SYSTEMATIC REVISION OF THE FAMILY SCIRTIDAE OF JAPAN, WITH PHYLOGENY, MORPHOLOGY AND BIONOMICS (INSECTA: COLEOPTERA, SCIRTOIDEA)

Hiroyuki YOSHITOMI

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Systematic Revision of the Family Scirtidae of Japan, with phylogeny, morphology and bionomics (Insecta: Coleoptera, Scirtoidea) *

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Abstract

The Japanese species of the family Scirtidae are revised. Sixty-four species belonging to eight genera are recognized, and 18 species of them are new to science and four species and the genus Ora are newly recorded from Japan. New species described in the present paper are as follows: Elodes takahashii, Sacodes okinawana, Cyphon aomorianus, C. tohokuanus, C. proprius, C. vulgaris, C. uenoi, C. occidentes, C. ohbayashii, C. kyushuanus, C. honshuanus, C. amami, C. okinawanus, C. spinifer, C. yayeyamanus, C. nipponicus, C. tsushimaus and C. yakushimanus. Four Cyphon species, C. magicus KLAUSNITZER, C. consobrinus NYHOLM, C. padi (LINNAEUS) and C. ussuricus NYHOLM, are newly recorded from Japan. Three Scirtes species, S. okinawanus, S. yayeyamanus and S. mawatarii, are transferred to the genus Ora.

Descriptions of seven genera are given with keys to the Japanese species. All the species are described or redescribed with figures, except for Scirtes ovetulus LEWIS and Prionocyphon fuscipennis KIESENWETTER. The larval stages of six species, viz. Sacodes sp., Scirtes japonicus, S. sobrinus, Ora okinawanus, Prionocyphon sexmaculatus and Cyphon consobrinus, are also described with brief biological notes.

Phylogeny of the seven Japanese genera is analyzed using the computer program PAUP4.0b2 (Swofford, 1998) and MacClade 3.07 ( Maddison & Maddison, 1992). The cladistic analysis based on the midpoint method resulted in one most parsimonious tree as ((Elodes, Odeles), Sacodes), (((Hydrocyphon), ((Scirtes, Ora)), (Prionocyphon, Cyphon))). The cladogram is isomorphic to the hypothesis of Hannappel & Paulus (1987, 1991) based on the larval characters, but don't support the Klausnitzer’s hypotheses (Klausnitzer, 1974 a). The reason of the inconsistent results is discussed.

Morphology and bionomics are briefly discussed and summarized mainly based on the knowledge of the Japanese genera and species.

* Dissertation submitted to the Graduate School of Agriculture, Ehime University, in partial fulfillment of the requirements for the degree of PhD., 2002 [abridged for publication, Yoshitomi (2002 a)].

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I. Introduction

The coleopteran family Scirtidae, along with Eucinetidae, Clambidae and Declinidae, comprises the superfamily Scirtoidea, which is recognized as one of the most primitive groups of Polyphaga (Crowson, 1960; Lawrence & Newton, 1995). But the autapomorphy of the superfamily has not been proposed, and its monophyly is doubtful (Lawrence & Newton, 1995; Beutel, 1997; Lawrence, 2001). Therefore the systematic and phylogenetic studies in the superfamily Scirtoidea are very important and necessary.

The family Scirtidae is distributed throughout the world, and more than 900 species in 30 genera have been described. "Marsh Beetles" in English name refers to their adult and larval habitats, and the Japanese name of the family "Maru-hananomi" has been originated from the jumping behaviour in the genus Scirtes. In the past, the family had been treated with a part of Psephenidae, Ptilocactylidae and the other small families by the similarity of their external features, but the Scirtidae constitutes a monophyletic group characterized by some autapomorphies (Crowson, 1955; Lawrence & Newton, 1995). Particularly the larval stage is very unique in having multi-segmented antennae and complicated mouthparts. These characteristics of the larvae are not only the family's autapomorphies, but also easily distinguished from other coleopteran families. The larval morphology has been relatively well studied (e.g. Hannapel & Paulus, 1987, 1991), but the adult morphology has been studied by only a few entomologists (e.g. Klausnitzer, 1974 a; Nyholm, 1972 a, b; Yoshitomi, 1997) because of difficulty of taxonomic study.

In this study, I review the genera and species of the family Scirtidae in Japan, together with biological information, descriptions of the larvae and phylogenetic consideration of the genera. This is the first comprehensive study of the family Scirtidae not only in Japan but also in Asia.

II. Materials & Methods

Materials

This study is mainly based on dried (adults) and 70% ethanol preserved (larvae, pupae and adults) specimens in my collection. In addition, I could loan and examine many specimens which are preserved in the institutions and personal collections. Totally more than 1,500 dried specimens have been examined including many type specimens, and based on them more than 700 permanent slides were made by me in any parts, i.e. mouth parts, antennae, hind wings, thorax, abdominal segments and male and female genitalia.

Followings are acronyms used in this paper for public and private collections. These are mainly referred to Heppner & Lamas (1982).
BMNH– British Museum, Natural History, London
EUM– Entomological Laboratory, Ehime University, Matsuyama
KMNH– Kurashiki Museum of Natural History, Okayama, Japan
MNHP– Muséum National d'Histoire Nationelle, Paris
NHMW– Naturhistorisches Museum Wien
NSMT– National Science Museum, Tokyo
NWU– Biological Laboratory, Nagoya Women's University (this collection was moved
to EUM, after the retirement of Dr. M. SATÔ)
SEHU– Systematic Entomology, Hokkaido University
TMNH– Toyohashi Museum of Natural History, Aichi, Japan
TPM– Tochigi Prefectural Museum, Utsunomiya, Japan
ZIL– Zoological Institute, Academy of Science, Leningrad
TN–Private collection of the late Dr. T. NAKANE (now in SEHU)

In addition, a great number of permanent slides preserved in EUM and NWU made by Mr. K. SASAGAWA, who had studied the Japanese species of the genus Cyphon, were numbered by me with slide labels (slide no. KS l– KS 116) for the purpose to sort.

Methods of collecting and rearing

The adults were collected by the general collecting methods, i.e., beating, sweeping and looking in wet land, river side and any other biotope. The larvae were obtained from marsh, pond, lake, phytotelmata and river side.
The rearing of the larvae were carried out in room temperature using a plastic container.

Methods of observation and dissection

The general observation and dissection were done under a stereoscopic microscope. Microstructures were observed under a microscope. Dissection and preparation were carried out as follows:
(1) Dried specimens are put in hot water until they are relaxed, but this process is not necessary in the case of specimens preserved in 70% ethanol.
(2) For the observation of the male and female genitalia, whole abdominal segments are removed and put in 10% KOH approximately 10 hours.
(3) Rinsed in distilled water.
(4) Dissected and cleaned under a stereoscopic microscope using microdissection probes and tweezers.
(5) Dehydrated at first by 99.5% ethanol, next by 100% ethanol, and then by xylene.
(6) A permanent slide is made by slide glass using microcover glass with Canada Balsam. Collected data and slide numbers are stuck with paste on the slide, and the same numbers are also labeled under the specimens to identify them.
For the observation of thick organs, the following methods were taken:
(a) Thorax and abdominal sternite are mounted on a depression slide with Canada Balsam.
(b) Tegmen and penis are mounted on a slide with glycerol using microcover glass putting four small pieces of clay on each corner.
(c) After the examination, they are preserved in microvial with glycerol or mounted on a slide with Canada Balsam without microcover glasses.

