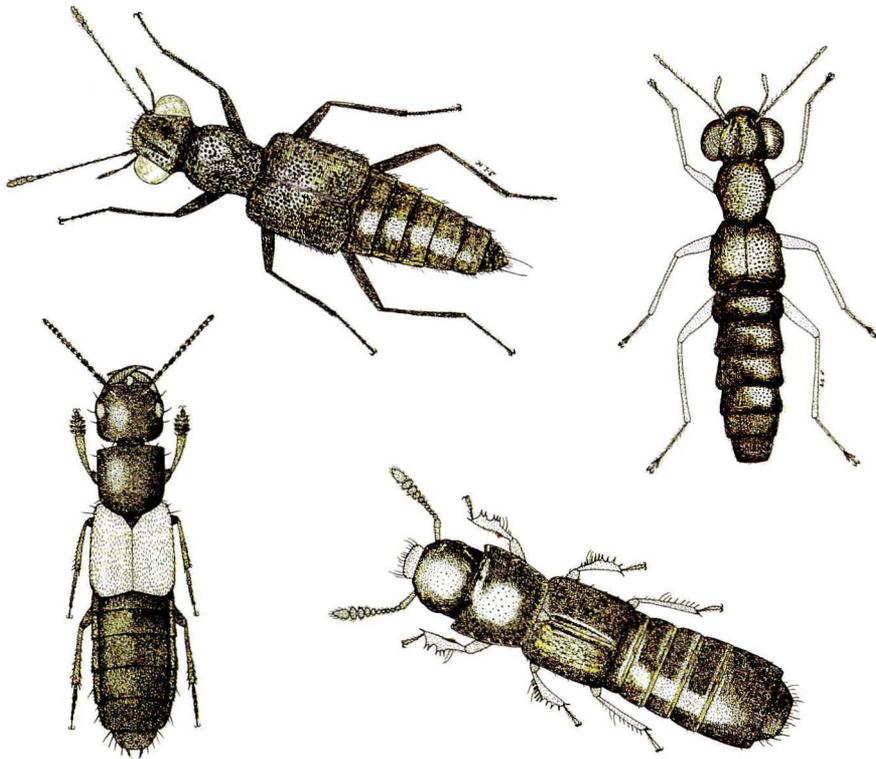


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(Coleoptera, Staphylinidae, Steninae) of Japan :  
Species Group of *S. (Hypostenus) rufescens* Sharp**



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# Taxonomic Revision of the Genus *Stenus* Latreille, 1797 (Coleoptera, Staphylinidae, Steninae) of Japan: Species Group of *S. (Hypostenus) rufescens* Sharp<sup>1)</sup>

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**Abstract** A taxonomic study of *Stenus rufescens* Sharp is presented, including historical review, discussion of taxonomic characters and techniques, definitions of *S. rufescens* group and its 7 subgroups, a key to species, descriptions and redescrptions of species, and a list of Japanese species of *S. rufescens* group. Twenty-four species and 4 subspecies of this species group are recognized, and they are all brachypterous and probably endemic in the Japanese Archipelago.

Ten new species and 3 new subspecies are described as follows: *S. miroku* sp. nov. (Hiroshima Pref.), *S. ohtoensis* sp. nov. (Wakayama Pref.), *S. agrestis* sp. nov. (Mie Pref.), *S. olliformis* sp. nov. (Nara Pref.), *S. olliformis owasenus* subsp. nov. (Mie Pref.), *S. ebisu* sp. nov. (Nara Pref.), *S. ichikawai* sp. nov. (Nara and Mie Prefs.), *S. ingens* sp. nov. (Mie Pref.), *S. ingens ryugataakensis* subsp. nov. (Mie Pref.), *S. lubomiri* sp. nov. (Kyoto, Osaka, Nara and Mie Prefs.), *S. ichihashii* sp. nov. (Mie Pref.), *S. ichihashii miunensis* subsp. nov. (Nara Pref.), and *S. gyrosus* sp. nov. (Aichi Pref.). *S. ignorabilis* Naomi and *S. ignorabilis awajinis* Naomi are newly synonymized with *S. nakanei* Hromádka. Thus, a new combination, *S. nakane awajinis* is proposed for the subspecies *S. ignorabilis awajinis* Naomi. *S. nakanei mikawanis* Naomi is newly revalidated and upgraded to a distinct species, *S. mikawanis* Naomi stat. nov. All of the known species and subspecies of this species group are redescribed.

The 6th and 7th sternites of male, the 8th sternite of male, the 9th sternite of male and the aedeagus are illustrated for each species. The median hooks of endophallus of 23 species, the basal tube of endophallus of 17 species, the 9th sternite of female of 20 species, and the spermatheca of 18 species are also illustrated. The other taxonomically important structures such as the 9th tergite of male, the 10th tergite of male, the 8th sternite of female, the 9th tergite of female and the 10th tergite of female are also illustrated when their illustrations are considered to be necessary for comparison.

**Key words:** Insecta, Coleoptera, Staphylinidae, Steninae, *Stenus*, revision, Japan.

## Introduction

In this paper I intend to study the species group of *S. rufescens* on the basis of all the available taxonomic informations for presenting the classification of this group as the second step to the revisional studies of the Japanese Steninae. For this group, 14 species and 2 subspecies had been hitherto described from Japan (see "Historical Review"). Of these 1 species (*S. ignorabilis*) and 1 subspecies (*S. ignorabilis awajinis*) are here synonymized with *S. nakanei*, and the subspecies is subsequently recognized as a valid subspecies of *S. nakanei* (*S. nakanei awaji-*

*nis* (Naomi) comb. nov.). A subspecies *S. nakanei mikawanis* is here revalidated as a good species (*S. mikawanis*). In addition, 10 new species and 3 new subspecies are also described here. Thus, this paper treated taxonomically 24 species and 4 subspecies, aiming mainly at the descriptions and redescrptions of species, the discussion and illustrations of the taxonomic characters, the taxonomic definitions for *S. rufescens* group and its 7 subgroups, and the provision of a key to species.

## Historical Review

Among the known species of *S. rufescens* group treated in this paper, *S. rufescens* (Fig. 1A) was first described by David Sharp in 1874 based on 2 specimens collected from Maiyasa-

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1) Studies on the subfamily Steninae from Japan, 39.

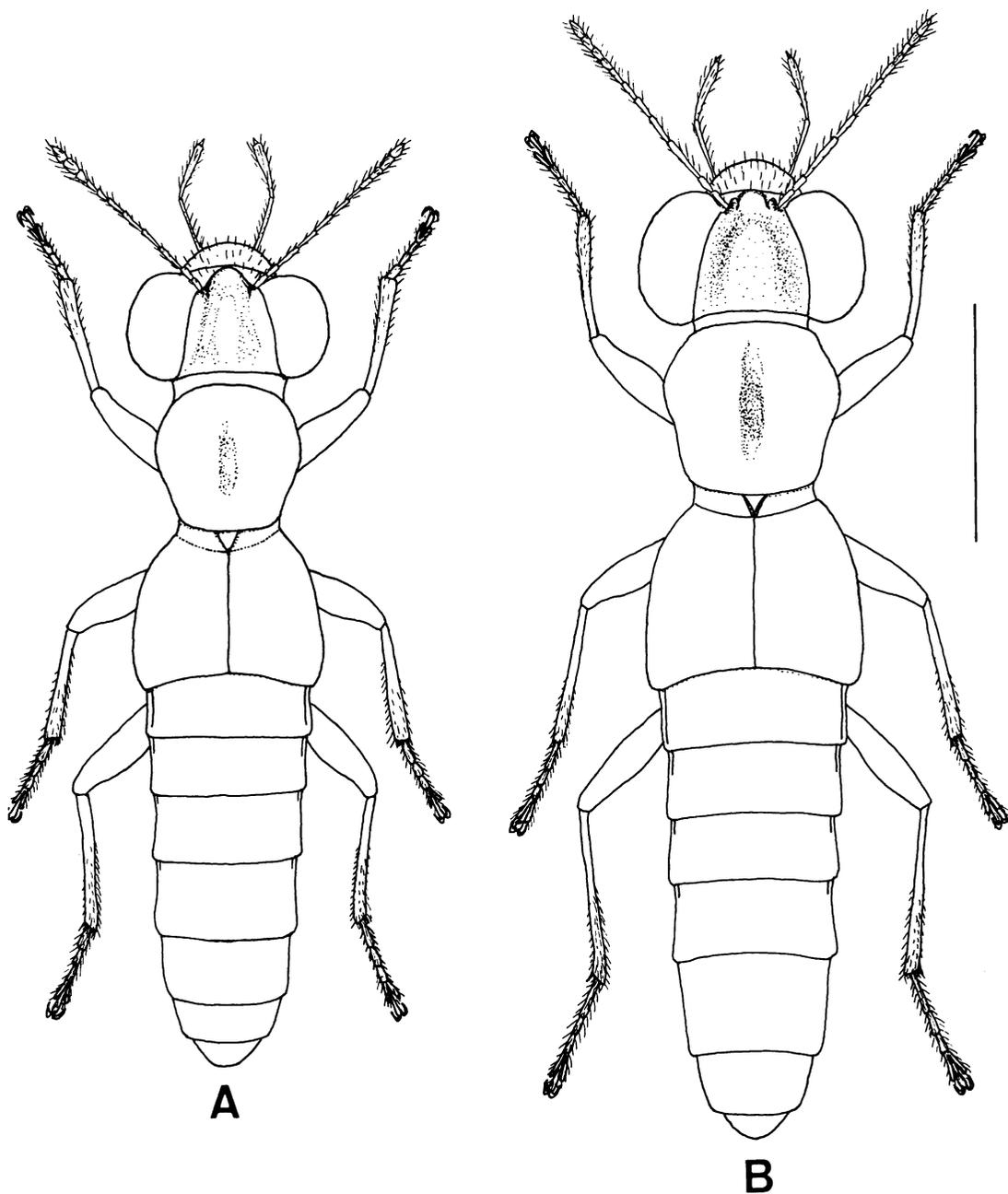


Fig. 1. A. *S. rufescens* Sharp (Maya, Hyogo); B. *S. ebisu* sp. nov. (Ohdaigahara, Nara).

ma (= Mt. Maya, Hyogo Pref.). Bernhauer (1938) described *S. testaceopiceus* from China. Puthz (1968) synonymized this species with *S. rufescens*. However, Hromádka (1982) revalidated it as a valid species, and recorded it from Kinki district, Japan. In his same paper, Hromádka (1982) described 4 new species, *S. nakanei*, *S. akogagai*, *S. wasabi* and *S. jukata*

from Kinki and Chugoku districts of Honshu, based on the collection of Dr. Kohei Sawada. Naomi (1990) described 2 new species, *S. gagyumontis* and *S. enma* from Chugoku district of Honshu. Naomi (1990a) published a paper on Japanese *Hypostenus*, together with a key to the species of Japanese *Hypostenus*, and included the above-mentioned 8 known species in that

key.

Naomi and Puthz (1993) described a new species, *S. daigonis* from Kyoto Pref. Naomi (1997) redescribed *S. wasabi* and *S. nakanei*, with the description of a new subspecies *S. nakanei mikawanis*. Additionally I described in the same paper a new species, *S. ignorabilis* from Shikoku, and its subspecies, *S. ignorabilis awajinis* from Awaji Island. Naomi (1998) described a new species *S. tsurusakii* from Tottori Pref., and Naomi (1998a) described two new species, *S. volkeri* and *S. pubicornis* from Kinki district. Puthz (2001) described a new species, *S. cygnipenis* from Wakayama Pref. Thus, the known taxa of this group from Japan are 14 species and 2 subspecies in number in total.

### Characters Useful for the Classification of *S. rufescens* Group

#### 1. Paratergites and anterolateral foveae of 3rd abdominal segment

In most species of *S. rufescens* group, 3rd paratergite is completely atrophied or highly degenerated, but the remnant of tergo-paratergal suture is found (Fig. 2B). A spiracle is found at the side of 3rd tergite, and is placed in a shallow excavation. A anterolateral fovea is, as described below, situated just beneath (or outside) the excavation. The remnant of tergo-paratergal suture (Fig. 2B) runs between the excavation and the anterolateral fovea, and more or less extends posteriorly beyond the posterior margin of anterolateral fovea. Therefore, the tergite and sternite of 3rd segment are only partially (= anterolaterally) separated by this remnant of tergo-paratergal suture in usual. However, in *S. tsurusakii* and *S. akojagai* the 3rd paratergites are complete (Fig. 2A), namely, they run in the full length of the segment and are horizontal in position.

A characteristic fovea (or an excavation) is found on each side of 3rd abdominal segment in the male and female of *Stenus* (Figs. 2A, B). The fovea is just located at the outside of paratergite. In other words, it is located on the antero-upper corner of the 3rd sternite. The depth of fovea is various. When it is deep it is appropriate to call it "fovea". However, it may be better to call it "excavation" rather than "fovea" when it is shallow.

In the subgenus *Stenus* the 3rd paratergites are well developed. In such species as *S. (Ste-*

*nus) lewisius* Sharp, 1874, this fovea is rather shallow and open behind, but located on the antero-upper corner of 3rd sternite. In some species of the subgenus *Hemistenus* the 3rd paratergites are rather degenerated when compared with those in the subgenus *Stenus*. In *S. (Hemistenus) longisetosus* Puthz, 1993, the 3rd paratergites are relatively degenerated but the paratergal plates are horizontally located. In this species, the fovea is located in the same position as in *S. lewisius*. In the subgenus *Hypostenus* the 3rd paratergites show various conditions. In some species the 3rd paratergites are complete, while in the other species they are highly atrophied. Even when the 3rd paratergites are highly atrophied, the fovea is present in the same position (the antero-upper corner of 3rd sternite) as in the species of *Hypostenus* in which the 3rd paratergites are well developed. In conclusion, the position of anterolateral foveae is almost constant in *Stenus*, irrespective of the degree of the development of 3rd paratergites.

In the brachypterous species of *Hypostenus* in which the 3rd paratergites are highly atrophied, the atrophied paratergal ridge partially or completely amalgamates with the upper rim of this fovea (Fig. 2B). Thus, the formation of this fovea is considered to be related with the atrophism of 3rd paratergal plate. In some cases this fovea may be structured in relation also with the formation of 3rd spiracle because the 3rd spiracle is situated near the upper rim of the fovea. In such species as *S. volkeri* the posterior portion of upper rim of the fovea directly continues to the tubercle of 3rd spiracle. Therefore, in addition to the tergal and sternal plates, the anterolateral foveae, paratergites and spiracles are considered to be the principal elements for the formation of anterolateral part of 3rd abdominal segment. Furthermore, the postero-external edge of elytron partially fits on this fovea to form a friction field so that the extension of the postero-external edge of elytron toward the ventral side may limit, for example, the height of the edges of this fovea. In other words, the structural evolution of the postero-external part of elytron and this fovea may be closely interdependent.

The structure of anterolateral fovea should be thus treated and discussed in this dynamic framework of abdominal and elytral evolution.

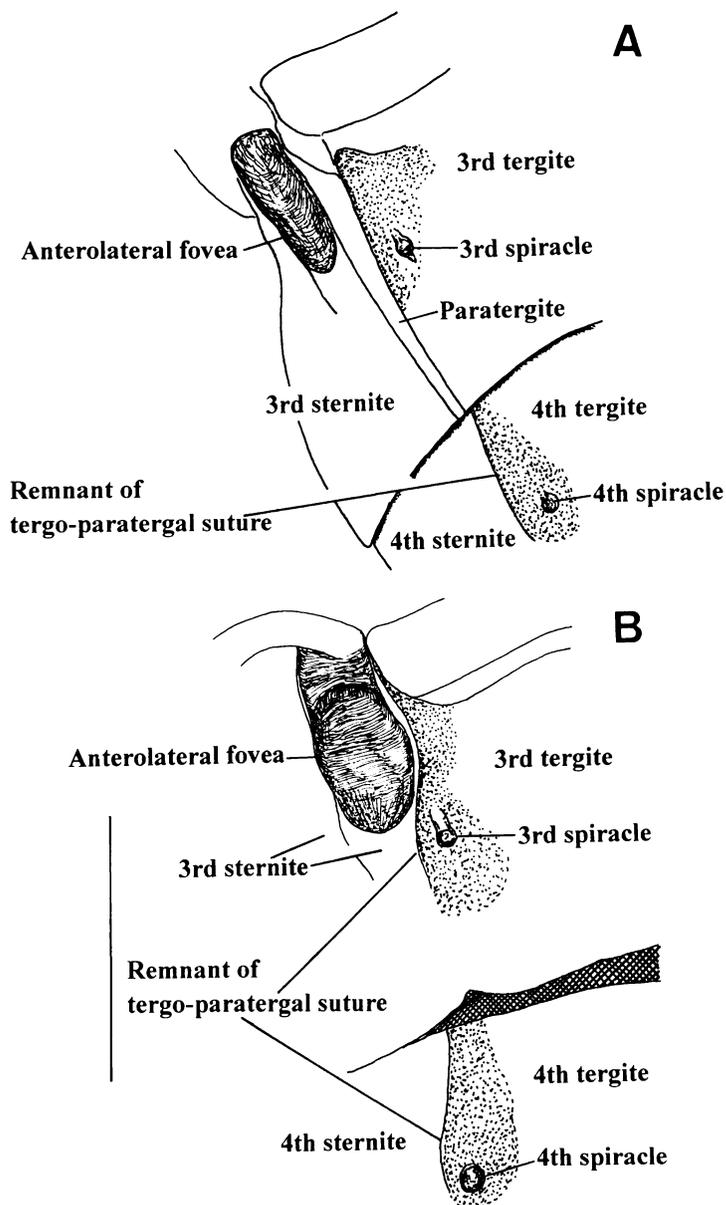


Fig. 2. A, *S. akojagai* Hromádka; B, *S. wasabi* Hromádka. A, Third to 4th abdominal segments in the left dorso-lateral view; B, 3rd to 4th abdominal segments in the left lateral view. Scale: 0.25 mm.

The upper and lower rims of this fovea are usually composed of the well sclerotized and robust ridges so that this fovea in itself is probably considered as the reinforcement of 3rd abdominal segment when considering the structure of fovea under the above-mentioned evolutionary framework. Thus, it will be worth studying the fovea from the viewpoint of functional morphology.

The anterolateral fovea of 3rd abdominal segment actually shows unique condition for some species. For example, the fovea is elongate-subelliptical in *S. akojagai* (Fig. 2A), while it is almost elliptical and broad in *S. wasabi* (Fig. 2B). Therefore, the structure of this fovea seems to be worthy to be treated also in the field of taxonomy, at least for some groups of *Stenus*. In this paper, it is described for each species of

*S. rufescens* group.

## 2. Paratergites of 4th to 6th abdominal segments

Paratergites are completely atrophied in each of the 4th to 6th abdominal segments. However, probable remnant of tergo-paratergal suture (or ridge) (Figs. 2A, B) is found only at the anterolateral part of each of the 4th to 6th segments. A spiracle is found at the side of each of the 4th to 6th tergites, and is placed in a shallow excavation. The remnant of tergo-paratergal suture (or ridge) eventually forms the ventral wall of this excavation (Figs. 2A, B) so that the tergite and sternite are only partially (= anterolaterally) demarcated by this remnant of tergo-paratergal suture in each of 4th to 6th segments. In other words the tergite and sternite of each of 4th to 6th segments completely amalgamate in its most posterior part.

## 3. Third to 7th sternites of male

Secondary sexual modifications are developed in the 6th and 7th abdominal sternites of male to various degrees, but they are very often found also in the 3rd, 4th and/or 5th sternites. Typical modifications are represented by the posteromedian depression and the flattening of posteromedian part. The depression is usually semicircular or C-shaped, and becomes deeper toward the posterior margin which is more or less arcuate. The flat area is also semicircular in shape in usual. For the male of *S. miroku*, the flat posteromedian part of 7th sternite is the only modification. The surface of depression or of flat area is usually covered with dense punctures and pubescence. The punctures and pubescence on the depression (or flat area) are denser than those on the other area of the same sternite. When these modifications are described in the section of "Description of Species", the modifications but for the conditions of punctures and pubescence are described in usual. See "Figures" for the modified conditions of punctures and pubescence on the surface of the depressions (or flat areas) of the 6th and 7th sternites of male.

The shape, size, breadth, length and depth of each depression, together with the structure of its side margins (or ridges) are useful for classification of species, but the infraspecific variations on the structures of depressions are some-

times found. For example, the length and depth of depression on the 7th sternite somewhat varies in *S. jukata*. Therefore, the identification of species is difficult based only on the secondary sexual characters developed on the abdominal sternites of male.

## 4. Eighth sternite of male

Typical modification on the 8th sternite of male is the emargination at its posteromedian part. The size and shape of emargination are useful for classification of species. The emargination is manifold in its condition among the members of *S. rufescens* group. For example, it is very deep in *S. enma* and *S. akojagai*, while it is very shallow in *S. ohtoensis*. In the male of *S. cygnipenis*, however, the emargination is not found and the posterior margin of 8th sternite of male is straight.

## 5. Ninth sternite of male

The basic structure of 9th sternite of male is same as in *S. indubius* group (See Naomi, 2006). When its morphological diversity in *S. rufescens* group is compared with that in *S. indubius* group, the former is lower partly because the structures around apicolateral projections are similar between the members of *S. rufescens* group. In *S. rufescens* group, the median seta is relatively short and inconspicuous, and sometimes very similar in length and thickness to the other setae found behind the oblique edges. Some characteristic structures are, however, found before lateral corners in some species. For example, the sclerotized marginal areas before lateral corners are long or moderately long in *S. ohtoensis*, *S. olliformis*, etc. In *S. ebisu* the lateral margins before lateral corners are characteristically arcuate, while in *S. olliformis* the 9th sternite is distinctly constricted at the anterior end of sclerotized lateral margin.

## 6. Ninth sternite of female

The basic structure of 9th sternite of female is same as in *S. indubius* group (See Naomi, 2006). The apico-external projection is short (or moderately long) and acutely pointed in usual. The apico-external tuft and median seta are usually very long, but they are relatively short in *S. rufescens* and *S. jukata*. An incurved seta is very often found at the basi-external part of apico-external projection. The internal margin

(= inner margin) of 9th sternite is moderately rounded or obtusely angulate in usual, but it is weakly arcuate behind the basi-internal corner in *S. tsurusakii* (Fig. 5D). The inner margin is smooth (for example, in *S. volkeri*) or minutely serrate (for example, in *S. akojagai*) around or behind the basi-internal corner.

### 7. General shape of median lobe

The general shape of median lobe is highly manifold in *S. rufescens* group, and is very useful for the classification of species level. Concerning the general shape, 10 or more types may be recognized within *S. rufescens* group, but these types are not very successfully reflected in the subgrouping of this species group. See the section "Descriptions of Species" for the general shape of median lobe of each species.

### 8. Apical part of median lobe

The apical sclerotized area of median lobe is usually triangular or subtriangular in shape, but in *S. akojagai*, the apical sclerotized area is very characteristic, and gimlet-shaped (Fig. 6A), while it is narrowly rounded at the tip (Fig. 8C) in *S. gagyumontis*.

In the median lobe in which the apical sclerotized area is more or less developed, the internal margin of apical sclerotized area forms the posterior "rim" for the internal space of median lobe in which the endophallus is stored. Thus, when the ventral side of median lobe taken upward, the internal margin of apical sclerotized area is more or less higher in level than the dorsal wall of median lobe. This condition of apical sclerotized area is widely found and common in *Stenus* species, including the species of *S. rufescens* group. In *S. enma* (Fig. 7B), however, the apical part of median lobe is utterly different in structure from the above-mentioned common type. Namely, the lateral edge of median lobe is well developed behind the middle of median lobe but it disappears behind the apicolateral corner of median lobe. The only structure of apical part behind the apicolateral corner of median lobe is the dorsal wall of median lobe, so the apical part of median lobe is simply tubular and is 'open' ventrally.

### 9. Median longitudinal bands of endophallus

The median longitudinal bands are usually developed and long, but they tend to become narrower and shorter in *S. enma*, *S. gagyumontis* and *S. miroku*. The dorsally folded portions of median longitudinal bands are very often developed and more or less pigmented in *S. rufescens* group. They are short in *S. akojagai*, *S. pubicornis*, *S. ohtoensis*, *S. rufescens*, *S. daigonis*, *S. wasabi*, etc., while they are long in 4 species of *S. olliformis* subgroup.

### 10. Median hooks of endophallus

The median hooks of endophallus are usually well developed and various in shape and structure. Actually, they are very important for the classification of species level, and they are indispensable especially for the classification of *S. nakanei* subgroup as mentioned later. In *S. rufescens* group, the median hooks in pair are distinctly separated, connected by a thin rod, or are connected by a broad submembranous plate. However, they are completely amalgamated into a U-shaped structure in *S. enma* (Fig. 7B), while they are highly atrophied into a very thin V-shaped structure in *S. gagyumontis* (Fig. 8B).

### 11. Basal tube of endophallus

In *Stenus*, the basal tube with its primary gonopore at apex is substantially the intromittent organ of aedeagus in coitus. This tube is, thus, the organ relating directly with the function of "sperm transfer". The structure of basal tube in *Stenus* was discussed at length in Naomi (2006). According to the discussion, the basal tube in *Stenus* was basically divided into 3 parts as follows: sperm sac, basal constriction and tube body (including basal broadened area). In this paper, however, the basal tube is divided into 4 parts (Fig. 3), using new terms as will be explained in "Materials and Methods".

- (1) Sperm sac consisting mainly of two basal shafts (left and right shafts).
- (2) Basal constriction. The tube body behind this basal constriction can be divided into the following two parts.
- (3) Proximal tube (including basal broadened area).
- (4) Distal tube (with gonopore at apex).

The basal tube is highly diverse in structure

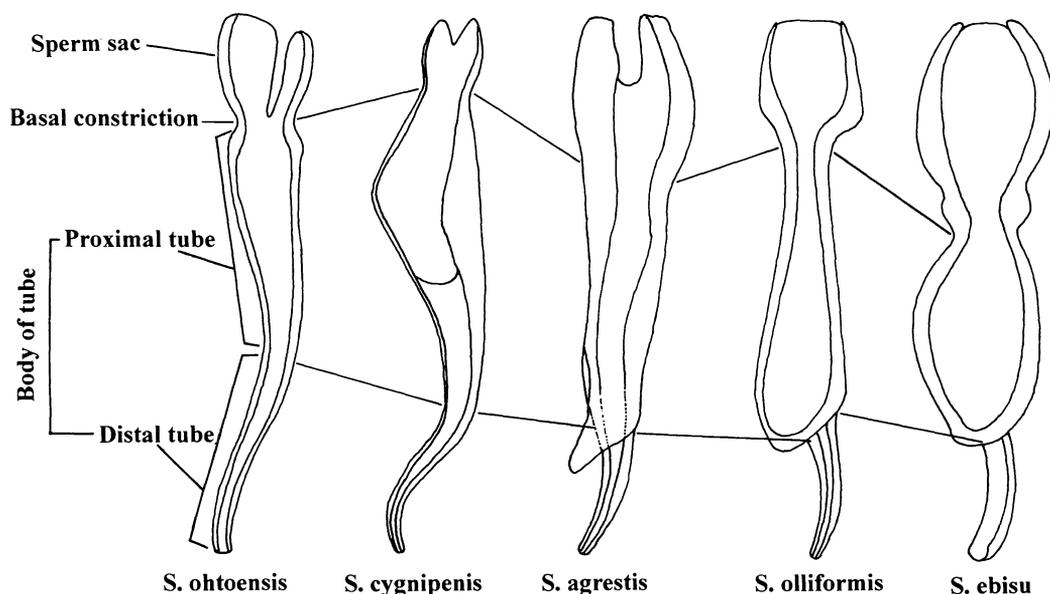


Fig. 3. Structural transformation of the basal tube of endophalus in *S. olliformis* subgroup (schematic).

in *Stenus*. Thus, this is very useful and important for classification both of species level and of the species group level. The high structural diversity is also true of *S. rufescens* group. The basal tube is usually moderately sclerotized in this group, but in *S. rufescens* both the basal and apical portions of basal tube are submembranous. In *S. miroku*, the tube shows a primitive condition (Fig. 9E). It is whip-like so that it may be called “flagellum” rather than basal tube. In *S. enma*, the basal tube is spindle-shaped, and its median part is broadest (Fig. 7B). The basal tube in *S. nakanei* subgroup is clearly divided into 3 specialized types as will be mentioned in the taxonomic definition of *S. nakanei* subgroup.

Another interesting type of basal tube is found in *S. olliformis* subgroup (*S. agrestis*, *S. olliformis* and *S. ebisu*) and in *S. tsurusakii* subgroup (*S. akogagai* and *S. tsurusakii*). The whole structure of this basal tube is just like “the shape of a pot with a pourer”, namely, “olliform”. This type of basal tube is hereinafter called “*S. olliformis* type”. The structural transformation of the basal tube of *S. olliformis* type (Fig. 3) is clearly found among the members of *S. olliformis* subgroup, so it is described below.

In *S. olliformis* subgroup, the incipient type of basal tube from which the basal tube of *S. olliformis* type had evolved, is found in *S. ohtoensis*.

In *S. ohtoensis*, the basal tube shows a basic type, and concerning the modification, the only one point, namely, the weakly curved condition of tube body, is enumerated. In *S. cygnipenis*, the basal tube is similar to that of *S. ohtoensis* in the curved condition of tube body, but the ventral rims of proximal tube are rather developed and high, and the tube body is gradually but strongly narrowed behind the broadest part of proximal tube. The 3rd stage of the structural transformation of basal tube is found in *S. agrestis*. In this species, the proximal tube and distal tube are distinctly separable because a short horn-like projection is equipped near the ventro-basal part of distal tube. This is probably most primitive in the basal tubes of *S. olliformis* type. In *S. olliformis*, the apical part of proximal tube is more strongly swollen and the projection near the ventro-basal part of distal tube becomes smaller to form a hump. On the other hand, the distal tube shows a rather narrow rod-like structure which is weakly curved on its way. Resultantly, the distinction of proximal tube and distal tube is much more clearly discernible. In addition, the basal constriction is distinctly developed. The final stage of the structural transformation of basal tube is found in *S. ebisu*. In this species, the projection near the ventro-basal part of distal tube almost disappears and the proximal tube more strongly

swells so that the proximal tube and distal tube are much more clearly distinguishable to each other. The sperm sac becomes larger and eventually is about as large as the whole size of proximal tube. In *S. ebisu*, the basal tube before the base of distal tube is just gourd-shaped, and the distal tube is just like a pourer of a pot. Therefore, the whole structure of basal tube in *S. ebisu* is just like the form of “a pot with a pourer”.

## 12. Parameres

In *S. rufescens* group, the paramere posteriorly extends more or less beyond the apex of median lobe. The basal part of paramere is hardly modified and more or less baculiform in usual, but in *S. miroku* (Fig. 9C), the dorsal rim of the basal part of paramere is minutely and irregularly serrate. In *S. volkeri* (Fig. 11A), the base of paramere is dorsoventrally compressed (namely, flat) to a considerable degree.

In *S. rufescens* group, three types are found for the apical part of paramere. In *S. tsurusakii* and *S. akojagai*, the paramere is very large and characteristically structured. The apical part of paramere is large to very large. The ventral margin of apico-internal area is twice arcuate, or at least tends to be twice arcuate. The ventral and dorsal margins of apico-internal part are furnished with few or several setae. These setae are usually very short to short, but the apicalmost one is exceptionally long. The most apical part of paramere is very acutely pointed, without setae. In *S. enma* and *S. gagyumontis*, the apical part of paramere is relatively large. The ventral margin of apico-internal area is gently and very weakly arcuate. The apico-internal area is furnished sporadically with short straight setae. The most apical part is narrowly rounded, and furnished with 1, 2 or 3 setae. In the other species of *S. rufescens* group, the apical part of paramere is various in size. The ventral margin of apico-internal area is moderately long, and gently weakly arcuate in usual (but in *S. pubicornis* it is rather short). The setae on apico-internal area rather vary from one species to another in length (short, moderate in length, long, or very long in some cases) and in density (sparse or moderately dense). The most apical part is not furnished with setae in usual, but the degree of the acuteness of the most apical part varies from one species to another.

## 13. Spermatheca

The apical parts of spermathecae are structurally manifold in *Stenus*, so Naomi (2006) tried to study and discuss the homology of these parts of spermathecae on the basis of some *Stenus* in Japan, and some homologous portions were inferred for them. Simultaneously, new terminology was introduced for the apical part of spermatheca based on the results of the study of homology. In my opinion, such terminology in which spermatheca and its duct are strictly distinguished, is of special value especially from the viewpoint of homology, and the distinction between spermatheca and its duct is meaningful in such studies as comparative morphology, evolutionary morphology, etc.

During this revisional study of *S. rufescens* group I examined both the basal and apical parts of spermatheca in *Stenus*, and noticed that a functional valve is found near the base of spermathecal duct in the members of *S. rufescens* group, and the valve is, as discussed below, assumed to be non-homologous to the valve situated at the base of collum in the members of *S. indubius* group. Thus, also noticed was the matter that the rooms whose function is that of “*receptacula seminis*” are positionally different between the “spermatheca with basal valve” (Fig. 4B) and the “spermatheca with apical valve (Fig. 4A)” when judging from the different structures in the two types of spermathecae. In the type of “spermatheca with apical valve”, the *receptaculum seminis* consists of the apical chamber and/or the capsule, while in the other type of “spermatheca with basal valve”, the more basal part of spermathecal duct may be included in a part of *receptaculum seminis*. As it is clear that the part of spermathecal duct functions as *receptaculum seminis* as in the members of *S. indubius* group, the rigorous distinction is not needed between spermatheca (namely, *receptaculum seminis*) and its duct, from the “functional” viewpoint. Thus, in this paper, the whole structure from the spermathecal opening to the apex of capsule is simply called “spermatheca”. Therefore, in this paper, the “spermatheca” of *Stenus* is, roughly speaking, composed of the spermathecal duct, collum (or RT-duct) and capsule.

I would like to start the discussion of spermatheca of *Stenus* by the descriptions and com-

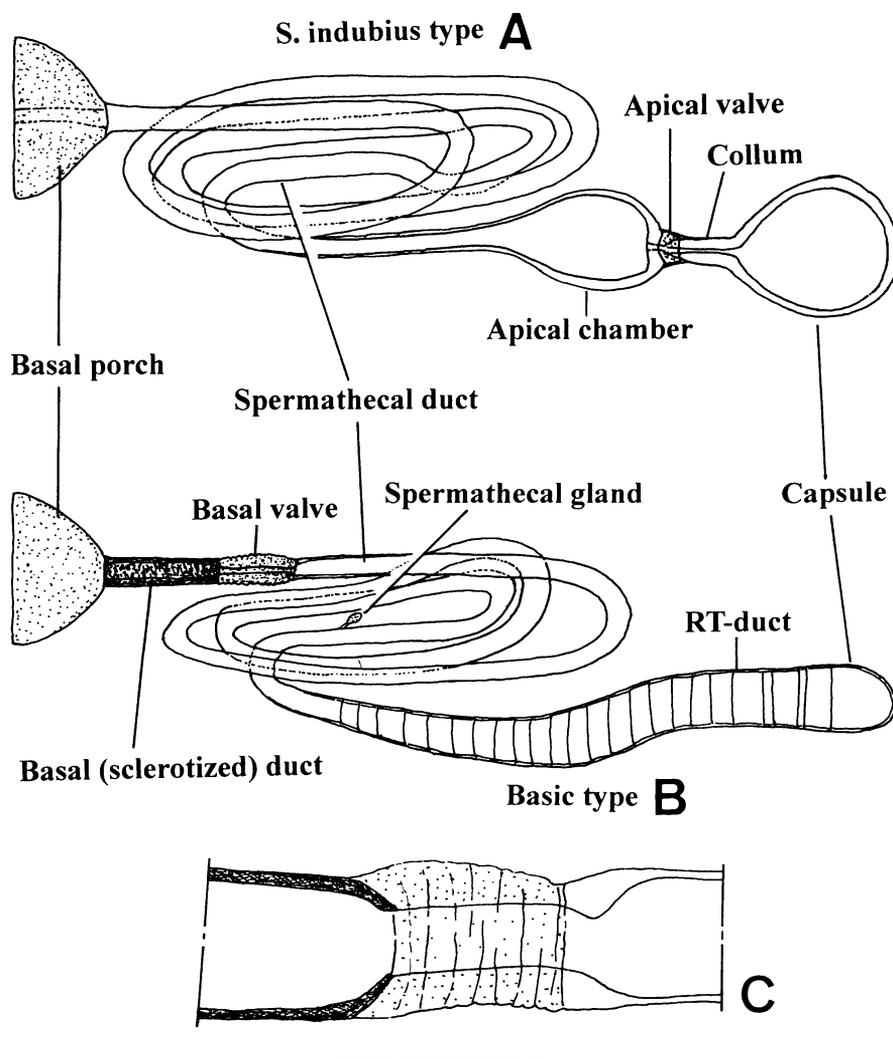


Fig. 4. A, General structure of spermatheca (*S. indubius* type; schematic); B, general structure of spermatheca (basic type; schematic); C, basal valve (left side: proximal) of *S. volkeri* (Mikusa, Osaka). Scale: 0.025mm for C.

parisons of the two types of spermathecae in *Stenus*. After the discussion, the spermatheca in the group of *S. rufescens* is specifically mentioned. Treated here is also the special structure (basal porch; Figs. 4A, B) that is situated behind and connected to the opening of spermatheca.

(1) Type of spermatheca with "non-spherical" capsule (Fig. 4B): The capsule is not spherical, and there is no constriction at the base of capsule in usual. The apical part of spermathecal duct as well as the RT-duct are not swollen. Therefore, the apical part of spermathecal duct, RT-duct and capsule together form a rod-like

structure in rather simple way. The basal part of spermathecal duct is more or less sclerotized, and a valve is placed just before the basal sclerotized duct. This type of spermatheca is so commonly found in *Stenus* that it can be called "basic type".

(2) Type of spermatheca with "spherical" capsule (Fig. 4A): The capsule is very large and spherical and is connected with the collum. The collum is usually thin and is composed of a more or less sclerotized duct, but the base of collum is submembranous and specially structured to form a (probable) functional valve in usual. The valve is proximally connected with the central

portion of apical plane of the apical chamber of spermathecal duct. However, the base of collum is sometimes moderately sclerotized and not soft enough to have a function as valve, for example, in *S. kishimotoi*, etc. In such species, there is no valve for the entire spermatheca. The apical part of spermathecal duct is swollen to form the “apical chamber” as mentioned in Naomi (2006). On the other hand, the proximal part of spermathecal duct is rather simply tubular in structure, and no functional valve is found between the opening of duct and the base of apical chamber as far as I examined. This type of spermatheca is found in the members of *S. indubius* group, and is thus called here “*S. indubius* type”.

The homologous areas of the apical parts of spermathecae of these two types were inferred by Naomi (2006). Thus, although the two types of spermathecae are structurally rather different from each other as easily understood by comparison of Figs. 4A and B, there are no substructures that are derived *de novo* in these types of spermathecae when they are interpreted from the homological viewpoint. The most important difference of these two types may become elucidated when they are interpreted from the functional viewpoint. Namely, it is concerned with the position of functional valve. Before going further, the valve in the spermatheca of basic type is called “basal valve”, while the valve in the spermatheca of *S. indubius* type is called “apical valve”, on account of the respective position of valve in the spermatheca.

The valve in spermatheca has a function in relation to the in-and-out of sperm. The basal valve in the spermatheca of basic type is proximally connected to the apical part of basal sclerotized duct, while distally to the base of spermathecal duct. So the stored room for spermatophore or sperm is, somewhere within the tube before the apex of basal valve. The muscle runs at side(s) of the apical portion of spermatheca. The example is illustrated in *S. cygnipenis* (Fig. 14E). In this example the RT-duct is moderately bent on its way probably due to the contraction of muscle. A similar muscle runs at one side of spermatheca in the case of *Aleochara* (see, for example, Gack and Peschke, 1994). In *Aleochara*, sperm is released from spermatophore when the head of spermatheca

is bent by the contraction of muscle. The movement of muscle plays some roles for the sperm displacement in *Aleochara*. In *Stenus* the function of muscle is not unfolded, but it may be inferred, based on the “analogy”, that the movement of muscle also plays some roles for the in-and-out of spermatophore or sperm deposited in the spermathecal room before the opening of spermathecal gland.

In a female of *S. naomii* (a member of *S. indubius* group), the spermatophore that is (temporarily?) stored in the apical chamber was once observed during this study. Although until now I do not observe the spermatophore that is stored in the capsule, the capsule is, without doubt, also a candidate as the room in which the spermatophore or sperm is stored. Thus, for the species with the spermatheca of *S. indubius* type, the candidates as the rooms in which the spermatophore or sperm is stored, are the apical chamber and capsule. The apical valve in the spermatheca of *S. indubius* type is situated at the base of collum. In this type of spermatheca, the longitudinal muscle (-like structures) run at the space between the capsule and the apical chamber. Although the running condition of the muscle-like structures is different from the running condition of muscle in the case of *S. cygnipenis*, it may be also inferred that the contraction of the muscle-like structures plays some roles for the in-and-out of spermatophore or sperm deposited in the capsule, if my interpretation that this “muscle-like structures” function just as muscles work, is not incorrect.

When following the structural transformation of the apical part of spermatheca discussed in Naomi (2006), this type of apical valve may be evolved from the most basal submembranous ring of RT-duct in the basic type of spermatheca. In conjunction with the development of this type of functional valve, the basal valve may be considered to degenerate. Actually, there is no basal valve for the spermatheca in which the apical valve is equipped. The apical valve is thus assumed to be non-homologous to the basal valve. Therefore, it may be hypothesized that the so-called “substitution” occurs for the function of valve. Namely, in the *S. indubius* group, the apical valve is substituted for the basal valve in such a way that the basal valve had disappeared from the spermatheca of all the members of *S. indubius* group (See Naomi, 2006).

The informations concerning the functions of the above-mentioned valves and muscles as well as the apical chamber, capsule and RT-duct are so scarce and fragmentary that the hypothesis on the functional substitution of apical valve for basal valve is largely speculated based on the comparative data of morphology of internal female genitalia and on the data gained from the excellent paper on *Aleochara* (Gack and Peschke, 1994). However, I would like here to address the hypothesis as a discussion-basis and for calling colleague's attention to it.

