarcely surpassing the apical margin of cephalothorax. Host : *A.* (*Holandrena*) **valeriana** *S. valerianae* sp. nov.
8. Opening of brood chamber broad, spreading near the lateral margins of cephalothorax.

Host: *A. (A.) benefica**S. japonicus* sp. nov.
 Opening of brood chamber not so broad, terminating remotely from the lateral margins
 of cephalothorax. Host : *A. (A.) shirozui**S. truncatoides* sp. nov.

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References

- Bohart, R. M., 1941. A revision of the Strepsiptera with special reference to the species of North America. *Univ. Calif. Publ. Ent.*, 7 : 91-159.
- Hirashima, Y., 1962. Systematic and biological studies of the family Andrenidae of Japan (Hymenoptera, Apoidea). Part 2. Systematics, 1. *J. Fac. Agr., Kyushu Univ.*, 12 : 117-154.
- Kinzelbach, R. K., 1978. Fächerflügler (Strepsiptera). *Tierw. Dtschl.*, (65) : 1-166.
- Luna de Carvalho, E., 1974. Contribuição para o estudo dos *Stylops* de Península Ibérica (Streps. Stylopidae). *Eos*, 48 : 301-365.
- Maeta, Y., 1963. Some biological notes on *Pseudoxenos iwatai* Esaki (I) (II) Its biology and life history. *Kontyû*, 31 : 1-15, 113-126. (In Japanese with English summary)
- Pierce, W. D., 1909. A monographic revision of the twisted winged insects comprising the order Strepsiptera Kirby. *U.S. Natn. Mus., Bull.*, (66) : I-XII, 1-232, 15 pls.