Measurement

The abbreviations for measurement used in the present paper are as follows:
HW– width of head (measured in larva)
PL– length of pronotum
Fig. 1. Adult of the Scirtidae in dorsal (left) and lateral (right) aspects, showing parts for biometric measurements.

PW—width of pronotum
EL—length of elytra
EW—width of elytra
TL—total length (PL plus EL in adult)
TW—maximal width (between left and right hind legs in pupa)

TL of the larva is measured from anterior margin of clypeus to the apex of abdominal segment in fully expanded specimen. TL of the pupa is measured from the apex of pronotal
spine to the apex of abdominal segment in pupa. The arithmetic means of the measurement are given in parenthesis after the range. If possible, twenty specimens are taken measurement in both sex.

Terms

The terminology refers generally to NYHOLM (1972 b, 1984, 2000) for the genital organ, KUKALOVÁ-PECK & LAWRENCE (1993) for the hind wing venation, LAWRENCE et al. (1999) for the thorax, and mainly to HANNAPPEL & PAULUS (1991) and YOSHITOMI (1997) for the mouth parts of the larva.

Type depositories

The holotypes and some paratypes described as new species in this paper are preserved in EUM, and other paratypes are deposited in SEHU, NSMT, NHMW, BMNH and in my collection.

Fig. 2. Adult of the Scirtidae in ventral aspect, showing terms for some parts. ——— A, prosternum; B, meso- and metasternum and abdomens.
III. Historical Review

There is no historical and bibliographical review about the family Scirtidae except for LAWRENCE & NEWTON (1995) and LAWRENCE, SILPINSKI & PAKALUK (1995) who have reviewed the all families and superfamilies of Coleoptera. In the following chapters, the previous studies in the family Scirtidae are summarized.

Classification and position of the family Scirtidae

1865. MULSANT & REY divided their tribe Brévicolis into the two groups Dascillides and Eucinétiides, the former including three families, namely Dascilliens (genus Dascillus), Cyphoniens (genera Elodes, Microcara, Cyphon, Hydrocyphon, Prionocyphon and Scirtes), and Eubriens (genus Eubria); while the Eucinétiides include only a single family, Eucinétiens (genus Eucinetus). His Cyphoniens corresponds to the family Scirtidae.

1868. TOURNIER published a monograph of the species of the family Dascillidae inhabiting the basin of the lake of Geneva, with the addition of some from other regions of the south Europe. He followed the MULSANT & REY (1865).

1878. SHARP described 28 new species from New Zealand. These species were divided into two groups "Dascilliens" and "Cyphoniens" of MULSANT & REY (1865), which were distinguished by the presence of a deep fossa extending from the base of the antennae to the base of the stipes of the maxillae. A provisional table of the genera is given.

1880. HORN proposed five tribes in the family Helodidae (an incorrect name of Scirtidae), namely Ptilodactylini, Eucinetini, Helocini, Eubriini and Placonychini.

1914. PIC showed the world list of the family Helodidae of the subfamily Helodinae (= Scirtidae). Fifteen genera and 324 species were listed. But five genera (i.e. Cyphotelus, Veronatus, Cyphamus, Cyphanodes and Atopida), which are included in the family Scirtidae in the present time, were listed in the family Dascillidae.

1918. CHAMPION reviewed the genera Scirtes and Ora.

1953. ARMSTRONG reviewed the Australian genera and species. This is the comprehensive study about Australian Scirtidae.

1955. CROWSON located the family Helodidae (= Scirtidae) in suborder Polyphaga, series Dascilloformia, superfamily Dascilloidea, with three families: Clambidae, Eucinetidae and Dascillidae.

1969. NYHOLM examined and detailed the function of male and female genital organs in copulation. This study was very important and useful for the taxonomy of the family.

1972-1 BERTRAND illustrated many identity and unidentity larvae with keys and short descriptions. This was very important and useful article for the study of the larval stage.

1972-2 NYHOLM (1972 b) examined and detailed male genitalia of nine genera. This was very excellent and important study, and has been followed by many researchers.

1972-3 NYHOLM (1972 c) reviewed the North European species of the genus Cyphon.

1974. KLAUSNITZER (1974 a) reviewed the genus Helodes of the world, and he showed the phylogenetic tree of genera and species. This study was the first phylogenetic reference in the family Scirtidae. See the discussion part given in full detail of this paper.

1976. POPE bibliographically reviewed this group, and indicated that the family name Scirtidae should be used instead of Helodidae which had been used commonly. He also
pointed out that the genus name "Helodes" was an incorrect name of "Elodes". The later researchers have followed his very important and useful proposals.

1981. CROWSON located the family Helodidae in suborder Polyphaga, series Eucimetiformia, superfamily Eucimetoidea (= Scirtoidea), with two families: Clambidae and Eucinetidae. His Eucimetoidea is characterized by the combination of the following characters: larva - a mandibular mola, maxillae with distinct but non-articulate galea and lacinia, spiracles with normal closing apparatus, loss of urogomphi, and similar sclerotization of abdominal tergites and sternites; adult - aedeagus with parameres not distinctly articulated, male abdominal segment IX with the pleurite fused together in front of the tergite, metendosternite characteristic.

1987. HANNAPEL & PAULUS showed the phylogenetic tree of the six Palaeartic genera on the basis of the larval characters of mouthparts and abdomen. They also reviewed and discussed the KLAUSNITZER's phylogenetic hypothesis (KLAUSNITZER, 1974 a). This is a very excellent study. See the discussion part given in full detail of this paper.

1991. HANNAPEL & PAULUS analyzed the phylogeny of undetermined Australian and New Zealand larvae. See the discussion part given in full detail of this paper.

1995. LAWRENCE & NEWTON classified the family Scirtidae in superfamily Scirtoidea of the series Elateriformia in the suborder Polyphaga, with three families, Declinidae, Clambidae and Eucinetidae.

According to my data base of the family Scirtidae, more than 700 articles have been published, and more than 900 species under 30 genera have been described up to the present time.

**Taxonomic and faunal studies on the Japanese species**

1874. KIESENWETTER described four species, Prionocyphonfuscipennis, P. ovalis, Scytes (!) japonicus and Cyphon puncticeps, and also recorded Helodes (!) flavicollis KIESENWETTER and Cyphon variabilis (THUNBERG) from Japan. This is the first study of the Japanese Scirtidae.

1881. HAROLD described Sacodes protecta as a new species.

1895. LEWIS described six new species, Helodes (!) dux, H. inornatus, H. scapularis, Prionocyphon sexmaculatus, Scytes ovatulus and Scirtes sobrinus, and treated Sacodes protecta as a junior synonym of Helodes flavicollis. This treatment was followed by PIC (1914).