In the group of *S. rufescens*, spermatheca is variously structured from the simple type in which two bents of spermathecal duct are found, to the very complex type in which the long compact coiled part of spermathecal duct is well developed. The simple type is probably primitive when considered from a functional viewpoint. In the group of *S. rufescens*, the simple type is found in *S. volkeri*, *S. gagyumontis*, *S. testaceopiceus* and *S. enma*, while the very complex type is found in *S. lubomiri*, *S. ichihashii*, etc.

The spermathecal gland is difficult to observe in the group of *S. rufescens* because it is highly membranous and fragile even at its opening area in most cases. In this study the informations on the position of spermathecal gland are fortunately gained in 9 out of 24 species. It is located near the 4th bent from the apex (*S. jukata*), near the 6th bent from the apex (*S. ichikawai*), between the 1st and 2nd bents from the apex (*S. ohotoensis*, *S. ebisu* and *S. olliformis*), between the 1st and 2nd bents from the base (*S. volkeri* and *S. testaceopiceus*), between the 7th and 8th bents from the apex (*S. lubomiri*) and between the 3rd and 4th bents from the apex (*S. daigonis*). The position of spermathecal gland varies within the group of *S. rufescens*, but it is constant in the subgroup of *S. olliformis*. Therefore, the position is probably useful as a taxonomic character in some cases. Concerning the structure and shape of spermathecal gland, on the other hand, few informations were gained because they easily deflate even in water.

In *S. rufescens* group, the opening of spermatheca is very often connected with a special and characteristic structure. This structure is conical or semi-spherical in shape, and completely heavily sclerotized, or partially sclero-

tized, or being almost submembranous. Puthz (1986) used a term "trichterförmiges Apikal-sklerit (= funnel-formed apical sclerite)" for this special structure of, for example, *S. brahmanus* Puthz, 1976. Puthz (1994) used another term "Einfüllstutzen (= inlet pipe)" for this structure of, for example, *Stenus pedemontanus* Puthz, 1994. Puthz (2000) called it "Einfülleinrichtung (= inlet equipment)" in the introductory part of his paper, while using the term "Einfüllstutzen" for the same structure in the part of description. Puthz (2005, p.1,2,4) finally coined a new Latin term "*infundibulum*" for it. I adopt here an English term "basal porch" (Figs. 4A, B) for this structure.

The basal porch is probably useful for classification of species so it should be described for each species as far as it is observed and adequately illustrated. In *S. indubius* group, no sclerotized basal porch is found as far as I examined, but a highly membranous basal porch is observed at least for some members of *S. indubius* group. Further studies are needed for solving the problem as to whether or not this "basal porch" is found in most members of *Stenus*.

#### Observation of a Spermatophore Preserved in the Female Genital Chamber of *S. ichihashii*

In Gack and Peschke (1994) the mechanism by which sperm is transferred from the male's spermatophore to the female's storing cage, was described for *Aleochara curtula* (Aleocharinae). According to their study, the tube of the spermatophore extends into the spermathecal duct through the guidance of the flagellum of the male endopallus. Further elongation of the spermatophore tube, however, occurs only after separation of the pair. Thus, in females examined just after copulation, the spermatophore is glued to the genital chamber (p. 231) and its extended tube introduced into the spermathecal duct.

During this study of *S. rufescens* group, I observed an elongate-pear shaped structure of about 169  $\mu$  (Fig. 4D) in a female genital chamber of *S. ichihashii*. In a male of *S. ichihashii* I also observed a spermatophore preserved in the sperm sac of basal tube of aedeagus (Fig. 27D). This spermatophore is a pear-shaped and about 160  $\mu$  in length. I think that the elongate-pear

shaped structure is an example of spermatophore because of their common structure and length, as well as the place where this structure is found. The anterior part of spermatophore is connected with a truncated conical. The truncated conical, interestingly, fits very well in size to the basal porch connected to the opening of spermathecal duct.

The basal tube (= flagellum) of male endophallus is usually functioned as a tube by which to transfer spermatophore to the basal porch or directly to the duct of spermatheca when the basal tube is whiplash as in *S. miroku* (Fig. 9E). When considering the male of *S. ichihashii*, however, the basal tube of endophallus is rather different in structure from that of *S. miroku* or of *A. curtula*. Namely, the basal tube of *S. ichihashii* is stalked, thick and well sclerotized but not whiplash. The most apical portion of the basal tube (Figs. 27D, 28G) is needle-shaped, and fits very well to the opening of spermathecal duct (Fig. 27A). Thus, we can assume that the function of this apical portion is (1) the duct through which the spermatophore is directly put into spermathecal tube, or (2) the hook by which the basal tube is stably held in position during copulation.

In *S. ichihashii* the dorsal side of basal tube is strongly sclerotized while its ventral side is mostly submembranous. The relatively large crevice (or opening ?) is found near the apicoventral portion of basal tube in species such as *S. nakanei* (Fig. 31C), an allied species of *S. ichihashii*. Thus, although such opening is not so far observed for *S. ichihashii* because of the membranous condition of apicoventral part of basal tube, it is possible that the spermatophore is put out from the opening near the apex of basal tube also in *S. ichihashii*. If so, the most apical portion of basal tube functions as "a hook". Actually, the most apical part of basal tube in *S. ichihashii* (Fig. 28G) may be too narrow to function as a tube through which the spermatophore is put out. The hypothesis that the most apical part of basal tube functions as a hook, seems to be plausible from a functional viewpoint, but the possibility that the most apical part functions as a duct, does not be denied at all.

Based on the observation of spermatophore in a female genital chamber of *S. ichihashii*, and also on the consideration about the special

structure and its possible function of the most apical portion of male basal tube of *S. ichihashii* as discussed just above, it may be concluded that, being similar to the case in *A. curtula*, the spermatophore of *Stenus* (at least, *S. ichihashii* and its allied species) is deposited in the female genital chamber during copulation by male, and thus the spermatophore is not put directly into spermathecal duct through the tip of basal tube (= flagellum). The tip of spermatophore observed (Fig. 4D) in female is somewhat pointed, while the tip of spermatophore observed in male is completely rounded (Fig. 27D). The comparison of the difference between these two conditions may mean that the extended tube of spermatophore (sensu Gack and Peschke, 1994) is just forming in the genital chamber of the female specimen in Fig. 4D.

According to Gack and Peschke (1994), the retention of the spermatophore after separation of the pair seems to be mediated by cuticular denticles of the female genital chamber close to the opening of the spermathecal duct. This means that the female for herself endeavors to keep spermatophore in the genital chamber. The spermatophore deposited in the female genital chamber of *S. ichihashi* has a truncated conical just fits in size to the basal porch (= *infundibulum*) as mentioned above, so this special truncated conical may function as an apparatus for attachment of spermatophore with the basal porch (or the opening of spermathecal duct). This means that, being similar to the case in *Aleochara*, the spermatophore may be glued to the basal porch via attachment (= truncated conical). If so, it is probable that the basal porch is a "receptacle" for the truncated conical, and plays a role for the retention of spermatophore in the female genital chamber. In cases of some *Stenus* (*S. gyrosus* : Fig. 30C; *S. nakanei* : Figs. 31C, 32D), the surface of spermatophore is minutely covered with cuticular denticuli. The denticuli may also play a helpful role when female keeps spermatophore in the genital chamber.

## Materials and Methods

This study is based on a total of more than 740 adult specimens. The materials used for this study were collected by myself, or donated or loaned by the entomologists whose names

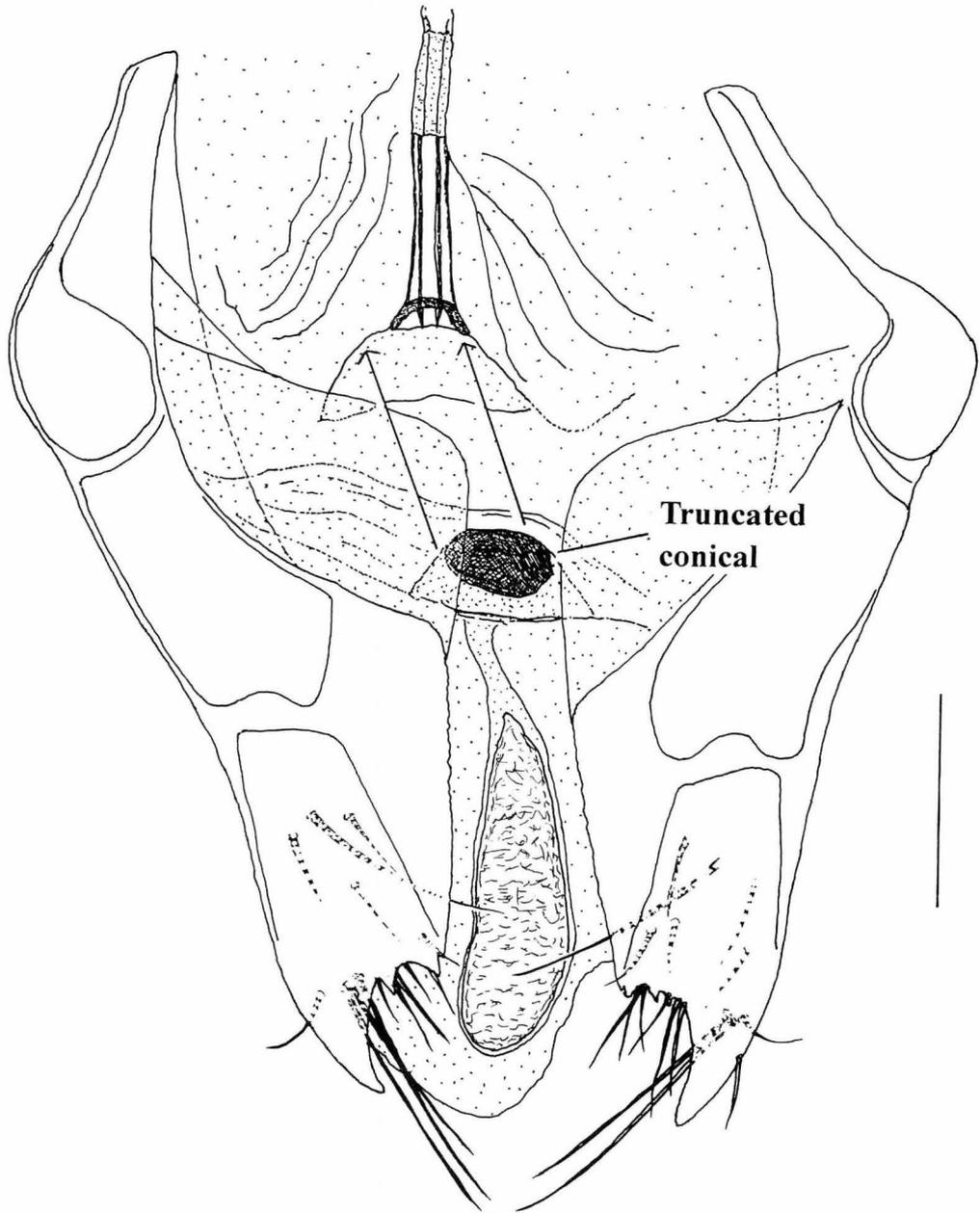


Fig. 4. D, Dorsal view of the 9th sternites and related organs of female *S. ichihashii*, showing an inserted spermatophore. Scale: 0.1 mm.

are mentioned in "Acknowledgements".

All the holotypes and some paratypes of new species described here are deposited in the Natural History Museum and Institute, Chiba. When new species are described the type specimens are designated in "Type series". The abbreviations "CBM" and "ZI" used in the "Type

series" mean "Natural History Museum and Institute, Chiba" and "Zoology Insecta", respectively. The number followed by the abbreviation "CBM-ZI" for holotype or paratype means the type number of "CBM".

## 1. Terminology

See Naomi (2006) concerning the terminology of terminalia and genitalia of both sexes in *Stenus*. However, the revised terms are used in this paper by considering their adequacy and convenience. In addition, some new terms are also adopted in this paper.

For the fovea situated at the antero-upper corner of 3rd sternite, a new term “anterolateral fovea” is used (Figs. 2A, B). For the structure of 9th sternite of female, a new term “basi-internal corner” is used to show the more or less rounded or angulate “basi-internal” part of the 9th sternite. For the structure of basal tube of endophallus of aedeagus (Fig. 3), the following terms are used: sperm sac (basically consisting of left and right shafts) + basal constriction + body of tube (or tube body). When the apical and basal portions of tube body are different in structure from each other, they are called “proximal tube” and “distal tube” respectively for the sake of convenience even when these two parts are not strictly separated by a suture, a ridge, *etc.* For the structure of paramere, Naomi (2006) called the apical portion of paramere “apical broadened area”. As this portion is hardly broadened nor swollen in some cases, I would like to simply call this portion “apical part” (see Fig. 10A) in this paper.

In this paper I distinguished two types of spermathecae in *Stenus* (Figs. 4A, B). For the spermatheca of basic type (Fig. 4B), the following terms are used: capsule + RT-duct + spermathecal duct + basal valve + basal sclerotized duct (or basal duct). On the other hand, the following terms are adopted for the spermatheca of *S. indubius* type (Fig. 4A): capsule + collum + apical valve + apical chamber (= swollen apical part of spermathecal duct) + spermathecal duct. The special structure connected with the opening of spermatheca, is called “basal porch”.

## 2. Dissection and preparation

Concerning the aedeagus and the terminalia of both sexes, the dissection and preparation are same as those in the study of *S. indubius* group (Naomi, 2006). On the other hand, the spermatheca and its related organs are dissected and illustrated by the new method described below.

The female terminalia were first soaked into

KOH solution. If the species is common and its females are large in number for study, the abdomen is directly separated from thorax by forceps, and the whole abdomen was soaked into 10% KOH solution overnight at room temperature. On the other hand, if the species is rare and its females are small in number for study, the female terminalia only were separated from the body of *Stenus* female after it was boiled in water, and then the terminalia were soaked into 10% KOH solution overnight at room temperature.

Next morning, the terminalia (or the whole abdomen) were cleaned in water, and the spermatheca and its related organs were separated from the terminalia. Ideally, the spermatheca and paired hemisternites of 9th sternite should be separated from the remains of terminalia as mentioned in Naomi (2006). A drop of water was put on slide glass, and the spermatheca and paired hemisternites were put in the water, and were carefully covered by cover glass. Then, the structure of spermatheca was illustrated by using microscope with the magnification up to  $\times 200$  in usual. After the observation and illustration, the spermatheca was embedded into Euparal as in the same way as described in Naomi (2006). However, the embedding of spermatheca into Euparal is, unfortunately, in most cases unsuccessful for the species of *S. rufescens* group because the spermatheca is more fragile and less strongly sclerotized than that in *S. indubius* group. The spermatheca is in most cases more or less deflated just after soaked into 100% ethanol or Euparal.

Methodological establishment of embedding spermatheca into Euparal or another solvent is decidedly needed for making it easier to compare the whole structures of spermathecae. I tried the embedding many times on my method during this study, but in vain as mentioned above. Dr. Volker Puthz (Schlitz) has the technique for doing this completely, though I was not able to master it despite his kind demonstration. I do hope he would publish his excellent method for staphylinidologists, especially of younger generations. His method would also be applied to the other genera of Staphylinidae in which the more or less sclerotized spermatheca is equipped. The embedding of spermathecae in good condition certainly enables direct comparison between the spermathecae of different in-

dividuals of a same species (or of different related species), under the binocular. Through this procedure, we could make the identification of species faster, and also grasp the important taxonomic characters of the spermatheca. This would resultantly bring forth the high quality of taxonomic descriptions in staphylinidology, in my opinion.

However, I would like here to note that the method introduced above is indispensable for the observation and illustration of such important characters as spermathecal gland, the functional valves of spermathecal duct, *etc.* Although this method is in a sense time-consuming requiring two whole days, the adoption of this method is decidedly needed for the observation and illustration (not for embedding!) because the membranous or submembranous portions of internal female genitalia are mostly melt away in Euparal.

### Species Group of *S. rufescens* Sharp

#### 1. Taxonomic definition of *S. rufescens* group

Taxonomic definition of *S. rufescens* group is difficult because no good synapomorphies are possessed by the members of this species group. However, this group is probably recognizable as a natural group by a combination of the following 6 characters.

- (1) Body is relatively small to moderately large (2.7 to 4.6 mm in length).
- (2) Most part of the body is usually brighter in color (yellowish brown to reddish brown) when compared, for example, with that of the member of *S. indubius* group. However, such species as *S. olliformis*, *S. ichikawai*, *etc.*, show the darker condition in color (dark brown or dark red to black).
- (3) The presence of median longitudinal line on the pronotum.
- (4) The secondary sexual characters such as depression, flattening, ridge, emargination, arcuation, dense punctuation, dense setation, *etc.* are developed on the abdominal sternites of male for all the members. Even in the species (*S. miroku*) with the least modifications, the flatness and moderately dense setation are found on the 7th sternite of male. This is one of the important characters for recognizing this to be a natural group.

(5) The basal tube of endophallus varies in structure among the members of this group, but *S. olliformis* type of basal tube (Fig.3) is found not only in 3 species of *S. olliformis* subgroup (*S. agrestis*, *S. olliformis* and *S. ebisu*), but also in 2 species (*S. tsurusakii* and *S. akoyagai*) of the most basal subgroup. The olliform condition of basal tube is not common among the brachypterous species of Japanese *Hypostenus*. Thus, the restricted distribution of this unique condition within the species group of *S. rufescens* shows that this apomorphic character may be evaluated as "homoiologous character" for *S. rufescens* group. This may support the unity of this species group if this and the other 5 characters described here are simultaneously taken into consideration.

(6) The parameral apex is usually acutely or very acutely pointed except for *S. enma* and *S. gagyumontis* in which the apex of paramere is narrowly rounded.

Remarks. In the various lineages of *Stenus*, the paratergites of abdomen has disappeared many times in parallel. In spite of this, the presence or absence of abdominal paratergites is adopted as the main definition character for subgenera in the traditional system. Resultantly, the allied members forming a good species group are often found intersubgenerically. This is also a case of *S. rufescens* group. Namely, as mentioned in the next section, some members of *Hemistenus* in Japan are more closely related to some members of *S. rufescens* group of *Hypostenus* than to the other members of *Hemistenus*. Thus, redefinitions or synonymizations of subgenera should be needed for the solution of this problem. Although this problem is certainly related to the definition of species group in this paper, I only mentioned specifically the possible phylogenetic relationship in cases where the allied *Stenus* species are found both in the traditional subgenera *Hypostenus* and *Hemistenus*.

#### 2. Taxonomic definition of subgroups of *S. rufescens* group

*S. rufescens* group is here classified into 7 subgroups. The subgrouping is by far easier than the recognition of whole *S. rufescens* group, and some subgroups (*S. nakanei* subgroup, *S. olliformis* subgroup, *etc.*) are unequivocally monophyletic. In this subsection, each sub-

group is defined taxonomically. If necessary, discussions on phylogeny, *etc.* are also presented.

(1) *S. tsurusakii* subgroup

This subgroup is composed of 2 species, *S. tsurusakii* and *S. akojagai*. It is clearly defined due to the common possession of the following 4 apomorphic characters.

First, the median longitudinal band of endophallus is very long, and reaches the posterior end of proximal tube of basal tube. In *S. tsurusakii* the band is uniformly covered with the minute dots, while in *S. akojagai* the antero-external part of band is not covered with the minute dots. Secondly, the anterior part (or anterior plate) of median hook is broad, and the posterior part is narrow. The median hook of *S. akojagai* is, however, different from that of *S. tsurusakii* in the submembranous condition of its antero-inner portion. Thirdly, the basal tube of endophallus is olliform or nearly olliform. Although the olliform condition of basal tube is found also in 3 species of *S. olliformis* subgroup, in *S. tsurusakii* subgroup the distal tube is distinctly longer than that in *S. olliformis* group. Concerning the structural variation of basal tube within *S. tsurusakii* subgroup, its distal tube is straight in *S. tsurusakii*, while it is moderately curved in *S. akojagai*. Fourthly, the apical part of paramere is very characteristic as follows: the ventral margin of apico-internal area is twice sinuate, and is furnished with 2 short setae, the seta occurring at the most apical part is longest, and the tip of paramere is very acute and more or less curved inward.

This subgroup is striking for the presence of complete 3rd abdominal paratergites. This primitive condition is found only for this subgroup within *S. rufescens* group. In the other subgroups of *S. rufescens* group, the 3rd paratergites are atrophied. Therefore, this subgroup is rather remote in relation to the other subgroups of *S. rufescens* group. This remote subgroup may form another species group when broader informations are gathered for the brachypterous species of Japanese *Hypostenus*.

*S. bosatsu* Naomi, 1989a, belongs to the subgenus *Hemistenus* under the current system of subgeneric classification simply because the complete suture runs between the tergite and sternite in the 4th to 6th abdominal segments of this species. From the phylogenetic viewpoint,

however, this species may be related to *S. akojagai* of *Hypostenus* when considering the general structure of aedeagus, *etc.* This problem will be solved when the taxonomic informations on the Japanese *Hemistenus* are gathered in more detail.

(2) *S. enma* subgroup

This subgroup consists of one species, *S. enma* based on two distinctly apomorphic characters. First, the median hooks are amalgamated into an U-shaped structure and it seems to be united with median longitudinal bands at their folded (namely, the most posterior) parts. Secondly, the apical sclerotized area of median lobe completely disappears. Thus, this subgroup is very distinctive among the members of *S. rufescens* group.

Of these two characters, the second apomorphy seems to be more valuable than the first for searching its sister species. This unique apomorphy is not found in the other members of *S. rufescens*, but it is possessed by *S. oni* Naomi, 1988, *S. haginoi* Naomi, 1997a (and probably also by *S. zdenae* Hromádka, 1990; see also Puthz, 1993). These 3 species belong to the subgenus *Hemistenus* under the current system of subgeneric classification. Under a phylogenetic consideration, these species may be, however, included in *S. enma* subgroup because the above-mentioned unique condition of median lobe is probably considered as a synapomorphy by which *S. enma* (*Hypostenus*) and these 3 species (*Hemistenus*) are united into a monophyletic group. Furthermore, if the uniqueness in the complete loss of apical sclerotized area of median lobe is studied in more detail from the viewpoint of character phylogeny, the above-mentioned 4 species may form an independent species group from *S. rufescens* group.

(3) *S. gagyumontis* subgroup

This subgroup consists of 2 species, *S. gagyumontis* and *S. miroku*. The following 3 apomorphies are possessed by these two species. First, the median lobe of aedeagus is weakly and vaguely constricted near the middle. This condition also occurs in parallel in *S. volkeri*. Secondly, the median longitudinal bands are each reduced into rather short and narrow one. Thirdly, the median hooks also have the tendency to reduce for these two species. Although the median hooks are the same in basic structure as in the other members, they are rather small in

*S. miroku*. In *S. gagyumontis*, the median hooks are highly degenerated into very thin strings forming a V-shape.

The following 2 plesiomorphies are also possessed by these two species, and are probably useful for taxonomic (not phylogenetic) definition of this subgroup. First, the secondary sexual characters are less developed. In *S. gagyumontis* the shallow depressions only are found on the 6th and 7th sternites, while the secondary sexual characters are hardly found on the abdominal sternites of *S. miroku* except for the flat area and moderately dense setation on the posteromedian part of 7th sternite. Secondly, the basal tube of endophallus is rather simple in structure, namely flagelliform.

(4) *S. pubicornis* subgroup

This subgroup consists of 3 species, *S. testaceopiceus*, *S. volkeri* and *S. pubicornis*. These 3 species are possessed by the following 3 apomorphic characters: (1) the anterior and posterior plates of median hook are completely fused, (2) the postero-external corner of median hook is moderately emarginate (or arcuate), and (3) the basal tube of endophallus is rather stout and thick, and weakly sinuate to form one or more angulations on its way. Of these apomorphies, the 1st one does not strongly support the monophyly of this subgroup because the same condition is also found in *S. miroku*, *S. jukata*, *S. rufescens*, etc. On the other hand, the 2nd and 3rd apomorphies support the monophyly of this subgroup because of its uniqueness among the members of *S. rufescens* group.

(5) *S. olliformis* subgroup

This subgroup consists of 5 species and 1 subspecies, *S. ohtoensis*, *S. cygnipenis*, *S. agrestis*, *S. olliformis*, *S. olliformis owasenus* and *S. ebisu*. One apomorphic character found among the members of this subgroup is as follows: The lateral margin of median lobe at least between the middle and the apicolateral corner is robustly structured and moderately pigmented. The monophyly of this subgroup is also evidenced by the distinct structural transformation of the basal tube of endophallus (Fig. 3). The tendency that the dorsally folded portions of median longitudinal bands become longer and more strongly pigmented, are unique in this subgroup, but this subgroup cannot be defined by this apomorphic trend because this is possessed by all the members but for *S. ohtoensis*.

Although the judgement is difficult as to whether or not the following 3 characters show the apomorphies for this subgroup, they are at least useful for taxonomic definition of this subgroup. First, the body is bicolourous, namely, the head is darker in color (black, etc.) while the rest of body is brighter in color (reddish brown, etc.). The dark condition of body color is primitive for *Stenus*. The black condition of head is, thus, apparently primitive, but a two-coloured condition of body with relatively distinct contrast as shown in this subgroup may be regarded as apomorphic. Secondly, the apical sclerotized area of median lobe is triangular or subtriangular, and the apex is simply pointed, bluntly pointed or narrowly rounded in contrast to the very acutely pointed or acutely pointed apex of median lobe in *S. nakanei* subgroup. The conditions found in *S. olliformis* subgroup are apparently more plesiomorphic in comparison with those in *S. nakanei* subgroup. However, an apomorphy may be gained from the apical sclerotized area of median lobe for *S. olliformis* subgroup because in *S. olliformis* subgroup this area is a little more strongly sclerotized than that in *S. nakanei* subgroup, and more sclerotized condition is considered to be apomorphic. Thirdly, the spermathecal duct is 4 times (*S. ohtoensis* and *S. cygnipenis*) or 6 times (*S. olliformis* and *S. ebisu*) bent on its way. No informations are gained for the spermatheca of *S. agrestis* because its female is unknown at the present stage.

In all the members of *S. olliformis* subgroup the side margin of median lobe between the middle and the apicolateral corner is very weakly bisinuate. This bisinuation is also possessed by *S. jukata* (*S. rufescens* subgroup) as well as the members of *S. nakanei* subgroup. The median longitudinal line is more or less developed on the apical sclerotized area of median lobe in *S. ohtoensis* as well as all the members of *S. rufescens* subgroup and *S. nakanei* subgroup. As these two apomorphic conditions are not found in the other subgroups of *S. rufescens* group in usual, they unite these three subgroups (*S. olliformis* subg., *S. rufescens* subg. and *S. nakanei* subg.) into a monophyletic group.

(6) *S. rufescens* subgroup

This subgroup consists of 3 species, *S. ichikawai*, *S. jukata* and *S. rufescens*. These 3 species are loosely united in a probable natural

group based only on the following 2 characters: (1) the median lobe of aedeagus is relatively slender, weakly bulbous at base and then gently narrowing apically and (2) the apical sclerotized area of median lobe is triangular or subtriangular, with the median longitudinal line running partially or incompletely.

The apomorphic similarities are, on the one hand, found between *S. rufescens* subgroup and *S. nakanei* subgroup. First, the spermatheca of *S. jukata* is similar in structure to that of *S. daigonis*. Secondly, the median longitudinal line is found on the apical sclerotized area of median lobe in *S. rufescens* subgroup although the condition in *S. rufescens* subgroup is slightly different from that in *S. nakanei* subgroup. Thirdly, the dorsally folded portion of median longitudinal band is found in *S. rufescens*. This portion is also found in *S. olliformis* subgroup and *S. nakanei* subgroup, but the condition of the dorsally folded portion in *S. rufescens* seems to be more similar in structure to that in *S. nakanei* subgroup than that in *S. olliformis* subgroup. Therefore, it does not seem to be inadequate to include these three species in *S. nakanei* subgroup based on a combination of apomorphic characters that is shared by *S. rufescens* subgroup and *S. nakanei* subgroup.

The dissimilarities are, on the other hand, found between *S. rufescens* subgroup and *S. nakanei* subgroup. First, the basi-internal corner of 9th sternite of female is less strongly angulate in *S. jukata* and *S. rufescens*. Secondly, the side margin of the median lobe between the middle and the apicolateral angle is almost straight in *S. rufescens* and *S. ichikawai*. Thirdly, the anterior plate and posterior plate of median hook are amalgamated into a solid plate in *S. jukata* and *S. rufescens*. When the median hook is separated into the anterior plate and posterior plate by suture in *S. ichikawai*, these two plates are almost similar in size. (In *S. nakanei* subgroup the anterior and posterior plates can be more or less distinguished by suture and are rather different in structure from each other.) Fourthly, each median hook is relatively slender in *S. rufescens* subgroup. Of these conditions found in *S. rufescens* subgroup, all but the 3rd condition (amalgamation of the anterior and posterior plates of median hook) are probably based on plesiomorphies. Thus, if the members of *S. rufescens* subgroup are included

in *S. rufescens* subgroup, they may form primitive members within *S. rufescens* subgroup. Anyway, as no robust synapomorphies are found enough to form a monophyletic group consisting of all the members both of *S. rufescens* group and *S. nakanei* group at the present stage, *S. rufescens* subgroup is here tentatively recognized as a different subgroup from *S. nakanei* subgroup.

#### (7) *S. nakanei* subgroup

This subgroup consists of 8 species and 3 subspecies, *S. daigonis*, *S. wasabi*, *S. ingens*, *S. ingens ryugadakensis*, *S. lubomiri*, *S. ichihashii*, *S. ichihashii miunensis*, *S. mikawanis*, *S. gyrosus*, *S. nakanei* and *S. nakanei awajinis*. This subgroup is defined by the following 2 apomorphies: (1) The apical sclerotized area of median lobe is triangular or subtriangular, and very acutely pointed or acutely pointed, and (2) the median longitudinal line runs on its full length. These conditions are shared by all the members of this subgroup.

Within this subgroup there are three different types of basal tube. In the 1st type the sperm sac is very large, and the body of basal tube is strongly sinuate. The 1st type is found in *S. daigonis*, *S. wasabi* and *S. ingens*. In the 2nd type the sperm sac is moderate in size, the body of basal tube is almost baculiform, weakly narrowed or weakly broadened at the subapical part, but at the apicalmost part it is always strongly constricted to form a spur-like tip. The 2nd type is found in *S. lubomiri* and *S. ichihashii*. In the 3rd type the basal tube is very thick and stout, more or less weakly constricted medially, and then strongly swollen at subapical portion. The 3rd type is found in *S. mikawanis*, *S. gyrosus* and *S. nakanei*. Each type of basal tube is unique in the concerned members of *S. rufescens* subgroup so that *S. rufescens* subgroup is further subdivided into three based on the above-mentioned apomorphic conditions of basal tube.

*S. nakanei* subgroup is striking in its extreme difficulty of the classification at species level as I will reiterate in the descriptions of some species. This is based on interspecific similarities concerning the external structure of aedeagus as well as the external morphology of body. Three types of basal tube are certainly recognizable at the earlier stage of classification, but further distinctions are difficult to notice for

recognition of species. This is because the differences of median hooks between species are difficult to observe under the binocular due to their overlapping position with median longitudinal bands even when the aedeagus is well prepared and embedded into Euparal. However, once noticed is that the key characters are found in the structure of median hooks through the careful observation and illustration under microscope, the species-level classification is open to us.

No detailed descriptions are provided here concerning the key characters for each species because they appear in the descriptions of species in detail. In the following sentences I simply enumerate the points as to where the important characters are found in the structure of median hooks: (1) the median hooks are connected each other or not; (2) the anterior plate and posterior plate of median hook are completely or partially separated; (3) the shapes of anterior and posterior plates; (4) relative breadth of the base of anterior plate to the base of posterior plate; (5) relative size of the anterior plate to the posterior plate; (6) presence or absence of the submembranous portion in the anterior plate; (7) the structure of anterior tip (curved internally, curved externally, etc.).

**Key to Species of *S. rufescens* Group**

- 1(4) Third paratergites completely developed.
- 2(3) Depressions on 6th and 7th sternites of male larger; emargination on 8th sternite of male shallower; anterolateral margin of 9th sternite of male before lateral corner almost rounded; 9th sternite of female weakly broadly arcuate and hardly serrate at latero-internal margin; median lobe of aedeagus gently constantly narrowed apically from the middle to the apicolateral corners; the antero-inner portion of median hook normally sclerotized; distal tube of the basal tube of endophallus straight; paramere larger, with a flap at the base of ventral margin of apico-internal area. . . . .  
 . . . . . *S. tsurusakii* Naomi
- 3(2) Depressions on 6th and 7th sternites of male smaller; emargination on 8th sternite of male deeper; anterolateral margin of 9th sternite of male before lateral corner weakly bisinuate; 9th sternite of female gently

- rounded and minutely serrate at internal margin; median lobe of aedeagus very strongly constricted on its way to form a gimlet-like structure in about apical 1/3; the antero-inner portion of median hook submembranous; distal tube of the basal tube of endophallus moderately curved; paramere smaller, without flap at the base of ventral margin of apico-internal area . . . . . *S. akojagai* Hromáka
- 4(1) Third paratergites completely atrophied, but the remnant of tergo-paratergal suture found only at the anterior part of 3rd segment.
- 5(8) Apex of paramere narrowly rounded.
- 6(7) Depressions developed in the 3rd to 7th sternites of male; posteromedian emargination of the 8th sternite of male deeper; median lobe broader behind the middle, without apical sclerotized area; median longitudinal band parallel-sided; median hooks atrophied to an U-shaped structure; basal tube broadest near the middle . . . . .  
 . . . . . *S. enma* Naomi
- 7(6) Depressions developed only in the 6th and 7th sternites of male; posteromedian emargination of the 8th sternite of male shallower; median lobe narrower behind the middle, with apical sclerotized area; median longitudinal band narrowing anteriorly; median hooks strongly atrophied to an very thin V-shaped structure; basal tube broadest before the middle . . . . .  
 . . . . . *S. gagyumontis* Naomi
- 8(5) Apex of paramere acutely or very acutely pointed.
- 9(12) Median lobe of aedeagus sub-rhombic or elongate-ovoidal in shape.
- 10(11) Seventh sternite posteromedially with a shorter and deeper depression, its posterior margin more deeply arcuate; median longitudinal bands broader, each narrowing apically, and narrowly rounded or almost pointed at tip; median hooks each broader, each incurved internally and acutely pointed at anterior tip; spermathecal duct shorter, twice bent on its way . . . . .  
 . . . . . *S. testaceopiceus* Bernhauer
- 11(10) Seventh sternite posteromedially with a longer and shallower depression, its posterior margin more shallowly arcuate; median longitudinal bands narrower, each

- subparallel-sided, and gently rounded at tip; median hooks each narrower, weakly divergent anteriorly, and obtusely pointed at anterior tip; spermathecal duct longer, with numerous bents on its way . . . . .  
 . . . . . *S. pubicornis* Naomi
- 12(9) Median lobe of aedeagus various in shape (but for sub-rhombic or elongate-ovoidal shape).
- 13(16) Median lobe of aedeagus very weakly constricted near the middle, and the posterior part of median lobe behind the constriction partially broader than the constricted part.
- 14(15) Flat area found only on 7th sternite of male; emargination of 8th sternite of male shallower; aedeagus smaller and very slender, with the apex less strongly pointed; median longitudinal bands much smaller and narrower; median hook without expansion antero-externally; basal tube of endophallus whip-shaped and very thin; paramere with basal part irregularly and minutely serrate at dorsal margin . . . . .  
 . . . . . *S. miroku* Naomi sp. nov.
- 15(14) Depressions developed both on 6th and 7th sternites of male; emargination of 8th sternite of male deeper; aedeagus larger and slender, with the apex more strongly pointed; median longitudinal bands much larger and broader; median hook much expanded antero-externally; basal tube of endophallus stout and thick; paramere with basal part straight at dorsal margin . . . . .  
 . . . . . *S. volkeri* Naomi
- 16(13) Median lobe of aedeagus more or less narrowing posteriorly from the middle to the apicolateral corner.
- 17(26) Median lobe of aedeagus with the marginal area of apical half more strongly sclerotized and pigmented; spermathecal duct with 4 or 6 bents on its way as far as the females are examined.
- 18(21) Eighth sternite of male without distinct emargination at posterior margin; 9th sternite of male with side margin rounded around lateral corner; median hook with posterior plate distinctly separated from anterior plate by suture; basal tube of endophallus without distinct demarcation between proximal tube and distal tube; spermathecal duct with 4 bents on its way.
- 19(20) Eighth sternite of male very weakly arcuate at posterior margin; apical sclerotized area of median lobe with median longitudinal line; median longitudinal band narrower, with its dorsally folded portion much shorter; median hook with anterior plate subparallel-sided; basal tube of endophallus with proximal tube uniformly narrowing apically; paramere with setae on apico-internal area longer; spermatheca with capsule smaller, and its duct thicker . . . . .  
 . . . . . *S. ohtoensis* sp. nov.
- 20(19) Eighth sternite of male almost straight at posterior margin; apical sclerotized area of median lobe without median longitudinal line; median longitudinal band broader, with its dorsally folded portion much longer; median hook with anterior plate distinctly narrowing anteriorly, and weakly incurved in apical part; basal tube of endophallus with proximal tube strongly projecting ventrally to form the angulate walls in pair; paramere with setae on apico-internal area shorter; spermatheca with capsule larger, and its duct thinner . . . . .  
 . . . . . *S. cygnipenis* Puthz
- 21(18) Eighth sternite of male with distinct emargination at posterior margin; 9th sternite of male with side margin not rounded before lateral corner; median hook with posterior plate partially separated from anterior plate by suture; basal tube of endophallus with distinct demarcation between proximal tube and distal tube; spermathecal duct with 6 bents on its way as far as the females are examined.
- 22(25) Ninth sternite of male with side margin almost straight before lateral corner; median hook with posterior plate not subcircular, about as long as or a little shorter than its anterior plate; basal tube of endophallus with basal constriction less distinct.
- 23(24) Sixth sternite of male with depression larger; median hooks connected each other by an U-shaped rod, with posterior plates each angulate latero-externally; basal tube of endophallus with basal constriction very vague, its proximal tube more or less narrowed apically, with a short obtuse projection at apicoventral part . . . . .  
 . . . . . *S. agrestis* sp. nov.
- 24(23) Sixth sternite of male with depression

- smaller; median hooks of endophallus connected each other by a broad submembranous plate, with posterior plates each not angulate latero-externally; basal tube of endophallus with basal constricted portion very long, its proximal tube more or less broadened apically, with rounded apex . . . . . *S. olliformis* sp. nov.
- a. Median longitudinal band of endophallus about as long as its dorsally folded portion; median hook with posterior plate a little shorter than its anterior plate, the anterior plate gently rounded at postero-external corner; basal tube with basal constriction stronger . . . . . *S. olliformis olliformis* subsp. nov.
- b. Median longitudinal band of endophallus distinctly shorter than its dorsally folded portion; median hook with posterior plate about as long as its anterior plate, the anterior plate obtusely angulate at postero-external corner; basal tube with basal constriction weaker . . . . . *S. olliformis owasenus* subsp. nov.
- 25(22) Ninth sternite of male with side margin weakly arcuate before lateral corner; median hook with posterior plate subcircular, much shorter than its anterior plate; basal tube of endophallus with basal constriction more distinct . . . . . *S. ebisu* sp. nov.
- 26(17) Median lobe of aedeagus with the marginal area of apical half less strongly sclerotized and pigmented; spermathecal ducts with more than 6 bents on its way as far as the females are examined.
- 27(32) Apical sclerotized area of median lobe with median longitudinal line not running at its whole length.
- 28(31) Eighth sternite of male with shallower emargination; median longitudinal band without its dorsally folded portion; basal tube of endophallus normally moderately sclerotized; internal female genitalia with sclerotized spermatheca.
- 29(30) Sixth sternite of male with larger depression; apical sclerotized area of median lobe larger, with its apex more acutely pointed; median hook with distinct demarcation line between posterior plate and anterior plate; basal tube of endophallus strongly curved behind basal broadened area; paramere shorter . . . . . *S. ichikawai* sp. nov.
- 30(29) Sixth sternite of male with smaller depression; apical sclerotized area of median lobe smaller, with its apex less acutely pointed; median hook without demarcation line between posterior plate and anterior plate; basal tube of endophallus feebly sinuate behind basal broadened area; paramere longer . . . . . *S. jukata* Hromáka
- 31(28) Eighth sternite of male with deeper emargination; median longitudinal band with its dorsally folded portion tapering anteriorly; basal tube of endophallus with basal and apical portions membranous and obscure; internal female genitalia without sclerotized spermatheca . . . . . *S. rufescens* Sharp
- 32(27) Apical sclerotized area of median lobe with median longitudinal line running at its whole length.
- 33(42) Basal tube of endophallus thinner behind its basal constriction, with subapical part of tube not thick nor swollen.
- 34(39) Basal tube of endophallus strongly curved, more or less narrowing apically, usually without the spur-like tip.
- 35(36) Median hooks of endophallus connected each other at a point situated behind the middle of the latero-internal margin of posterior plate; latero-external portion of anterior plate of median hook usually submembranous . . . . . *S. wasabi* Hromádka
- 36(35) Median hooks of endophallus connected each other at the latero-internal corner situated before the middle of posterior plate; latero-external portion of anterior plate of median hook moderately or strongly sclerotized.
- 37(38) Anterior plate of median hook with its latero-internal part submembranous . . . . . *S. daigonis* Naomi et Puthz
- 38(37) Anterior plate of median hook with its latero-internal part normally sclerotized . . . . . *S. ingens* sp. nov.
- a. Anterior plate of median hook much larger and much broader than its posterior plate; posterior plate of median hook partially separated from its anterior plate by the transverse suture; the basal part of posterior plate of median hook much narrower than the basal part of its anterior plate . . . . . *S. ingens ingens* subsp. nov.
- b. Anterior plate of median hook a little

- larger and a little broader than its posterior plate; posterior plate of median hook completely separated from its anterior plate by the transverse suture; the basal part of posterior plate of median hook a little narrower than the basal part of its anterior plate . . . . .*S. ingens ryugadakensis* subsp. nov.
- 39(34) Basal tube of endophallus weakly curved, its apical part abruptly constricted, with the spur-like tip.
- 40(41) Median hooks of endophallus separated; posterior plate of median hook completely separated from its anterior plate by suture; the anterior plate of median hook with latero-internal marginal areas normally sclerotized in usual; the anterior plate with its apical part more or less incurved; basal tube of endophallus thinner; most posterior end of the coiled part of spermathecal duct situated behind the 1st bent of duct when counted from the apex; basal porch larger, submembranous with anterior sclerotization . . . . .*S. lubomiri* sp. nov.
- 41(40) Median hooks of endophallus connected each other; posterior plate of median hook partially separated from its anterior plate by suture; the anterior plate of median hook with latero-external marginal area submembranous in usual; the anterior plate with its apical part not incurved; basal tube of endophallus broader; most posterior end of the coiled part of spermathecal duct situated before the 1st bent of duct when counted from the apex; basal porch smaller, wholly submembranous . . . . .*S. ichihashii* sp. nov.
- a. Median hooks broadly connected each other by submembranous plate; posterior plate broader, more or less pointed at apex; anterior plate well angulate at postero-external corner, without oblique suture on its sclerotized area . . . . .*S. ichihashii ichihashii* subsp. nov.
- b. Median hooks connected each other at a point of latero-internal margin behind the middle of posterior plate; posterior plate narrower, narrowly rounded at apex; anterior plate rounded at postero-external corner, with oblique suture on its sclerotized area . . . . .*S. ichihashii miunensis* subsp. nov.
- 42(33) Basal tube of endophallus thicker behind its basal constriction, with subapical part of tube very thick and strongly swollen.
- 43(44) Median hook of endophallus with posterior plate a little shorter than anterior plate . . . . .*S. mikawanis* stat. nov.
- 44(43) Median hook of endophallus with posterior plate distinctly longer than anterior plate.
- 45(46) Seventh sternite of male with posteromedian depression smaller; median longitudinal bands of endophallus longer, with its dorsally folded portions longer and weakly divergent anteriorly; median hook with posterior plate narrower at base, distinctly jointed almost transversely with anterior plate; anterior plate longer, divided further into two portions by oblique suture; basal tube of endophallus thinner, with its distal part uniformly sclerotized; apical part of paramere without flap at the apico-internal corner; spermatheca with longer duct, basal porch broader and almost submembranous . . . . .*S. gyrosus* sp. nov.
- 46(45) Seventh sternite of male with posteromedian depression larger; median longitudinal bands of endophallus shorter, with its dorsally folded portions shorter and strongly divergent anteriorly; median hook with posterior plate broader at base, connected obliquely with anterior plate by a short submembranous area, anterior plate shorter and solid; basal tube of endophallus thicker, with its distal part partially sclerotized; apical part of paramere with subtransparent flap at the ventral side of the apico-internal corner; spermatheca with shorter duct, basal porch robust, strongly sclerotized and completely amalgamated with basal duct of spermatheca . . . . .*S. nakanei* Hromáka
- a. Sixth sternite of male with smaller depression; 7th sternite of male with smaller depression, with its posterior margin more shallowly arcuate; median lobe of aedeagus with apical sclerotized area longer and narrower; anterior plate of median hook larger; apical part of paramere with a larger subtransparent flap . . . . .*S. nakanei nakanei* Hromáka
- b. Sixth sternite of male with larger depression; 7th sternite of male with larger depression, with its posterior margin more

deeply arcuate; median lobe of aedeagus with apical sclerotized area shorter and broader; anterior plate of median hook smaller; apical part of paramere with a smaller subtransparent flap.....  
 ...*S. nakanei awajinis* (Naomi) comb. nov.