1914. In the world list of the family, PIC listed twelve Japanese species into four genera.

1918. PIC (1918 b) described two new species, Elodes wilsoni, from Kioto (= Kyoto) and Cyphon (Dermestocyphon) beatyi, from Japan.

1957. HAYASHI reported biology of some scirtid larvae, with descriptions of the larvae of Prionocyphon sp. (= Sacodes protecta HAROLD) and Elodes sp. (= Elodes inornata LEWIS). This is a excellent study, and there had been no other biological and taxonomic studies about Japanese scirtid larvae until YOSHITOMI (1997).

1958. NAKANE described a new species, Scytes mawatarii, from Shimokita of Honshu.

1963-1. NAKANE (1963 a) figured 18 species under the five genera with short descriptions. This article includes the original description of the following species: Scytes okinawanus NAKANE, Cyphon intermedius NAKANE, C. japonicola NAKANE, C. fuscomarginatus NAKANE, C. thunbergi NAKANE, C. hasegawai NAKANE, C. seryu
NAKANE, C. sanho NAKANE, C. mizoro NAKANE, Elodes kojimai NAKANE, Sarabandus monticola NAKANE.

1963-2. NAKANE (1963 b) described Cyphon ainu, from Hokkaido.

1966. SATÔ described a new species, Elodes amamiensis, from Amami-Ōshima.

1972. SATÔ & CHUJO described two new species and one new subspecies, Scirtes tsumaguro, S. sakishimanus and S. okinawanus yayeyamamus, and they recorded Cyphon formosanis from Japan for the first time, and also newly recorded Elodes amamiensis from Tokuno-shima.

1973. In his comprehensive study of the genus Helodes (!), KLAUSNITZER (1973 a) reviewed the flavicollis species-group of Japan and described two new species, H. minima and H. nakanei. In addition, he excluded Helodes flavicollis KIESENWETTER from the Japanese fauna.


1975. Sato described Elodes sp. (= Elodes elegans YOSHITOMI) and E. flavicollis in the list of Coleoptera of Ōzou-san. It is probable that E. flavicollis KIESENWETTER is misidentification.

1980. KLAUSNITZER (1980 a) elected the genus Flavohelodes for the flavicollis species-group of the genus Helodes and transferred four Japanese species, i.e. H. nakanei KLAUSNITZER, H. minima KLAUSNITZER, H. protecta HAROLD, and H. dux LEWIS, into this new genus.

1982. SATÔ described a new species, Cyphon ozensis, from Ozegahara Moor, Honshu.

1985-1. SATÔ (1985 a) described a new species, Helodes (!) obhayashii, from Hokkaido.

1985-2. SASAGAWA reviewed the Japanese species of the genus Cyphon. He described five new species (C. sinuosus, C. satoi, C. ishiharai, C. paludosus and C. granulosus) and two new subspecies of the species C. puncticeps KIESENWETTER (ssp. hisamatsui and ssp. shikokensis). He also treated C. thunbergi NAKANE as a junior synonym of C. puncticeps KIESENWETTER.

1985-3. SATÔ (1985 c) figured 27 species, and mentioned four species and three subspecies. Key to genera and key to species of the genus Cyphon were given with brief descriptions.

1989. In the list of Japanese insects, SATÔ recorded 39 species and three subspecies under the five genera.

1995. In the list of Scirtidae of China and neighboring areas, KLAUSNITZER reported that Flavohelodes kaszabi KLAUSNITZER was known from Japan. However, with no definite collecting data, it was likely to be a simple mistake.

1996. YOSHITOMI described a new species, Cyphon sanmoides, from Henshu, and mentioned that the following species belonged to the members of the collaris species-group: C. ainu NAKANE, C. sanho NAKANE, C. hasegawai NAKANE and C. seryu NAKANE.

1997. YOSHITOMI reviewed the Japanese species of the genera Elodes and Sacoed, and described two new species, Elodes elegans and Sacoed tsushimensis. All the species were described or redescribed with the male and female genital figures. The larvae of E. inornata, E. wilsoni, E. kojimai, S. nakanei, S. protecta and S. dux were also described.

1998. YOSHITOMI described Cyphon hashimotorum from Ryukyu Islands.

2001. YOSHITOMI newly recorded the genus Hydrocyphon from East Asia, and described three new species, H. satoi, H. iriomotensis and H. nakanei, from Japan. The larva of H. satoi was also described.

2002. NYHOLM described the male and female genitalia of Scirtes japonicus KIESENWETTER.
2003. Klausnitzer & Yoshitomi gave a new name to Cyphon intermedius Nakane as C. sasagawai Yoshitomi et Klausnitzer. Cyphon paludosus K. Sasagawa, C. aberratus Klausnitzer and C. kerzneri Klausnitzer were treated as the junior synonyms of C. obscuratus Klausnitzer, C. fuscomarginatus Nakane and C. ainu Nakane, respectively.


Up to the present time, 44 species and three subspecies under seven genera have been known from Japan. In this revisional study I recognize 64 species and two subspecies under seven genera as shown in the next chapter.

**IV. A List of Japanese Species**

The family Scirtidae Fleming, 1821

The genus Odeles Klausnitzer, 2004

*Odeles inornata* (Lewis, 1895)  *Odeles wilsoni* (Pic, 1918)

*Odeles scapularis* (Lewis, 1895)

The genus Elodes Latreille, 1796

*Elodes elegans* Yoshitomi, 1997  *Elodes takahashii* Yoshitomi, n. sp.

*Elodes kofimai* Nakane, 1963

The genus Sacodes LeConte, 1853

*Sacodes nakanei* (Klausnitzer, 1973)  *Sacodes amamiensis* (M. Satô, 1966)

*Sacodes okinawana* Yoshitomi, n. sp.  *Sacodes minima* (Klausnitzer, 1973)

*Sacodes tsushimensis* Yoshitomi, 1997  *Sacodes protecta* Harold, 1881

*Sacodes dux* (Lewis, 1895)

The genus Hydrocyphon Redtenbacher, 1858

The renati species-group

*Hydrocyphon satoi* Yoshitomi, 2001  *Hydrocyphon iriomotensis* Yoshitomi, 2001

The kambaiticus species-group

*Hydrocyphon nakanei* Yoshitomi, 2001

The genus Scirtes Illiger, 1807

The japonicus species-group

*Scirtes japonicus* Kiesenwetter, 1874  *Scirtes ovatus* Lewis, 1895

The hemisphaericus species-group

*Scirtes sobrinus* Lewis, 1895  *Scirtes tsunaguro* M. Satô et Chûjô, 1972

*Scirtes tsunaguro* M. Satô et Chûjô, 1972
The genus *Ora* CLARK, 1865

*Ora okinawana* (NAKANE, 1963), n. comb.  
*Ora mawatarii* (NAKANE, 1958), n. comb.  
*Ora yayeyamana* (M. SATÔ et CHÔIÔ, 1972), n. comb.

The genus *Prionocyphon* REDTENBACHER, 1858

*Prionocyphon fuscipennis* KIESENWETTER, 1874  
*Prionocyphon sexmaculatus* LEWIS, 1895  
*Prionocyphon ovalis* KIESENWETTER, 1874

The genus *Cyphon* PÂYKULL, 1799

The *hashimotorum* species-group

*Cyphon hashimotorum* YOSHITOMI, 1998

The *beattyi* species-group

*Cyphon beattyi* PIC, 1918

The *collaris* species-group

Subgroup A

*Cyphon ainu* NAKANE, 1963  
*Cyphon hasegawai* NAKANE, 1963  
*Cyphon aomorianus* YOSHITOMI, n. sp.

Subgroup B

*Cyphon proprius* YOSHITOMI, n. sp.

Subgroup C

*Cyphon seryu* NAKANE, 1963  
*Cyphon sannoides* YOSHITOMI, 1996  
*Cyphon ueno* YOSHITOMI, n. sp.

Subgroup D

*Cyphon ohbayashii* YOSHITOMI, n. sp.

Subgroup E

*Cyphon kyushuanus* YOSHITOMI, n. sp.

The *chlorizans* species-group

*Cyphon sinusus* K. SASAGAWA, 1985  
*Cyphon honshuanus* YOSHITOMI, n. sp.

*Cyphon amami* YOSHITOMI, n. sp.  
*Cyphon okinawanus* YOSHITOMI, n. sp.

*Cyphon spinifer* YOSHITOMI, n. sp.  
*Cyphon yae+yamanus* YOSHITOMI, n. sp.

The *japonicola* species-group

*Cyphon japonicola* NAKANE, 1963  
*Cyphon obscuratus* KLAUSNITZER, 1982

*Cyphon sasagawai* YOSHITOMI et KLAUSNITZER, 2003

The *coarctatus* species-group

Subgroup 1

*Cyphon puncticeps* KIESENWETTER, 1874  
*Cyphon fuscomarginatus* NAKANE, 1963

*Cyphon nipponicus* YOSHITOMI, n. sp.  
*Cyphon tsushima* YOSHITOMI, n. sp.

*Cyphon yakushimanus* YOSHITOMI, n. sp.  
*Cyphon ozensis* M. SATÔ, 1982

*Cyphon formosanus* PIC, 1918

Subgroup 2

*Cyphon consobrinus* NYHOLM, 1950  
*Cyphon magicus* KLAUSNITZER, 1973

*Cyphon granulosus* K. SASAGAWA, 1985  
*Cyphon ussuricus* NYHOLM, 1948

The *variabilis* species-group

*Cyphon variabilis* (THUNBERG, 1785)  
*Cyphon padi* (LINNAEUS, 1758)

*Cyphon mizoro* NAKANE, 1963  
*Cyphon ussuricus* NYHOLM, 1948
V. Morphology of the Family

Adults

*General appearance.* Body small to middle size, soft and easily broken, about 1.0–15 mm, and densely covered with easily removable pubescence throughout in many species. Coloration simply brown in most species, in some cases yellow to black, but variable in species and/or among individuals.

*Head.* Head (Fig. 3) transverse in most species, and its surface granulate in some genera and species (= surrounding parts of setal sockets are elevated). A pair of genal ridges running from postero-lateral margin to base of maxillae under eyes, arcuate in most species, its apex pointed and projecting triangularly in the genus *Cyphon*. Gula well developed; anterior part is covered sparsely with short setae, concave in the genus *Ora*. Antennae compose 11-segmented, filiform, serrate or pectinate; ratio of each segment showing diagnostic character in genus and species. Eyes are moderate to large, weakly to well prominent; the distance between eyes show the diagnostic character in species.

*Mouth parts.* Labrum free, transverse or a little longer than width, and closely covered with short setae.

Mandible (Fig. 4) complete, covered with short setae in lateral part. The following five forms recognized in Japanese genera and species-groups:

Form 1: both mandibles symmetrical; inner margin with long hairy bristles; apex pointed, protruding intero-anteriorly; molar area with short bristles (in the genera *Elodes*, *Odeles* and *Sacodes*)

Form 2: both mandibles symmetrical; apex obtuse, lacking apical tooth; inner margin covered with short bristles; molar area projecting interiorly (in the genus *Hydrocyphon*)

Form 3: both mandibles symmetrical, almost triangular, covered with short setae on dorsal surface of interior part; inner margin lacking bristles; molar area covered with short bristles; apex pointed, somewhat projecting intero-anteriorly (in the genera *Scirtes* and *Ora*)

Form 4: mandibles asymmetrical; right one provided with denticle on inner margin; left one lacking denticle; molar area slender, lacking bristles; apex pointed, projecting intero-anteriorly (in the genera *Cyphon* [except a part] and *Prionocyphon*)

Form 5: both mandibles symmetrical; molar area with short bristles; apex pointed, strongly prolonging intero-anteriorly (in *Cyphon sinuosus* and *collaris* species-groups).

Maxillae (Fig. 6) consist of palpifers, laciniae, subgaleae, galeae and palpi. Maxillary palpi 4-segmented. The ratio of each segment and the shape of distal segment showing specific and generic characters. The longest segment is II (in the genera *Odeles* and *Prionocyphon*), in III (in *Hydrocyphon*) and IV (in the other genera and species groups).

Labium (Fig. 5) connected with a pair of 3-segmented labial palpus. Labial palpi having discal segment arising from apex of segment II (in genera *Hydrocyphon* and *Cyphon*) or lateral margin of segment II (in the other genera). The shape and size of distal segment are important as specific and generic character, but not always clear.

*Thorax.* Pronotum semicircular or transversal trapezoidal. Anterior margin of mesosternum simply arcuate, or deeply excised. Mesocoxae separated by mesocoxal process, or touching each other; mesocoxal process long and excised at apex, or short and simple.

Metasternal longitudinal suture distinct, long and reaching at mesocoxal cavity, or shorter and not reaching.
Metendosternite (CROWSON, 1938; 1944) consisting of anterior tendon, posterior sclerotisation, lateral arm, ventral process and stalk (Fig. 9).

Fig. 3. Head capsules in ventral aspect. ——— A, Odeles wilsoni (Pic); B, Cyphon magicus KLAUSNITZER; C, Sacodes amamiensis (M. SATÔ); D, Ora yayeyamanus (M. SATÔ et CHUO); E, Scirtes japonicus KIESENWETTER; F, Hydrocyphon satoi YOSHITOMI; G, Prionocyphon ovalis KIESENWETTER.
Fig. 4. Mandibles of adults. —— A, Odeles inornatus (LEWIS); B, Sacodes nakanei (KLAUSNITZER); C, Hydrocyphon satoi YOSHIKIMI; D, Scirtes japonicus KIESENBURGER; E, Ora yayeyamanus (M. SATO et CHÜ); F, Cyphon sp.; G, Prionocyphon ovalis KIESENBURGER; H, Cyphon tsushimaensis YOSHIKIMI, n. sp.; I, Cyphon sanvoideis YOSHIKIMI; J, Cyphon honshuanus YOSHIKIMI, n. sp.
Fig. 6. Maxillae (A–D) and maxillary palpi (E–I). ——— A, Odeles inornatus (Lewis); B, Scirtes japonicus Kiesenwetter; C, Cyphon tsushimaanus Yoshitomi, n. sp.; D, Prionocyphon ovalis Kiesenwetter; E, Elodes elegans Yoshitomi; F, Odeles wilsoni (Pic); G, Sacodes nakanei (Klausnitzer); H, Ora yayeyamanus (M. Satô et Chuô); I, Hydrocyphon satoi Yoshitomi.
Leg. Legs short to moderate in length, simple and normal. Tarsal segment forming 5-5-5.