### Descriptions of Species

In this section all the males and females of 24 species treated in this paper are described or redescribed. The following 4 species, *S. miroku*, *S. agrestis*, *S. ingens* and *S. mikawanis* are, however, newly described or redescribed based only on the male because their females are unknown to me at present.

#### *Stenus (Hypostenus) tsurusakii* Naomi

(Figs. 5A-G)

*Stenus (Hypostenus) tsurusakii* Naomi, 1998a, Ent., Sci., 1(1): 100; Herman, 2001, Bull. Amer. Mus. Nat. Hist., (265): 2423; Puthz and Naomi, 2003, Newsl. Staphyl. Soc. Jpn., (20): 7; Smetana, 2004, Cat. Pal. Col., 2: 551.

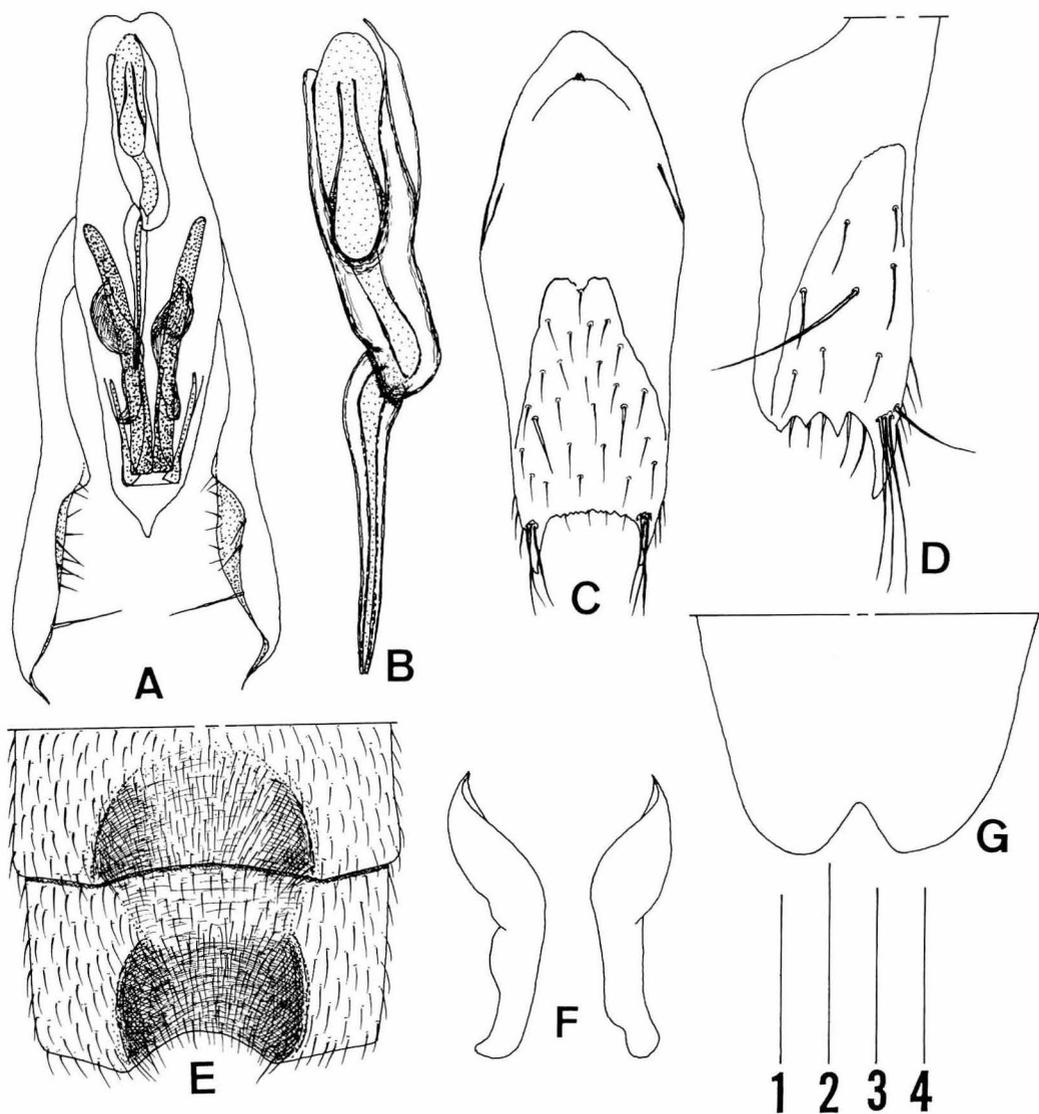
Male and female. Brachypterous, 3.2-3.4 mm in length, weakly to moderately shining. Head black to dark brown, with reddish brown clypeofrontal area; pronotum and elytra reddish brown to brown; abdomen dark reddish brown in basal segments, dark brown in apical segments; legs yellowish brown to reddish brown.

Relative measurements: HL: 30; HW: 50; PL: 40; PW: 39; EL: 44; SL: 33; EW: 47.

Head transverse, interocular area with a pair of longitudinal depressions convergent anteriorly, distinct and relatively deep, median part between the depressions moderately broad and convex; surface uniformly with punctures round, dense to moderately dense, somewhat umbilicate and irregular, interstices indistinctly or distinctly microsculptured. Pronotum with surface weakly uneven, median longitudinal depression very shallow, rather ambiguous in outline; punctures very dense, round and coarse, interstices very narrow, indistinctly microsculptured. Elytra gently rounded laterally; surface somewhat flat or shallowly depressed along sutural area; punctures large, very dense, distinct, interstices vaguely

microsculptured. Abdomen strongly cylindrical; 3rd segment with anterolateral fovea elliptical, shallowing posteriorly, and about half the length of segment, paratergite complete, horizontal in position, and weakly narrowing posteriorly; 3rd tergite with punctures dense, distinct, round to elliptical and various in size, interstices weakly microsculptured; 7th tergite with punctures fine and sparse, interstices indistinctly microsculptured.

Male. Fourth sternite flat or very shallowly depressed at posteromedian part; 5th sternite with a shallow semicircular depression at posteromedian part, its posterior margin very shallowly arcuate; 6th sternite (Fig. 5E) with a large, deep and semicircular depression at posteromedian part, its side ridges distinctly edged, and its posterior margin widely shallowly arcuate; 7th sternite (Fig. 5E) anteromedially with a broad depression which continues to posteromedian depression, the posteromedian depression narrower and a little deeper than that in 6th sternite, and C-shaped, with its side ridges distinctly edged, and its posterior margin deeply arcuate; 8th sternite (Fig. 5G) with a moderate V-shaped emargination at posteromedian part; 9th sternite (Fig. 5C) with apicolateral projection short and acutely pointed. Aedeagus (Fig. 5A) with median lobe broadest near the middle, apicolateral corner distinctly but obtusely angulate, apical sclerotized area subtriangular, small, pointed, with its internal margin almost straight; median longitudinal bands divergent anteriorly, each relatively narrow and very slender; lateral longitudinal bands each very thin; median hooks (Fig. 5F) relatively large, with posterior plate narrow, rounded at posterior margin, anterior plate broader than posterior plate, acutely pointed and weakly incurved at anterior tip; basal tube (Fig. 5B) with sperm sac very large, basal constriction very vague, distal tube acicular, almost straight, clearly separable from proximal tube by the very distinct constriction; parameres well developed and much extending posteriorly beyond the apex of median lobe, each weakly sinuate on the way, the apical part very large, with its tip very acute and distinctly incurved, ventral margin of apico-internal area distinctly twice sinuate, with a flap at its base, setae 3 in number on the ventral margin of apico-internal area (of these, the seta occurring at the most apical part



**Fig. 5.** *S. tsurusakii* Naomi (Kano, Tottori). A, Aedeagus; B, basal tube of endophallus; C, 9th sternite of male; D, 9th sternite of female; E, 6th and 7th sternites of male; F, median hooks of endophallus; G, 8th sternite of male. Scale 1: 0.25 mm for E; scale 2: 0.25 mm for G; scale 3: 0.2 mm for A, C; scale 4: 0.1 mm for B, D, F.

longest), setae minute and 7 in number on the dorsal margin of apico-internal area.

**Female.** Ninth sternite (Fig. 5D) weakly arcuate and hardly serrate in inner margin, with apico-external projection pointed, and apico-external tuft and median seta very long.

**Type specimens examined.** Paratypes: 1 ♂ 1 ♀, Kano-cho, Kedaka-gun, Tottori Pref., 6. i. 1994, N. Tsurusaki leg.

**Distribution.** Honshu (Tottori Pref.).

**Remarks.** *S. tsurusakii* was first described by

Naomi (1998a), but after the description the additional specimens were not collected. During this study, I examined one female for spermatheca, but it was too immature to illustrate.

*S. tsurusakii* is allied to *S. akojagai*, but the posterior margin of 7th sternite of male is deeply arcuate, the emargination of 8th sternite of male is shallower, the latero-internal margin of 9th sternite of female is weakly arcuate, the median lobe of aedeagus is not strongly constricted behind the middle, the distal tube of basal tube

is straight, and the apical part of paramere is much larger, with a flap at the base of the ventral margin of apico-internal area.

***Stenus (Hypostenus) akojagai* Hromádka**

(Figs. 2A; 6A-G)

*Stenus (Hypostenus) akojagai* Hromádka, 1982, *Fragm. Col.*, (33/34): 132; Naomi, 1989a, *Check List Jpn. Ins.*, p.265; Naomi, 1989b, *Elytra*, Tokyo, 17(2): 160; Naomi, 1990b, *Elytra*, Tokyo, 18(2): 203; Herman, 2001, *Bull. Amer. Mus. Nat. Hist.*, (265): 2048; Puthz and Naomi, 2003, *Newsl. Staphyl. Soc. Jpn.*, (20): 8; Smetana, 2004, *Cat. Pal. Col.*, 2: 547.

Male and female. Brachypterous, 2.8-3.7 mm in length, weakly to moderately shining. Head black to dark brown near inner margins of eyes, reddish brown to brown on the median part; pronotum and elytra reddish brown to brown; abdomen reddish brown to brown in basal segments, dark reddish brown to dark brown in apical segments; antennae pale yellowish brown to reddish brown in basal segments, reddish brown to dark brown in apical segments.

Relative measurements: HL: 25; HW: 45; PL: 32; PW: 33; EL: 34; SL: 24; EW: 40.

Head transverse, interocular area with a pair of longitudinal depressions convergent anteriorly, distinct, median part between the depressions moderately convex, almost elongate-triangular in shape; punctures moderately dense, medial in size, distinct, round and somewhat irregular, and interstices distinctly microsculptured near inner margins of eyes, while punctures moderately dense, small, round, distinct and shallow, and interstices distinctly minutely sculptured on the median part. Pronotum with surface weakly uneven, median longitudinal depression very shallow and vague in outline; punctures very dense, round, distinct, and interstices almost distinctly microsculptured. Elytra much rounded laterally; surface almost smooth, with punctures very dense, round, distinct and regular, and interstices smooth or faintly microsculptured. Abdomen strongly cylindrical; 3rd segment with anterolateral fovea elongate-subelliptical, less than half the length of segment, paratergite complete, horizontal in position but weakly narrowing posteriorly; 3rd tergite with punctures dense, round to elliptical

and distinct, becoming smaller toward posterior margin, interstices feebly or distinctly microsculptured; 7th tergite with punctures on very fine and regular, interstices indistinctly microsculptured.

Male. Third sternite flat at posteromedian part, with its posterior margin very weakly arcuate; 4th sternite provided with a similar flat area as in 3rd sternite, but its size larger; 5th sternite posteromedially with a shallow semicircular depression, its posterior margin shallowly arcuate; 6th sternite (Fig. 6F) posteromedially with a horse-hoof-shaped depression moderately deep, its posterior margin shallowly arcuate; 7th sternite (Fig. 6F) with anteromedian depression which continues posteriorly to the posteromedian depression, the posteromedian depression subcircular in shape, moderately deep, and gently rounded in the posterior margin of depression, so the whole posterior margin of 7th sternite showing bi-arcuation, the surface of posteromedian depression covered with very dense short setae except for the glabrous median longitudinal area; 8th sternite (Fig. 6G) posteromedially with a very deep and large emargination; 9th sternite (Fig. 6E) weakly bisinuate before the lateral corner, apicolateral projections sharply pointed. Aedeagus (Fig. 6A) with median lobe strongly bulbous in basal 2/3, and gimlet-like in structure in apical 1/3, median longitudinal bands very long and slender, median hooks (Fig. 6B) with posterior part narrow, moderately curved inward, anterior part broader than posterior part, with its internal area submembranous; basal tube (Fig. 6B) oliform, sperm sac and proximal tube together forming a cylindrical structure, without basal constriction, distal tube thin and curved; parameres each weakly sinuate on the way, the apical part developed, with very acutely pointed tip, setae 2 in number on the ventral margin of apico-internal area, setae 4 to 6 in number on or near the dorsal margin of apico-internal area (of these, the seta occurring at the most apical part longest).

Female. Ninth sternite (Fig. 6C) minutely serrate at inner margin, with apico-external projection acutely pointed, apico-external tuft and median seta very long; spermatheca (Fig. 6D) with capsule rather small, RT-duct thick, broader than capsule, spermathecal duct relatively thick, short but strongly coiled, with its surface

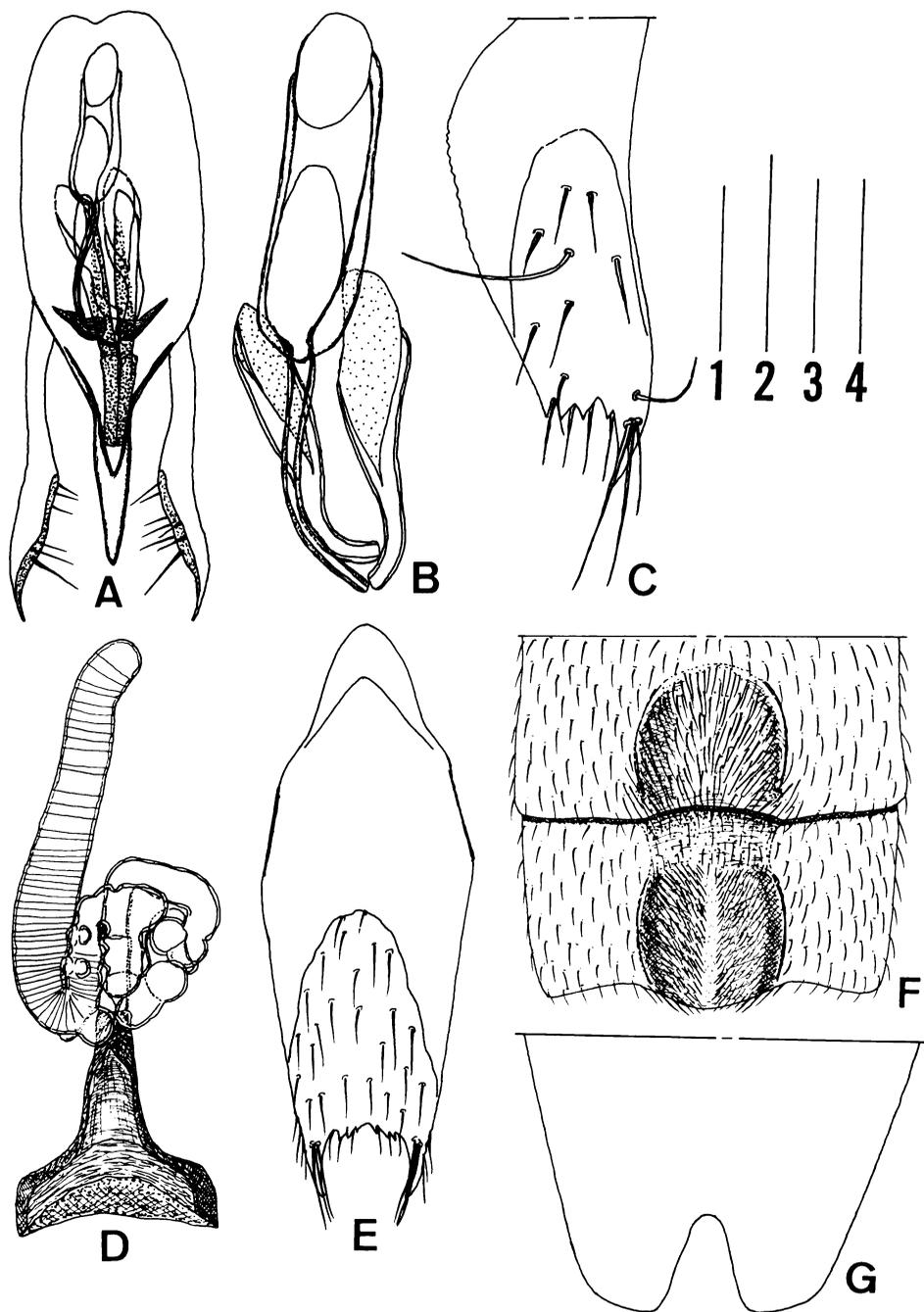


Fig. 6. *S. akojagai* Hromádka. A, Aedeagus (Sawada, Okayama); B, basal tube and median hooks of endophallus (Sawada, Okayama); C, 9th sternite of female (Misasa, Tottori); D, spermatheca and basal porch (Misasa, Tottori); E, 9th sternite of male (Midou, Okayama); F, 6th and 7th sternites of male (Misasa, Tottori); G, 8th sternite of male (Misasa, Tottori). Scale 1: 0.25 mm for F; scale 2: 0.25 mm for G; scale 3: 0.2 mm for A, E; scale 4: 0.1 mm for B-D.

strongly tuberculate, basal sclerotized duct and basal porch together forming a funnel-like

structure.

Specimens examined. 3 ♂ 4 ♀, Misasa Spa,

Tottori Pref., 28. ix. 1986, T. Ito leg.; 1 ♂ 1 ♀, Mt. Daisen, Tottori Pref., 26. iv. 1998, T. Kishimoto leg.; 2 ♀, same locality, 3-5. vi. 1980, *S. Naomi* leg.; 1 ♂ 2 ♀, Sawada, Okayama C., Okayama Pref., 18. i. 2004, Nakano et Fujitani leg.; 1 ♂, Midou Valley, Oosa-machi, Okayama Pref., 2. xi. 2003, O. Yamaji leg.

Distribution. Honshu (Tottori and Okayama Prefs.).

Remarks. *S. akojagai* is very distinctive in considering such peculiar characters as the bi-arcuate posterior margin of 7th sternite of male, the median lobe of aedeagus gimlet-shaped in the posterior 1/3, the olliform basal tube of endophallus, and the well tuberculate duct of spermatheca. This species is clearly separable from all the other species of *S. rufescens* group by the characters mentioned above.

### *Stenus (Hypostenus) enma* Naomi

(Figs. 7A-G)

*Stenus (Hypostenus) enma* Naomi, 1990a, Akitu, New Ser., (113): 6.; Naomi, 1990b, Elytra, Tokyo, 18(2): 203; Herman, 2001, Bull. Amer. Mus. Nat. Hist., (265): 2168; Puthz and Naomi, 2003, Newsl. Staphyl. Soc. Jpn., (20): 7; Smetana, 2004, Cat. Pal. Col., 2: 548.

Male and female. Brachypterous, 2.9-3.1mm in length, moderately to strongly shining. Head reddish brown to dark brown near inner margins of eyes, clear reddish brown on median part; pronotum and elytra clear reddish brown; abdomen entirely reddish brown in usual, but sometimes dark reddish brown at apical segments; antennae yellowish brown in apical segments, pale yellow in basal segments; legs yellowish brown to reddish brown.

Relative measurements: HL: 25; HW: 43; PL: 33; PW: 34; EL: 33; SL: 23; EW: 39.

Head transverse, interocular area with a pair of longitudinal depressions constantly converging anteriorly, median part between the depressions weakly convex and elongate-triangular in shape; punctures dense, small, round and distinct, and interstices indistinctly microsculptured near inner margins of eyes, while punctures moderately dense, small to fine and distinct, and interstices obscurely microsculptured on the median part. Pronotum with surface weakly uneven, median longitudinal depression rather vague and very shallow; punctures dense

to very dense, distinct, round to almost round, interstices relatively broad, with very distinctly microsculptures which are composed of very small facets. Elytra relatively large, rounded laterally; surface weakly uneven, flat or very shallowly depressed at anteromedian part, with punctures very dense, round to elliptical and distinct, interstices distinctly microsculptured. Abdomen strongly cylindrical; 3rd segment with anterolateral fovea small, ovoidal and open behind, about 1/3 the length of segment, another large elongate-elliptical fovea situated just above the anterolateral fovea, about 3/4 the length of segment, the spiracle placed in this fovea, remnant of tergo-paratergal suture found only at the anterior part of segment; 3rd tergite with punctures dense, round and distinct, becoming smaller posteriorly toward posterior margin, interstices indistinctly microsculptured; 7th tergite with punctures fine, elliptical to ovoidal, distinct and regular, interstices indistinctly microsculptured.

Male. Secondary sexual characters well developed in 3rd to 7th sternites (Fig. 7C); semicircular depressions developed in each of posteromedian parts of 3rd to 6th sternites, the depression becoming larger in size from 3rd to 6th sternites, and the arcuation at the posterior margins of these depressions also becoming deeper from 3rd to 6th sternites; 7th sternite (Fig. 7C) broadly depressed at the anteromedian part, the depression continuing to the very deep posteromedian depression, with its side ridges sharply edged, and posterior margin with a moderately deep and wide V-shaped arcuation; 8th sternite (Fig. 7D) posteromedially with a very deep V-shaped emargination; 9th tergite (Fig. 7A) anteriorly with a pair of thin and straight struts; 9th sternite (Fig. 7E) with posterolateral projections short and pointed; 10th tergite (Fig. 7A) very shallowly arcuate at posterior margin. Aedeagus (Fig. 7B) with median lobe moderately constricted behind the middle, apicolateral corner angulate, the apical part behind apicolateral corners almost triangular in shape, completely open behind due to the absence of apical sclerotized area; median longitudinal bands short, each parallel-sided, its dorsally folded portion very thin and attenuate, and weakly curved outside at apical part; median hooks atrophied and amalgamated into a small U-shaped structure which seems to con-

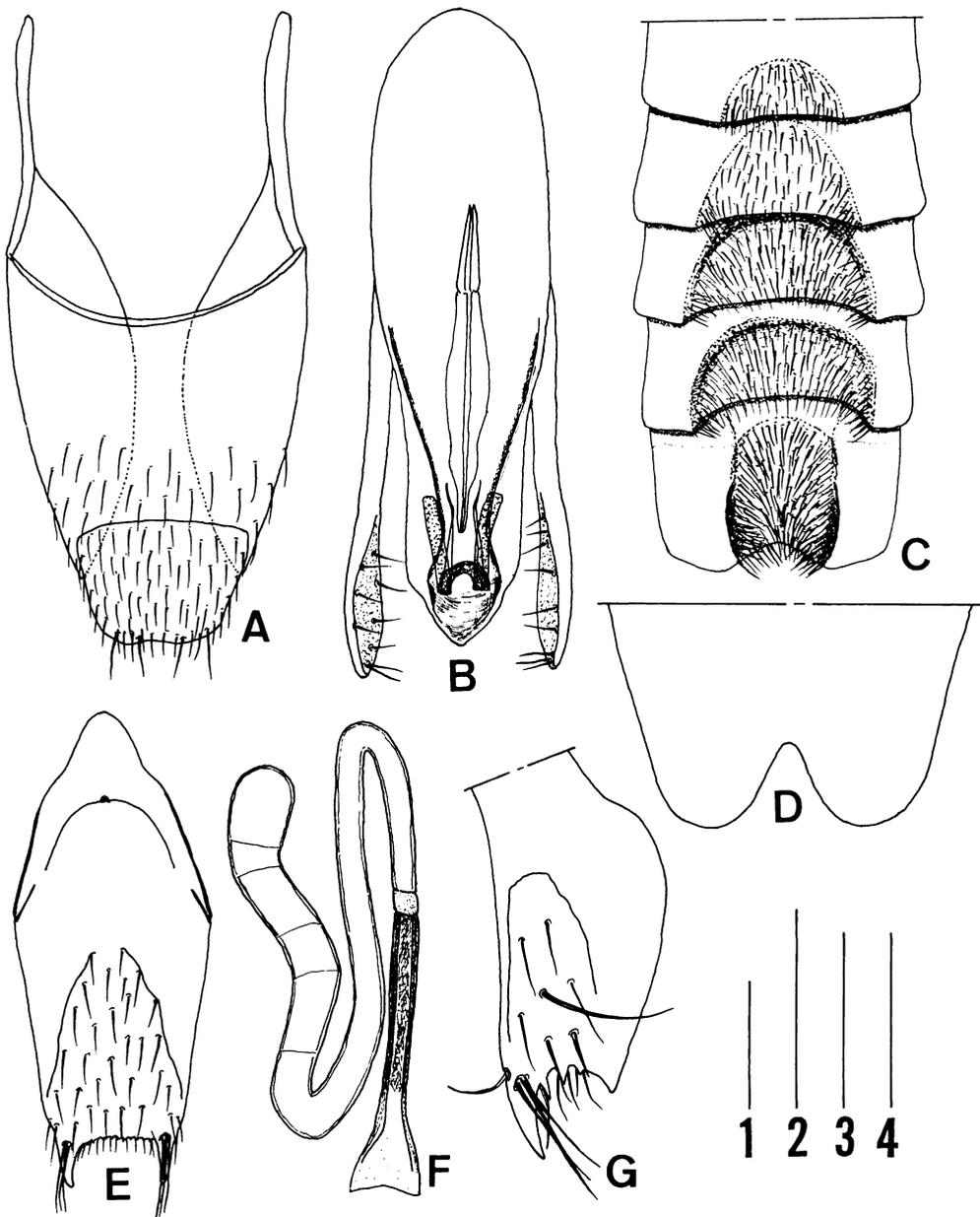


Fig. 7. *S. enma* Naomi. A, Ninth and 10th tergites of male (Shobara, Hiroshima); B, aedeagus (Shobara, Hiroshima); C, 3rd to 7th sternites of male (Shobara, Hiroshima); D, 8th sternite of male (Shobara, Hiroshima); E, 9th sternite of male (Shobara, Hiroshima); F, spermatheca and basal porch (Mukaibara, Hiroshima); G, 9th sternite of female (Mukaibara, Hiroshima). Scale 1: 0.25 mm for C; scale 2: 0.25 mm for D; scale 3: 0.2 mm for A, B, E; scale 4: 0.1 mm for F, G.

nect with median hooks at their folded portion; basal tube very characteristic in structure, almost elongate-fusiform, and broadest near the middle, left and right shafts symmetrical, straight and narrowing anteriorly, basal con-

striction minute but distinct, tube body with lateral margin weakly bisinuate behind the middle; parameres extending posteriorly beyond the apex of median lobe, the apical part relatively large, narrowly rounded at tip, apico-internal

area with setae short, 9 to 10 in number.

Female. Ninth sternite (Fig. 7G) with postero-external projection weakly incurved and sharply pointed, with apico-external tuft and median seta long; spermatheca (Fig. 7F) with capsule much rounded apically, and a little broader than RT-duct, spermathecal duct twice bent on its way, with its most anterior portion a little beyond the apex of capsule, basal sclerotized duct long, and connected with cone-shaped basal porch.

Type specimen examined. Paratype: 1 ♀, Mukaibara-cho, Hiroshima Pref., 29. ix. 1985, I. Okamoto leg.

Other specimens examined. 2 ♂, Nanatsukahara, Shobaru, Hiroshima Pref., 28. iv. 1990, I. Okamoto leg.

Distribution. Honshu (Hiroshima Pref.).

Remarks. *S. enma* is very distinctive in the well development of secondary sexual characters on the 3rd to 7th abdominal sternites of male, the amalgamated median hooks of U-shape, the fusiform basal tube of endophallus, and the absence of apical sclerotized area of median lobe. This species is thus very easily separable from all the other members of *S. rufescens* group by the characters mentioned above.

***Stenus (Hypostenus) gagyumontis* Naomi**  
(Figs. 8A-G)

*Stenus (Hypostenus) gagyumontis* Naomi, 1990a, Akitu, New Ser., (113): 4; Naomi, 1990b, Elytra, Tokyo, 18(2): 203; Herman, 2001, Bull. Amer. Mus. Nat. Hist., (265): 2194; Puthz and Naomi, 2003, Newsl. Staphyl. Soc. Jpn., (20): 7; Smetana, 2004, Cat. Pal. Col., 2: 549.

Male and female. Brachypterous, 2.8-3.2 mm in length, weakly to moderately shining. Head reddish brown, but a little darker in color near inner margins of eyes; pronotum and elytra clear reddish brown to reddish brown; abdomen clear reddish brown to reddish brown in basal segments, dark reddish brown to dark brown in apical segments; antennae pale yellowish brown to yellowish brown in basal segments, pale brown to brown in apical segments; legs yellowish brown to reddish brown.

Relative measurements: HL:25; HW: 45; PL:33; PW: 32; EL: 32; SL:23; EW:38.

Head transverse, interocular area with a pair

of longitudinal depressions uniformly convergent anteriorly, median part between the depressions moderately convex and elongate-triangular in shape; surface uniformly with punctures moderately dense, irregular, round, distinct and somewhat umbilicate, interstices almost distinctly microsculptured. Pronotum with surface very weakly uneven, median longitudinal depressions very shallow, vague in outline; punctures very dense, round to almost round, regular, interstices distinctly microsculptured. Elytra with surface flat on sutural area; punctures very dense, large, almost regular, interstices very narrow, indistinctly microsculptured. Abdomen much cylindrical; 3rd segment with anterolateral fovea elliptical, about half the length of segment, remnant of tergo-paratergal suture found only at the anterior part of segment; 3rd tergite with punctures dense to moderately dense, round to almost round, distinct and various in size, interstices faintly microsculptured; 7th tergite with punctures very fine and regular, interstices weakly microsculptured.

Male. Sixth sternite (Fig. 8G) medially with a shallow semi-elliptical depression, its posterior margin weakly arcuate; 7th sternite (Fig. 8G) medially with a long and shallow depression, its side margin gently curved, and its posterior margin weakly arcuate; 8th sternite (Fig. 8F) posteromedially with a relatively small emargination; 9th sternite (Fig. 8D) with side margin almost uniformly rounded around lateral corner, apicolateral projection short but pointed. Aedeagus (Fig. 8C) with median lobe weakly bulbous at base, and weakly constricted near the middle, its anterolateral corner very indistinct, apical sclerotized area subtriangular, narrowly rounded at apex, with its internal margin moderately rounded; median longitudinal bands very small and thin, narrowing anteriorly; median hooks (Fig. 8B) degenerated into a very thin structure of V-shape; basal tube (Fig. 8B) elongate, sperm sac submembranous, with its shafts very thin and long, basal constrictions very indistinct, tube body almost straight or weakly sinuate; parameres a little extending posteriorly beyond the apex of median lobe, the apical part relatively large, narrowly rounded at tip, its apico-internal area with setae short to moderately long, 8 to 10 in number.

Female. Ninth sternite (Fig. 8A) with apico-

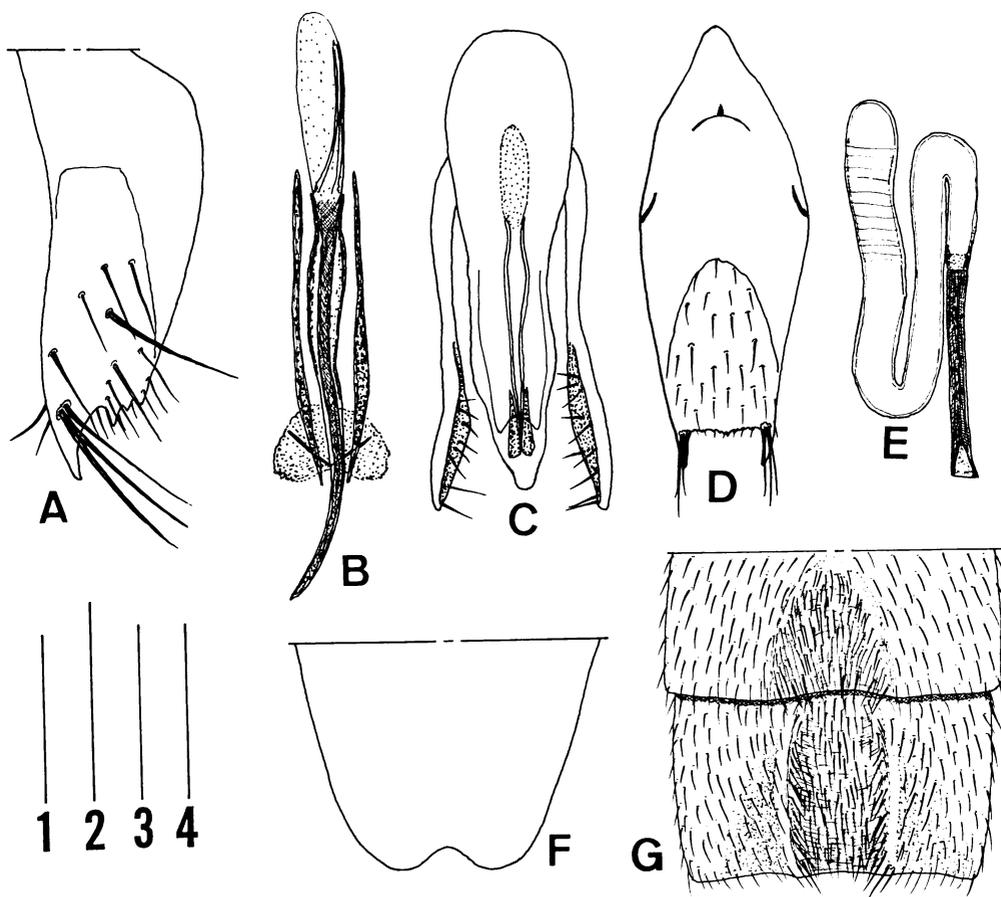


Fig. 8. *S. gagyumontis* Naomi (Gagyū, Okayama). A, Ninth sternite of female; B, basal tube and extended median hooks of endophallus; C, aedeagus; D, 9th sternite of male; E, spermatheca; F, 8th sternite of male; G, 6th and 7th sternites of male. Scale 1: 0.25 mm for G; scale 2: 0.25 mm for F; scale 3: 0.2 mm for C, D; scale 4: 0.1 mm for A, B, E.

external projection pointed or acutely pointed, apico-external tuft and median seta very long; spermatheca (Fig. 8E) with capsule medial in size, well rounded apically, RT-duct short, spermathecal duct with 2 bents, basal sclerotized duct thin and long.

Type specimens examined. Paratypes: 4 ♂ 9 ♀, Mt. Gagyū, Okayama Pref., 28. viii. 1977, H. Ohishi leg.

Other specimens examined. 1 ♂ 2 ♀, Gohkei, Okayama Pref., 16. v. 1993, T. Ito leg.

Distribution. Honshu (Okayama Pref.).

Remarks. *S. gagyumontis* is allied to *S. miroku*, but the secondary sexual modifications of male are found on the 6th and 7th sternites, the apical sclerotized area of median lobe is less developed and rounded at tip, the median hooks

are composed of a very thin structure of V-shape, the basal tube of endophallus is broader, and the paramere is narrowly rounded at apex.

***Stenus (Hypostenus) miroku* Naomi sp. nov.**

(Figs. 9A-E)

Male. Brachypterous, 2.8 mm in length, moderately shining. Head dark red near inner margins of eyes, reddish brown on the middle; pronotum and elytra clear yellowish brown to reddish brown; abdomen yellowish brown in basal segments, reddish brown to brown in posterior segments; antennae yellow in basal segments, reddish brown to brown in apical segments; legs clear yellow.

Relative measurements: HL: 27; HW: 47;

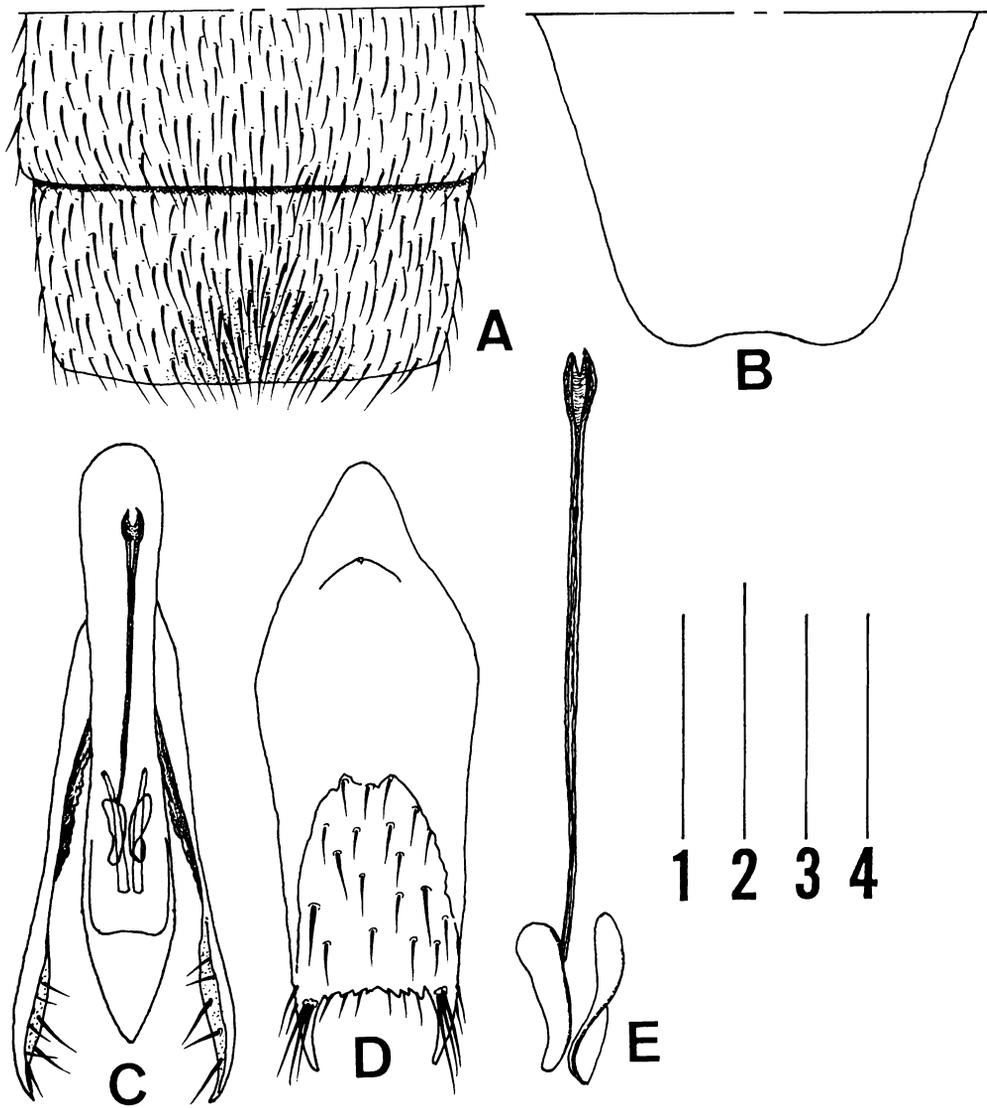


Fig. 9. *S. miroku* sp. nov. (Takano, Hiroshima). A, Sixth and 7th sternites of male; B, 8th sternite of male; C, aedeagus; D, 9th sternite of male; E, basal tube and median hooks of endophallus. Scale 1: 0.25 mm for A; scale 2: 0.25 mm for B; scale 3: 0.2 mm for C, D; scale 4: 0.1 mm for E.