Front legs (Fig. 7) short; fore coxae transverse, projecting below prosternum; trochantin at least partly exposed. Forecoxal cavities externally open and internally open.

Middle legs (Fig. 7) longer than front leg; midcoxal cavities partly closed by mesepisternum.

Hind legs (Fig. 8) longest; metafemur enlarged for jumping in genera *Scirtes* and *Ora*.

*Elytra*. Elytra oval to oblong, convex above slightly to strongly, rounded apically. Epipleuron absent or incomplete. EL/EW about 0.8–2.0.

*Hind wing*. Hind wing (Figs. 11–12) about twice as long as wide, not reduced. Wing venation is eucinetoid lineage (*Kukalová-Peck & Lawrence*, 1993). Radial field is semicircular, with RA, MP_{1+2} and RP veins; RA (Radius Anterior) running along anterior margin; MP_{1+2} (Media Posterior) crossing diagonally, somewhat weakness in proximal part of jointing point with RP; RP (Radius Posterius) curved proximally, and indistinct in proximal part. Apical field wide, lacking distinct vein. Central field with r4 and r3 (Radial Cross-vein), lacking r4 in some species. Medial field with MP_{3}, MP_{4} (Media Posterius), CuP
(Cubitus Posterior), AA (Anal Anterior), AA₃, AA₄ veins, characterized following four formation:

Form 1: MP₄ very short, connected with CuP+AA₃ in proximal part (in genera *Elodes*, *Odeles* and *Sacodes*)

Form 2: MP₄ long, connected with CuP+AA₃ in caudal part (in genera *Scirtes*, *Ora* and *Prionocyphon*)

Form 3: resemble form 2, but CuP+AA₃ indistinct in posterior from jointing point with MP₄ (in genus *Hydrocyphon*)

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Fig. 8. Hind legs. ——— A, *Scirtes japonicus* KIESENWETTER in ventral aspect; B, right hind femur of *S. japonicus* in dorsal aspect; C, *Odeles wilsoni* (Pic); D, *Cyphon magicus* KLUSNITZER; E, *Prionocyphon ovalis* KIESENWETTER; F, ditto of tib.
Fig. 9. Metendosternites (A & B) and scutellum (C–E). ——— A, Odeles wilsoni (PIC); B, Hydrocyphon satoi YOSHITOMI; C, Odeles wilsoni (PIC); D, Prionocyphon sexmaculatus LEWIS; E, Scirtes japonicus KIESENWETTER.

Form 4: MP₄ very long, not connected with CuP+AA₃ (in genus Cyphon).
Anal field with only AP₃+₄ (Anal Posterior 3+4), but forked into AP₃ and AP₄ in the Australian genera Pseudomicrocara and Macrhoelodes (KUKALOVA-PECK & LAWRENCE, 1993).

Abdomen. Abdominal sternites (Fig. 13) five visible segment (III to VII); sternite III normal or separated by metacoxae; sternite VII arcuate in general, but concave in male of some species, showing specific characters; sternite VIII spiracles lost.

Male genitalia. Sternites and tergites VIII–IX genital segments, useful to specific and genetic determination. Aedeagus (consist of tegmen and penis; Figs. 14–15) trilobe type, very specialized and complicated and quite useful to specific determination (SHARP & MUIR, 1912; NYHOLM, 1972 b).
Fig. 10. Mesosternum and Metasternum. —— A, Odeles wilsoni (Pic); B, Sacodes minima (KLUSNITZER); C, Hydrocyphon satoi YOSHITOMI; D, Prionocyphon sexmaculatus LEWIS; E, Scirtes japonicus KIESENWETTER; F, Ora yayeyamanus (M. SATÔ et CHÛJÔ); G, Cyphon magicus KLUSNITZER.
Fig. 11. Hind wing of *Odeles inornatus*, showing terms of hind wing venations.

*Female genitalia.* Tergite VIII and sternite VIII distinct, useful to specific determination in most species; tergite VIII moderately or well sclerotized, with a pair of apodemes; sternite VIII lightly or well sclerotized. Tergite IX and sternite IX membranous. Ovipositor "elongate type" (TANNER, 1927); stylus small, finger-like shaped, with apical setae, arising from the end of coxite; coxite long, divided into two segments in some species; baculus long, simple or with a short branchlet in posterior part; ratio of each length showing specific and generic features. Prehensor peculiar in the family's specific important.

Female genitalia have been studied by a few authors, for example, TANNER (1927) and NYHOLM (1948, 1972 a), but the comparative study has not done in Scirtidae. Above all, homology of an extra organ "prehensor" is problematical. The name prehensor was originally used by NYHOLM (1948) for the sclerite of bursa copulatrix. However, KLAUSNITZER (e.g. 1976 b, 1982) and YOSHITOMI (1997) have used "prehensor" for all the sclerotized organ in the female reproductive tract. Therefore the comparative morphology on the female reproductive tract including "prehensor" will be needed.

**Larvae**

Body well or lightly sclerotized, campodeiform, similarly sclerotized in dorsal and ventral plates, covered sparsely with minute to long setae.

Head prognathous and protracted, visible in dorsal view (invisible in some Australian and African species).
Fig. 12. Hind wings. —— A, Odeles inornatus (LEWIS); B, Elodes elegans YOSHITOMI; C, Sacodes nakanei (KLAUSNITZER); D, Hydrocyphon satoi YOSHITOMI; E, Scirtes japonicus KIESENWETTER; F, Ora yayeyamanus (M. SATō et CHūJō); G, Prionocyphon ovalis KIESENWETTER; H, Cyphon tsushimaicus YOSHITOMI, n. sp.; I, Cyphon samnoides YOSHITOMI; J, Cyphon japonicola NAKANE.
Fig. 13. Abdominal sternites. ———— A, Odeles inornatus (LEWIS); B, Cyphon sp.

Antennae filiform, multi-segmented in flagellum, about 10–150 segmented. Labrum free. Mandible having mola, with many hairy bristles in inner areas. Maxilla with galea and lacinia. Maxillary palpi 3- or 4-segmented, showing the diagnostic character of the genera and species. Labium very large, fully covered to ventral surface of head; labial palpi short, 2-segmented. Hypopharyngeal sclerome present. Hypostomal rods absent. Ventral epicranial ridges absent. Leg 5-segmented, moderate in length, covered with spinous short setae; tarsungular setae 2. Urogompi on tergite IX absent. Type of abdominal spiracle reduced and non-functional spiracles.

**Pupae**

Very soft body, without "gin-trap" projection, covered with fine minute spines throughout. Pronotal spines present or absent. Larval skin removed, situated in caudal part of pupa. More close examination will be needed.
Fig. 14. Tegmen. —— A, Odeles inornatus (LEWIS); B, Sacodes minuta (KLAUSNITZER); C, Hydrocyphon satoi YOSHITOMI; D, Scirtes japonicus KIESEWETTER; E, Cyphon sasagawai YOSHITOMI & KLAUSNITZER; F, Cyphon variabilis (THUNBERG); G, Cyphon hashimotorum YOSHITOMI. p: parameres.
Fig. 15. Penis. — A, Odeles inornatus (LEWIS); B, Sacodes minuta (KLAUSNITZER); C, Hydrocyphon satoi YOSHITOMI; D, Scirtes japonicus KIESENWETTER; E, Ora mawataarii (NAKANE), n. comb.; F, Prionocyphon sexmaculatus LEWIS; G, Cyphon hashimotorum YOSHITOMI; H, Cyphon sannoides YOSHITOMI; I, Cyphon sasagawai YOSHITOMI & KLAUSNITZER. par: parameroids; t: tegmen; tri: trigonium.
Fig. 16. Female genitalia. ——— A, C & E, _Elodes elegans_ YOSHITOMI; B, D, F & G, _Cyphon hashimotorum_ YOSHITOMI; A & B, Tergite VIII; C & D, sternite VIII; E & F, ovipositor; G, prehensor.
VI. Systematics

Family SCIRTIIDAE FLEMING, 1821
[Japanese name: Maruhananomi Ka]

Scirtidae FLEMING, 1821, 50. — POPE, 1976, 186.  
Cyphonidae STEPHENS, 1830, 281.  
Elodidae SHUCKARD, 1840, 41  
Helodidae AGASSIZ, 1847, 506. — PIC, 1914, 21 [a part].  
Type genus: Scirtes ILLIGER, 1807.

*Diagnostic description.* Adults. Body small to middle sized, soft and easily broken, about 1.0–15 mm, covered densely with easily removable pubescence in throughout. Coloration variable in species and individuals, yellow to black in most species, but is brown in most species. Head transverse in most species. A pair of genal ridges running from postero-lateral margin to base of maxillae under eyes, arcuate in most species. Gula well developed. Antennae 11-segmented, filiform, serrate or pectinate. Eyes moderate to large size, weakly to well prominent. Maxillary palpi 4-segmented. Labium connected with a pair of 3-segmented labial palpi. Legs short to moderate in length, simple and normal. Tarsal segment forming 5-5-5. Fore coxae transverse, projecting below prothorax; trochantin at least partly exposed. Fore coxal cavities externally open and internally open, midcoxae contiguous, midcoxal cavities partly closed by mesepisternum. Metasternal longitudinal suture distinct. Metendosternite consist of anterior tendon, posterior sclerotisation, lateral arm, ventral process and stalk. Hind wing about twice as long as wide. Wing venation eucinetoid lineage (KUKALOVA-PECK & LAWRENCE, 1993). Abdominal sternites five visible segment (III to VII); sternite VIII spiracles lost. Male genitalia trilobe type, very complicated and confused. Ovipositor elongate type (TANNER, 1927); stylus small, finger-like shaped, with apical setae, arising from the end of coxite; coxite long, divided into segments in some species; baculus long, simple or having a short branchlet in posterior part. Prehensor peculiar in this family.

Larvae. Body campodeiform, similarly sclerotized in dorsal and ventral plates. Head prognathous and protracted. Antennae filiform, multi-segmented in flagellum. Labrum free. Mandible having mola, with many hairy bristles in inner areas. Maxilla with galea and lacinia. Maxillary palpi 3- or 4-segmented. Labium very large, fully covered to ventral surface of head. Hypopharyngeal sclerome present. Leg 5-segmented; tarsungular setae 2. Urogomphi on tegrite IX absent. Type of abdominal spiracle reduced and non-functional spiracles.

Pupae. Very softened body, without "gin-trap" projection, covered with fine minute spines throughout.

*Biological notes.* The larvae are usually aquatic, and the adults are generally riparian and terrestrial. See bionomics section in this paper.

*Remarks.* In the old articles, we can see some names of subfamily or tribe in this family, for example, "Helodinae", "Scirtiinae" and "Cyphonini". However these are no available name, and there are no subfamilies and tribes in Scirtidae in the present time. Higher classification and generic revision in the family Scirtidae must be studied in the future.

Mouth parts of this family have not been studied, and KLAUSNITZER (1974 a) have mentioned that "mouth part of this family are very simple, and not useful for phylogenetic
study". However, the diagnostic feature and phylogenetic relationship are shown particularly in the characteristics of mandible, maxillary and labial palpi.

Larval chaetotaxy on maxillary palpi, legs, thorax and abdomen must be studied in the future.

**Key to the Japanese genera of the family Scirtidae**

(Adults)

1. Hind legs adapted for jumping; metafemur strongly inflated; metatibial spur about as long as metataesomere I. ................................................................. 2
- Hind legs normal; metafemur not inflated; metatibial spur clearly shorter than metatarsomere I. ................................................................. 3

2. Body circular to oblong; hind coxae meeting along full length of median line, hind margins conjointly forming a subquadrate plate which is not on same plane as intercoxal process of abdomen; TL about 2.0–5.0 mm. ......................... Scirtes ILLIGER
- Body circular; hind coxae touching each other only anteriorly, arcuately diverging posteriorly where they are about on a plane with the abdominal process which separates them; TL about 3.8–5.5 mm. ......................................................... Ora CLARK

3. Pronotum semicircular, without distinct antero-lateral angles. ......................... 4
- Pronotum transversal trapezoiform, with distinct antero-lateral angles. .............. 6

4. Coloration yellow to black, variable with species; labial palpi long; distal segment small and finger-like shaped, smaller than segment II; TL about 2.8–6.0 mm. ............... 5
- Most species with brownish black body and yellowish-orange pronotum; labial palpi short; distal segment ovate and large, distinctly larger than segment II; TL about 2.2–6.5 mm. ................................................................. Sacodes LECONTE

5. Body oval; antennae and legs rather short; parameres distinctly serrate; apices of penis rather round; tergites more strongly sclerotized. .......................... Odeles KLAUSNITZER
- Body slender; antennae and legs long; parameres lacking distinct serra; apices of penis rather pointed; tergites VIII–IX rod-like in some species. .................. Elodes LATREILLE

6. Antennae serrate or bipectinate in male; scutellum longer than wide; TL about 3.0–4.5 mm. ................................................................. Prionocyphon REDTENBACHER
- Antennae filiform; scutellum almost as long as wide; TL about 1.0–7.0 mm. .......... 7

7. Mandible pointed at apex; antennal segment III as long as segments II–IV; mesosternum arcuate in anterior margin; TL about 1.0–7.0 mm. ....................... Cyphon PAYKULL
- Mandible obtuse at apex; antennal segment III distinctly shorter than segments II–IV; mesosternum deeply notched in anterior margin; TL about 1.0–3.0 mm. ................... Hydrocyphon REDTENBACHER