PL: 32; PW: 35; EL: 35; SL: 26; EW: 40.

Head transverse, interocular area with a pair of longitudinal depressions broad and gently converging anteriorly, median part between the depressions weakly convex and oblong-oval in shape; punctures moderately dense, distinct, round and irregular, and interstices distinctly microsculptured near inner margins of eyes, while punctures moderately dense, round and regular, and interstices indistinctly minutely sculptured on the median part. Pronotum with surface weakly uneven, median longitudinal

depression short and broad, elongate-ovoidal in shape; punctures very dense, round, distinct and somewhat rough, interstices very narrow, almost distinctly microsculptured. Elytra rounded laterally; surface almost smooth, with punctures very dense, round and almost regular, interstices very narrow and indistinctly microsculptured. Abdomen cylindrical; 3rd segment with anterolateral fovea ovoidal, less than half the length of 3rd segment, remnant of tergo-paratergal suture found only at the anterior part of segment; 3rd tergite with punctures

round to elliptical, dense and distinct, medial in size but small near posterior margin, interstices faintly microsculptured; 7th tergite with punctures fine, elliptical and regular, interstices distinctly microsculptured.

Sixth sternite (Fig. 9A) without modifications; 7th sternite (Fig. 9A) flat at posteromedian part, with setae on the flat area a little denser and longer than those on the lateral parts; 8th sternite (Fig. 9B) posteromedially with a shallow and broad emargination; 9th sternite (Fig. 9D) with apicolateral projections acutely pointed. Aedeagus (Fig. 9C) with median lobe very slender, very weakly narrowed near the middle, gently rounded at apicolateral corner, apical sclerotized area almost triangular, and pointed at apex, with its internal margin very weakly rounded; median longitudinal bands very thin and short; median hooks (Fig. 9E) small, weakly curved externally, and rounded at anterior tip; flagellum (= basal tube) (Fig. 9E) whip-like and straight, with sperm sac small and spindle-shaped; parameres extending posteriorly beyond the apex of median lobe, very thick and irregularly minutely serrate at the dorsal rim of its basal portion, flat dorso-ventrally near the middle, the apical part incurved and acutely pointed at tip, its apico-internal area with 5 to 7 short setae.

Female. Unknown to me.

Type series. Holotype: ♂ (CBM-ZI 121835), Takano City, Hiroshima Pref., 22. viii. 1982, S. Tanaka leg.

Distribution. Honshu (Hiroshima Pref.).

Remarks. *S. miroku* is closely allied to *S. gagyumontis*, but the secondary sexual modifications are hardly developed except for the moderately dense setation and flat area on the 7th sternite of male, the median lobe of aedeagus is more slender and broadest at the apicolateral corner, the apical sclerotized area of median lobe is almost triangular, the median hooks are present in pair, the basal tube is much thinner, and the paramere is irregularly minutely serrate on its dorsobasal rim and is acutely pointed at the apex.

Etymology. The specific epithet of this new species is derived from a name of Bodhisattva.

### *Stenus (Hypostenus) testaceopiceus*

Bernhauer

(Figs. 10A-G)

*Stenus (Hypostenus) testaceopiceus* Bernhauer, 1938, Ent. Nachr., Troppau, 12(1): 31; Puthz, 1968, Ent. Rev. Jpn., 20(1/2): 45; Hromádka, 1982, Fragm. Col., (33/34): 135; Naomi, 1989, Check List Jpn. Ins., p.266; Naomi, 1990a, Akitu, New Ser., (113): 2; Naomi, 1990b, Elytra, Tokyo, 18(2): 204; Herman, 2001, Bull. Amer. Mus. Nat. Hist., (265): 2417; Puthz and Naomi, 2003, Newsl. Staphyl. Soc. Jpn., (20): 7; Smetana, 2004, Cat. Pal. Col., 2: 551.

Male and female. Brachypterous, 3.2-3.8 mm in length, weakly or moderately shining. Head dark red to black near inner margins of eyes, reddish brown to yellowish brown on the median part; pronotum and elytra yellowish brown to reddish brown; abdomen reddish brown to dark brown; antennae reddish brown to dark brown in apical segments, yellow to yellowish brown in basal segments; legs yellow to yellowish red.

Relative measurements: HL: 26; HW: 46; PL: 35; PW: 36; EL: 34; SL: 28; EW: 45.

Head transverse, interocular area with a pair of longitudinal depressions very weakly converging anteriorly, median part between the depressions weakly convex; punctures dense, round and distinct, and interstices distinctly microsculptured near inner margins of eyes, while punctures moderately dense, distinct, and interstices distinctly minutely sculptured on the median part. Pronotum with surface weakly uneven, median longitudinal depression short and shallow; punctures very dense, round and distinct, and interstices very narrow, distinctly microsculptured. Elytra rounded laterally; surface almost smooth or very weakly uneven, flat on sutural area; punctures very dense, regular, round and distinct, interstices distinctly microsculptured. Abdomen strongly cylindrical; 3rd segment with anterolateral fovea moderately large and ovoidal, a little less than half the length of segment, remnant of tergo-paratergal suture found only at the anterior part of segment; 3rd tergite with punctures moderately dense to dense, round to elliptical, various in size and distinct, interstices faintly or weakly microsculptured; 7th tergite with punctures

fine, sparse and regular, interstices distinctly microsculptured.

Male. Fifth sternite flat at the posteromedian part; 6th sternite (Fig. 10F) posteromedially with a semicircular depression moderately deep, with its side ridges low and indistinct, and its posterior margin very weakly arcuate; 7th sternite (Fig. 10F) flat at anteromedian part, the posteromedian depression relatively short and transverse but very deep, distinctly edged laterally, with its posterior margin deeply arcuate; 8th sternite (Fig. 10G) posteromedially with a medium-sized V-shaped emargination; 9th sternite (Fig. 10C) with lateral margin of considerable length before lateral corner moderately sclerotized, with apicolateral projection short and pointed. Aedeagus (Fig. 10A) with median lobe large and almost elongate-oval in shape, apicolateral corner very weakly angulate but distinct, apical sclerotized area triangular, pointed, with its internal margin very weakly arcuate; median longitudinal bands very broad at base, each narrowed anteriorly; lateral longitudinal bands very thin, string-shaped; median hooks (Fig. 10E) connected each other by the submembranous plate, each distinctly emarginate at posterolateral corner, acutely pointed and strongly incurved at anterior tip, with a large latero-external area submembranous; basal tube stout, sperm sac with left shaft longer than right one, basal constriction weak but distinct, tube body weakly sinuate, weakly gradually narrowed apically; parameres a little extending posteriorly beyond the apex of median lobe, each weakly sinuate on the way, the apical part acutely pointed at tip, its apico-internal area with 11 to 12 setae of moderate length.

Female. Ninth sternite (Fig. 10D) with apico-external projection acutely pointed, apico-external tuft and median seta very long; spermatheca (Fig. 10B) with capsule very small, RT-duct broader than capsule, spermathecal duct with 2 bents, its basal sclerotized duct stout, spermathecal gland large, located near the middle between 1st and 2nd bents of spermathecal duct.

Type specimen examined. Holotype: ♂, Northwestl. China, Chinkiang, Col. Reitter; *testaceopiceus* Bernh. Typus unic.; Chicago NHMus. M. Bernhauer Collection. The 8th tergite, 8th sternite, 9th sternite and 9th + 10th tergites are embedded into a drop of Euparal on a

pasteboard, while the aedeagus (into 6 pieces) are similarly embedded into a drop of Euparal on the other pasteboard. These two pasteboards are pinned under the holotype specimen, whose 6th and 7th segments of abdomen are separately pasted at the rim of the mount.

Specimens examined. 8 ♂ 4 ♀, Mizuho, Kyoto, 23. xi. 1989, T. Ito leg.; 3 ♂ 3 ♀, same locality, 2. vii. 1989, T. Ito leg.; 1 ♂, same locality, 26. viii. 1989, Y. Hayashi leg.; 1 ♂, same locality, 23. xi. 1989, Y. Hayashi leg.; 1 ♂, same locality, 23. iv. 1994, Y. Hayashi leg.; 2 ♀, same locality, 18. iv. 1987, Y. Hayashi leg.; 2 ♂ 1 ♀, same locality, 14. v. 1994, Y. Hayashi leg.; 1 ♂, same locality, 12. v. 1984, Y. Hayashi leg.; 1 ♂ 1 ♀, Todoromi; 1 ♂ 4 ♀, Mt. Myoken, Nose, Osaka Pref., 25. ix. 1994, T. Ito leg.; 6 ♂ 8 ♀, same locality, 30. viii. 1986, T. Ito leg.; 1 ♀, same locality, 13. viii. 1985, T. Ito leg.; 2 ♂ 2 ♀, same locality, 16. v. 1987, T. Ito leg.; 2 ♂ 4 ♀, Mt. Mikusa, Osaka Pref., 19. iii. 1993, Y. Sawada leg.; 1 ♂ 4 ♀, Mt. Shosha, Hyogo Pref., 19. iii. 1988, T. Ito leg.; 1 ♂ 3 ♀, Mt. Amaishi, Sasayama, Hyogo Pref., 19. iv. 1997, Y. Hayashi leg.; 2 ♂ 1 ♀, Higashi-Rokko, Hyogo Pref., 4. iv. 1987, T. Ito leg.

Distribution. Honshu (Kyoto, Osaka and Hyogo Prefs.); China?

Remarks. *S. testaceopiceus* was first described based only on 1 male by Bernhauer (1938) from the Northwestern part of China. Although Puthz (1968) synonymized this species with *S. rufescens*, Hromádka (1982) revalidated it as a good species. I examined the holotype of *S. testaceopiceus* deposited in the Field Museum, Chicago, paying special attention to its secondary sexual modifications and the endophallus of aedeagus, and I concluded here that the holotype of *S. testaceopiceus* is exactly same in structure as the specimens from Japan. Thus, if taken it literally, the distribution of *S. rufescens* extends from the Japanese Archipelago to the China mainland.

During this study I examined 53 specimens of *S. testaceopiceus* from Japan, and this species is, I think, common in Japan. However, all of these specimens were collected strictly from Kyoto, Osaka, and Hyogo Prefectures, the western part of Kansai district, Honshu. Thus, as far as the distributional range of this species within Japan is taken into consideration, it seems to have been rather narrow by nature as in most of

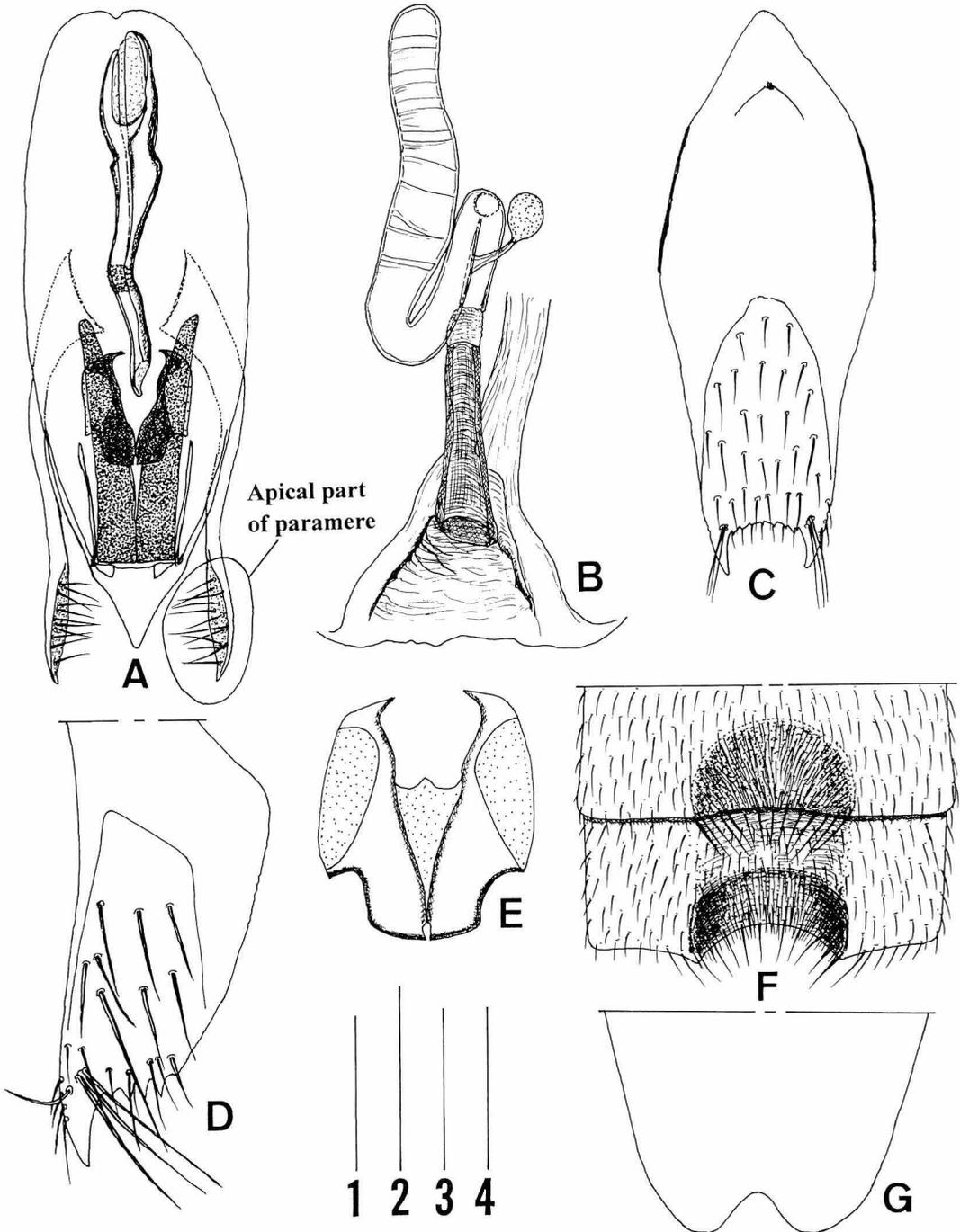


Fig. 10. *S. testaceopiceus* Bernhauer (Myoken, Osaka). A, aedeagus; B, spermatheca and its related organ; C, 9th sternite of male; D, 9th sternite of female; E, median hooks of endophallus; F, 6th and 7th sternites of male; G, 8th sternite of male. Scale 1: 0.25 mm for F; scale 2: 0.25 mm for G; scale 3: 0.2 mm for A, C; scale 4: 0.1 mm for B, D, E.

the other members of *S. rufescens* group. The northwestern China, the type locality of *S. testaceopiceus*, is at least 2000 km distant from

the Kinki District, Honshu. If when considering the brachypterous thus flightless condition of this species, the disjunct distribution of this

type does not seem to be natural. Although I do not deny a possibility that the Northwestern part of China is a part of original distributional range of *S. testaceopiceus*, the inclusion of the Northwestern part of China in the distributional range of *S. testaceopiceus* should be suspended in this paper until further specimens of *S. testaceopiceus* are collected from there.

*S. testaceopiceus* is closely allied to *S. volkeri*, but the median lobe of aedeagus is elongate-ovoidal in shape, the median longitudinal band is broader and more strongly narrowed apically, the median hook is larger, and the apex of its anterior portion is incurved and very acutely pointed.

***Stenus (Hypostenus) volkeri* Naomi**

(Figs. 11A-G)

*Stenus (Hypostenus) volkeri* Naomi, 1998a, Ent. Sci., 1(3): 385; Herman, 2001, Bull. Amer. Mus. Nat. Hist., (265): 2435; Puthz and Naomi, 2003, Newsl. Staphyl. Soc. Jpn., (20): 7; Smetana, 2004, Cat. Pal. Col., 2: 551.

Male and female. Brachypterous, 2.8-3.3 mm in length, weakly to moderately shining. Head black to dark brown near inner margins of eyes, reddish brown on the median part; pronotum and elytra reddish brown to brown; abdomen dark brown; antennae yellowish brown to brown; legs reddish brown to brown.

Relative measurements: HL: 30; HW: 47; PL: 37; PW: 35; EL: 37; SL: 29; EW: 43.

Head transverse, interocular area with a pair of longitudinal depressions convergent anteriorly, median part between the depressions moderately convex, almost elongate-triangular in shape; surface uniformly with punctures dense, round, distinct, somewhat irregular and umbilicate, interstices distinctly microsculptured. Pronotum with surface slightly uneven, median longitudinal depression shallow, short and vague in outline; punctures very dense, round, coarse, interstices weakly microsculptured. Elytra with surface almost flat on sutural area; punctures very dense, coarse, almost regular and distinct, interstices weakly microsculptured. Abdomen cylindrical; 3rd segment with anterolateral fovea small, less than half the length of segment, relatively deep, and with a thin suture at side; 3rd tergite with punctures dense, round, distinct, interstices indistinctly

microsculptured; 7th tergite with punctures fine and elliptical, interstices indistinctly microsculptured.

Male. Third sternite with a small flat area at posteromedian part; 4th sternite posteromedially with a flat area which is a little larger than that on 3rd tergite; 5th sternite with a very shallow depression at posteromedian part; 6th sternite (Fig. 11F) posteromedially with a shallow semicircular depression, its posterior margin very shallowly arcuate; 7th sternite (Fig. 11F) posteromedially with a moderately deep depression, its sides distinctly ridged and each protruding posteriorly to form a short pointed projection, posterior margin of the depression with a broad, moderately deep arcuation; 8th sternite (Fig. 11E) posteromedially with a moderately deep V-shaped emargination; 9th sternite (Fig. 11B) with posterolateral projections short and pointed, apicolateral tufts short. Aedeagus (Fig. 11A) with median lobe very large, slender and rather elongate, weakly narrowed near the middle, apicolateral corners weakly angulate, apical sclerotized area triangular, pointed, with its internal margin rounded; median longitudinal bands long and very broad; lateral longitudinal band well developed, converging and much extending anteriorly beyond the anterior ends of median hooks; median hooks (Fig. 11G) connected near posterior 1/4, each shoe-shaped, broadly arcuate at posterolateral part; basal tube large and robust, sperm sac with left shaft longer than right one, basal constriction small but almost distinct, tube body slightly asymmetrical, with a blunt angularity at the middle of the right side; parameres a little extending posteriorly beyond the apex of median lobe, each once gently folded ventrally near the basal 1/3, the apical part acutely pointed and incurved at tip, its apico-internal area with setae short, 8 to 9 in number.

Female. Ninth sternite (Fig. 11D) with apico-external projection acutely pointed, apico-external tufts and median seta very long; spermatheca (Fig. 11C) with capsule rather small, RT-duct thick and sinuate, spermathecal duct twice bent on its way, with basal sclerotized duct stout and broadened basally, spermathecal gland placed near the middle between 1st and 2nd bents of spermathecal duct.

Type specimens examined. Holotype: ♂, Mt. Mikusa, Osaka Pref., 2. viii. 1989; 1 ♀, same

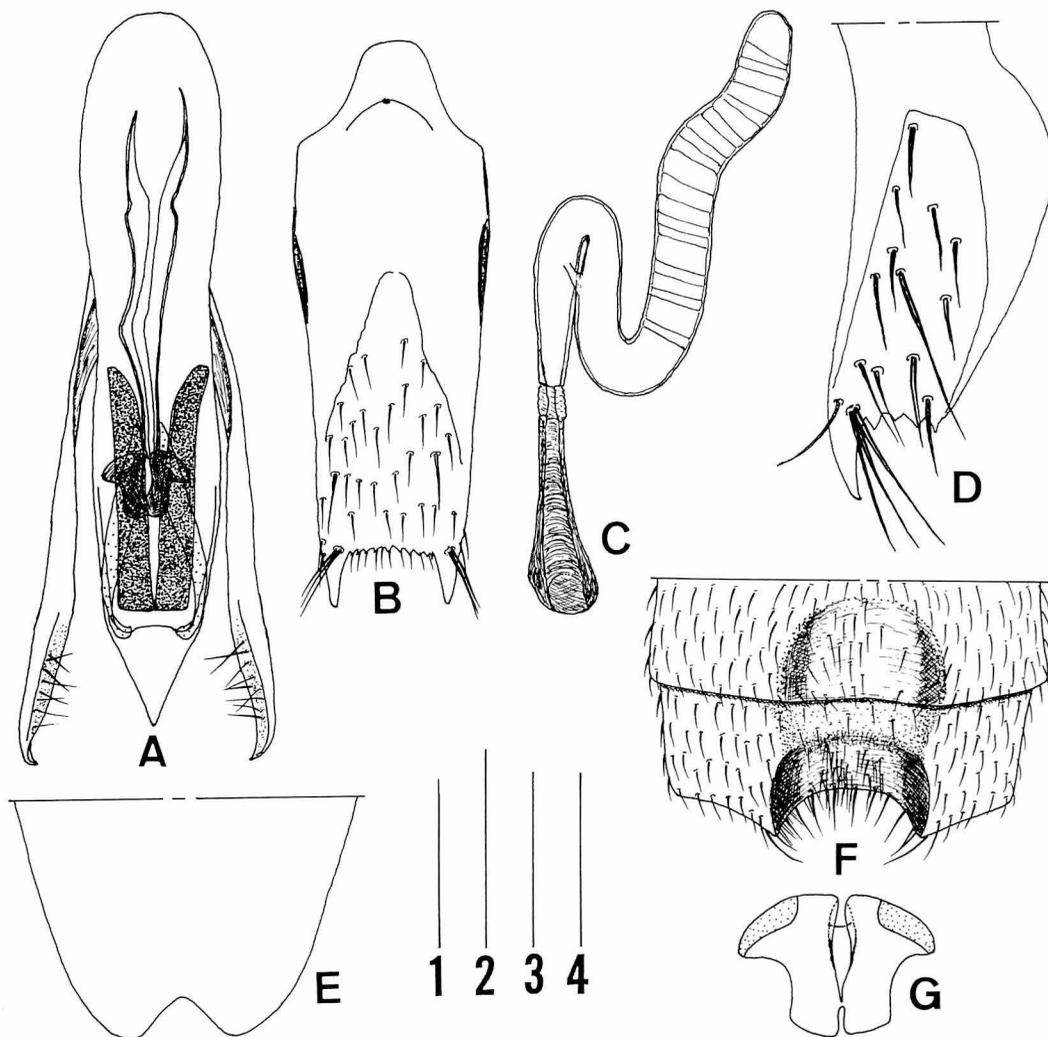


Fig. 11. *S. volkeri* Naomi (Mikusa, Osaka). A, Aedeagus; B, 9th sternite of male; C, spermatheca; D, 9th sternite of female; E, 8th sternite of male; F, 6th and 7th sternites of male; G, median hooks of endophallus. Scale 1: 0.25 mm for F; scale 2: 0.25 mm for E; scale 3: 0.2 mm for A, B; scale 4: 0.1 mm for C, D, G.

data as holotype.

Distribution. Honshu (Osaka Pref.).

Remarks. *S. volkeri* is most closely allied to *S. testaceopiceus* when considering the apomorphic similarities found not only in the median hooks and basal tube, but also in the 7th sternite of male (namely, the deep and short depression on posteromedian part), but the median lobe of aedeagus is much more slender and very shallowly loosely narrowed near the middle, the median longitudinal band is narrower, the median hook is smaller and strongly protruded anterolaterally, and the paramere is dorsoventrally flat in the

basal 1/3.

This species was first described by Naomi (1998a) based on 1 male and 1 female from Osaka Pref., but after the description the additional specimens were not collected. In the 9th sternite of male (Fig. 11B), the lateral side is slightly rolled dorsally due to a damage by the repeated immersion of KOH solution. Its natural condition is considered to be "more rounded" as in the other members of *S. rufescens* group.

***Stenus (Hypostenus) pubicornis* Naomi**

(Figs. 12A-G)

*Stenus (Hypostenus) pubicornis* Naomi, 1998a, Ent. Sci., 1(3): 387; Herman, 2001, Bull. Amer. Mus. Nat. Hist., (265): 2357; Puthz and Naomi, 2003, Newsl. Staphyl. Soc. Jpn., (20): 7; Smetana, 2004, Cal. Pal. Col., 2: 550. Male and female. Brachypterous, 3.1-3.4 mm in length, moderately shining. Head dark reddish brown to dark brown, but anterior part of interocular area reddish brown; pronotum and elytra clear reddish brown; abdomen dark reddish brown, with apical segments a little darker; antennae yellowish brown in basal segments, reddish brown to brown in apical segments; legs clear reddish brown.

Relative measurements: HL: 30; HW: 50; PL: 38; PW: 38; EL: 37; SL: 30; EW: 42.

Head transverse, interocular area with a pair of longitudinal depressions converging anteriorly, moderately deep, median part between the depressions moderately convex; surface uniformly with punctures moderately dense, small, round and distinct, interstices distinctly microsculptured. Pronotum with surface very weakly uneven, median longitudinal depression shallow, with its bottom distinctly microsculptured; punctures very dense, coarse and round, and interstices distinctly microsculptured. Elytra moderately rounded laterally; surface weakly uneven, with punctures very dense, round and somewhat coarse, interstices very narrow, indistinctly microsculptured. Abdomen strongly cylindrical; 3rd segment with anterolateral fovea oval and open behind, less than half the length of segment, remnant of tergo-paratergal suture found only at the anterior part of segment; 3rd tergite with punctures moderately dense, round to elliptical, distinct and small, interstices indistinctly microsculptured; 7th tergite with punctures fine, elliptical and sparse, interstices indistinctly microsculptured.

Male. Third sternite flat at posteromedian part; 4th and 5th sternites each very shallowly depressed in posteromedian part; 6th sternite (Fig. 12F) with a shallow semicircular depression at posteromedian part, its posterior margin shallowly arcuate; 7th sternite (Fig. 12F) with a large, deep or moderately deep depression at median part, its side ridges bluntly edged, its

posterior margin moderately arcuate; 8th sternite (Fig. 12C) with a wide and moderately deep emargination at posteromedian part; 9th sternite (Fig. 12D) with side margin rounded around lateral corner, apicolateral projections short and pointed. Aedeagus (Fig. 12E) with median lobe large, broadest a little before the middle, obtusely angulate at apicolateral corner, apical sclerotized area subtriangular and acutely pointed at apex, with apicolateral margin weakly arcuate, its internal margin narrowly arcuate; median longitudinal bands each moderately broad, rounded apically, with its dorsally held portion reaching anteriorly near the middle of median hook; median hooks (Fig. 12B) connected each other by a curved rod, each moderately but broadly arcuate at postero-external part, minutely pointed at the middle of latero-external margin, obtusely pointed at anterior tip; basal tube stout, sperm sac with basal shafts almost equal in length, basal constriction small but distinct, tube body thick, weakly sinuate and pointed at apex; parameres extending posteriorly beyond the apex of median lobe, the apical part very acutely pointed at tip, its apico-internal part short, with setae occurring before and behind the apico-internal corner, short to moderately long, and 15 to 16 in number.

Female. Ninth sternite (Fig. 12G) with apico-external projection gently incurved and acutely pointed, apico-external tuft and median seta long; spermatheca (Fig. 12A) with capsule small, RT-duct thick, spermathecal duct relatively thin and long, loosely coiled, basal sclerotized duct short, and the most anterior part of duct not reaching anteriorly the base of capsule.

Type specimens examined. Holotype: ♂, Reiganji, Hirogawa-cho, Wakayama Pref., 11. xii. 1985, I. Matoba leg.; 1 ♂ 2 ♀, same data as holotype.

Distribution. Honshu (Wakayama Pref.).

Remarks. *S. pubicornis* was first described by Naomi (1998a), but after the description, additional specimens have not been collected. This species is allied to *S. testaceopiceus* and *S. volkeri*, but the depression on the 7th sternite of male is larger and longer, the median longitudinal band of endophallus is narrower, almost parallel-sided and rounded apically, the median hook of endophallus is more elongate especially at its posterior half, the setae of paramere occur not only on the apico-internal area, but also

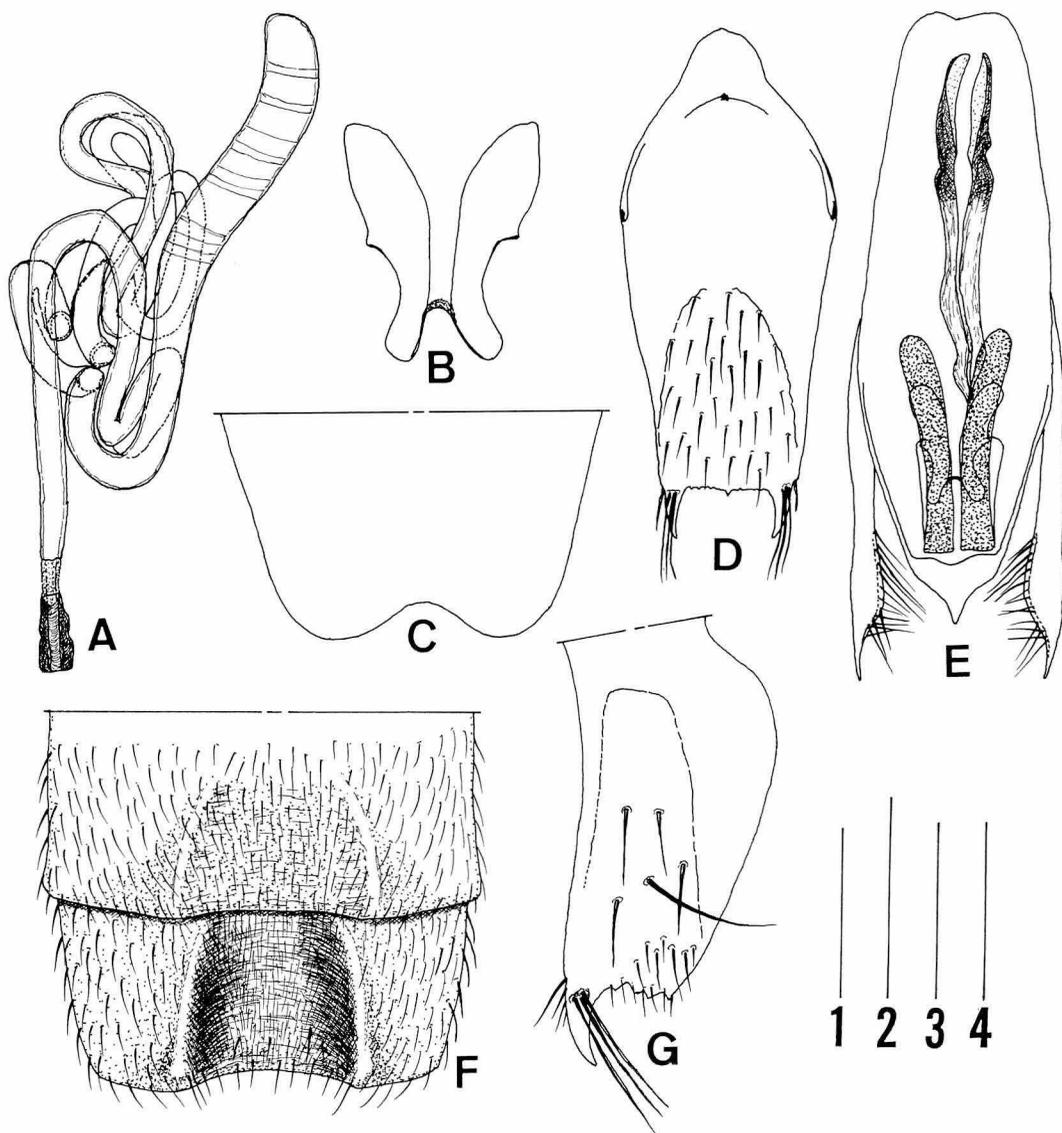


Fig. 12. *S. pubicornis* Naomi (Reiganji, Wakayama). A, spermatheca; B, median hooks of endophallus; C, 8th sternite of male; D, 9th sternite of male; E, aedeagus; F, 6th and 7th sternites of male; G, 9th sternite of female. Scale 1: 0.25 mm for F; scale 2: 0.25 mm for C; scale 3: 0.2 mm for D, E; scale 4: 0.1 mm for A, B, G.

along the internal margin before the apico-internal corner, and the spermathecal duct is much more longer and the basal sclerotized duct is shorter.

***Stenus (Hypostenus) ohtoensis***  
**Naomi sp. nov.**  
 (Figs. 13A-H)

Male and female. Brachypterous, 3.0-3.3 mm in length, moderately shining. Head black to

dark red; pronotum dark reddish brown to dark red; elytra dark yellowish brown to dark red; abdomen reddish brown through dark red to dark brown; antennae reddish brown to dark brown; legs reddish brown to brown.

Relative measurements: HL:23; HW:39; PL:28; PW:28; EL:28; SL:22; EW:34.

Head transverse, interocular area with a pair of longitudinal depressions converging anteriorly, median part between the depressions moderately convex, elongate-ovoidal in shape; surface

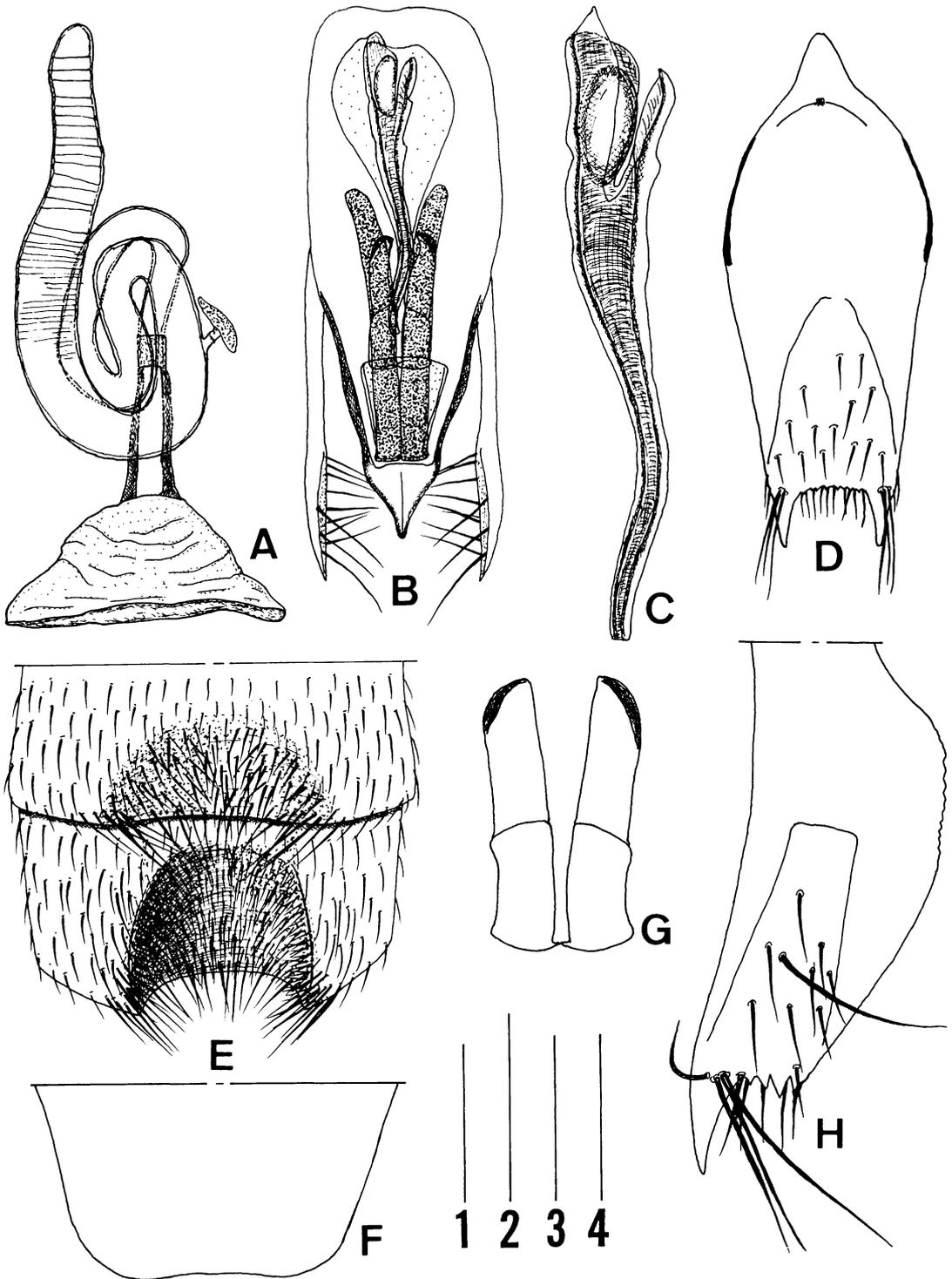


Fig. 13. *S. ohtoensis* sp. nov. (Ohto, Wakayama). A, Spermatheca; B, aedeagus; C, basal tube of endophallus; D, 9th sternite of male; E, 6th and 7th sternites of male; F, 8th sternite of male; G, median hooks of endophallus; H, 9th sternite of female. Scale 1: 0.25 mm for E; scale 2: 0.25 mm for F; scale 3: 0.2 mm for B, D; scale 4: 0.1 mm for A, C, G, H.

uniformly with punctures moderately dense, relatively small, round, distinct and somewhat irregular, interstices distinctly microsculptured. Pronotum with surface weakly uneven, median longitudinal depression long, shallow, somewhat vague in outline; punctures very dense, round to almost round, and coarse, interstices distinctly microsculptured. Elytra rounded laterally; surface almost smooth or very weakly uneven, with punctures very dense, round to almost round, various in size, interstices very narrow, distinctly microsculptured. Abdomen cylindrical; 3rd segment with anterolateral fovea subelliptical and relatively deep, about 2/5 the length of segment, remnant of tergo-paratergal suture found only at the anterior part of segment; 3rd tergite with punctures moderately dense, round and regular, interstices indistinctly microsculptured; 7th tergite with punctures very fine and regular, interstices indistinctly microsculptured.

Male. Third to 5th sternites each furnished posteromedially with setae suberect and relatively long; 6th sternite (Fig. 13E) posteromedially with a very broad and shallow depression, its posterior margin very weakly arcuate; 7th sternite (Fig. 13E) posteromedially with a C-shaped and very deep depression, its side ridges sharply edged and its posterior margin moderately deeply arcuate; 8th sternite (Fig. 13F) very shallowly arcuate at posterior margin; 9th sternite (Fig. 13D) with side margin rounded and moderately sclerotized around lateral corner, apicolateral projections short and pointed. Aedeagus with median lobe (Fig. 13B) broad at base, narrowing apically behind the middle, side margin weakly bisinuate behind the middle, apicolateral corner rounded, apical sclerotized area subtriangular, almost pointed at apex, with a thin median longitudinal line running except for the basal part, and internal margin weakly rounded; median longitudinal bands very long and broad, with its dorsally folded portion short, broad, and extending anteriorly a little beyond the posterior margin of median hooks; median hooks (Fig. 13G) connected each other at postero-internal corners, with posterior plate distinctly separable from anterior plate by the suture, anterior plate obtusely pointed at apico-internal corner; basal tube (Fig. 13C) stout, sperm sac with left shaft shorter than right shaft, basal constriction weak but distinct,

tube body narrowing apically and weakly sinuate; parameres extending posteriorly beyond the apex of median lobe, the apical part acutely pointed at tip, apico-internal corner not or weakly swollen internally, apico-internal area with setae long to very long, 11 to 12 in number.

Female. Ninth sternite (Fig. 13H) with apico-external projection long and acutely pointed, apico-external tuft and median seta very long; spermatheca (Fig. 13A) with capsule rather small, RT-duct weakly broadened proximally, broader than capsule, spermathecal duct relatively thick, bent 4 times on its way, basal sclerotized duct relatively long, a little broadened proximally, and connected to the large submembranous conical basal porch.

Type series. Holotype: ♂ (CBM-ZI 121738), Mt. Ohto, Wakayama Pref., 28-29. vi. 1981, S. Naomi leg. Paratypes: 9♂9♀, same data as holotype; 1♀ (CBM-ZI 121836), same data as holotype.

Distribution. Honshu (Wakayama Pref.).

Remarks. *S. ohtoensis* is allied to *S. cygnipennis*, but the 8th sternite of male is very shallowly arcuate, the apical sclerotized area of median lobe is incompletely provided with a thin median longitudinal line, the dorsally folded portion of the median longitudinal bands of endophalus is much shorter, the anterior plate of median hook is broader, and the spermathecal duct is thicker.

Etymology. The specific epithet of this new species is derived from the name of type locality (Ohto).

***Stenus (Hypostenus) cygnipennis* Puthz**  
(Figs. 14A-G)

*Stenus (Hypostenus) cygnipennis* Puthz, 2001, Rev. Suis. Zool., 108(1): 52; Puthz and Naomi, 2003, Newsl. Staphyl. Soc. Jpn., (20): 7; Smetana, 2004, Cat. Pal. Col., 2: 548.

Male and female. Brachypterous, 3.0-3.7 mm in length, strongly shining on head, moderately shining on pronotum, elytra and abdomen. Head pitchy black; pronotum and elytra yellowish brown to reddish brown; abdomen reddish brown through dark reddish brown to dark brown; antennae pale yellowish brown to reddish brown in basal segments, reddish brown to dark brown in apical segments; legs yellow to pale yellowish red.

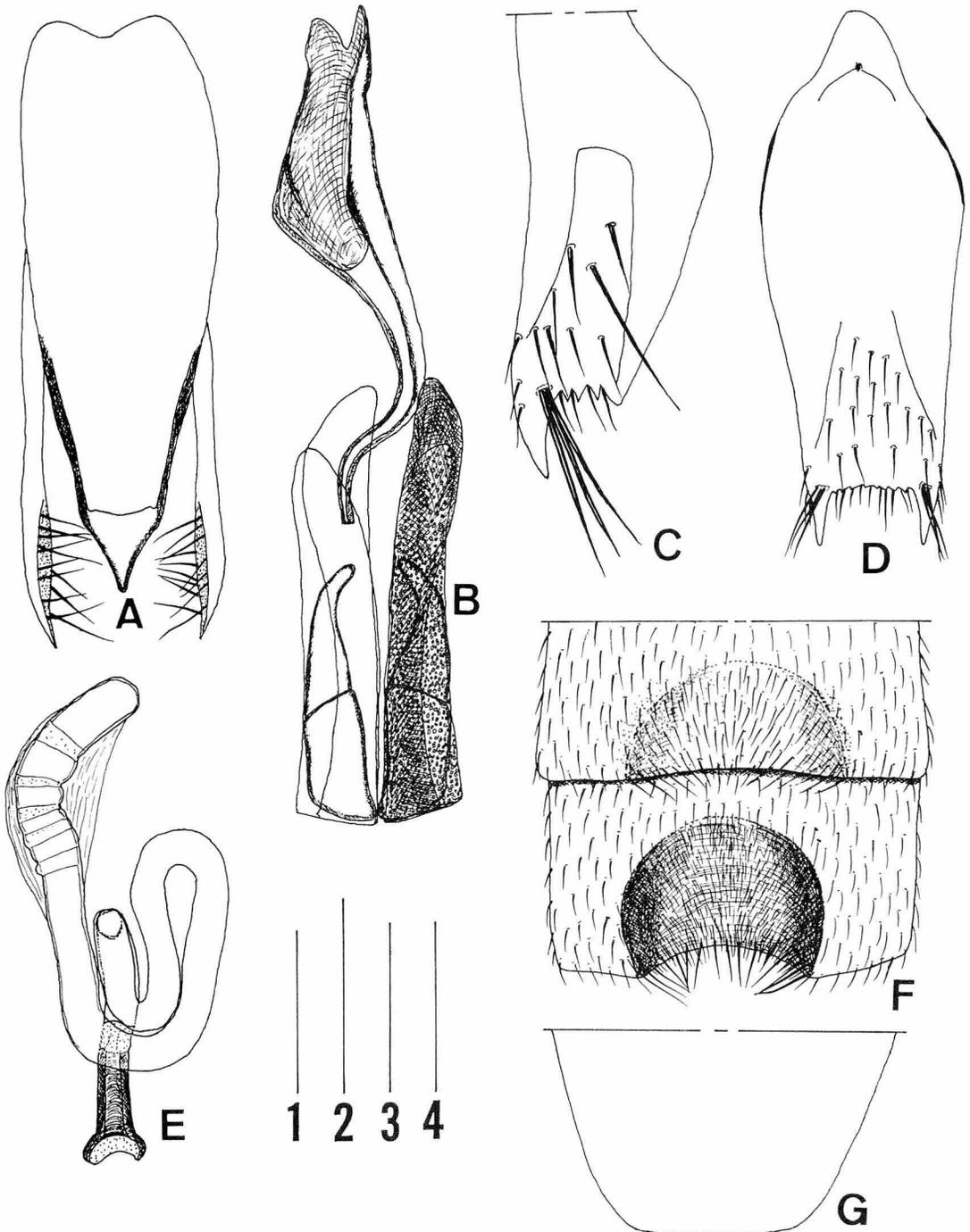


Fig. 14. *S. cygnipenis* Puthz (Hirai, Wakayama). A, aedeagus without endophallus; B, endophallus; C, 9th sternite of female; D, 9th sternite of male; E, spermatheca; F, 6th and 7th sternites of male; G, 8th sternite of male. Scale 1: 0.25 mm for F; scale 2: 0.25 mm for G; scale 3: 0.2 mm for A, D; scale 4: 0.1 mm for B, C, E.

Relative measurements: HL:32; HW:51; PL:38; PW:38; EL:39; SL:28; EW:45.

Head transverse, interocular area with a pair

of longitudinal depressions convergent anteriorly, median part between the depressions moderately convex, and almost elongate triangular in

shape; surface uniformly with punctures moderately dense, relatively small, round, distinct and somewhat irregular, interstices distinctly but shallowly microsculptured. Pronotum with surface weakly uneven, median longitudinal depression long, shallow, broadest near the middle, and indistinct in outline; punctures very dense, round and somewhat coarse, interstices distinctly microsculptured. Elytra gently rounded laterally; surface somewhat flat on sutural area; punctures very dense, round and distinct, interstices very narrow, almost distinctly microsculptured. Abdomen cylindrical; 3rd segment with anterolateral fovea ovoidal, a little shorter than the length of segment, and with the short and very thin ridge (remnant of paratergite) at the anterior part; 3rd tergite with punctures dense, relatively small, round, distinct and regular, interstices indistinctly microsculptured; 7th tergite with punctures very fine and sparse, interstices with fine sculptures running transversely.

Male. Third to 5th sternites each flat on posteromedian part, the flat area becoming larger from 3rd to 5th sternites, the posterior margin of flat area straight in 5th sternite; 6th sternite (Fig. 14F) posteromedially with a semi-circular depression very large, broad and shallow, its posterior margin shallowly arcuate; 7th sternite (Fig. 14F) posteromedially with a C-shaped depression very large and very deep, its side ridges sharply edged, its posterior margin moderately deeply arcuate; 8th sternite (Fig. 14G) almost straight at posterior margin; 9th sternite (Fig. 14D) with side margin almost rounded around lateral corner, apicolateral projections almost acutely pointed. Aedeagus (Fig. 14A) with median lobe moderately bulbous at basal half, narrowing apically, with side margin very weakly bisinuate behind the middle, apicolateral corner obtusely angulate, apical sclerotized area almost triangular, pointed at apex, without median longitudinal line, its internal margin weakly arcuate; median longitudinal band (Fig. 14B) very broad, shorter than its dorsally folded portion; median hook (Fig. 14B) with posterior plate trapezoidal, distinctly separable from anterior plate by oblique line, the anterior plate narrowing anteriorly, and weakly incurved at apical part; basal tube (Fig. 14B) with sperm sac small, basal constriction indistinct, tube body with proximal tube

strongly projecting ventrally to form the angulate walls in pair, distal tube narrowing apically and strongly sinuate; paramere extending posteriorly beyond the apex of median lobe, the apical part not or very weakly swollen internally, acutely pointed at tip, its apico-internal area with setae 12 to 13 in number.

Female. Ninth sternite (Fig. 14C) with apico-external projection relatively large and acutely pointed, apico-external tuft and median seta very long; spermatheca (Fig. 14E) with capsule relatively long, RT-duct short, spermathecal duct with 4 bents on its way, basal sclerotized duct relatively long, with its opening area swollen.

Type specimens examined. Paratypes: 1 ♂ 1 ♀, JAPAN: Wakayama Pref., ob. Hirai, 380 m, decid. Forest, 14. 7. 1999, Puthz col.

Distribution. Honshu (Wakayama Pref.).

Remarks. *S. cygnipenis* is closely allied to *S. ohtoensis*, but the apical sclerotized area of median lobe has no median longitudinal line, its internal margin is weakly arcuate, the anterior plate of median hook is narrowed anteriorly and incurved at apical part, the proximal tube of basal tube is much larger and stouter, the distal tube of basal tube is more strongly sinuate, and the spermathecal duct and RT-duct are thinner.

***Stenus (Hypostenus) agrestis* Naomi sp. nov.**  
(Figs. 15A-F)

Male. Brachypterous, 4.6 mm in length, moderately shining. Head black; pronotum and elytra dark red; abdomen dark reddish brown in basal segments, dark brown to black in apical segments; antennae and legs yellowish brown to reddish brown.

Relative measurements. HL:51; HW:29; PL:38; PW:38; EL:40; SL:30; EW:45.

Head transverse, interocular area with a pair of longitudinal depressions converging anteriorly, median part between the depressions moderately convex, elongate-ovoidal in shape; surface uniformly with punctures moderately dense, relatively small, round, distinct and somewhat irregular, interstices distinctly microsculptured. Pronotum with surface weakly uneven, median longitudinal line relatively long, vague in outline; punctures very dense, round and coarse, interstices distinctly microsculptured. Elytra weakly rounded laterally; surface flat

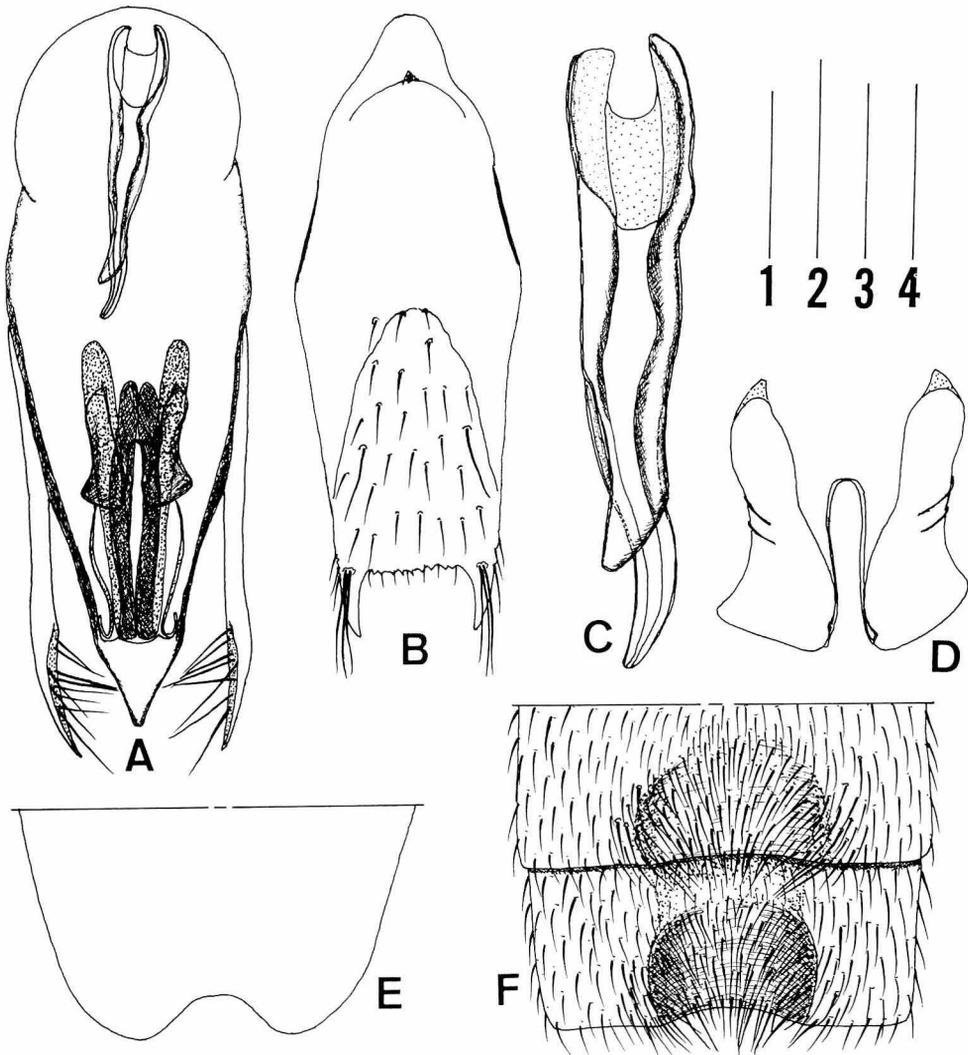


Fig. 15. *S. agrestis* sp. nov. (Nanto, Mie). A. Aedeagus; B. 9th sternite of male; C. basal tube of endophallus; D. median hooks of endophallus; E. 8th sternite of male; F. 6th and 7th sternites of male. Scale 1: 0.25 mm for F; scale 2: 0.25 mm for E; scale 3: 0.2 mm for A, B; scale 4: 0.1 mm for C, D.

along sutural area, with punctures very dense, round and somewhat coarse, interstices rather narrow, distinctly microsculptured. Abdomen well-developed and cylindrical; 3rd tergite with anterolateral fovea large and elliptical, punctate on its bottom, more than half the length of segment, and also with a thin suture of the full length of segment between tergite and sternite; 3rd tergite with punctures dense to moderately dense, round, distinct, and becoming smaller toward posterior margin, interstices indistinctly microsculptured; 7th tergite with punctures moderately dense, fine and regular, interstices

distinctly microsculptured.

Third to 5th sternites each flat on posteromedian part; 6th sternite (Fig. 15F) posteromedially with a semicircular depression shallow, its posterior margin very weakly arcuate; 7th sternite (Fig. 15F) anteromedially with a large depression which continues to posteromedian depression C-shaped, with its side ridges obtusely edged, its posterior margin gently arcuate; 8th sternite (Fig. 15E) with a large and broad emargination at posterior margin; 9th sternite (Fig. 15B) with side margin weakly bisinuate before lateral

corner, apicolateral projection weakly incurved and acutely pointed. Aedeagus (Fig. 15A) with median lobe spherical at basal part, moderately constricted just behind this spherical portion, broadest near anterior 3/7, then narrowing apically, with side margin very weakly bisinuate behind the anterior 3/7, apicolateral corner obtusely angulate, apical sclerotized area triangular, almost pointed at apex, without median longitudinal line, its internal margin bidentate; median longitudinal band long and slender, and longer than its dorsally folded portion; lateral longitudinal band very thin, reaching anteriorly the posterior margin of median hook; median hooks (Fig. 15D) connected each other by U-shaped thin rod, posterior plate expanded latero-externally, anterior plate rounded apically, with a submembranous subtriangular flap; basal tube (Fig. 15C) with sperm sac large but indistinguishable from tube body because of its vague basal constriction, tube body with proximal tube with a short horn-like projection at apicoventral part, distal tube short and weakly curved; parameres a little extending posteriorly beyond the apex of median lobe, the apical part not or hardly swollen internally, very acutely pointed at tip, its apico-internal area with setae moderately long, 8 to 10 in number.

Female. Unknown.

Type series. Holotype: ♂ (CBM-ZI 121780), Nanto, Mie Pref., 26. ii. 1987, A. Amagasu leg.

Distribution. Honshu (Mie Pref.).

Remarks. *S. agrestis* is allied to *S. olliformis*, but the depression of the 6th sternite of male is larger, the base of the 9th sternite of male is more weakly indistinctly constricted, the median hook of endophallus is broadened posteriorly, and is well angulate at the postero-external corner, the basal constriction of basal tube is very vague, and the short horn-like projection is found at the apicoventral portion of its proximal tube.

Etymology. The specific epithet of this new species is derived from a Latin adjective "*agrestis*" that pertains to "field" or "country".

***Stenus (Hypostenus) olliformis***

**Naomi sp. nov.**

(Figs. 16A-H)

Male and female. Brachypterous, 3.9-4.5 mm in length, moderately shining. Head black;

pronotum and elytra dark red; abdomen dark red in basal segments, dark brown in apical segments; antennae yellowish brown to dark yellowish brown; legs yellowish brown to reddish brown.

Relative measurements: HL:30; HW:50; PL:40; PW:39; EL:40; SL:31; EW:45.

Head transverse, interocular area with a pair of longitudinal depressions convergent anteriorly, median part between the depressions moderately convex, almost elongate-elliptical in shape; surface uniformly with punctures moderately dense, relatively small, distinct, round and somewhat irregular, interstices distinctly microsculptured. Pronotum with surface slightly uneven, median longitudinal depression relatively long, moderately deep and broad at its median part, and almost distinct in outline, with its bottom covered with distinct microsculptures which consists of minute facets; punctures very dense, round and coarse, interstices distinctly microsculptured. Elytra rounded laterally; surface weakly uneven, with punctures very dense, round and coarse, interstices almost distinctly microsculptured. Abdomen cylindrical; 3rd tergite with anterolateral fovea subovoidal, shallow, open behind, and about half the length of segment, and with the short and very thin ridge (remnant of paratergite) at the anterior part; 3rd tergite with punctures dense, round, distinct and almost regular, interstices indistinctly microsculptured; 7th tergite with punctures fine and regular, interstices distinctly microsculptured.

Male. Third to 5th sternites each flat on posteromedian part, the flat area becoming larger from 3rd to 5th sternites; 6th sternite (Fig. 16G) posteromedially with a semicircular depression moderately deep and relatively small, its side margins obtusely edged, its posterior margin weakly arcuate; 7th sternite (Fig. 16G) anteromedially with a large depression which continues to posteromedian depression, the posteromedian depression moderately deep, its side ridges distinctly edged and its posterior margin shallowly arcuate; 8th sternite (Fig. 16H) with a large almost V-shaped emargination at posterior margin; 9th sternite (Fig. 16D) moderately distinctly constricted at base, with side margin moderately sclerotized between the constriction and the lateral corner, posterolateral projection sharply pointed. Ae-

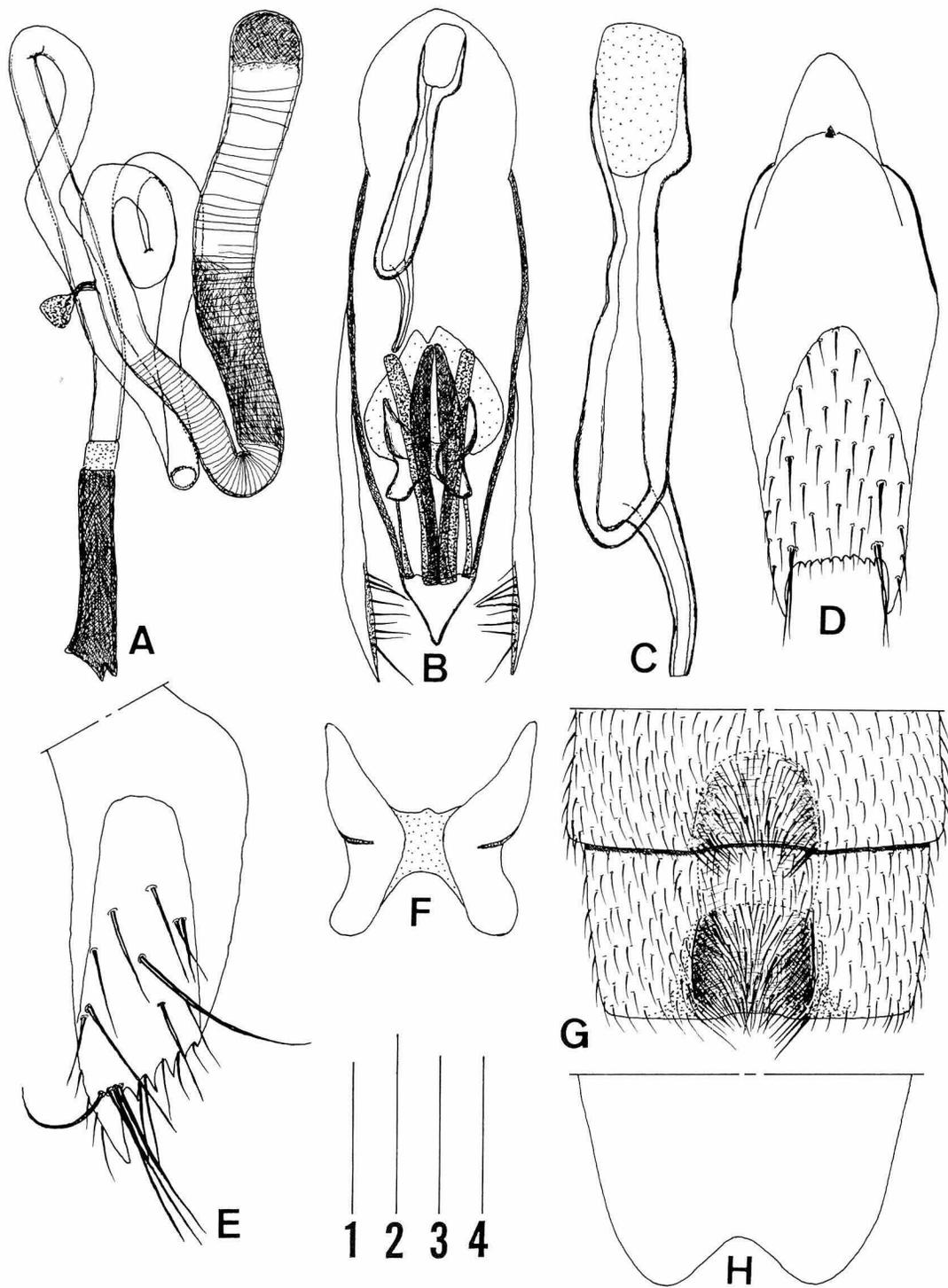


Fig. 16. *S. olliformis* sp. nov. (Inamura, Nara). A, Spermatheca; B, aedeagus; C, basal tube of endophallus; D, 9th sternite of male; E, 9th sternite of female; F, median hooks of endophallus; G, 6th and 7th sternites of male; H, 8th sternite of male. Scale 1: 0.25 mm for G; scale 2: 0.25 mm for H; scale 3: 0.2 mm for B, D; scale 4: 0.1 mm for A, C, E, F.

deagus (Fig. 16B) with median lobe weakly bulbous or subspherical at base, moderately constricted just behind this subspherical portion, side margin weakly rounded near the middle, and very weakly bisinuate behind the middle, apicolateral corner very obtuse, apical sclerotized area almost triangular, pointed at apex, with its internal margin very weakly arcuate; median longitudinal bands each narrow and long, about as long as its dorsally folded portion; lateral longitudinal bands very thin, reaching anteriorly the posterior margins of median hooks; median hooks (Fig. 16F) connected each other by broad submembranous plate, posterior plates each rounded at posterior margins, anterior plates weakly divergent anteriorly, and obtusely pointed at apices; basal tube (Fig. 16C) with sperm sac subrectangular, basal constriction large but very loose, tube body with proximal tube broadened apically, rounded at apical margin, and distinctly demarcated from distal tube, the distal tube short and weakly curved; parameres extending posteriorly beyond the apex of median lobe, the apical part not swollen internally, very acutely pointed, its apico-internal area with setae short to relatively short, 9 in number.

Female. Ninth sternite (Fig. 16E) with apico-external projection acutely pointed, apico-external tuft and median seta very long; spermatheca (Fig. 16A) with capsule relatively large, much rounded and moderately sclerotized, RT-duct very long, partially sclerotized, extending proximally beyond the 1st bent when counted from the apex, spermathecal duct very loosely coiled, with 6 bents on its way, basal sclerotized duct long, only very weakly broadened proximally; spermathecal gland situated near the middle of the duct between 1st and 2nd bents when counted from the apex.

Type series. Holotype: ♂ (CBM-ZI 121821), Mt. Inamura, Oomine, Nara Pref., 16. vi. 1995, T. Ito leg. Paratypes, 1 ♀ (CBM-ZI 121878), same data as holotype; 2 ♂ 1 ♀, same locality, 23. vii. 1994, T. Ito leg.; 1 ♂, same locality, 22. vii. 1994, T. Ito leg.; 1 ♂, same locality, 11. vi. 1993, T. Ito leg.; 2 ♀, same locality, 17. vi. 1995, T. Ito leg.

Distribution. Honshu (Nara Pref.).

Remarks. *S. olliformis* is allied to *S. agrestis*, but the depression of the 6th sternite of male is smaller, the posterior plate of median hook is

not broadened posteriorly but simply rounded at the posterior margin, the basal constriction of basal tube is large but very loose, the proximal tube is more or less broadened apically, and rounded at the apical margin, and the distal tube is narrower and longer.

Etymology. The specific epithet of this new species is derived from a Latin adjective “*olliformis*” because of its olliform shape of basal tube of endophallus.

***Stenus (Hypostenus) olliformis owasenus***  
**Naomi subsp. nov.**  
 (Figs. 17A-C)

Description of some characters of male. Third to 4th sternites each flat at posteromedian part; 5th sternite very shallowly depressed at posteromedian part, its posterior margin very feebly arcuate; 6th sternite posteromedially with a semicircular depression, its posterior margin shallowly arcuate; 7th sternite posteromedially with a depression moderately deep, with its side ridges distinctly edged and its posterior margin moderately arcuate. Aedeagus with median longitudinal bands (Fig. 17A) moderately divergent anteriorly, long but distinctly shorter than the dorsally folded portions; lateral longitudinal bands (Fig. 17A) very thin and long, reaching anteriorly near the middle of median hooks; median hooks (Fig. 17C) connected each other by a broad submembranous plate, with posterior plate almost straight or rounded at posterior margin, partially separable from anterior plate by the oblique line, anterior plate well angulate at postero-external corner and pointed at anterior tip; basal tube (Fig. 17B) with sperm sac subrectangular, basal constriction large but very loose, tube body with proximal tube broadened apically, and rounded at posterior margin, demarcation between proximal tube and distal tube very distinct, distal tube relatively short and weakly curved.

Female. Unknown.

Type series. Holotype: ♂ (CBM-ZI 121794), Sugari, Owase City, Mie Pref., 13. i. 1996, H. Yokozeki leg.

Distribution. Honshu (Mie Pref.).

Remarks. *S. olliformis owasenus* is separable from the nominotypical subspecies by the characters mentioned in the key.

Etymology. The subspecific epithet of this

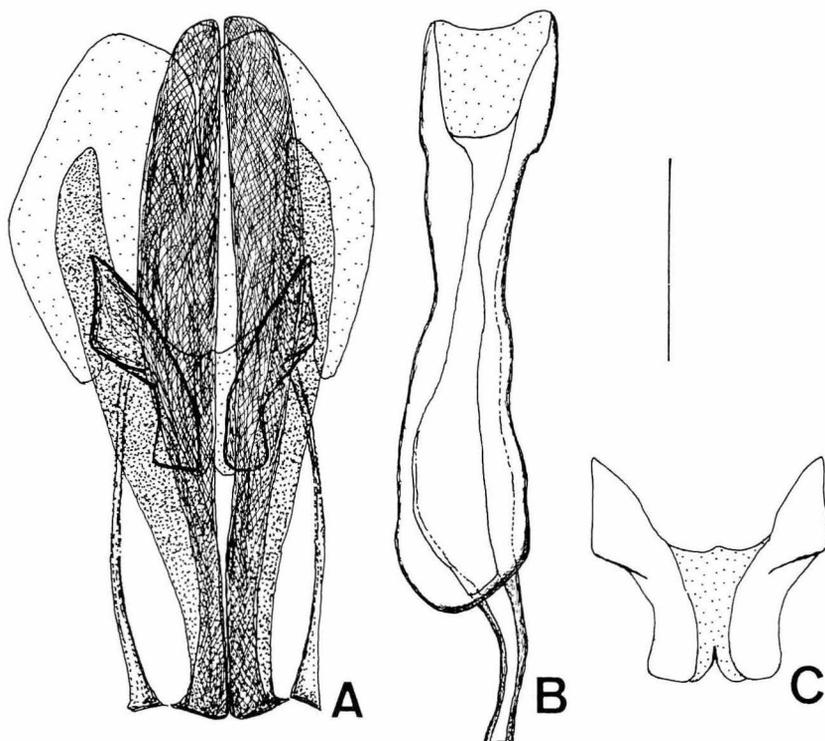


Fig. 17. *S. olliformis owasenus* subsp. nov. (Owase, Mie). A. Posterior part of endophallus; B, basal tube of endophallus; C, median hooks of endophallus. Scale: 0.1 mm.

new species is derived from the name of type locality (Owase).

***Stenus (Hypostenus) ebisu Naomi* sp. nov.**  
(Figs. 1B; 18A-H)

Male and female. Brachypterous, 3.8-4.0 mm in length, moderately to strongly shining. Head black to dark red; pronotum and elytra reddish brown to dark reddish brown; abdomen clear reddish brown in basal segments, dark reddish brown to dark brown in apical segments; antennae yellowish brown to dark yellowish brown; legs yellowish brown to reddish brown.

Relative measurements: HL:29; HW:52; PL:38; PW:39; EL:40; SL:32; EW:45.

Head transverse, interocular area with a pair of longitudinal depressions convergent anteriorly, median part between the depressions moderately convex, elongate-triangular or elongate-elliptical in shape; surface uniformly with punctures moderately dense, relatively small, round, distinct and somewhat irregular, interstices distinctly but shallowly microsculptured.

Pronotum with surface weakly uneven, median longitudinal depression relatively long, moderately deep, and broadest and deepest on the median part, with its bottom distinctly microsculptured; punctures very dense, round to almost round, coarse, interstices distinctly microsculptured. Elytra gently rounded laterally; surface almost flat along suture, with punctures very dense, round to almost round, coarse, interstices distinctly microsculptured. Abdomen cylindrical; 3rd segment with anterolateral fovea subovoidal, moderately deep, and about half the length of segment, also with a thin suture of the full length of segment between tergite and sternite; 3rd tergite with punctures moderately dense, round and regular, interstices distinctly microsculptured; 7th tergite with punctures very fine and regular, interstices feebly and rather minutely sculptured.

Male. Third to 5th sternites each flat on posteromedian part, the flat areas on 4th and 5th sternites more distinct than that on 3rd sternite; 6th sternite (Fig. 18G) posteromedially with a C-shaped depression moderately deep,

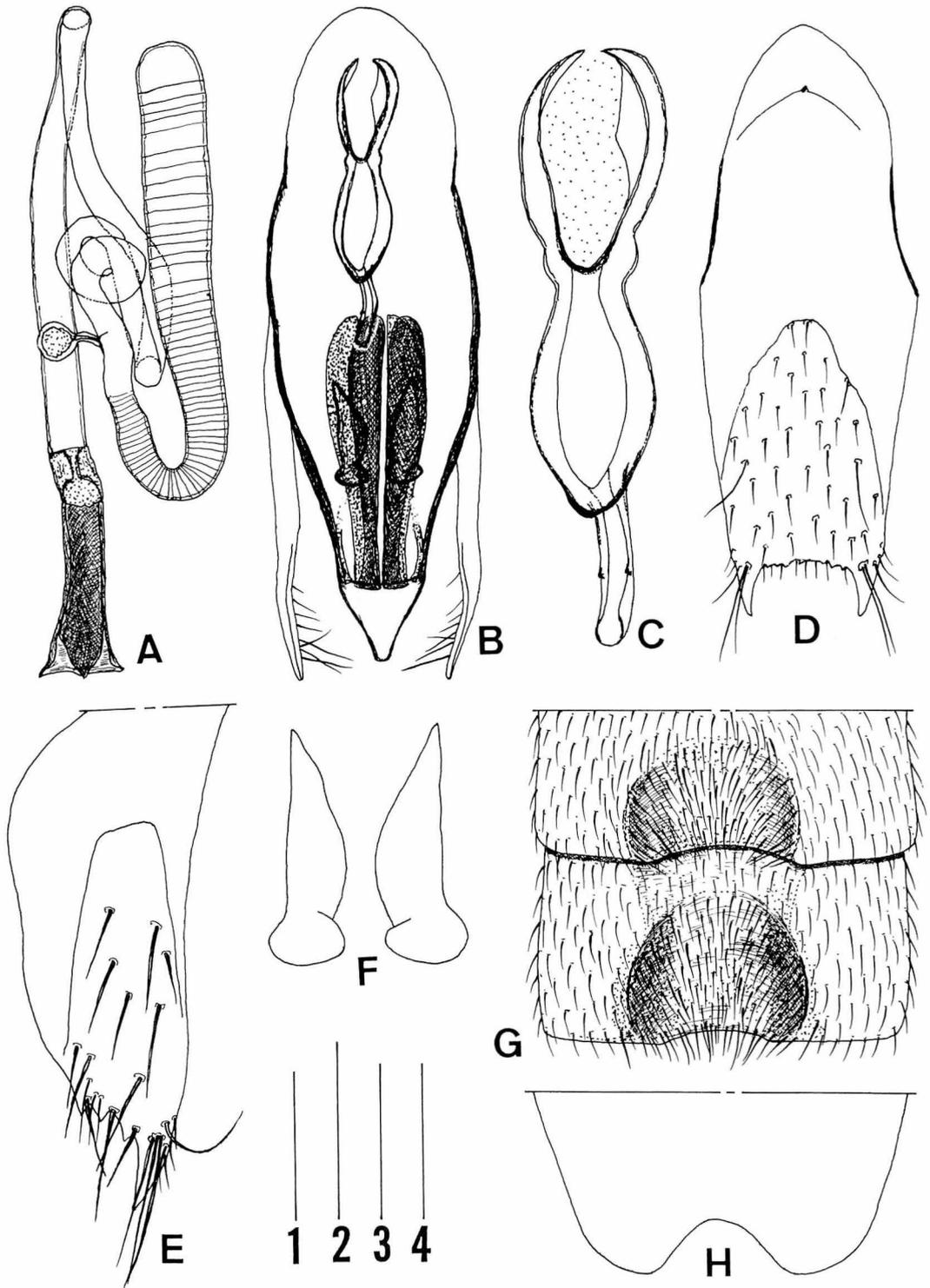


Fig. 18. *S. ebisu* sp. nov. (Ohdaigahara, Nara). A, Spermatheca; B, aedeagus; C, basal tube of endophallus; D, 9th sternite of male; E, 9th sternite of female; F, median hooks of endophallus; G, 6th and 7th sternites of male; H, 8th sternite of male. Scale 1: 0.25 mm for G; scale 2: 0.25 mm for H; scale 3: 0.2 mm for B, D; scale 4: 0.1 mm for A, C, E, F.

its side margins distinctly edged and its posterior margin moderately arcuate; 7th sternite (Fig. 18G) anteromedially with a broad depression which continues to posteromedian depression, the posteromedian depression almost C-shaped and moderately deep, its side ridges distinctly edged and its posterior margin shallowly arcuate; 8th sternite (Fig. 18H) with a large emargination at posterior margin; 9th sternite (Fig. 18D) with side margin weakly arcuate and moderately sclerotized before lateral corner, apicolateral projections short and acutely pointed. Aedeagus (Fig. 18B) with median lobe bulbous at base, weakly constricted just behind the bulbous base, side margin gently rounded and very weakly bisinuate between the constriction and apicolateral corner, the apicolateral corner obtusely angulate but distinct, apical sclerotized area subtriangular, narrowly rounded at apex, its internal margin very weakly arcuate; median longitudinal bands long, each gradually broadened anteriorly, about as long as its dorsally folded portion; lateral longitudinal bands very thin and weakly curved, reaching anteriorly the posterior margin of median hooks, but their anterior halves submembranous; median hooks (Fig. 18F) with posterior plate small and subcircular, partially separated from anterior plate, the anterior plate narrowing anteriorly and pointed at tip; basal tube (Fig. 18C) very characteristically olliform in shape (namely, gourd-shaped), sperm sac very large and subspherical, basal constriction distinct, tube body with proximal tube subfusiform, almost rounded at apical margin, about as large as sperm sac, its distal tube relatively short, with paired minute denticles at the middle of ventral rims; parameres extending posteriorly a little beyond the apex of median lobe, the apical part weakly curved internally and gradually, thin apically, without distinct apico-internal corner, its apicalmost portion pointed but not very acutely pointed, its apico-internal area with setae very short through short to moderately long, 8 in number.

Female. Ninth sternite (Fig. 18E) with apico-external projection very acutely pointed; spermatheca (Fig. 18A) with capsule short but broad, rounded at apical margin, RT-duct gradually narrowing proximally, and extending proximally beyond the 1st bent when counted from the apex; spermathecal duct, with 6 bents

on its way, basal sclerotized duct long and relatively broad, weakly broadened at opening area; spermathecal gland situated near the middle of the duct between 1st and 2nd bents when counted from the apex.

Type series. Holotype, ♂ (CBM-ZI 121709), Ohdaigahara, Nara Pref., 29. v. 1985, S. Nomura leg. Paratypes: 1 ♀ (CBM-ZI 121793), same data as holotype; 6 ♀, same data as holotype; 1 ♂ 2 ♀, same locality, 25-26. vi. 1981, S. Naomi leg.

Distribution. Honshu (Nara Pref.).

Remarks. *S. ebisu* is very distinctive in having the very characteristic basal tube of endophallus. The basal tube is, namely, gourd-shaped as described above, and by this unique character, this new species is easily distinguishable from all the other members of *S. rufescens* group.

Etymology. The specific epithet of this new species is derived from a name of the Japanese gods of fortune, Ebisu.

***Stenus (Hypostenus) ichikawai***

**Naomi sp. nov.**

(Figs. 19A-H)

Male and female. Brachypterous, 2.9-3.8 mm in length, moderately shining. Head dark red to black; pronotum and elytra dark red; abdomen dark red to black, sometimes with anterior segments a little lighter in color than posterior segments; antennae and legs yellowish brown to reddish brown.

Relative measurements: HL:32; HW:55; PL:40; PW:42; EL:43; SL:30; EW:48.

Head transverse, interocular area with a pair of longitudinal depressions shallow and gently converging anteriorly, median part between the depressions weakly convex and elongate-triangular in shape; surface with punctures dense, round, distinct and somewhat umbilicate, and interstices distinctly or faintly microsculptured near inner margins of eyes, while punctures moderately dense to dense, round, and interstices distinctly or indistinctly microsculptured on the median part. Pronotum with surface weakly uneven, median longitudinal depression vague in outline, with its bottom distinctly microsculptured; punctures very dense, somewhat rough and round, interstices distinctly microsculptured. Elytra rounded laterally; surface weakly uneven, with punctures very dense,

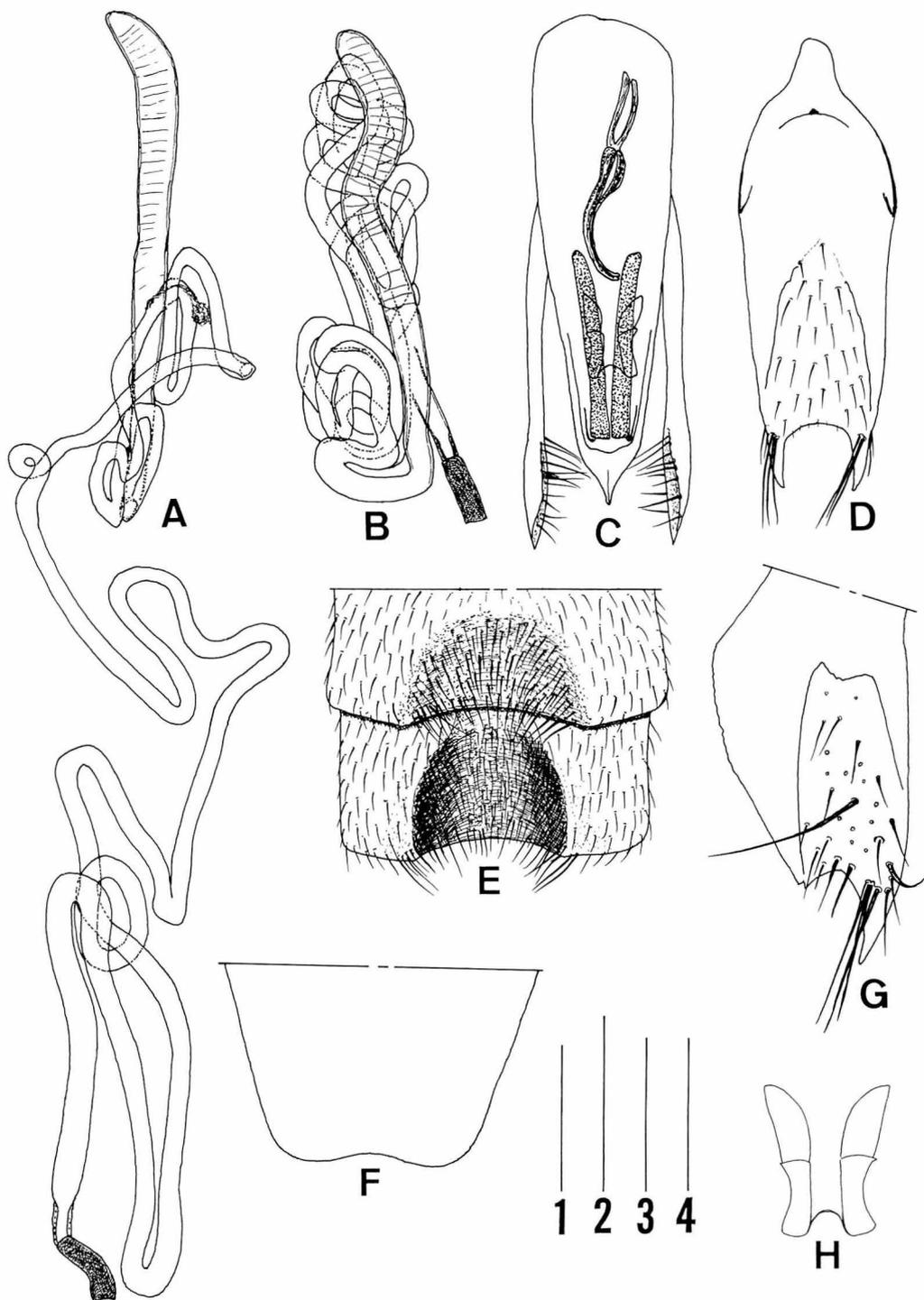


Fig. 19. *S. ichikawai* sp. nov. A, Spermatheca extended to show its length and spermathecal gland (Mikizaki, Mie); B, spermatheca (Mikizaki, Mie); C, aedeagus (Mikizaki, Mie); D, 9th sternite of male (Mikizaki, Mie); E, 6th and 7th sternites of male (Nasazaki, Mie); F, 8th sternite of male (Mikizaki, Mie); G, 9th sternite of female (Mikizaki, Mie); H, median hooks of endophallus (Mikizaki, Mie). Scale 1: 0.25 mm for E; scale 2: 0.25 mm for F; scale 3: 0.2 mm for C, D; scale 4: 0.1 mm for A, B, G, H.

large, and almost regular, interstices very narrow, distinctly microsculptured. Abdomen strongly cylindrical; 3rd segment with anterolateral fovea small, rounded but weakly narrowed posteriorly, paratergite atrophied into a very narrow line or ridge which runs on the anterior 2/3 of segment; 3rd tergite with punctures moderately dense to dense, round and regular, interstices weakly microsculptured; 7th tergite with punctures very fine, sparse and regular, interstices weakly minutely sculptured.

Male. Fifth sternite broadly flat on posteromedian part; 6th sternite (Fig. 19E) posteromedially with a depression very large, broad, moderately deep and semicircular in shape, its posterior margin gently moderately arcuate; 7th sternite (Fig. 19E) posteromedially with a depression very large and deep, its lateral ridges distinctly edged, its posterior margin moderately arcuate; 8th sternite (Fig. 19F) shallowly broadly arcuate at posterior margin; 9th sternite (Fig. 19D) with apicolateral projections narrow and pointed, apicolateral tufts relatively long. Aedeagus (Fig. 19C) with median lobe moderately broad at base, almost constantly narrowing apically, apicolateral corners gently rounded, apical sclerotized area relatively small, strongly narrowed to the acutely pointed apex, narrowly arcuate at internal margin, with the thin median longitudinal line at apical half; median longitudinal bands slender, each almost equal in breadth in whole length; median hooks (Fig. 19H) with posterior plates connected each other by a U-shaped thin rod, anterior plate distinctly separated from posterior plate by transverse line, and bluntly pointed at anterior end; basal tube short, sperm sac with basal shafts each thin and slender, basal constriction distinct, tube body with proximal tube swollen, distal tube strongly curved behind the middle; parameres extending posteriorly beyond the apex of median lobe, the apical part hardly swollen internally, acutely pointed at tip, its apico-internal area with 11 to 14 setae of various lengths.

Female. Ninth sternite (Fig. 19G) with apico-external projection very acutely pointed, apico-external tuft and median seta very long; spermatheca with capsule very small, only vaguely demarcated from RT-duct, spermathecal duct very long and relatively thin, strongly coiled

and compact in natural condition (Fig. 19B), with basal sclerotized duct relatively long, straight or curved; spermathecal gland (Fig. 19A) situated near the 6th bent of duct when counted from the apex.