**Key to the Japanese genera of the family Scirtidae**

(Larvae)

1. Antenna short, not reaching abdominal segment; maxillary palpus with very short segment IV, seemingly 3-segmented; hypopharynx with a pair of long and simple (in the genus Elodes bifurcate at apex) setae on keel sclerite; mandible pointed at terminal tooth, or lacking terminal tooth; thoracic segments wider than abdominal segments.
Habitat: river, spring, clear pond, tree-hole. .......................................................... 2
- Antenna long or moderate in length, exceeding abdominal segment II; maxillary palpus 4-segmented; hypopharynx with a pair of short stout setae on keel sclerite; terminal tooth of mandible pointed, or bi- or multicornuted; thoracic segments as wide as abdominal segments. Habitat: river, pond, marsh, tree-hole. ........................................... 5
- Body small, TL about 3.0–5.0 mm; mandible lacking terminal tooth; living in running water of small river. ......................................................... *Hydrocyphon Redtenbacher*
- Body moderate in size, TL about 6.0–8.0 mm; mandible pointed at terminal tooth; mainly living in standing water of river, spring, clear pond and tree-hole. ................................. 3
3. Antennae with almost straight scape; epipharynx with long and stout setae and some pectinate setae in anterior area of ventral lobes, granulate around the sockets of ventral setae; mandible with simple bristles; segment I of maxillary palpus with many long setae in ventro-lateral area; hypopharynx with fused keel sclerite and socket of tooth-bristles, bicornated at apex of tooth bristle; posterior margin of tergite IX simply arcuate. Habitat: tree-hole (phytotelmata). ................................. *Sacodes LeConte*
- Antennae with curved scape; epipharynx with long and simple setae in anterior area of ventral lobes, with a pair of ventral setae of which sockets have no particular sculpture; mandible with feathered bristles at inner areas; segment I of maxillary palpus with some short setae in ventro-lateral area; hypopharynx with separated keel sclerite and socket of tooth-bristles, tri-or multicornated at apex of tooth-bristle; posterior margin of tergite IX bicornute. Habitat: river, spring and clear pond. ......................................................... 4
4. Postero-lateral corners of pronotum projecting postero-laterally. ..... *Odeles Klausnitzer*
- Postero-lateral corners of pronotum not projecting. ................................. *Elodes Latreille*
- Antennae very long, about as long as the length of abdomen; terminal tooth of mandible bi- or multicornuted or obtuse. ............................................................... 6
- Antennae long, shorter than abdominal length; terminal tooth of mandible simply pointed. ........................................................................................................ 7
6. Segment IV of maxillary palpus long, about as long as III; terminal tooth of mandible obtuse. Habitat: puddle and small pond in forest, tree-hole. .......................... *Ora Clark*
- Segment IV of maxillary palpus short, about 1/6 times as long as III; terminal teeth of mandible bi- or multicornate. Habitat: pond and marsh. .......................... *Scirtes Illiger*
7. Sensory organs in ventral surface of maxillary palpus well developed, contiguous with each other; tergite IX and sternite with pectinate setae along posterior margins. Habitat: marsh, pond and river. ............................................................... *Cyphon Paykull*
- Sensory organs in ventral surface of maxillary palpus not so developed, independent; tergite IX and sternite with normal setae along posterior margins. Habitat: tree-hole (phytotelmata). ................................................................. *Prionocyphon Redtenbacher*

This key is based on the mature larval specimens in fully expanding.
Genus **Odeles** KLAUSNITZER

[Japanese name: Kuro-maruhananomi Zoku]

*Odeles* Klausnitzer, 2004, 80.


Type species: *Cistela marginata* **Fabricius**, 1798 (by original designation).

**Key to the Japanese species of the genus Odeles**

1. Pronotum with shallow and distinct concavities, seemingly punctate distinctly. ............

   .................................................................................. *O. inornata* (Lewis)

2. Pronotum finely punctate. ........................................................................................................ 2

2. Frons and clypeus yellow in male; sternite VII shallowly concave. .......... *O. wilsoni* (PIC)

   - Frons and clypeus brownish-black; sternite VII deeply concave. .........................................................

   .................................................................................. *O. scapularis* (Lewis) *

" Female has not been determined yet.

**Odeles inornata** (Lewis)

[Japanese name: Ko-kuro-maruhananomi]

(Fig. 17 A)

*Helodes inornatus* **Lewis**, 1895, 107 (Type: Nagasaki, in BMNH, not examined).


*Sarabandus inornatus* **Nakane**, 1963 a, 140, pl. 70, fig. 18. — **Satô**, 1985 b, 424, pl. 77, fig. 31.


**Measurement.** Male (*n = 20*): TL 2.8–3.8 (3.3) mm; PL 0.6–1.0 (0.8) mm; PW 1.2–1.5

(1.3) mm; EL 2.2–2.8 (2.5) mm; EW 1.5–2.0 (1.8) mm. Female (*n = 20*): TL 3.1–4.2 (3.7)

mm; PL 0.7–1.0 (0.9) mm; PW 1.3–1.6 (1.5) mm; EL 2.4–3.3 (2.8) mm; EW 1.7–2.3 (2.0)

mm.

**Distribution.** Japan: Hokkaido, Honshu, Shikoku, Kyushu; Korea; Kuril Archipelago

(Kunashir Is.).
Odeles wilsoni (Pét.)

[Japanese name: Kuro-maruhananomi]

(Fig. 17 B)


E. sp.: HayASHI, 1957, 47, figs. 2a–2g, 5a–b [description of larva and pupa].

Sarabandus monticolus Nakane, 1963 a, 140, pl. 70, fig. 19 (Type: Yumoto, Nikko, in TN, examined).

— Sato, 1985 b, 424.

Measurement. Male (n = 20): TL 3.8–4.5 (4.3) mm; PL 0.8–1.0 (0.9) mm; PW 1.4–1.7 (1.6) mm; EL 3.0–3.5 (3.3) mm; EW 1.8–2.2 (2.1) mm. Female (n = 20): TL 3.6–4.8 (4.5) mm; PL 0.7–1.0 (0.9) mm; PW 1.3–1.8 (1.7) mm; EL 2.9–3.8 (3.6) mm; EW 1.7–2.6 (2.3) mm.


Distribution. Japan: Hokkaido, Honshu, Shikoku, Kyushu; Kuril Archipelago (Kunashir Is.).

*Odeles scapularis* (LEWIS)

[Japanese name: Kyushu-kuro-maruhananomi ]

(Fig. 17 C)

*Helodes scapularis* LEWIS, 1895, 107 (Type: Japan, Nagasaki, in BMNH, not examined). — KLAUSNITZER, 1974 a, 479 [phylogenetic systematic]; 1974 b, 21, figs. 36–41 [redescription].


Measurement. Male (n = 1): TL 3.8 mm; PL 1.0 mm; PW1.5 mm; EL 2.8 mm; EW 2.0 mm.


**Genus Elodes LATREILLE**

[Japanese name: Maruhananomi Zoku]


Type species: *Lapyrus minuta* LINNAEUS, 1767 (subsequent designation by LATREILLE, 1810).