Type series. Holotype: ♂ (CBM-ZI 121863), Mikizaki, Mie Pref., 1. iv. 1995, N. Narukawa leg. Paratypes: 2 ♀, same data as holotype; 1 ♂ 3 ♀, Kukizaki, Kuki-cho, Owase City, Mie Pref., 28. i. 1996, K. Akita leg.; 1 ♂, same locality, 1. vi. 1996, H. Yokozeki leg.; 4 ♂ 2 ♀, same locality, 12. ii. 1996, H. Yokozeki leg.; 1 ♂, same locality, 11. iii. 1995, H. Yokozeki leg.; 3 ♂ 1 ♀, Nasazaki, Owase City, Mie Pref., 3. xi. 1997, F. Ichikawa leg.; 1 ♂, same locality, 11. iv. 1998, H. Yokozeki leg.; 1 ♀ (CBM-ZI 121892), same locality, 7. x. 1995, H. Yokozeki leg.

Distribution. Honshu (Mie Pref.).

Remarks. *S. ichikawai* is allied to *S. jukata*, but the depressions on the 6th and 7th sternites of male are larger, the emargination of 8th sternite of male is shallower, the median lobe of aedeagus is larger, the anterior plate of median hook is more obtusely pointed at tip, the basal tube of endophallus is more strongly curved behind the middle, the parameres are much shorter, the apico-external tuft of 9th sternite of female is longer, and the spermathecal duct is thinner, longer and more strongly compact.

Etymology. The specific epithet of this new species is named in honour of Mr. Futoshi Ichikawa who is a collector of paratypes.

***Stenus (Hypostenus) jukata* Hromádka**  
(Figs. 20A-G)

*Stenus (Hypostenus) jukata* Hromádka, 1982, *Fragm. Col.*, (33/34):135; Naomi, 1989a, *Check List Jpn. Ins.*, p.265; Naomi, 1990a, *Akitsu, New Ser.*, 113: 2; Naomi, 1990b, *Elytra, Tokyo*, 18(2): 204; Herman, 2001, *Bull. Amer. Mus. Nat. Hist.*, (265): 2239; Puthz, 2003, *Ent. Rev. Jpn.*, 58(1): 19; Puthz and Naomi, 2003, *Newsl. Staphyl. Soc. Jpn.*, (20):7; Smetana, 2004, *Cat. Pal. Col.*, 2: 549.

Male and female. Brachypterous, 2.7-3.0 mm in length, moderately shining. Head dark brown to dark red; pronotum and elytra reddish brown to brown; abdomen brown to dark reddish brown; antennae yellowish brown to reddish brown; legs reddish brown.

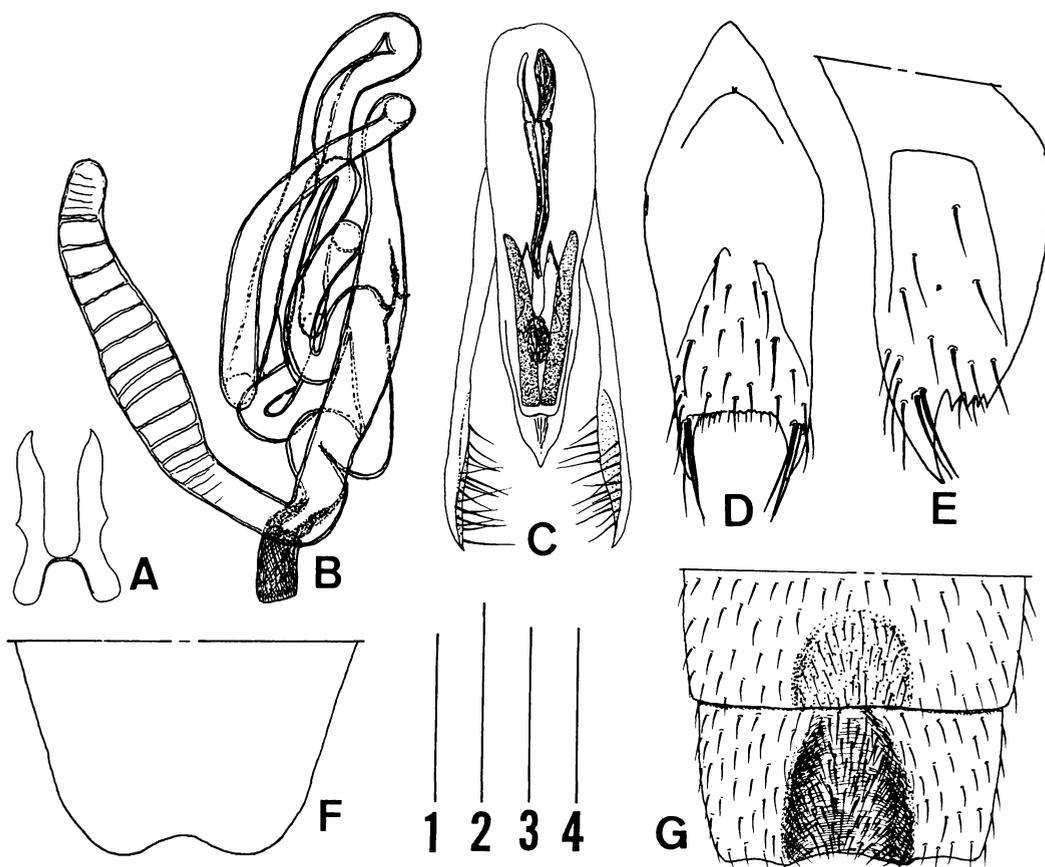


Fig. 20. *S. jukata* Hromádka. A, Median hooks of endophallus (Zenki, Nara); B, spermatheca (Inamura, Nara); C, aedeagus (Zenki, Nara), D, 9th sternite of male (Zenki, Nara); E, 9th sternite of female (Inamura, Nara); F, 8th sternite of male (Zenki, Nara); G, 6th and 7th sternites of male (Inamura, Nara). Scale 1: 0.25 mm for G; scale 2: 0.25 mm for F; scale 3: 0.2 mm for C, D; scale 4: 0.1 mm for A, B, E.

Relative measurements: HL: 31; HW: 56; PL: 36; PW: 38; EL: 35; SL: 28; EW: 43.

Head transverse, interocular area with a pair of longitudinal depressions distinctly convergent anteriorly, median part between the depressions moderately convex and elongate-triangular in shape; surface with punctures small, distinct, round, shallow, irregular and sparse, and interstices very distinctly microsculptured near inner margins of eyes, while punctures on the median part sparser than those near inner margins of eyes, and their interstices distinctly microsculptured. Pronotum with surface uneven, median longitudinal depression shallow, distinct or obscure in outline, with distinctly microsculptured bottom; punctures very dense, rough and somewhat irregular, interstices vaguely microsculptured.

Elytra rounded laterally; surface uneven, with punctures very dense, round to almost round, and large, interstices very narrow, vaguely microsculptured. Abdomen cylindrical; 3rd segment with anterolateral fovea small and oval, remnant of tergo-paratergal suture found only at the anterior part of segment; 3rd tergite with punctures moderately dense, round to oblong, distinct and almost regular, interstices about as long as the diameter of puncture, finely almost transversely microsculptured; 7th tergite with punctures fine, sparse and regular, interstices finely distinctly microsculptured.

Male. Fourth and 5th sternites each almost flat on posteromedian part; 6th sternite (Fig. 20G) posteromedially with a semicircular depression shallow, its posterior margin very shallowly arcuate; 7th sternite (Fig. 20G)

posteromedially with a depression deep or very deep, with its lateral ridges distinct or indistinct, and its posterior margin of depression moderately arcuate; 8th sternite (Fig. 20F) posteromedially with a broad emargination; 9th sternite (Fig. 20D) with apicolateral projections pointed, apicolateral tufts moderately long. Aedeagus (Fig. 20C) with median lobe slender, gradually narrowed apically, but weakly sinuate at lateral margin, without distinct apicolateral corners, apical sclerotized area small, narrowed and strongly pointed at tip, narrowly rounded at internal margin, with a vague median longitudinal line; median longitudinal bands well developed, relatively broad; median hooks (Fig. 20A) connected with each other near posterior 1/3, each rounded posteriorly, angulate near the middle of latero-external margin, with anterior tip very weakly incurved and almost sharply pointed; basal tube with sperm sac large, its left shaft larger than right one, basal constriction small but distinct, tube body weakly sinuate behind the middle; parameres very long, much extending posteriorly beyond the apex of median lobe, the apical part acutely pointed at tip, not or weakly swollen internally, its apico-internal area with setae short, and 16 to 17 in number.

Female. Eighth sternite gently rounded or vaguely angulate at the middle of posterior margin; 9th sternite (Fig. 20E) with apico-external projection acutely pointed, apico-external tufts short; spermatheca (Fig. 20B) with capsule small and rounded, RT-duct broader than capsule, spermathecal duct moderately coiled and compact, with its anterior end placed beyond the apex of capsule, basal sclerotized duct short; spermathecal gland situated near the external part of the 4th bent of duct when counted from the apex.

Specimens examined. 3♂ 1♀, Mt. Inamura, Ohmine, Nara Pref., 12. vi. 1993, T. Ito leg.; 11♂ 2♀, same locality, 5. v. 1994, T. Ito leg.; 2♀, same locality, 23. vii. 1994, T. Ito leg.; 1♂ 1♀, same locality, 6. v. 1994, T. Ito leg.; 4♂ 7♀, Dorogawa, Yamato, 2. vi. 1985, T. Ito leg.; 1♀, Dorogawa, Ohmine, Nara, 22. vii. 1994, T. Ito leg.; 1♀, same locality, 23. vii. 1994, T. Ito leg.; 1♀, same locality, 16. vi. 1995, T. Ito leg.; 3♂ 2♀, Oomine, Yamato, 1. vi. 1985, T. Ito leg.; 1♂, Zenki Val.(700m), Shimokitayama V., Nara Pref., 29. vi. 1998, S. Nomura leg.; 1♂ 1♀, Shinohara, Ohto-mura, Wakayama Pref., 26. vi.

1998, T. Kishimoto leg.; 1♂, Mt. Kohjin, Tateri, Nara Pref., 7. viii. 1966, T. Ito leg.; 1♂ 2♀, same locality, 30. vi. 1968, T. Ito leg.; 1♂ 8♀, same locality, 4. viii. 1968, T. Ito leg.; 1♂, same locality, 1. v. 1968, T. Ito leg.; 6♂ 3♀, same locality, 30. vii. 1995, T. Ito leg.; 2♂ 3♀, Mt. Wasamata, Yamato, 14-15. vi. 1997, T. Ito leg.; 4♂ 4♀, Mt. Koya, Kii, 1. v. 1985, T. Ito leg.; 1♂ 1♀, Mt. Koya, Wakayama Pref., 31. vii. 1995, I. Matoba leg.; 11♂ 9♀, same locality, 4. v. 1993, T. Ito leg.

Distribution. Honshu (Nara and Wakayama Prefs.).

Remarks. *S. jukata* is closely allied to *S. ichikawai* when considering the similarities on the general shape of median lobe and the general structures of basal tube and median longitudinal bands of endophallus, but the depressions of 6th and 7th sternite of male are narrower, the emargination of 8th sternite of male is a little deeper, the median lobe is more slender, the anterior part of median hook is more strongly pointed, the basal tube of endophallus is less strongly curved in posterior half, the paramere is much longer, the apico-external tuft of 9th sternite of female is shorter, the spermathecal duct is broader and the spermathecal gland is situated near the external part of the 4th bent of duct when counted from the apex.

***Stenus (Hypostenus) rufescens* Sharp**  
(Figs.1A; 21A-F)

*Stenus rufescens* Sharp, 1874, Trans. Ent. Soc. London, 1874: 88.

*Stenus (Hypostenus) rufescens* Sharp: Bernhauer and Schubert, 1911, Col. Cat., (29): 177; Adachi, 1957, J. Toyo Univ., (11): 10; Nakane, 1963, Icon. Ins. Jap. Col. Nat., 2: 86; Shibata, 1976, Ann. Bull. Nichidai Sanko, (19): 202; Watanabe, 1985, Col. Jpn. Col., 2: 280; Naomi, 1989a, Check List Jpn. Ins., p.266; Naomi, 1990b, Elytra, Tokyo, 18(2): 206; Herman, 2001, Bull. Amer. Mus. Nat. Hist., (265): 2372; Puthz and Naomi, 2003, Newsl. Staphyl. Soc. Jpn., (20): 7; Smetana, 2004, Cat. Pal. Col., 2: 550.

Male and female. Brachypterous, 2.7-3.0 mm in length, moderately shining. Head reddish brown, but dark brown near inner margins of eyes; pronotum and elytra yellowish brown to reddish brown; abdomen reddish brown, but

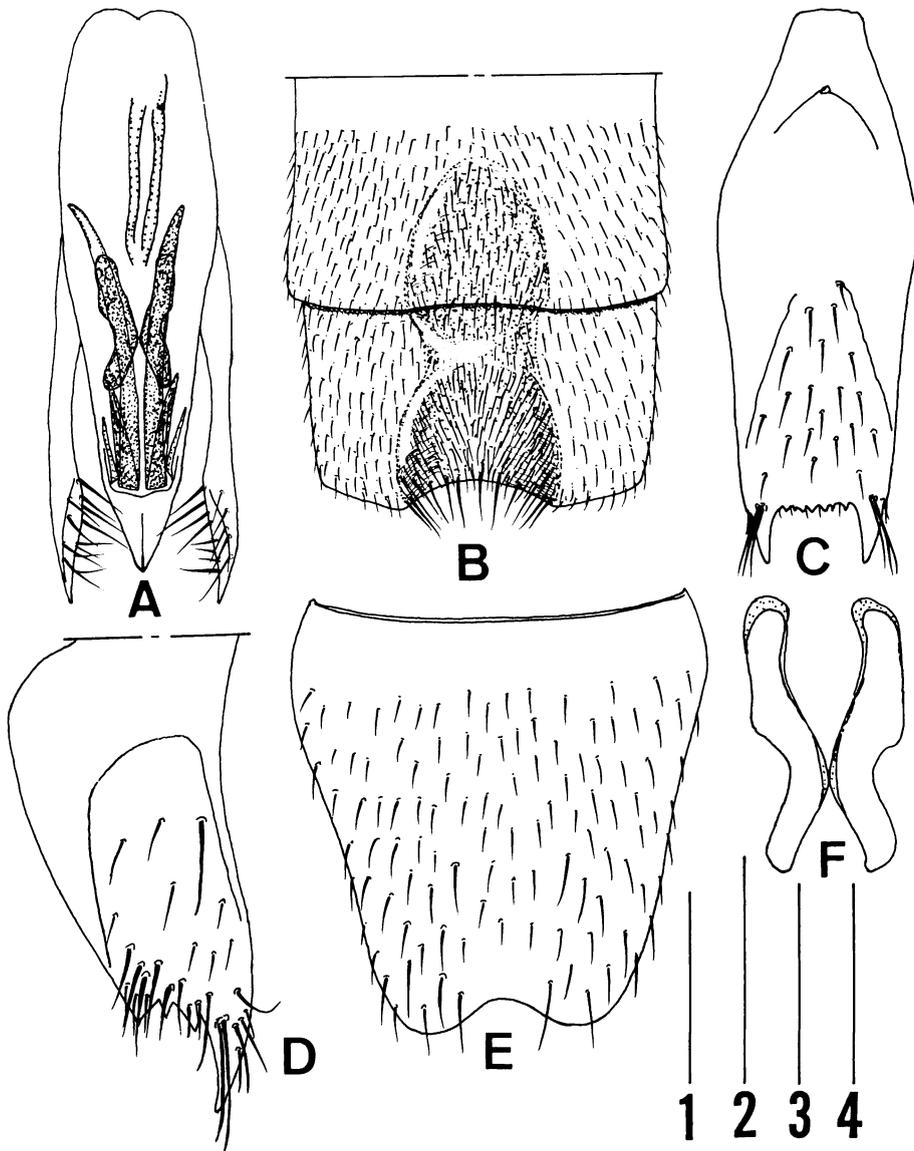


Fig. 21. *S. rufescens* Sharp (Mayasan, Hyogo). A, Aedeagus; B, 6th and 7th sternites of male; C, 9th sternite of male; D, 9th sternite of female; E, 8th sternite of male; E, median hooks of endophallus. Scale 1: 0.25 mm for B; scale 2: 0.25 mm for E; scale 3: 0.2 mm for A, C; scale 4: 0.1 mm for D, F.

dark brown in apical segments; antennae and legs yellowish brown to reddish brown.

Relative measurements: HL: 28; HW: 50; PL: 35; PW: 36; EL: 35; SL: 30; EW: 45.

Head transverse, interocular area with a pair of longitudinal depressions shallow and relatively broad, median part between the depressions weakly convex; surface with punctures dense, round, umbilicate and distinct, and interstices distinctly reticulate near inner margins of

eyes, while punctures moderately dense, round and umbilicate, and interstices weakly microsculptured on the median part. Pronotum with surface distinctly uneven, median longitudinal depression distinct but sometimes vague in outline, shallow and relatively broad; punctures very dense, round and distinct, interstices distinctly microsculptured. Elytra large, well convex above, rounded laterally; surface uneven, with punctures very dense, large and

round, interstices very narrow, vaguely microsculptured. Abdomen strongly cylindrical; 3rd segment with anterolateral fovea large, open behind, about half the length of segment, remnant of tergo-paratergal suture found only at the anterior part of segment; 3rd tergite with punctures moderately dense, round and almost regular, interstices weakly microsculptured; 7th tergite with punctures fine, sparse and regular, interstices minutely sculptured.

Male. Fifth sternite flat on posteromedian part; 6th sternite (Fig. 21B) posteromedially with a depression shallow, gently broadened posteriorly, its posterior margin very shallowly arcuate; 7th sternite (Fig. 21B) with a shallow anteromedian depression which continues to posteromedian depression, the posteromedian depression semicircular, becoming deeper toward posterior margin which is moderately arcuate; 8th sternite (Fig. 21E) posteromedially with a moderately deep emargination; 9th sternite (Fig. 21C) with apicolateral projections almost straight and pointed. Aedeagus (Fig. 21A) with median lobe moderately slender, with very indistinct apicolateral corners, apical sclerotized area almost triangular, moderately pointed at apex, very weakly arcuate at internal margin, with a median longitudinal line which runs behind the anterior 1/3; median longitudinal bands very long and slender, gradually divergent anteriorly, each gradually tapering anteriorly, its dorsally folded portion distinct, narrowed apically and reaching anteriorly the posterior corner of median hook; lateral longitudinal bands very thin and short; median hooks (Fig. 21F) connected each other near the middle, almost X-shaped; basal tube short, relatively broad, and so membranous both in anterior and posterior parts that these parts are very vague in outline; parameres extending posteriorly beyond the apex of median lobe, the apical part acutely pointed at tip, with apico-internal corner weakly developed, and apico-internal area with setae short, 11 to 13 in number.

Female. Eighth sternite almost entire but vaguely angulate at the middle of posterior margin; 9th sternite (Fig. 21D) with apico-external projection weakly incurved and sharply pointed, apico-external tufts moderately long; internal genitalia without sclerotized spermatheca.

Specimens examined. 5 ♂ 6 ♀, Mt. Maya, Kobe, Hyogo Pref., 12. v. 1997, H. Hoshina

leg.; 6 ♂ 8 ♀, same locality, 19. vii. 2001, H. Hoshina leg.; 1 ♂ 1 ♀, same locality, 5. v. 1993, T. Kishimoto leg.; 1 ♀, same locality, 11. iii. 1991, K. Taniguchi leg.; 2 ♂ 1 ♀, same locality, 4. xi. 1983, T. Ito leg.; 2 ♂ 2 ♀, same locality, 15. x. 1983, T. Ito leg.; 4 ♂ 2 ♀, same locality, 30. iii. 1985, T. Ito leg.; 2 ♂ 2 ♀, same locality, 9. xi. 1986, T. Ito leg.; 1 ♂ 1 ♀, same locality, 10. x. 1990, T. Ito leg.; 1 ♂ 1 ♀, same locality, 30. iii. 1991, T. Ito leg.; 10 ♂ 7 ♀, same locality, 8. v. 1993, T. Ito leg.

Distribution. Honshu (Hyogo Pref.).

Remarks. *S. rufescens* has been so far commonly considered as a species with the broader range of distribution by the Japanese coleopterologists although it is brachypterous. For example, Shibata (1976) and Watanabe (1985) suggested that it is distributed at least in the whole range of Hokkaido, Honshu, Shikoku and Kyushu, Japan, based probably on the vague distributional informations. During this study I examined 66 specimens of this species, all of which were collected from Mt. Maya of Hyogo Pref., the type locality of this species. It seems to be somewhat strange to see that the whole distributional range of a brachypterous *Stenus* species is strictly limited within such a narrow area as Mt. Maya. Although new localities will be discovered from the neighboring areas of Mt. Maya, this species is probably highly limited in its distribution to Mt. Maya and its neighboring areas. Further chorological studies are needed to determine the accurate distributional range of this species.

*S. rufescens* is probably related to *S. jukata* and *S. ichikawai*, but the apical sclerotized area of median lobe is more distinctly triangular, the median hooks of endophallus are almost X-shaped, and the basal tube of endophallus is membranous at its anterior and posterior parts. This species is easily separable from all of the related species by the absence of sclerotized spermatheca.

***Stenus (Hypostenus) daigonis* Naomi et Puthz**  
(Figs. 22A-H; 24E-K)

*Stenus (Hypostenus) daigonis* Naomi et Puthz, 1993, Elytra, Tokyo, 21(2): 310; Herman, 2001, Bull. Amer. Mus. Nat. Hist., (265): 2155; Puthz and Naomi, 2003, Newsl. Staphyl. Soc. Jpn., (20): 7; Smetana, 2004,

Cat. Pal. Col., 12: 548.

Male and female. Brachypterous, 3.0-4.0 mm in length, weakly to moderately shining. Head clear reddish brown to reddish brown on the median part, dark brown near inner margins of eyes; pronotum and elytra yellowish brown to reddish brown; abdomen reddish brown in basal segments, dark brown in apical segments; antennae yellow to pale yellowish brown in basal segments, reddish brown to dark brown in apical segments; legs yellowish brown to reddish brown.

Relative measurements: HL:29; HW:50; PL:38; PW:38; EL:38; SL:27; EW:45.

Head transverse, interocular area with a pair of depressions convergent anteriorly, median part between the depressions moderately convex, almost elongate-elliptical in shape; surface with punctures dense, almost round, weakly irregular and umbilicate, and interstices distinctly microsculptured near inner margins of eyes, while punctures moderately dense, round and somewhat umbilicate, and interstices almost distinctly microsculptured on the median part. Pronotum with surface slightly uneven, median longitudinal depression long and broadest near the middle, with its bottom distinctly microsculptured; punctures very dense, round and coarse, interstices distinctly microsculptured. Elytra rounded laterally; surface almost flat along suture, with punctures very dense, round and almost regular, interstices very narrow, indistinctly microsculptured. Abdomen cylindrical; 3rd segment with anterolateral fovea subovoidal, less than half the length of segment, remnant of tergo-paratergal suture found only at the anterior part of segment; 3rd tergite with punctures dense, round to elliptical, distinct, interstices faintly microsculptured; 7th tergite with punctures fine and regular, interstices minutely shallowly sculptured.

Male. Fourth to 5th sternites each flat on the posteromedian part; 6th sternite (Fig. 22B) posteromedially with a semicircular depression large but shallow, its side ridges very weakly edged, its posterior margin very shallowly arcuate; 7th sternite (Fig. 22B) with a broad anteromedian depression which continues to posteromedian depression, the posteromedian depression deep, its side ridges distinctly edged and its posterior margin deeply arcuate; 8th sternite (Fig. 22H) with a medium-sized emargi-

nation at the posterior margin; 9th sternite (Fig. 22F) with apicolateral projection short and pointed. Aedeagus (Fig. 22E) with median lobe bulbous at base, distinctly narrowed apically, with side margin bisinuate behind the middle, the apicolateral corner obtusely angulate but distinct, apical sclerotized area elongate-triangular in shape, acutely pointed at apex, and narrowly arcuate at internal margin, with the median longitudinal line of full length; median longitudinal bands relatively short, weakly divergent anteriorly, its dorsally folded portion well pigmented, short and rounded apically; median hooks (Fig. 24F-K) connected each other at the latero-internal corner situated before the middle of posterior plate, posterior plate relatively broad, pointed or sharply pointed at apex, and distinctly sharply angulate latero-internally, anterior plate completely separated from posterior plate by the transverse line, with its sclerotized portion more or less incurved in various manner, and with submembranous area at its latero-internal part; basal tube (Fig. 24E) with sperm sac large to very large when seen ventrally, tube body moderately curved and narrowing on its way, then curved at right angle to form a hooked apex; parameres extending posteriorly beyond the apex of median lobe, the apical part acutely pointed at tip, very weakly swollen internally, its apico-internal area with setae short to moderately long, 14 to 15 in number.

Female. Eighth sternite (Fig. 22C) entire at posterior margin; 9th tergite (Fig. 22G) gently and broadly arcuate at posterior margin, with its pointed posterolateral projections; 9th sternite (Fig. 22D) distinctly angulate at basi-internal corner, with apico-external projection very acutely pointed, apico-external tuft and median seta very long; 10th tergite (Fig. 22G) almost entire at posterior margin; spermatheca (Fig. 22A) with capsule very small, RT-duct very long, extending proximally beyond the 3rd bent when counted from the apex, basal sclerotized duct long, hardly broadened proximally; spermathecal gland distant proximally from the 3rd bent of duct when counted from the apex.

Type specimen examined. Paratype: 1 ♀, JAPAN: Kyo[to], Daigo, 21. 5. 1973, K. Sawada.

Other specimens examined. 1 ♂ 4 ♀, Uji, Kyoto, 30. xii. 1992, K. Mizuno leg.; 9 ♂ 10 ♀,

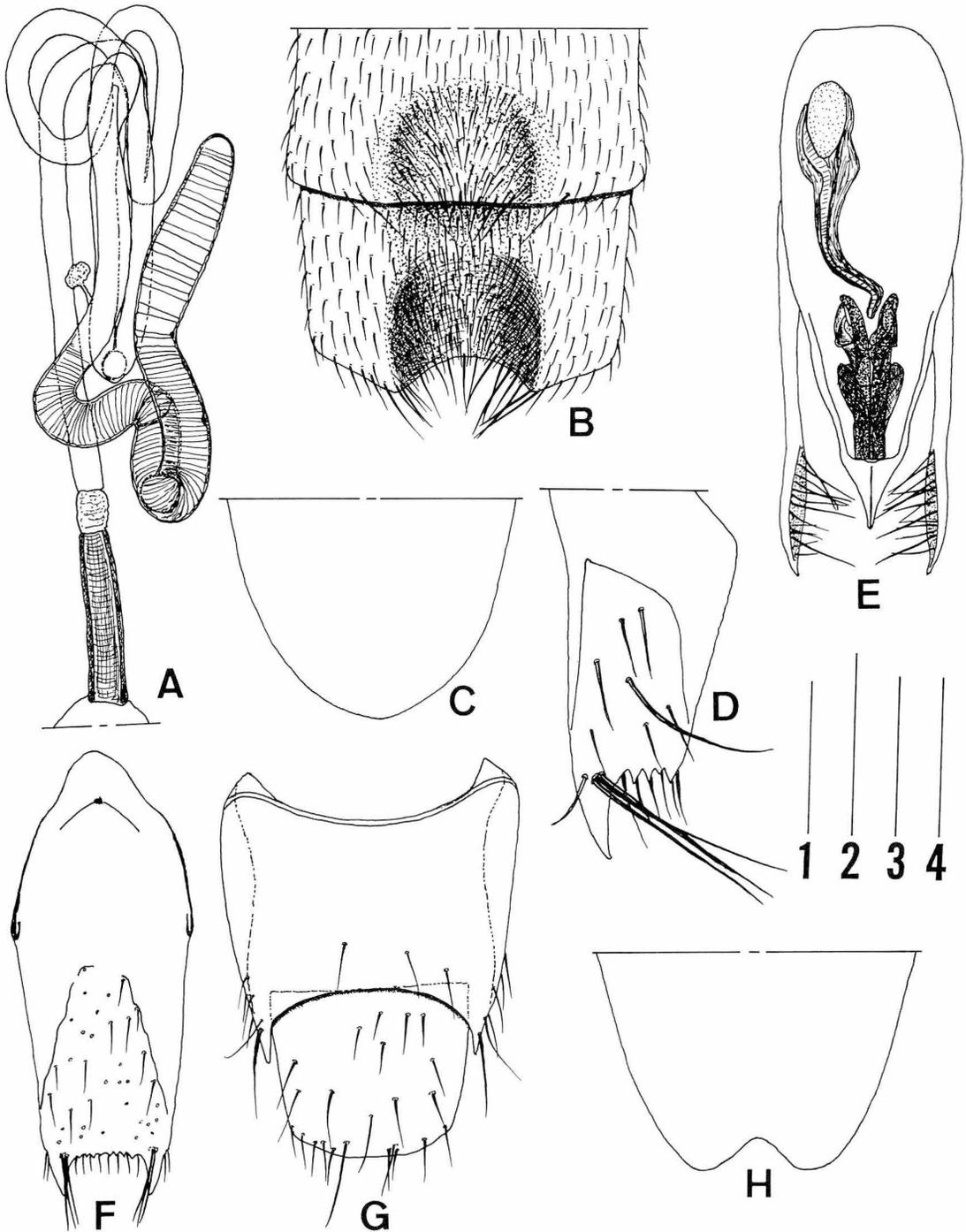


Fig. 22. *S. daigonis* Naomi et Puthz. A, Spermatheca (Daigo, Kyoto); B, 6th and 7th sternites of male (Uji, Kyoto); C, 8th sternite of female (Daigo, Kyoto); D, 9th sternite of female (Daigo, Kyoto); E, aedeagus (Daigo, Kyoto); F, 9th sternite of male (Daigo, Kyoto); G, 9th and 10th tergites of female (Daigo, Kyoto); H, 8th sternite of male (Daigo, Kyoto). Scale 1: 0.25 mm for B; scale 2: 0.25 mm for C, H; scale 3: 0.2 mm for E-G; scale 4: 0.1 mm for A, D.

same locality, 23. i. 1993, T. Ito leg.; 1 ♂, same locality, 13. ii. 1993, K. Mizuno leg.; 1 ♀, same locality, 14. iii. 1993, K. Mizuno leg.; 1 ♂ 3 ♀, Amagase, Uji, Kyoto, 26. iv. 1997, S. Takahashi leg.; 3 ♂ 1 ♀, Gounho, Uji, Kyoto, 16. xii. 1995, S. Takahashi leg.; 1 ♀, same locality, 13. iv. 1996, S. Takahashi leg.; 1 ♀, same locality, 16. xi. 1996, S. Takahashi leg.; 1 ♂, same locality, 8. ii. 1997, S. Takahashi leg.; 1 ♀, same locality, 15. iii. 1997, S. Takahashi leg.; 1 ♀, same locality, 19. iv. 1997, S. Takahashi leg.; 2 ♂ 1 ♀, Higashikasatori, Uji, Kyoto, 3. iv. 1994, K. Mizuno leg.; 1 ♂ 2 ♀, Sumiyama, Uji, Kyoto, 13. ii. 1993, K. Mizuno leg.; 1 ♂ 1 ♀, same locality, 17. iv. 1994, T. Ito leg.; 2 ♂ 3 ♀, Mt. Jubusen, Kyoto, 15. ix. 1989, T. Ito leg.; 6 ♀, same locality, 5. viii. 1989, T. Ito leg.; 1 ♂, same locality, 22. xi. 1992, K. Mizuno leg.; 3 ♂ 1 ♀, Nonodo, Kyoto, 17. iv. 1994, T. Ito leg.; 1 ♂ 1 ♀, Daimonji, Kyoto, 7. x. 1989, T. Ito leg.; 5 ♂ 5 ♀, Mt. Daigo, Kyoto, 17. iv. 1994, T. Ito leg.; 1 ♂ 1 ♀, Suwa, Ueno City, Mie Pref., 24. x. 1996, H. Yokozeki leg.; 1 ♂ 3 ♀, same locality, 28. ix. 1996, H. Yokozeki leg.; 1 ♂ 4 ♀, Okumura, Shimagahara, Ayama-gun, Mie Pref., 19. xi. 1995, H. Yokozeki leg.; 1 ♂, Sakura Pass, Ayama-cho, Ayama-gun, Mie Pref., 7. xii. 1996, H. Yokozeki leg.

Distribution. Honshu (Kyoto and Mie Prefs.).

Remarks. *S. daigonis* is very similar not only in the external morphology of body, the external structure of aedeagus, but also in such endophallic structures as median longitudinal bands and basal tube, to *S. wasabi* and *S. ingens*. Thus, the classification of these 3 species has been extremely difficult until their key characters are investigated from the median hooks of endophallus. *S. daigonis* is clearly distinguishable from the latter two species by the following way.

First is concerned with male. *S. daigonis* is clearly separable from *S. wasabi* by the point by which the median hooks are connected. Namely, in *S. daigonis*, the median hooks are connected each other at the latero-internal corner situated before the middle of posterior plate. In Figs. 24F-K, the median hooks of *S. daigonis* collected from various localities are shown, and the comparison shows that the condition as to how paired median hooks are connected, is rather stable among the individuals of *S. daigonis*. This is the most important character to

recognize the species *S. daigonis*. *S. daigonis* is also separable from *S. wasabi* by the apical margin of posterior plate of median hook pointed, the anterior plate of median hook with submembranous portion at the latero-internal part, the sclerotized portion of anterior plate of median hook being more or less incurved at the apical part, etc. On the other hand, *S. daigonis* and *S. ingens* have the similarity in the point by which median hooks are connected, but in *S. daigonis*, the posterior plates of median hooks are robuster and larger, and the anterior plate of median hook is provided with the submembranous portion at the latero-internal part.

Next is concerned with female. The informations on spermatheca are restricted only for two species (*S. daigonis* and *S. wasabi*). *S. daigonis* is clearly separable from *S. wasabi* by the RT-duct of spermatheca longer, and extending proximally beyond the 3rd bent of duct when counted from the apex, and the spermathecal duct distinctly thicker and much shorter.

#### *Stenus (Hypostenus) wasabi* Hromádka

(Figs. 2B; 23A-F; 24A-D)

*Stenus (Hypostenus) wasabi* Hromádka, 1982, *Fragm. Col.*, (33/34): 133; Naomi, 1989a, *Check List Jpn. Ins.*, p.266; Naomi, 1990a, *Akitu, New Ser.*, (113): 1; Naomi, 1990b, *Elytra, Tokyo*, 18(2): 204; Herman, 2001, *Bull. Amer. Mus. Nat. Hist.*, (265): 2436; Puthz and Naomi, 2003, *Newsl. Staphyl. Soc. Jpn.*, (20): 7; Smetana, 2004, *Cal. Pal. Col.*, 2: 551.

Male and female. Brachypterous, 3.0-3.9 mm in length, weakly to moderately shining. Head yellowish brown to reddish brown, but sometimes darker (dark yellowish brown to dark reddish brown) near inner margins of eyes; pronotum and elytra yellowish brown to reddish brown; abdomen yellowish brown to reddish brown in basal segments, dark yellowish brown to dark reddish brown in apical segments; antennae yellow to yellowish brown in basal segments, reddish brown to dark brown in apical segments.

Relative measurements: HL:28; HW:50; PL:38; PW:38; EL:38; SL:29; EW:46.

Head transverse, interocular area with a pair of longitudinal depressions weakly convergent anteriorly, median part between the depres-

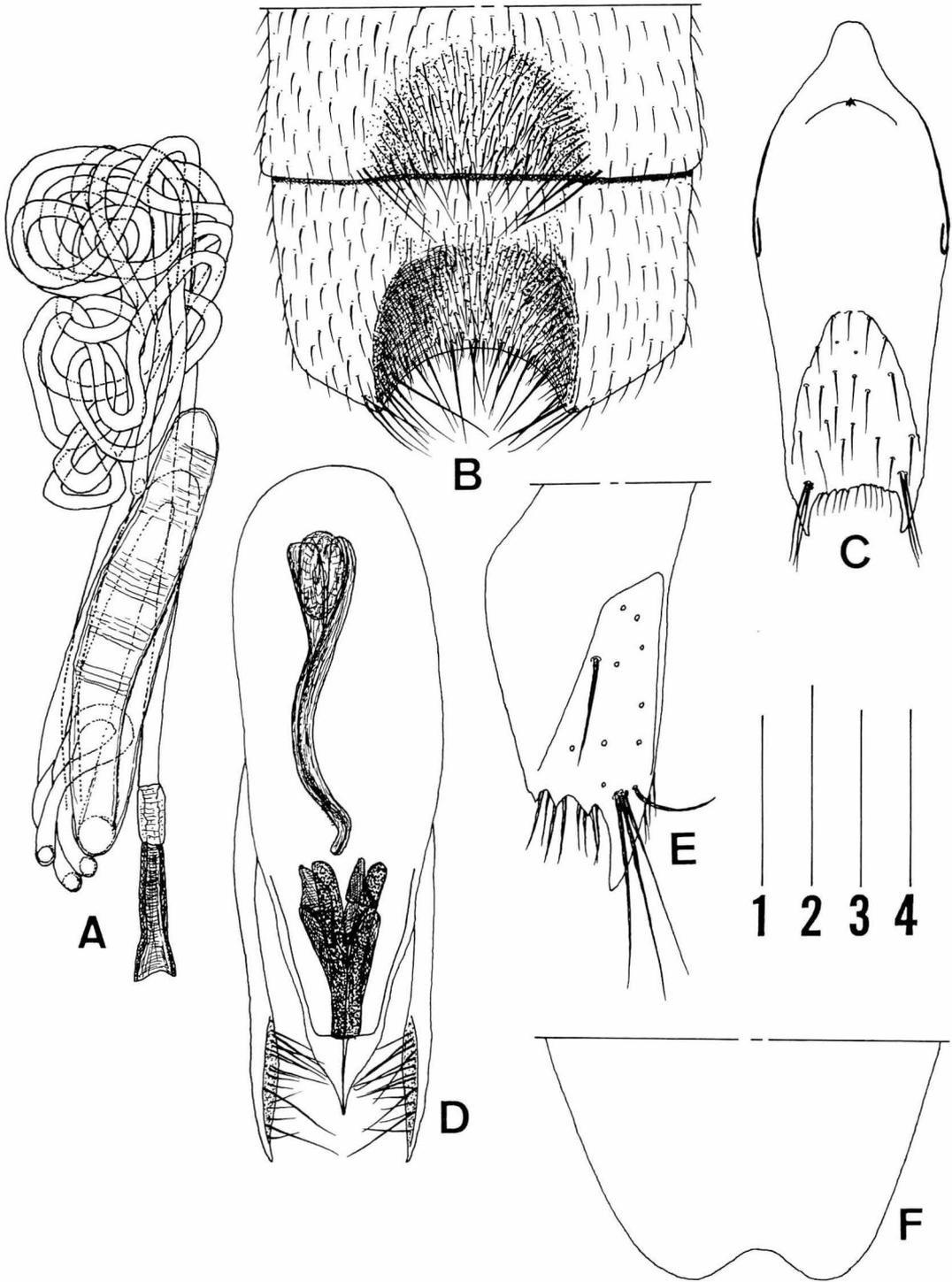


Fig. 23. *S. wasabi* Hromádka. A, Spermatheca (Kurama, Kyoto); B, 6th and 7th sternites of male (Kurama, Kyoto); C, 9th sternite of male (Daimoji, Kyoto); D, aedeagus (Daimoji, Kyoto); E, 9th sternite of female (Kurama, Kyoto); F, 8th sternite of male (Kurama, Kyoto). Scale 1: 0.25 mm for B; scale 2: 0.25 mm for F; scale 3: 0.2 mm for C, D; scale 4: 0.1 mm for A, E.

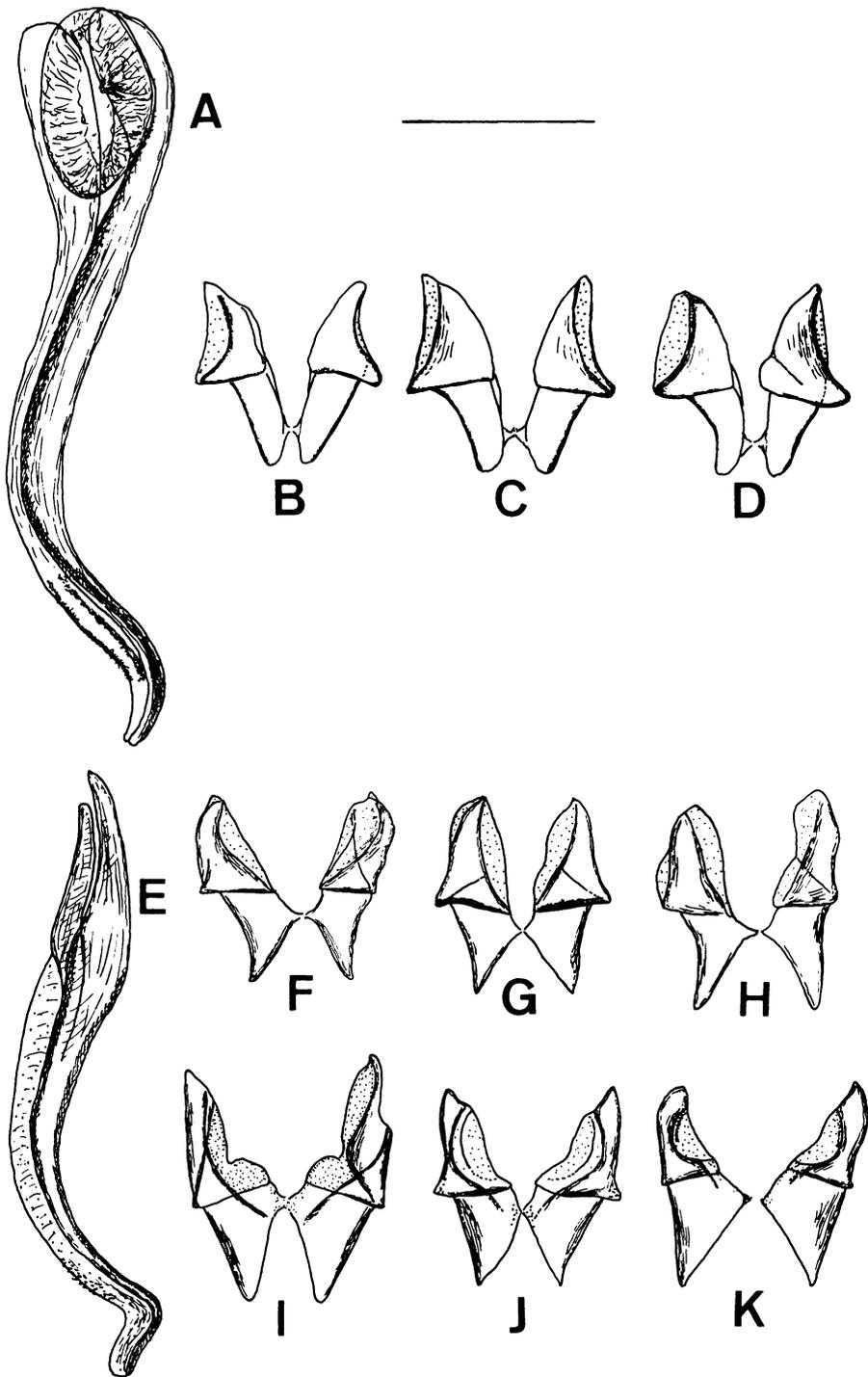


Fig. 24. *S. wasabi* Hromádka (A, B, Daimoji, Kyoto; C, Shizushi, Kyoto; D, Tentaki, Hyogo); *S. daigonis* Naomi et Puthz (E, F, Daigo, Kyoto; G, Amagase, Kyoto; H, Daimoji, Kyoto; I, Sakura, Mie; J, Suwa, Mie; K, Okumura, Mie). A, E, basal tube of endophallus; B-D, F-K, median hooks of endophallus. Scale: 0.1 mm.

sions gently convex; surface uniformly with punctures moderately dense, round and distinct, but punctures near inner margins of eyes a little larger than those on the median part, interstices distinctly microsculptured. Pronotum with surface weakly uneven, median longitudinal depression very shallow and obscure in outline; punctures very dense, round to almost round, coarse, interstices distinctly microsculptured. Elytra gently rounded laterally; surface weakly uneven, and almost flat along suture; punctures very dense, round and distinct, and interstices distinctly microsculptured. Abdomen strongly cylindrical; 3rd segment with anterolateral fovea small, broad-elliptical, and less than half the length of segment, remnant of tergo-paratergal suture found only at the anterior part of segment; 3rd tergite with punctures dense to moderately dense, round to elliptical, distinct and almost regular, interstices indistinctly microsculptured; 7th tergite with punctures dense, elliptical, shallow and regular, interstices shallowly but distinctly microsculptured.

Male. Third to 5th sternites each flat on posteromedian part, the flat area becoming larger from 3rd to 5th sternites; 6th sternite (Fig. 23B) posteromedially with a semicircular depression shallow and broad, its side ridges obtusely edged, and its posterior margin very shallowly arcuate; 7th sternite (Fig. 23B) with shallow anteromedian depression which continues to posteromedian depression, the posteromedian depression large and deep, its side ridges sharply edged and its posterior margin strongly arcuate; 8th sternite (Fig. 23F) with a moderately large emargination at posterior margin; 9th sternite (Fig. 23C) with posterolateral projection relatively small, pointed. Aedeagus (Fig. 23D) with median lobe moderately bulbous at base, side margin very weakly bisinuate behind the middle, apicolateral corner very obtusely angulate, apical sclerotized area almost triangular in shape, very acutely pointed at apex, and almost straight at its internal margin, with the median longitudinal line of full length; median longitudinal bands relatively short, each narrow, longer than its dorsally folded portions; median hooks (Figs. 24B-D) connected each other by the point on the latero-internal corner behind the middle of posterior plate, the posterior plate more or less

rounded apically, with its base much narrower than the base of anterior plate, the anterior plate distinctly separated from posterior plate by transverse suture, protruding at postero-external corner, and distinctly curved externally, with its latero-external portion more or less submembranous; basal tube (Fig. 24A) with sperm sac very large, basal constriction indistinct, tube body strongly sinuate on its way and gradually thinner apically; parameres extending posteriorly beyond the apex of median lobe, the apical part very weakly swollen internally, and very acutely pointed at tip, its apico-internal area with setae short to moderately long, 15 to 16 in number.

Female. Ninth sternite (Fig. 23E) obtusely angulate at basi-internal corner, with apico-external projection pointed; spermatheca (Fig. 23A) with capsule very small, RT-duct thick, spermathecal duct very long, thin and strongly coiled, with its coiled part mostly located anteriorly beyond the apex of capsule, basal sclerotized duct straight, very weakly broadened proximally.

Specimens examined. 7♂ 11♀, Kurama, Kyoto, 9. viii. 1985, T. Ito leg.; 1♂ 1♀, Daimonji, Kyoto, 18. vi. 1989, T. Ito leg.; 1♀, same locality, 27. iii. 1988, T. Ito leg.; 1♂, Kibune, Kyoto, 31. viii. 1992, T. Ito leg.; 3♂ 3♀, Kitayama, Kamiohkubu, Mizuho T., Kyoto, 1. v. 1999, Y. Hayashi leg.; 1♂ 1♀, Shizushi, Mizuho T., Kyoto, 3. v. 1997, Y. Hayashi leg.; 2♂, Iwakura, Kyoto, 11. iv. 1981, T. Ogata leg.; 1♂ 3♀, Tentaki, Ooya-cho, Hyogo Pref., 8. vi. 1996, H. Hoshina leg.; 1♂, Shinomi, Sasayama T., Hyogo, 24. v. 1986, Y. Hayashi leg.; 1♀, Kagobou, Sasayama T., Hyogo, 10. x. 1985, Y. Hayashi leg.; 1♂, Mt. Amaishi, Sasayama T., Hyogo, 1. vii. 1982, Y. Hayashi leg.; 8♂ 7♀, Takara-dera, Yamazaki, Hyogo Pref., 30. ix. 1989, T. Ito leg.

Distribution. Honshu (Kyoto and Hyogo Prefs.).

Remarks. The median hooks of *S. wasabi* collected from 3 localities are shown in Figs. 24B-D, and the comparison shows that the median hooks are rather stable in various aspects of the structure. They are the most important characters to recognize the species, *S. wasabi*. This species is closely allied to *S. daigonis* and *S. ingens*, but the median hooks are connected each other by the point on the latero-internal

corner behind the middle of posterior plate, the posterior plate of median hook is rounded apically, and the latero-external hook portion of anterior plate is more or less submembranous.

***Stenus (Hypostenus) ingens* Naomi sp. nov.**  
(Figs. 25A-G, K)

Male. Brachypterous, 3.1-3.3 mm in length, moderately shining. Head black near inner margins of eyes, reddish brown to dark reddish brown on the median part; pronotum and elytra reddish brown; abdomen reddish brown in basal segments, dark brown to black in apical segments; antennae yellowish brown in basal segment, dark brown in apical segments; legs yellowish brown to reddish brown.

Relative measurements: HL:26; HW:46; PL:36; PW:36; EL:35; SL:30; EW:43.

Head transverse, interocular area with a pair of depressions uniformly convergent anteriorly, median part between the depressions moderately convex, almost elongate-triangular in shape; surface uniformly with punctures dense to moderately dense, distinct and somewhat irregular, and interstices distinctly or almost distinctly microsculptured. Pronotum with surface slightly uneven, median longitudinal depression relatively long and narrow, obscure in outline; punctures very dense, round to almost round, and coarse, interstices distinctly microsculptured. Elytra rounded laterally; surface almost smooth or very weakly uneven, with punctures very dense and round, interstices very narrow and indistinctly microsculptured. Abdomen cylindrical; 3rd segment with anterolateral fovea subelliptical, less than half the length of segment, remnant of tergo-paratergal suture found only at the anterior part of segment; 3rd tergite with punctures moderately dense, round to elliptical, distinct, and becoming smaller toward posterior margin, interstices almost distinctly microsculptured; 7th tergite with punctures moderately dense, fine, elliptical and regular, interstices shallowly minutely sculptured.

Third to 4th sternites each flat on posteromedian part, the flat area on 4th sternite larger than that on 3rd sternite; 5th sternite very shallowly depressed on posteromedian part, with its posterior margin very shallowly arcuate; 6th sternite (Fig. 25A) posteromedially with a C-

shaped depression shallow, its side margins obscure and its posterior margin very shallowly arcuate; 7th sternite (Fig. 25A) with a broad anteromedian depression which continues to posteromedian depression, the posteromedian depression deep, with its side ridges acutely edged and its posterior margin moderately arcuate; 8th sternite (Fig. 25B) with a medium-sized emargination at the posterior margin; 9th sternite (Fig. 25D) with apicolateral projection short and pointed. Aedeagus (Fig. 25C) with median lobe broadest near the middle, side margin very weakly bisinuate behind the middle, the apical sclerotized area subtriangular, acutely pointed at apex, and narrowly arcuate at internal margin, with the median longitudinal line of its full length; median longitudinal band moderately long and narrow, reaching the anterior end of median hook, its dorsally folded portion short, broadened anteriorly before the middle and then narrowing toward tip; lateral longitudinal bands each very thin and short; median hooks (Figs. 25E-G) connected each other at the latero-internal corner situated near the base of posterior plate, the posterior plate simply or acutely pointed at tip, partially separated from anterior plate by suture, with its base distinctly narrower than the base of anterior plate, the anterior plate well angulate at postero-external corner, very weakly incurved near the tip, with its latero-external margin moderately sclerotized; basal tube (Fig. 25K) with sperm sac very large, basal constriction indistinct, tube body strongly sinuate and gradually narrowing apically; parameres extending posteriorly beyond the apex of median lobe, the apical part hardly swollen internally, acutely pointed at tip, its apico-internal area with setae short to moderately long or long, 18 in number.

Female. Unknown.

Type series. Holotype: ♂ (CBM-ZI 121877), Yunoyama, Komono-cho, Mie Pref., 26. x. 1996, H. Yokozeki leg. Paratypes: 2 ♂, same locality, 5. i. 1997, H. Yokozeki leg.

Distribution. Honshu (Mie Pref.).

Remarks. *S. ingens* is closely allied to *S. daigonis*, but the posterior plate of median hook is triangular or subtriangular, and the anterior plate of median hook is sclerotized especially along the latero-external margin.

Etymology. The specific epithet of this new species is derived from a Latin participle "*in-*

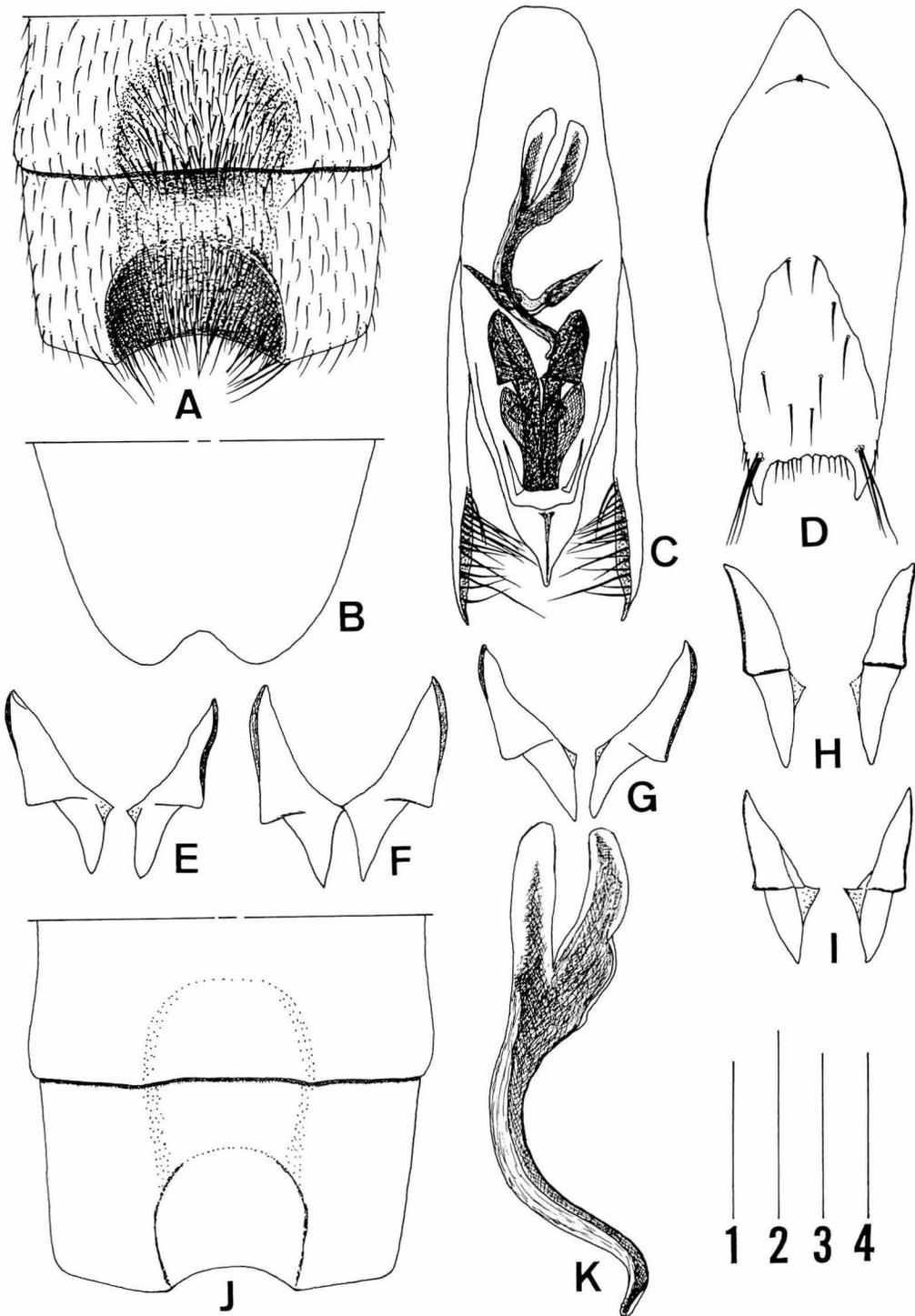


Fig. 25. *S. ingens* sp. nov. (A-G, K); *S. ingens ryugadakensis* subsp. nov. (H-J). A, Sixth and 7th sternites of male (Yunoyama, Mie); B, 8th sternite of male (Yunoyama, Mie); C, aedeagus (Yunoyama, Mie); D, 9th sternite of male (Yunoyama, Mie); E-G, median hooks of endophallus (Yunoyama, Mie); H, median hooks (Kirihata, Mie); I, median hooks (Ryugadake, Mie); J, 6th and 7th sternite of male (Ryugadake, Mie); K, basal tube of endophallus (Yunoyama, Mie). Scale 1: 0.25 mm for A, J; scale 2: 0.25 mm for B; scale 3: 0.2 mm for C, D; scale 4: 0.1 mm for E-I, K.

*gens*" that means "huge". This is because the sperm sac of the basal tube of endophallus is very large in this species.

***Stenus (Hypostenus) ingens ryugadakensis*  
Naomi subsp. nov.**

(Figs. 25H-J)

Description of some characters of male. Third to 4th sternites each almost flat on posteromedian part; 5th sternite very shallowly depressed on posteromedian part, with its posterior margin hardly or very shallowly arcuate; 6th sternite (Fig. 25J) posteromedially with a depression semicircular and shallow, its posterior margin very shallowly arcuate; 7th sternite (Fig. 25J) posteromedially with a C-shaped depression moderately deep, its posterior margin moderately arcuate; aedeagus with median hooks (Figs. 25H,I) distantly positioned from each other, each with posterior plate elongate-subtriangular, narrowing apically, and pointed at tip, with a triangular submembranous flap at basi-internal part, the anterior plate completely separated from the posterior plate by transverse suture, about as long as or longer than the posterior plate, elongate-subtriangular, narrowing anteriorly and pointed at tip, sometimes with latero-external margin more strongly sclerotized than the other area.

Female. Unknown.

Type series. Holotype: ♂ (CBM-ZI 121822), Mt. Ryugadake, Daian-cho, Mie Pref., 23. x. 1993, H. Yokozeki leg. Paratype: 1 ♂, Kirihata, Komono-cho, Mie Pref., 1. v. 1998, F. Ichikawa leg.

Distribution. Honshu (Mie Pref.)

Remarks. *S. ingens ryugadakensis* is clearly separable from nominotypical subspecies by the 6th sternite posteromedially with a smaller depression, the 7th sternite posteromedially with a smaller and shallower depression and its side margin more lower and less sharply edged, the median hook of endophallus with the base of posterior plate only a little narrower than the base of anterior plate, and the anterior plate of median hook distinctly narrower, and completely separated from the posterior plate by transverse suture.

The distributional area of this subspecies is very near to that of nominotypical subspecies within the same Mie Prefecture, the south-

eastern part of Kii Peninsula of Kinki district. In this paper *S. ingens ryugadakensis* is treated as a subspecies of *S. ingens* because the qualitative distinction between these two subspecies is found only in the median hooks of endophallus. However, if further chorological studies show an overlapping condition of their distributional range, this subspecies should be regarded as a different species from *S. ryugadakensis*.

Etymology. The subspecific epithet of this new subspecies is derived from the name of holotype locality "Ryugadake" in Mie Prefecture.

***Stenus (Hypostenus) lubomiri* Naomi sp. nov.**

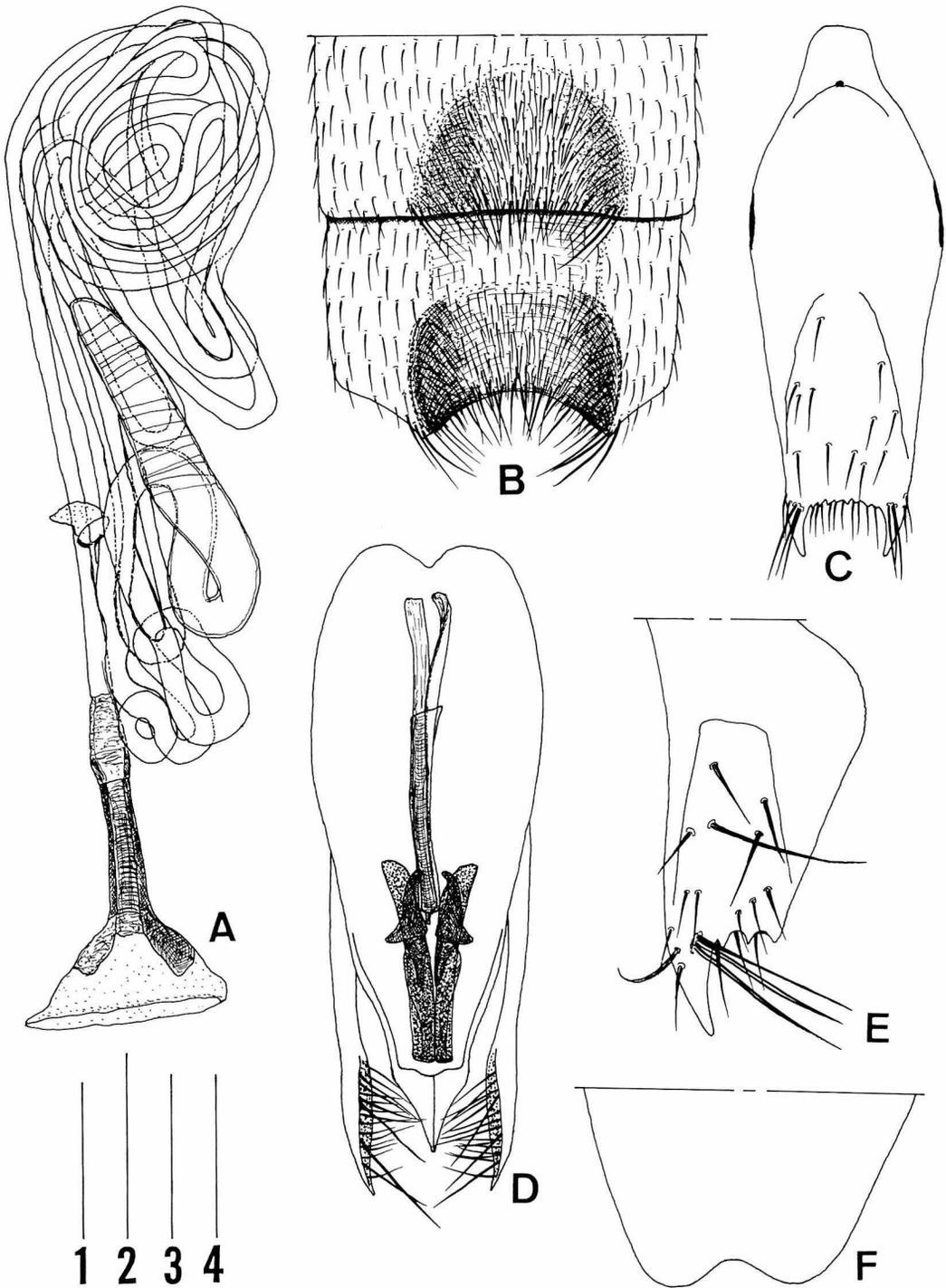
(Figs. 26A-F; 28A-F)

*Stenus (Hypostenus) nakanei* Hromádka: Naomi, 1989a, Check List Jpn. Ins., p.266 (misidentification); Naomi, 1990a, Akitu, New Ser., (113): 2 (misidentification); Naomi, 1990b, Elytra, Tokyo, 18(2): 204 (misidentification); Naomi, 1997a, Jpn. J. Ent., 65(3): 606 (misidentification); Herman, 2001, Bull. Amer. Mus. Nat. Hist., (265): 2295; Puthz and Naomi, 2003, Newsl. Staphyl. Soc. Jpn., (20): 7; Smetana, 2004, Cat. Pal. Col., 2: 550.

Male and female. Brachypterous, 3.2-3.7 mm in length, moderately shining. Head dark brown near inner margins of eyes, yellowish brown to reddish brown on the median part; pronotum and elytra pale reddish brown to reddish brown; abdomen reddish brown to dark red in basal segments, dark reddish brown to dark brown in apical segments; antennae yellow to yellowish brown; legs yellowish brown to reddish brown.

Relative measurements: HL:29; HW:50; PL:40; PW:39; EL:39; SL:28; EW:45.

Head transverse, interocular area with a pair of depressions convergent anteriorly, median part between the depressions moderately convex, almost elongate-elliptical in shape; surface uniformly with punctures dense to moderately dense, distinct, round, somewhat shallow and umbilicate, interstices distinctly or indistinctly microsculptured. Pronotum with surface uneven, median longitudinal depression moderately long, vague in outline; punctures very dense, round and coarse; interstices almost distinctly microsculptured. Elytra rounded laterally; surface almost smooth to uneven; punctures very dense, round and almost regular, interstices



**Fig. 26.** *S. lubomiri* sp. nov. A, Spermatheca and basal porch (Ikoma, Nara); B, 6th and 7th sternites of male (Kasuga, Nara); C, 9th sternite of male (Ikoma, Nara); D, aedeagus (Kasuga, Nara); E, 9th sternite of female (Ikoma, Nara); F, 8th sternite of male (Kasuga, Nara). Scale 1: 0.25 mm for B; scale 2: 0.25 mm for F; scale 3: 0.2 mm for C, D; scale 4: 0.1 mm for A, E.

very narrow, almost distinctly microsculptured. Abdomen cylindrical; 3rd segment with anterolateral fovea large, subovoidal, punctate, open behind, and a little more than half the length of segment, remnant of tergo-paratergal suture found only at the anterior part of segment; 3rd tergite with punctures dense, round to elliptical, distinct and almost regular, interstices distinctly or indistinctly microsculptured; 7th tergite with punctures fine, sparse and regular, interstices obscurely microsculptured.

Male. Third sternite flat at posteromedian part; 4th to 5th sternites each posteromedially with a shallow depression, the depression on 5th sternite a little larger than that on 4th sternite, with its posterior margin very shallowly arcuate; 6th sternite (Fig. 26B) posteromedially with a semicircular depression very large and shallow, its side ridges indistinctly edged, its posterior margin very shallowly arcuate; 7th sternite (Fig. 26B) posteromedially with a C-shaped depression very large and very deep, its side ridges sharply edged, distinct and high, its posterior margin deeply arcuate; 8th sternite (Fig. 26F) with a medium-sized but broad emargination at posterior margin; 9th sternite (Fig. 26C) with posterolateral projection short and pointed. Aedeagus (Fig. 26D) with median lobe moderately bulbous at base, side margin very weakly bisinuate behind the middle, the apicolateral corner obtusely angulate but distinct, the apical sclerotized area subtriangular in shape, acutely pointed, and narrowly arcuate at internal margin, with median longitudinal line of full length; median longitudinal bands moderately long, weakly divergent anteriorly, the dorsally folded portion reaching the posterior margin of anterior plate of median hook; median hooks (Figs. 28B-F) usually with posterior plate elongate, very weakly curved outward, weakly narrowing apically and narrowly rounded at tip, anterior plate distinctly separated from the posterior plate by transverse suture, well angulate or projecting at its postero-external corner, narrowing anteriorly and more or less incurved at apical part, with the base of anterior plate distinctly broader than the base of posterior plate; basal tube (Fig. 28A) with basal shafts each stout and large, basal constriction small but distinct, tube body almost parallel-sided, very weakly sinuate dorso-ventrally, with a spur-like tip; parameres extending

posteriorly beyond the apex of median lobe, the apical part weakly swollen internally, acutely pointed at tip, apico-internal area with setae short to long or very long, 18 to 19 in number.

Female. Ninth sternite (Fig. 26E) rounded basi-internally, with apico-external projection large and acutely pointed, postero-external tuft and median seta very long; spermatheca (Fig. 26A) with capsule very small, RT-duct short but thick, spermathecal duct thin and very long, strongly coiled, with the strongly coiled portion situated before the apex of capsule, and the most posterior end of coiled duct situated behind the 1st bent of duct when counted from the apex, basal sclerotized duct long and straight; basal porch large, conical and submembranous, with anterior sclerotization.

Type series. Holotype: ♂ (CBM-ZI 122045), Mt. Kasagi, Kyoto Pref., 2. iv. 1988, T. Ito leg. Paratypes, 4♂ 11♀, same data as holotype, T. Ito leg.; 2♂ 3♀, same locality as holotype, 3. xi. 1984, T. Ito leg.; 3♂ 2♀, Kibusanji, Takatsuki, Osaka Pref., 13. ix. 1985, T. Ito leg.; 1♂ 1♀, ft of Mt. Kasuga, Nara Pref., 20. viii. 1980, P. M. Hammond leg.; 1♀, same locality, 16. vi. 1984, T. Ito leg.; 1♀, same locality, 30. vi. 1984, T. Ito leg.; 1♂, same locality, 20. iv. 1985, T. Ito leg.; 1♀, same locality, 25. x. 1992, T. Ito leg.; 1♂, same locality, 31. x. 1992, T. Ito leg.; 1♀, same locality, 16. viii. 1994, T. Ito leg.; 1♀, same locality, 3. v. 1996, T. Ito leg.; 4♂ 10♀, Mt. Ikoma, Nara Pref., 6. v. 1985, T. Ito leg.; 2♂ 5♀, Mt. Kamiji, Ise City, Mie Pref., 10. xii. 1967, Y. Hayashi leg.; 2♂ 2♀, Koraibiro, Ise City, Mie Pref., 10. i. 1998, H. Ichihashi leg.; 1♀, same locality, 10. i. 1998, H. Yokozeki leg.; 1♂, Kouchi, Anou-cho, Ayama-gun, Mie Pref., 23. xii. 1995, H. Yokozeki leg.

Distribution. Honshu (Kyoto, Osaka, Nara and Mie Prefs.).

Remarks. I mistook taxonomically this new species for *S. nakanei* in all of my previous papers in which I treated *S. nakanei* (Naomi, 1989a, 1990a, 1990b, 1997a). During this study I first examined the holotype of *S. nakanei* deposited in Mr. Hromádka's collection, and found that what I thought *S. nakanei* turned to be new to science (see also the discussion of *S. ignobilis*).

The normal coloration of body is described above for *S. lubomiri*, but the different pattern of coloration is found in some specimens of *Mie*

Prefecture. These specimens show darker coloration when compared with the specimens with normal coloration in the following: Head dark brown to black; pronotum and elytra dark red; abdomen dark red in basal segments, black in apical segments; antennae yellowish brown to reddish brown in basal segments, dark brown to black in apical segments; legs reddish brown to brown. Among the local populations of *S. daigonis*, the populations in Mie Prefecture shows the similar tendency to become darker in coloration as in *S. lubomiri*. Of the members of *S. rufescens* group, *S. ichikawai*, whose distribution is restricted in Mie Prefecture, also shows the darker coloration of body in usual. Although the reason why the body color of different *Stenus* species tends to become independently darker among their local populations of same area, is not unfolded, this tendency is true of Mie's populations of some species of *S. rufescens* group at least at the phenomenological level.

The structure of median hooks (Figs. 28B-F) varies among the local populations of *S. lubomiri* to some degree. The median hook of individual from Kasuga (Fig. 28B) is simplest, without such modifications as ridge, sclerotization and membranization on it. The anterior plate of median hook of individual from Ikoma (Fig. 28C) is large and robust, its internal margin is strongly sinuate, and two longitudinal lines (or ridges) run on the anterior plate. The anterior plates of median hooks of individuals from Ayama (Fig. 28D), Ise (Fig. 28E) and Koraibiro (Fig. 28F) are partially sclerotized and/or membranous in various manners. The degrees of incurvature of its apical portion are also different among different populations. However, the basic structure as described above is rather constant in and unique for *S. lubomiri*, so the median hook is one of the important characters for recognizing this species.

*S. lubomiri* is closely allied to *S. ichihashii*, but the former is distinctly separable from the latter by the structure of the spermatheca as well as the median hooks and basal tube of endophallus as mentioned in the key.

**Eymology.** The specific epithet of this new species is named in honour of Mr. Lubomír Hromádka who contributed to the study of *Stenus* fauna of Japan.

***Stenus (Hypostenus) ichihashii***

**Naomi sp. nov.**

(Figs. 27A-F; 28G-K)

Male and female. Brachypterous, 3.3-3.8 mm in length, moderately shining. Head dark brown to black near inner margins of eyes, reddish brown to dark red on the median part; pronotum and elytra reddish brown; abdomen reddish brown to dark reddish brown in basal segments, dark red to dark brown in apical segments; antennae yellowish brown to dark yellowish brown in basal segments, reddish brown to dark reddish brown in apical segments; legs yellowish brown through reddish brown to brown.

Relative measurements: HL:30; HW:52; PL:40; PW:39; EL:38; SL:27; EW:45.

Head transverse, interocular area with a pair of depressions weakly convergent anteriorly, median part between depressions moderately convex, almost elongate-triangular or elongate-trapezoidal in shape; surface uniformly with punctures dense to moderately dense, round, distinct, somewhat umbilicate and shallow, interstices distinctly microsculptured. Pronotum with surface slightly uneven, median longitudinal depression relatively long and vague in outline, with its bottom distinctly microsculptured; punctures very dense, round and coarse, interstices distinctly microsculptured. Elytra rounded laterally; surface more or less flat along suture, with punctures very dense, various in size and coarse, interstices indistinctly microsculptured. Abdomen cylindrical; 3rd segment with anterolateral fovea subovoidal, less than half the length of segment, remnant of tergo-paratergal suture found only at the anterior part of segment; 3rd tergite with punctures dense, round and distinct, becoming smaller toward posterior margin, interstices indistinctly microsculptured; 7th tergite with punctures fine and regular, interstices indistinctly microsculptured or very finely shallowly sculptured.

Male. Third to 5th sternites each flat at posteromedian parts; 6th sternite (Fig. 27B) posteromedially with a semicircular depression rather shallow, its posterior margin very shallowly arcuate; 7th sternite (Fig. 27B) posteromedially with a C-shaped depression very large and deep, its side ridges obtusely edged and its posterior margin deeply arcuate; 8th sternite

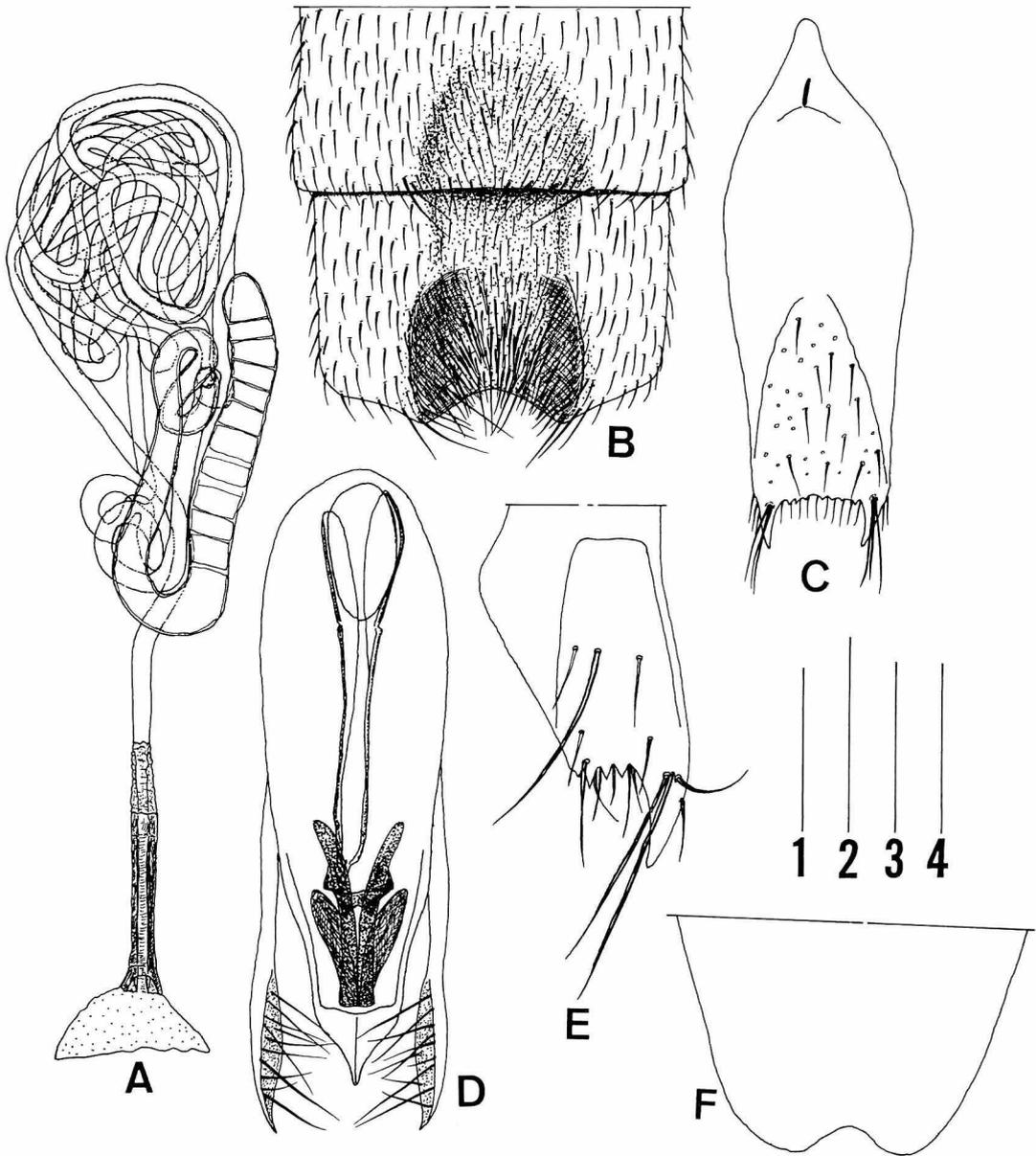


Fig. 27. *S. ichihashii* sp. nov. A, Spermatheca and basal porch (Kuroso, Mie); B, 6th and 7th sternites of male (Kuroso, Mie); C, 9th sternite of male (Hirakura, Mie); D, aedeagus (Kuroso, Mie); E, 9th sternite of female (Kuroso, Mie); F, 8th sternite of male (Kuroso, Mie). Scale 1: 0.25 mm for B; scale 2: 0.25 mm for F; scale 3: 0.2 mm for C, D; scale 4: 0.1 mm for A, E.

(Fig. 27F) with a moderately sized emargination at posterior margin; 9th sternite (Fig. 27C) with apicolateral projection short and acutely pointed. Aedeagus (Fig. 27D) with median lobe weakly bulbous at basal half, side margin very shallow, bisinuate behind the middle, apicolateral corner obtusely angulate but distinct, api-

cal sclerotized area subtriangular, acutely pointed at apex, shallowly arcuate at internal margin, with the median longitudinal line of its full length; median longitudinal bands gradually divergent anteriorly, each narrow and relatively short, the dorsally folded portions distinctly divergent anteriorly, each broad, narrowly

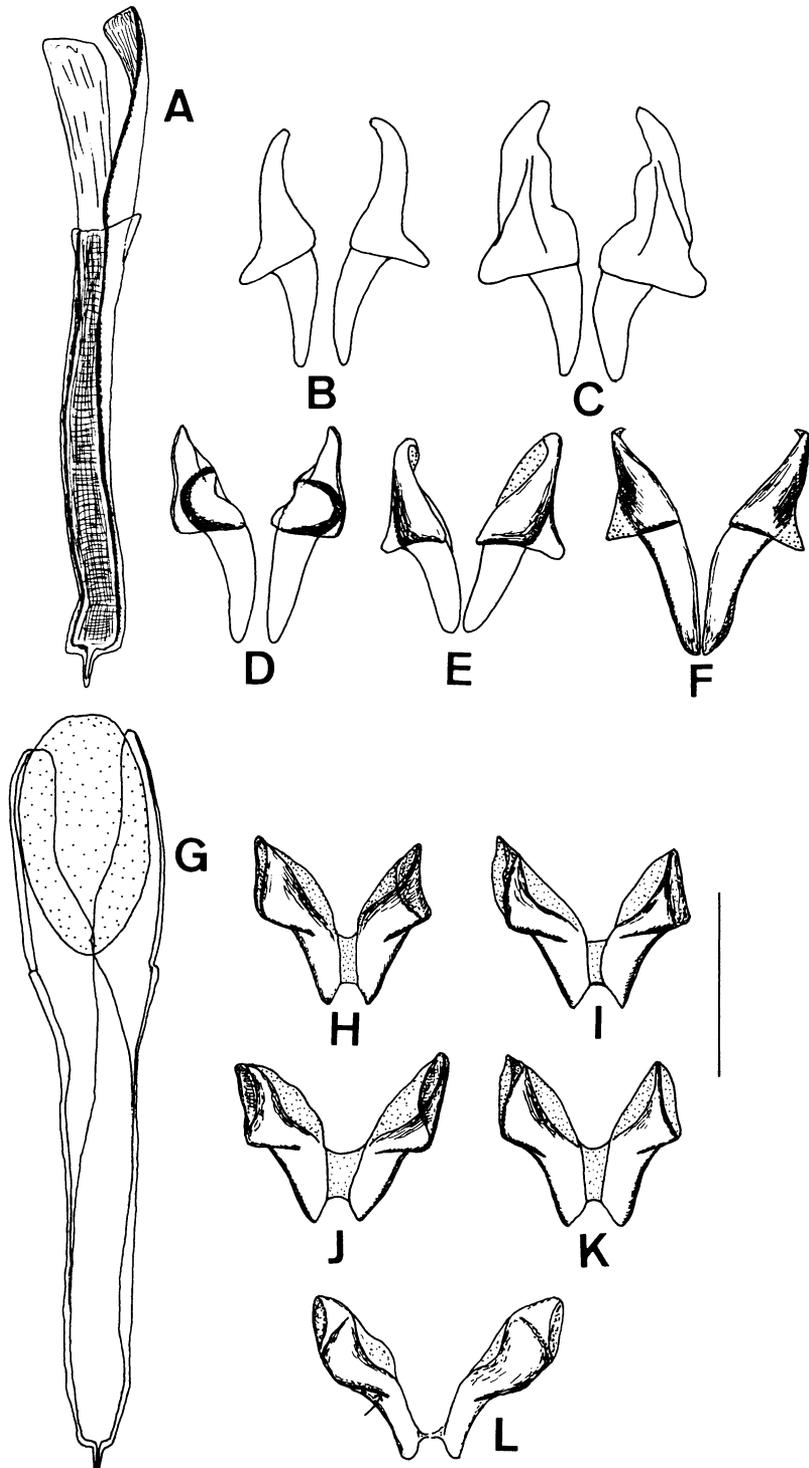


Fig. 28. *S. lubomiri* sp. nov. (A, B, Kasuga, Nara; C, Ikoma, Nara; D, Ayama, Mie; E, Ise, Mie; F, Koraibiro, Mie); *S. ichihashii* sp. nov. (G, H, Hirakura, Mie; I, Kuroso, Mie; J, Kameyama, Mie; K, Komono, Mie); *S. ichihashii miunensis* subsp. nov. (L, Miune, Nara). A, G, basal tube of endophallus; B-F, H-L, median hooks of endophallus. Scale: 0.1 mm.

rounded at apex; median hooks (Figs. 28H-K) broadly connected each other by a broad submembranous plate, posterior plate narrowing posteriorly, with pointed or almost pointed at apex, anterior plate partially separated from posterior plate by transverse suture, well angulate at postero-external corner, usually with its latero-external and latero-internal marginal areas submembranous; basal tube (Fig. 28G) with sperm sac very large, basal constriction very minute but distinct, tube body rather thick and stout, weakly narrowing apically, then abruptly constricted to form a spur-like tip; parameres extending posteriorly beyond the apex of median lobe, the apical part weakly swollen internally, very acutely pointed at tip, its apico-internal area with setae short to moderately long, 11 in number.

Female. Ninth sternite (Fig. 27E) obtusely angulate at bas-internal corner, its apico-external tuft and median seta very long; spermatheca (Fig. 27A) with capsule small, RT-duct as broad as capsule, spermathecal duct thin and very long, strongly coiled, with the strongly coiled part mostly situated before the apex of capsule, and the most posterior end of coiled duct situated before the 1st bent of duct when counted from the apex, basal sclerotized duct slender and straight; basal porch semi-spherical and totally submembranous.

Type series. Holotype, ♂ (CBM-ZI 121807), Hirakura, Mie Pref., 20. xi. 1994, T. Ito leg. Paratypes: 1 ♀ (CBM-ZI 121765), same data as holotype; 1 ♂ 1 ♀, same data as holotype; 1 ♂, Asake-keikoku, Komono-cho, Mie Pref., 21. iii. 1995, H. Yokozeki leg.; 1 ♂ 1 ♀, Sekisuikei, Kameyama C., Mei Pref., 23. ii. 1998, A. Amagasu leg.; 2 ♂ 2 ♀, Mt. Kuroso, Mie Pref., 2. x. 1993, T. Ito leg.

Distribution. Honshu (Mie Pref.).

Remarks. *S. ichihashii* is closely allied to *S. lubomiri* in the common possession of the apical part of basal tube with its spur-like tip and abrupt constriction, etc., but the former is distinctly separable from the latter by the structure of the spermatheca as well as the median hooks and basal tube of endophallus as mentioned in the key.

Etymology. The specific epithet of this new species is named in honour of Mr. Hajimu Ichihashi who contributed to the clarification of *Stenus* fauna of Mie Prefecture.

*Stenus (Hypostenus) ichihashii miunensis*  
Naomi subsp. nov.

(Fig. 28L)

Description of some characters of male. The distinction between nominotypical subspecies and *S. ichihashii miunensis* is gained from the structure of median hooks described as follows: median hooks (Fig. 28L) connected each other at a point of the latero-internal margin situated behind the middle of posterior plate; posterior plates gently convergent posteriorly, each rounded apically, anterior plate partially separated from posterior plate by oblique suture, its postero-external corner gently rounded, and its latero-external and latero-internal marginal areas more or less submembranous, and its sclerotized portion of anterior plate indistinctly divided into two areas by an obscure line.

Female. Unknow.

Type series. Holotype, ♂ (CBM-ZI 121752), Mt. Miune, Nara Pref., 28. v. 1994, K. Mizuno leg.

Distribution. Honshu (Nara Pref.).

Remarks. At present *S. ichihashii miunensis* is distributed only in Mt. Miune located at the boundary area between Nara and Mie Prefectures. This new subspecies is very similar in external morphology of body and external structure of aedeagus to nominotypical subspecies, but the former is clearly distinguishable from the latter by the structure of median hooks as mentioned in the key.

Etymology. The subspecific epithet of this new subspecies is derived from the name of holotype locality "Miune" in Nara Prefecture.

*Stenus (Hypostenus) mikawanis*  
Naomi stat. nov.

(Figs. 29A-F)

*Stenus (Hypostenus) nakanei mikawanis* Naomi, 1997a, Jpn. J. Ent., 65(3): 606; Herman, 2001, Bull. Amer. Mus. Nat. Hist., (265): 2295; Puthz and Naomi, 2003, Newsl. Staphyl. Soc. Jpn., (20): 8; Smetana, 2004, Cal. Pal. Col., 2: 550.

Male. Brachypterous, 3.5 mm in length, moderately shining. Head dark brown near inner margins of eyes, reddish brown on the median part; pronotum and elytra reddish brown; ab-

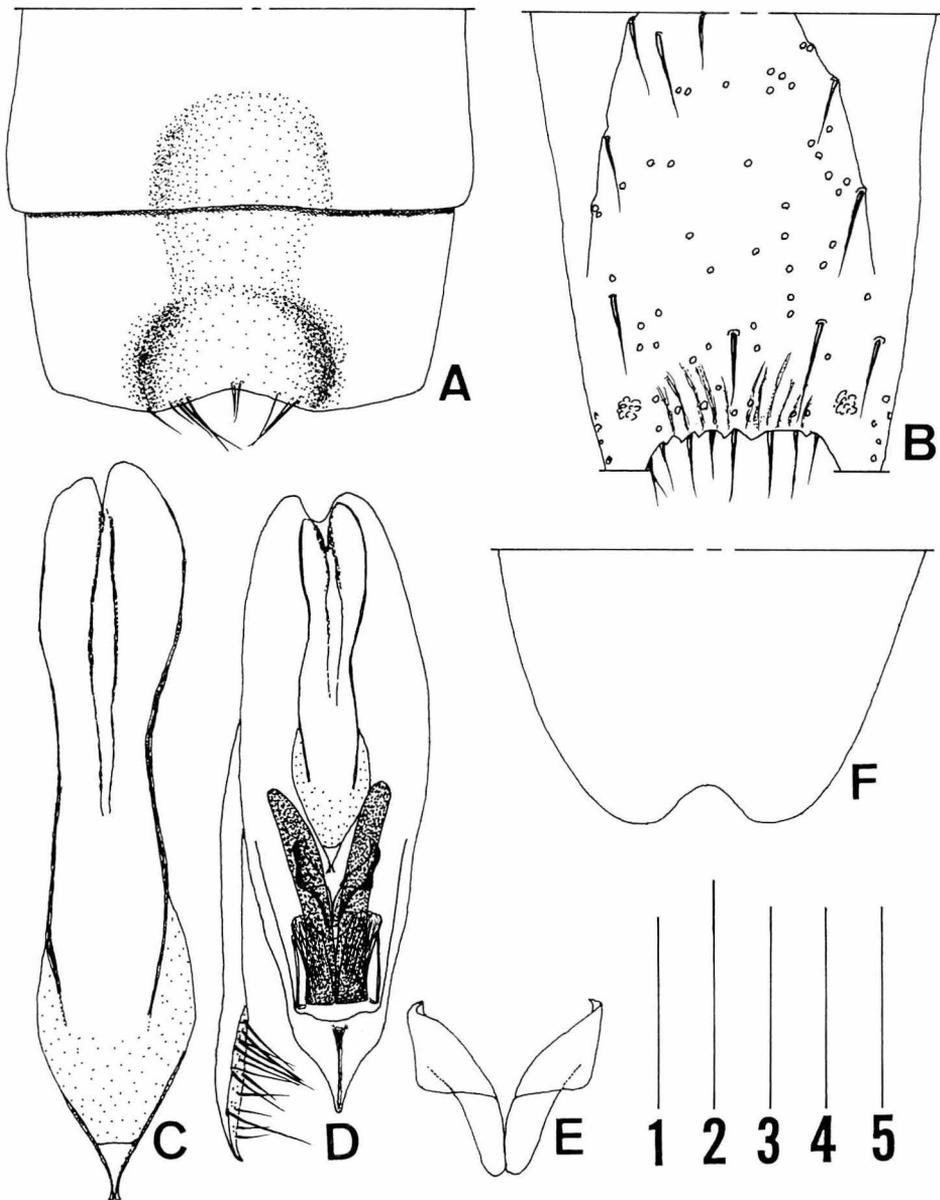


Fig. 29. *S. mikawanis* Naomi stat. nov. (Mennoki, Aichi). A, Sixth and 7th sternites of male; B, 9th sternite of male; C, basal tube of endophallus; D, aedeagus; E, median hooks of endophallus; F, 8th sternite of male. Scale 1: 0.25 mm for A; scale 2: 0.25 mm for F; scale 3: 0.2 mm for D; scale 4: 0.1 mm for C, E; scale 5: 0.05 mm for B.

domen reddish brown in basal segments, brown in apical segments; antennae yellowish brown in basal segments, reddish brown to dark reddish brown in apical segments.

Relative measurements: HL:28; HW:50; PL:39; PW:40; EL:40; SL:30; EW:47.

Head transverse, interocular area with a pair of depressions gently convex, almost elongate-

triangular in shape; surface uniformly with punctures dense to moderately dense, round, regular and somewhat umbilicate, interstices distinctly microsculptured. Pronotum with surface weakly uneven, median longitudinal depression short, vague in outline, with its bottom distinctly microsculptured; punctures very dense, round to almost round, and coarse, interstices

distinctly microsculptured. Elytra almost rounded laterally; surface weakly uneven, almost flat along suture, with punctures very dense and round, interstices very narrow, indistinctly microsculptured. Abdomen cylindrical; 3rd segment with anterolateral fovea subovoidal, less than half the length of segment, remnant of tergo-paratergal suture found only at the anterior part of segment; 3rd tergite with punctures dense, round to elliptical, distinct and almost regular, interstices distinctly microsculptured; 7th tergite with punctures fine and regular, interstices indistinctly microsculptured.

Sixth sternite (Fig. 29A) posteromedially with a semicircular depression rather shallow, its side margins obscure and its posterior margin very shallowly arcuate; 7th sternite (Fig. 29A) posteromedially with a C-shaped depression shallow, and its side margins ridged low only at posterior portion; 8th sternite (Fig. 29F) with a relatively small emargination at posterior margin; 9th sternite as in Fig. 29B. Aedeagus (Fig. 29D) with median lobe broadest a little before the middle, side margin weakly bisinuate behind the middle, apicolateral corner obtusely angulate but distinct, apical sclerotized area almost triangular, acutely pointed at apex, weakly arcuate at internal margin, with median longitudinal line of its full length; median longitudinal bands weakly divergent anteriorly, each relatively broad and rounded apically, with its dorsally folded portion short but reaching anteriorly a little beyond the posterior end of median hook; lateral longitudinal bands each very thin and string-like; median hooks (Fig. 29E) directly connected each other at the posterior half of the latero-internal margin of posterior plate; posterior plates weakly convergent posteriorly, each rounded apically; anterior plate completely separated from posterior plate by transverse suture, almost triangular in shape, well angulate at postero-external corner, and very minutely but distinctly incurved at tip, with its basal part much broader than the base of posterior plate; basal tube (Fig. 29C) with sperm sac very large, basal constriction very vague and loose, tube body rather thick and robust, swollen and almost submembranous at subapical portion, and strongly narrowed toward the almost pointed tip; parameres extending posteriorly beyond the apex of median

lobe, the apical part hardly swollen internally, acutely pointed at tip, its apico-internal area with setae short to moderately long, 14 to 15 in number.

Female. Unknown.

Type specimen examined. Holotype: ♂, Mennoki Pass, Aichi Pref., 13. viii. 1990, S. Nomura leg.

Distribution. Honshu (Aichi Pref.).

Remarks. *S. mikawanis* was first described as a subspecies of *S. nakanei* in Naomi (1997a) mainly because the more or less incurved condition at the apical part of anterior plate of median hook is possessed both in *S. nakanei* (sensu Naomi, 1997a) and *S. nakanei mikawanis*. However, *S. nakanei mikawanis* is very distinctive in the very large basal tube of endophallus with its swollen submembranous subapical portion (Fig. 29C). Thus, this subspecies is here newly revalidated and upgraded to a distinct species, *S. mikawanis* Naomi stat. nov.

*S. mikawanis* is more closely related to *S. gyrosus* and *S. nakanei* (sense of this paper) than to *S. lubomiri* in considering their common possession of the very thick basal tube of endophallus. This species is clearly separable from *S. gyrosus* and *S. nakanei* (sense of this paper) by the posterior plate of median hook a little shorter than anterior plate, and the basal tube very vaguely and loosely constricted between sperm sac and tube body.

***Stenus (Hypostenus) gyrosus* Naomi sp. nov.**  
(Figs. 30A-H)

*Stenus (Hypostenus) wasabi* Hromádka: Naomi, 1997a, Jpn. J. Ent., 65(3): 603 (in part).

Male and female. Brachypterous, 3.5-3.6 mm in length, moderately shining. Head dark red to dark brown near inner margins of eyes, reddish brown on the median part; pronotum and elytra yellowish brown to reddish brown; abdomen reddish brown to brown in basal segments, dark brown in apical segments; antennae yellowish brown in basal segments, dark brown in apical segments; legs yellowish brown to reddish brown.

Relative measurements: HL:30; HW:54; PL:40; PW:40; EL:39; SL:29; EW:48.

Head transverse, interocular area with a pair of depressions weakly convergent anteriorly, median part between the depressions moderate-

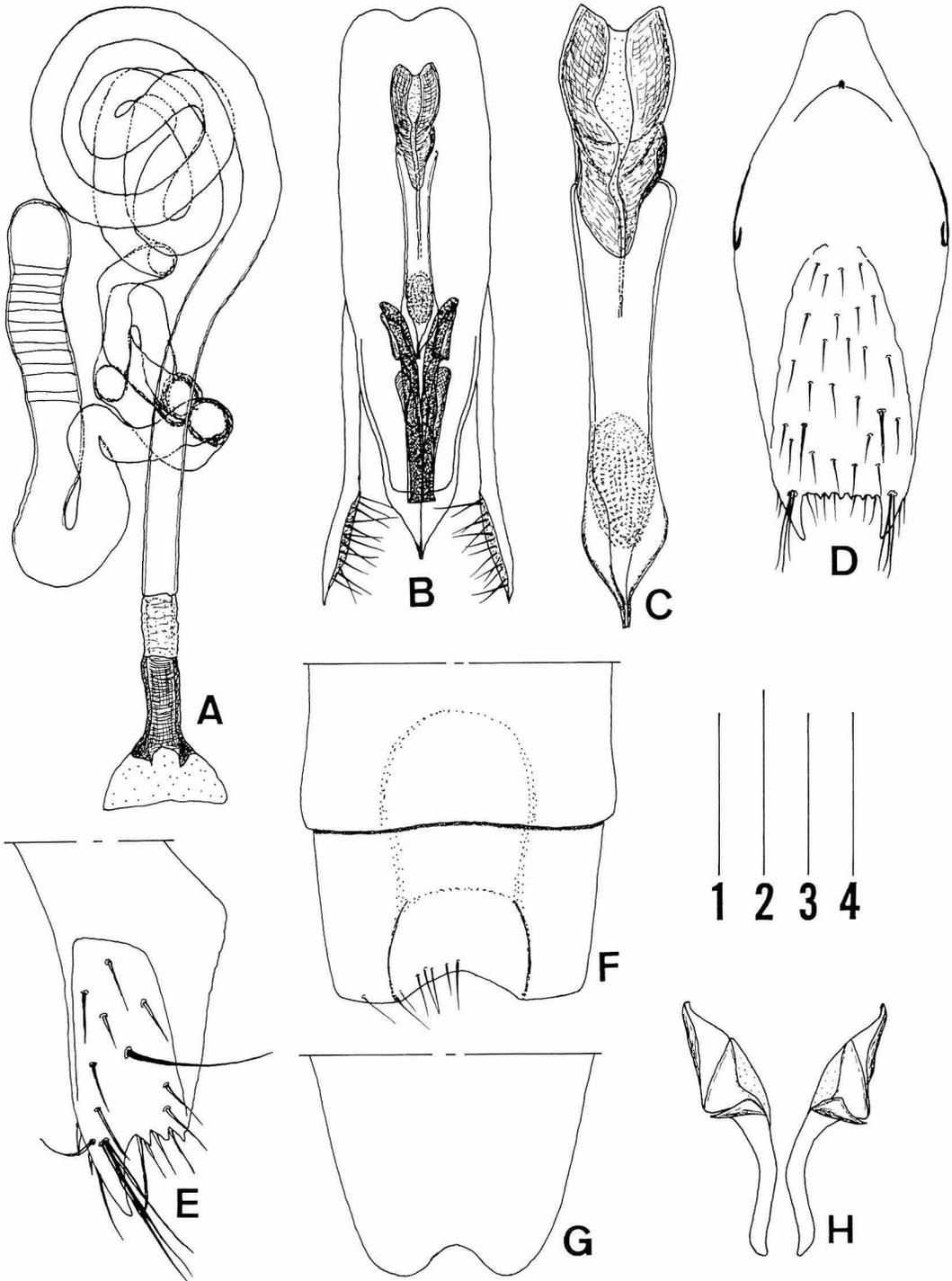


Fig. 30. *S. gyrosus* sp. nov. (Kaijyo, Aichi). A, Spermatheca; B, aedeagus; C, basal tube of endophallus; D, 9th sternite of male; E, 9th sternite of female; F, 6th and 7th sternites of male; G, 8th sternite of male; H, median hooks of endophallus. Scale 1: 0.25 mm for F; scale 2: 0.25 mm for G; scale 3: 0.2 mm for B, D; scale 4: 0.1 mm for A, C, E, H.

ly convex, almost elongate-ovoidal in shape; surface uniformly with punctures dense, round, distinct and regular, and interstices distinctly microsculptured. Pronotum with surface slightly uneven, median longitudinal depression vague in outline; punctures very dense, round and distinct, interstices distinctly microsculptured. Elytra rounded laterally; surface almost flat or very shallowly depressed along suture, with punctures very dense, round, distinct and somewhat various in size, interstices very narrow but almost distinctly microsculptured. Abdomen cylindrical; 3rd segment with anterolateral fovea subovoidal, less than half the length of segment, anterolaterally with a short edge (remnant of tergo-paratergal suture); 3rd tergite with punctures dense, almost round to elliptical, distinct and regular, interstices distinctly microsculptured; 7th tergite with punctures small, moderately dense and regular, interstices almost distinctly microsculptured.

Male. Third and 4th sternites each flat at posteromedian part, the flat area on 4th sternite a little larger than that on 3rd sternite; 5th and 6th sternites each posteromedially with a semi-circular depression shallow and its posterior margin very shallowly arcuate, but the depression on 6th sternite (Fig. 30F) a little deeper than that on 5th sternite; 7th sternite (Fig. 30F) posteromedially with a C-shaped depression moderately deep, its side ridges weakly curved and almost distinctly edged, its posterior margin moderately deeply arcuate, 8th sternite (Fig. 30G) with moderate emargination at posterior margin; 9th sternite (Fig. 30D) well rounded around lateral corner, apicolateral projections short and pointed. Aedeagus (Fig. 30B) with median lobe relatively slender, side margin very weakly bisinuate behind the middle, apicolateral corner round but almost distinct, apical sclerotized area subtriangular, acutely pointed at apex, and almost straight at its internal margin, with a median longitudinal line of its full length; median longitudinal bands long and slender, weakly divergent anteriorly, the dorsally folded portion reaching anteriorly a little behind the posterior margin of anterior plate of median hook, rounded at tip; median hooks (Fig. 30H) with posterior plates convergent before the middle and then a little divergent behind the middle, each very thin, long and weakly sinuate, almost pointed at apex, anterior

plate almost triangular in shape, narrowing anteriorly, very minutely incurved and almost pointed at apex, with oblique line running from postero-external corner to about the middle point of latero-internal margin, and with submembranous portion at basi-internal marginal area; basal tube (Fig. 30C) with sperm sac very large, basal constriction distinct, tube body rather thick, weakly loosely constricted near the middle, moderately swollen at subapical portion, then strongly narrowed apically to form a pointed gonopore; parameres extending posteriorly beyond the apex of median lobe, apical parts weakly divergent posteriorly, each hardly swollen internally, acutely pointed at tip, its apico-internal area with setae short in usual, 13 to 14 in number.

Female. Ninth sternite (Fig. 30E) with basi-internal corner distinctly angulate, apico-external projection pointed, apico-external tuft and median seta very long; spermatheca (Fig. 30A) with capsule much rounded apically, RT-duct short, spermathecal duct relatively thick and loosely coiled, basal sclerotized duct moderately short and straight; basal porch semi-spherical, relatively small, submembranous, with anterior sclerotization.

Type series. Holotype: ♂ (CBM-ZI 121891), Kaijyo, Seto City, Aichi Pref., 8. xi. 1992, T. Hozumi leg. Paratype: ♀, same data as holotype.

Distribution. Honshu (Aichi Pref.).

Remarks. *S. gyrosus* is closely allied to *S. nakanei* when considering such apomorphic similarity as the elongate posterior plates of median hooks that are convergent posteriorly on their basal halves, but the depression on the 7th sternite is smaller, the dorsally folded portions of median longitudinal bands are longer and more weakly divergent anteriorly, the basal tube of endophallus is uniformly sclerotized, the spermathecal duct is longer and the basal porch is broader and almost submembranous.

Etymology. The specific epithet of this new species is derived from a Latin adjective “*gyrosus*” that means “sinuate” and “gyrose” because the posterior plate of median hook is characteristically sinuate.

***Stenus (Hypostenus) nakanei* Hromádka**

(Figs. 31A-H)

*Stenus (Hypostenus) ignorabilis* Naomi, 1997a, Jpn. J. Ent., 65(3): 607; Herman, 2001, Bull. Amer. Mus. Nat. Hist., (265): 2222; Puthz and Naomi, 2003, Newsl. Staphyl. Soc. Jpn., (20): 8; Smetana, 2004, Cal. Pal. Col., 2: 549. (new synonym of *S. nakanei*.)

*Stenus (Hypostenus) ignorabilis awajinis* Naomi, 1997a, Jpn. J. Ent., 65(3): 609. (new synonym of *S. nakanei*.)

Male and female. Brachypterous, 3.4-3.8 mm in length, moderately shining. Head dark brown to black near inner margins of eyes, reddish brown to dark red on the median part; pronotum and elytra reddish brown; abdomen dark reddish brown to dark red on basal segments, dark brown to black on apical segments; antennae yellow to yellowish brown on basal segments, yellowish brown to dark brown on apical segments; legs yellowish brown to reddish brown.

Relative measurements: HL:30; HW:48; PL:39; PW:37; EL:40; SL:30; EW:46.

Head transverse, interocular area with a pair of longitudinal depressions shallow and weakly convergent anteriorly, median part between the depressions weakly convex and elongate-ovoidal in shape; surface uniformly with punctures dense to moderately dense, round, relatively small, distinct, somewhat shallow and umbilicate, interstices almost distinctly microsculptured. Pronotum with surface weakly uneven, median longitudinal depression long, narrow and relatively distinct in outline and broadest near the middle; punctures very dense, round and coarse, interstices almost distinctly microsculptured. Elytra rounded laterally; surface slightly uneven, almost flat along suture; punctures very dense, round and almost regular, interstices very narrow and indistinctly microsculptured. Abdomen strongly cylindrical, 3rd segment with anterolateral fovea moderately large and deep, subovoidal, a little more than half the length of segment, remnant of tergo-paratergal suture found only at the anterior part of segment; 3rd tergite with punctures dense, round and distinct, becoming smaller toward posterior margin, interstices very distinctly microsculptured; 7th tergite with punctures moderate in density, fine, ellipti-

cal and regular, interstices with fine and minute sculptures running almost transversely.

Male. Third to 5th sternites each flat on posteromedian part but the flat area becoming larger from 3rd to 5th sternites, 5th sternite with posterior margin of the flat area almost straight; 6th sternite (Fig. 31F) posteromedially with a semicircular depression moderately deep, its side ridges obtuse and indistinctly edged, its posterior margin very shallowly arcuate; 7th sternite (Fig. 31F) posteromedially with a C-shaped depression very large, its side ridges very distinct, high, moderately curved and almost distinctly edged, its posterior margin moderately deep; 8th sternite (Fig. 31H) with a deep emargination at posterior margin; 9th sternite (Fig. 31D) gently rounded at lateral corner, with apicolateral projections short and pointed. Aedeagus (Fig. 31B) with median lobe weakly bulbous at base, side margin weakly but distinctly bisinuate behind the middle, apicolateral corner gently rounded and indistinct, the apical sclerotized area relatively long, strongly narrowed apically, very acutely pointed, and almost straight or very weakly arcuate at internal margin, with the median longitudinal line of full length; median longitudinal bands moderately divergent anteriorly, each relatively broad and pointed at anterior end, its dorsally folded portions strongly divergent anteriorly, each rounded at anterior margin; median hooks (Fig. 31E) with posterior plates convergent at basal half and running parallel at apical half, each slender and narrowly rounded at apex, anterior plate relatively small and almost triangular in shape, distinctly separated from posterior plate by the membranous area running obliquely; basal tube (Fig. 31C) very large, partially submembranous, with sperm sac consisting of two long stout basal shafts, basal constrictions very indistinct, tube body weakly narrowed a little behind the basal constriction, gradually thickened subapically, then strongly constricted to form a thin tube with gonopore; parameres slender, extending posteriorly beyond the apex of median lobe, the apical part not swollen internally, very acutely pointed at tip, with a broad-triangular flap at the base of the ventral margin of apico-internal area, the apico-internal area with setae short to moderately long, 21 to 22 in number.

Female. Ninth sternite (Fig. 31G) well angu-

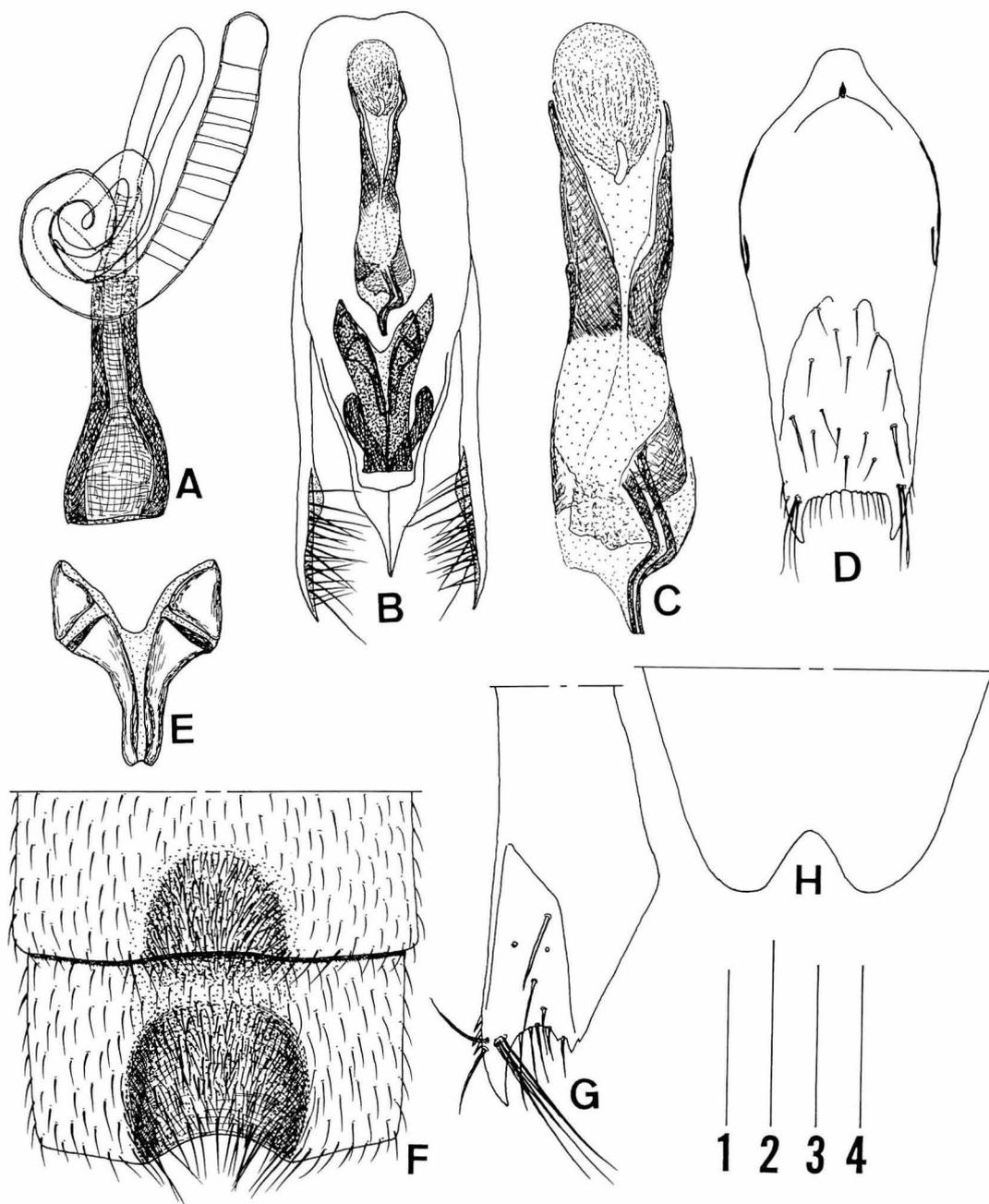


Fig. 31. *S. nakanei* Hromádka. A, Spermatheca (Shibakoya, Tokushima); B, aedeagus (Toonomine, Nara); C, basal tube of endophallus (Toonomine, Nara); D, 9th sternite of male (Tamagawakyo, Wakayama); E, median hooks of endophallus (Toonomine, Nara); F, 6th and 7th sternites of male (Yusuhara, Kochi); G, 9th sternite of female (Shibakoya, Tokushima); H, 8th sternite of male (Toonomine, Nara). Scale 1: 0.25 mm for F; scale 2: 0.25 mm for H; scale 3: 0.2 mm for B, D; scale 4: 0.1 mm for A, C, E, G.

late at basi-internal corner, apico-external projection incurved and acutely pointed; spermatheca (Fig. 31A) with capsule small, rounded at apical margin, RT-duct thick, spermathecal

duct loosely coiled, bent 8 times on its way, basal sclerotized duct very thick and stout, completely amalgamated with basal porch which is robust, moderately swollen and sclerotized.

Holotype specimen examined. I examined the holotype of *S. nakanei* deposited in Mr. Hromádka's Collection. The label is as follows: Asuka-Kinki Distr., 1. 9. 1963, K. Sawada; coll. Hromádka; HOLOTYPUS, *Stenus (Hypostenus) nakanei* sp. n. ♂, Hromádka, 1980.

Type specimens of *S. ignorabilis* Naomi examined. Paratypes: 1 ♀, Mt. Shibakoya, Kamiyama-cho, Tokushima Pref., 2. x. 1977, M. Yoshida leg.; 1 ♀, same locality, 6. iv. 1976, M. Yoshida leg.; 1 ♂ 1 ♀, same locality, 6. iv. 1975, M. Yoshida leg.; 1 ♂, Mt. Kumoso (1150 m), Tokushima Pref., 18. vii. 1988, M. Sakai leg.; 2 ♂, Okuohno, Ichiu-son, Mima, Tokushima Pref., 1. viii. 1967, M. Yoshida leg.; 1 ♂, Mt. Nakatsu, Nishiiyayama-son, Tokushima Pref., 23. viii. 1971, M. Yoshida leg.; 1 ♂, Mt. Kurotaki, Yamashiro-cho, Tokushima Pref., 3. viii. 1977, M. Yoshida leg.; 2 ♂, Harunokio, Nishiiyayama-son, Tokushima Pref., 24. viii. 1971, M. Yoshida leg.; 1 ♂ 2 ♀, Yusuhara-cho, Takaoka-gun, Kochi Pref., 30. iv. 1977, M. Yoshida leg.; 1 ♂ 1 ♀, Izumi, Niyodo-mura, Kochi Pref., 20. iii. 1976, M. Yoshida leg.; 1 ♂, Mt. Zozu, Kagawa Pref., 24. i. 1971, T. Kinoshita leg.

Other specimens of *S. nakanei* examined. 2 ♂ 1 ♀, Mt. Makio, Osaka Pref., 17. iv. 1960, Y. Kimura leg.; 1 ♂, Mt. Kongo, Osaka Pref., 10. viii. 1986, T. Ito leg.; 2 ♂ 2 ♀, Mt. Inunaki, Osaka Pref., 27. vii. 1985, T. Ito leg.; 1 ♂, Mt. Iwawaki, Osaka Pref., 5. vi. 1960, T. Ito leg.; 1 ♂, same locality, 7. iv. 1961, Y. Kimura leg.; 3 ♂, Mt. Iwawaki, Osaka Pref., 24. iv. 1966, Y. Hayashi leg.; 3 ♂ 3 ♀, same locality, 30. iv. 1986, T. Ito leg.; 5 ♂ 5 ♀, Kimi-toge, Kii (Wakayama Pref.), 17. iv. 1988, T. Ito leg.; 1 ♂, same locality, 27. viii. 1988, M. Yasui leg.; 1 ♂ 7 ♀, same locality, 2. xii. 1990, T. Ito leg.; 7 ♂ 6 ♀, Tamagawa-kyo, Kii, 24. viii. 1985, T. Ito leg.; 3 ♂ 4 ♀, same locality, 25. viii. 1985, T. Ito leg.; 1 ♂, Hase, Yamato (Nara Pref.), 14. iv. 1959, T. Shibata leg.; 1 ♀, same locality, 21. iv. 1968, T. Ito leg.; 1 ♂, same locality, 8. x. 1967, T. Ito leg.; 2 ♂, Murooji, Nara Pref., 10. x. 1984, T. Ito leg.; 1 ♂, Imoyama, Yamato, 15. ix. 1984, T. Ito leg.; 1 ♂, same locality, 2. vi. 1984, T. Ito leg. 2 ♂ 7 ♀, Mt. Tohnomine, Yamato, 13. viii. 1984, T. Ito leg.; 6 ♂ 11 ♀, same locality, 13. vii. 1985, T. Ito leg.; 1 ♂ 7 ♀, same locality, 12. x. 1986, T. Ito leg.; 12 ♂ 8 ♀, same locality, 9. x. 1988, T. Ito leg.; 4 ♂ 10 ♀, same locality,

11. ix. 1993, T. Ito leg.; 1 ♂ 1 ♀, Okuyashiki (600 m), Awa (Tokushima Pref.), 6. i. 1960, T. Shibata leg.

Distribution. Honshu (Osaka, Wakayama and Nara Prefs.) and Shikoku (Tokushima, Kochi and Kagawa Prefs.).

Remarks. I examined the holotype of *S. nakanei* for the first time. As a result I found that *S. ignorabilis* is exactly same species as *S. nakanei* so that I here synonymized the names of *S. ignorabilis* and *S. ignorabilis awajinis* with the name of *S. nakanei*.

*S. nakanei* is closely allied to *S. gyrosus*, but the former is distinctly separable from the latter by the structures of the median longitudinal bands, median hooks and basal tube of endophallus, the paramere of aedeagus and the spermatheca as mentioned in the key. This is the species whose distributional range is widest among the members of *S. rufescens* group.

***Stenus (Hypostenus) nakanei awajinis*  
(Naomi) comb. nov.**  
(Figs. 32A-D)

*Stenus (Hypostenus) ignorabilis awajinis* Naomi, 1997a, Jpn. J. Ent., 65(3): 609; Herman, 2001, Bull. Amer. Mus. Nat. Hist., (265): 2222; Puthz and Naomi, 2003, Newsl. Staphyl. Soc. Jpn., (20): 8; Smetana, 2004, Cal. Pal. Col., 2: 549. (new synonym of *S. nakanei*.)

Description of some characters of male. Third to 4th sternites each flat at posteromedian part, the flat area on 4th sternite larger than that on 3rd sternite; 5th sternite posteromedially with a semicircular depression very large and very shallow, its posterior margin very shallowly arcuate; 6th sternite (Fig. 32A) posteromedially with a semicircular depression very large and moderately deep, its side ridges curved, distinct and sharply edged, its posterior margin very shallowly arcuate; 7th sternite (Fig. 32A) posteromedially with a C-shaped depression very large and very deep, its side ridges high, curved and acutely edged, its posterior margin deeply arcuate; 8th sternite posteromedially with the emargination moderately large; aedeagus (Fig. 32C) with median lobe moderately slender, with side margin moderately bisinuate behind the anterior 1/3, apicolateral corner moderately rounded and distinct, apical sclero-

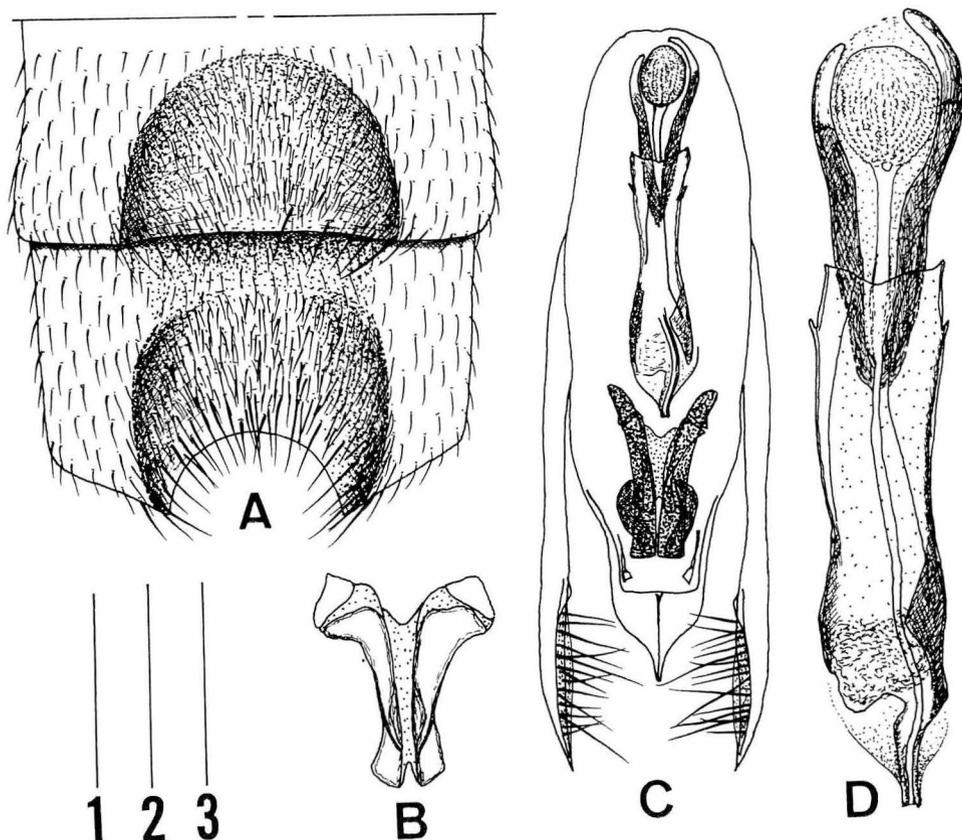


Fig. 32. *S. nakanei awajinis* (Naomi) comb. nov. (Sumoto, Awaji). A. Sixth and 7th sternite of male; B. median hooks of endophallus; C. aedeagus; D. basal tube of endophallus. Scale 1: 0.25 mm for A; scale 2: 0.2 mm for C; scale 3: 0.1 mm for B, D.

tized area subtriangular, very acutely pointed at apex, straight at inner margin, with the median longitudinal line of full length; median longitudinal bands moderately divergent anteriorly, relatively short, its dorsally folded portion very short, almost J-shaped; median hooks (Fig. 32B) with posterior plate long and elongate, expanded antero-externally, anterior plate rather small and almost triangular, distinctly separated from posterior plate by the narrow submembranous area; basal tube (Fig. 32D) with sperm sac very large, its left shaft longer than right shaft, basal constriction very distinct, tube body very weakly indistinctly constricted on its way, weakly swollen at subapical part, apically with the thin tube sinuate and sclerotized; parameres extending posteriorly beyond the apex of median lobe, slender, the apical part very acutely pointed at tip, with a small triangular flap at the base of the ventral margin of apico-internal

area, the apico-internal area with setae short to long, 16 to 18 in number.

Female. Unknown.

Type specimen examined. Holotype: ♂, Mt. Senzan, Sumoto, Awaji Is., Hyogo Pref., 15. iv. 1971, M. Tomokuni leg.

Distribution. Honshu (Awaji Is.).

Remarks. A new combination, *S. nakanei awajinis* is here proposed because the name of *S. ignorabilis awajinis* is synonymized with the name of *S. nakanei*. *S. nakanei awajinis* is a rare subspecies that is known only of the holotype specimen. This subspecies is also a sole insular one among the members of *S. rufescens* group. This subspecies is clearly separable from the nominotypical subspecies by the larger depression on the 6th sternite of male, the shorter apical sclerotized area of median lobe, the smaller anterior plate of median hook, etc.

**A List of the Japanese Species of  
*S. rufescens* group**

1. *S. tsurusakii* Naomi
2. *S. akojagai* Hromádka
3. *S. enma* Naomi
4. *S. gagyumontis* Naomi
5. *S. miroku* Naomi sp. nov.
6. *S. testaceopiceus* Bernhauer
7. *S. volkeri* Naomi
8. *S. pubicornis* Naomi
9. *S. ohtoensis* Naomi sp. nov.
10. *S. cygnipenis* Puthz
11. *S. agrestis* Naomi sp. nov.
12. *S. olliformis* Naomi sp. nov.
- 12a. *S. olliformis owasenus* Naomi subsp. nov.
13. *S. ebisu* Naomi sp. nov.
14. *S. ichikawai* Naomi sp. nov.
15. *S. jukata* Hromádka
16. *S. rufescens* Sharp
17. *S. daigonis* Puthz et Naomi
18. *S. wasabi* Hromádka
19. *S. ingens* Naomi sp. nov.
- 19a. *S. ingens ryugadakensis* Naomi subsp. nov.
20. *S. lubomiri* sp. nov.
21. *S. ichihashii* Naomi sp. nov.
- 21a. *S. ichihashii miuensis* Naomi subsp. nov.
22. *S. mikawani* Naomi stat. nov.
23. *S. gyrosus* Naomi sp. nov.
24. *S. nakanei* Hromádka  
= *S. ignorabilis* Naomi syn. nov.
- 24a. *S. nakanei awajinis* (Naomi) comb. nov.

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### 日本産メダカハネカクシ属

(甲虫目, ハネカクシ科, メダカハネカクシ亜科)

の分類学的再検討: トビイロメダカハネカクシ種群

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本論文では、日本産トビイロメダカハネカクシ種群の分類学的再検討を行った。トビイロメダカハネカクシ種群の研究史、ならびに分類に有用な形質および解剖などの技術について詳述した。トビイロメダカハネカクシ種群およびその7つの亜群を定義した。本種群に属するすべての種と亜種を対象として、検索表を作成し、記載もしくは再記載し、また重要形質を図示し

た。加えて、日本産のトビイロメダカハネカクシ種群のチェックリストを作成した。

日本産のトビイロメダカハネカクシは24種4亜種に分類された。すべての種と亜種において後翅が退行的で短翅であり、これらすべての種および亜種はおそらく日本列島に固有の分類群であるようだ。これらの構成分類群のなかには10新種3新亜種が含まれていたもので、以下のように記載した：*S. miroku* sp. nov. (広島県), *S. ohtoensis* sp. nov. (和歌山県), *S. agrestis* sp. nov. (三重県), *S. olliformis* sp. nov. (奈良県), *S. olliformis owasenus* subsp. nov. (三重県), *S. ebisu* sp. nov. (奈良県), *S. ichikawai* sp. nov. (奈良県, 三重県), *S. ingens* sp. nov. (三重県), *S. ingens ryugadakensis* subsp. nov. (三重県), *S. lubomiri* sp. nov. (京都府, 奈良県, 三重県), *S. ichihashii* sp. nov. (三重県), *S. ichihashii miunensis* subsp. nov. (奈良県), and *S. gyrosus* sp. nov. (愛知県)。*S. ignorabilis* Naomi and *S. ignorabilis awajinis* Naomi は *S. nakanei* Hromádka のシノニムとした。このことに関連して、新組み合わせ *S. nakanei awajinis* (Naomi) comb. nov. を *S. ignorabilis* の亜種 *S. ignorabilis awajinis* Naomi に対して設けた。*S. nakanei mikawanis* Naomi はこれまで *S. nakanei* の亜種として扱われてきたが、本論文ではそれを独立種 (*S. mikawanis* Naomi stat. nov.) として扱った。