Remarks. This species-group is characterized by the features shown in the key to genera. In addition to these characters, tergite VI lacks apodemes in two Japanese species, and most species of the species-group have a well sclerotized prehensor, which provides a good taxonomic character for identification in the female (NYHOLM, 1984).

**Key to the Japanese species of the genus Elodes**

1. Tergite VIII of male trapezoidal. .................................................. *E. kojimai* NAKANE
2. Tergite VIII of male rod-like hemitergite. .......................................................... 2
2. Pronotum yellowish-orange. .......................................................... *E. elegans* YOSHITOMI
- Pronotum with black marking. .......................................................... *E. takahashii* YOSHITOMI, n. sp. *
Female has not been determined yet.

**Eloides elegans** YOSHITOMI

[Japanese name: Hosoki-maruhananomi]

(Fig. 17 D)

*Eloides elegans* YOSHITOMI, 1997, 372 (Type: Mennoki-tōge, in NSMT, examined).

*Eloides sp.*: SATOH, 1975, 31.

**Measurement.** Male (n = 6): TL 3.8–4.6 (4.1) mm; PL 0.8–1.0 (0.9) mm; PW 1.2–1.4 (1.3) mm; EL 3.0–3.6 (3.2) mm; EW 1.6–2.0 (1.8) mm. Female (n = 6): TL 3.6–4.9 (4.4) mm; PL 0.8–1.0 (0.9) mm; PW 1.3–1.5 (1.4) mm; EL 2.8–3.9 (3.5) mm; EW 1.8–2.2 (2.0) mm.

**Distribution.** Japan: Honshu, Shikoku, Kyushu

**Eloides takahashii** YOSHITOMI, n. sp.

[Japanese name: Amami-hosoki-maruhananomi]

(Figs. 17 E, 18)

**Description.** Male. Body elongate, slightly shining, slightly convex, closely covered with yellowish-white hairs. Head dark brown; mouthparts and antennae pale brown, but antennal segments V–XI dark brown; pronotum whitish-yellow, but antero-mesal part fuscous; scutellum, elytra, legs and ventral surface of body light brown, but anterior and lateral margins of elytra widely black.

Head slightly convex above; front margin of clypeus almost straight; labrum as long as wide, arcuate in front margin. Eyes very large, prominent; the distance between eyes about 1.1 times as the diameter of an eye. Antennae long, reaching about the middle of elytra; approximate ratio of each segment (n = 1) as 5.5 : 2.8 : 1.0 : 9.7 : 8.0 : 8.0 : 7.7 : 7.2 : 6.5 : 7.0. Pronotum semicircular, broadest at the base; PW/PL 1.3. Scutellum triangular. Elytra elongate, broadest at the middle, subparallel-sided in about proximal 1/4 to 3/4; EL/EW 2.0; EL/PL 3.3; EW/PW 1.3; TL/EW 2.6. Legs very long.

Apical margin of sternite VII deeply concave. Sterites and tergites VIII–IX, tegmen and penis very similar to those of *E. elegans* YOSHITOMI, but tergites VIII–IX longer; sternite VIII with a pair of long setae on interior margin; tegmen and penis longer and slim.

**Measurement.** Male (n = 1): TL 3.83 mm; PL 0.9 mm; PW 1.15 mm; EL 2.93 mm; EW 1.50 mm.

Female and immature stages unknown.

**Type material.** Holotype: 1 male, Sumiyo-son, Amami-Ōshima, 13–III–2001, K. TAKAHASHI leg. (genit. s. no. HY 706).

**Distribution.** Japan: Ryukyu Isls. (Amami-Ōshima).

**Remarks.** This species is closely related to *E. elegans* YOSHITOMI, but differs from the latter in coloration of pronotum and elytra.

**Etymology.** This species is named after Dr. K. TAKAHASHI, who kindly supplied me this type specimen.
Fig. 18. *Elodes takahashii* n. sp., holotype, male. —— A, Antenna; B, abdominal sternites V–VII; C, tergite IX; D, tergite VIII; E, sternite IX; F, sternite VIII; G, tegmen; H, penis.
Elodes kojimai Nakane
[Japanese name: Munemon-maruhananomi]
(Fig. 17 F)

Elodes kojimai Nakane, 1963 a, 140, pl. 70, fig. 20 (Type: Tokachi-mitsumata, in TN, examined). — Yoshitomi, 1997, 375 [redescription of adult and larva].

Elodes kojimai: Satô, 1985 b, 421, pl. 77, fig. 5.

Flavohelodes migrata Klausnitzer, 1982, 275, fig. 1–7 (Type: Kunashir, in Zoologischen Institut Leningrad, examined). Synonymized by Yoshitomi (1997).


Measurement. Male (n = 4): TL 3.5–3.9 (3.7) mm; PL 0.8–0.9 (0.8) mm; PW 1.2–1.3 (1.3) mm; EL 2.7–3.0 (2.9) mm; EW 1.5–1.7 (1.6) mm. Female (n = 11): TL 3.8–5.3 (4.3) mm; PL 0.7–1.1 (0.9) mm; PW 1.3–1.7 (1.4) mm; EL 3.0–4.2 (3.4) mm; EW 1.7–2.4 (1.9) mm.

Distribution. Japan: Hokkaido, Honshu (northern part); Kuril Archipelago (Kunashir Is.).

Genus Sacodes Leconte
[Japanese name: Kimune-maruhananomi Zoku]


Type species: Elodes thoracica Guerin-Meneville, 1843 (designated by Yoshitomi, 1997).

Key to Japanese species of the genus Sacodes

1. Pronotum almost black. .................................................. S. amamiensis (M. Satô)
   - Pronotum almost yellow. ............................................. 2

2. Elytra with yellow markings on humeral angles. .............. S. tsushimaensis Yoshitomi
   - Elytra all black. ......................................................... 3

3. Legs yellow at least in a part, TL 2.2–4.8 mm. ....................... 4
   - Legs almost black (sometimes brown), TL 3.7–6.2 mm. ..................... 6

4. Antennal segments all yellow; apical margin of male sternite VII protruding. ......................
   - Antennal segments IV–XI black (sometimes brown); apical margin of male sternite VII shallowly concave. ......................... 5
   - Scutellum black; tibiae and tarsi usually yellow. .............. S. minima (Klausnitzer)
   - Scutellum yellowish; tibiae usually brownish black. ..... S. okinawana Yoshitomi, n. sp.

5. Apical margin of male sternite VII deeply concave; tergite VI lack apodeme; prehensor indistinct. .................................................. S. dux (Lewis)
   - Apical margin of male sternite VII almost straight; tergite VI with short apodemes; prehensor consisting of a pair of very sclerotized plates. .............. S. protecta Harold
Fig. 19. Habitus of *Sacodes* spp. —— A. *S. nakanei* (KLAUSNITZER); B. *S. amamienensis* (M. SAITO), from Okinawa-jima; C, ditto from Amami-Ōshima; D, *S. okinawana* YOSHIKOMI, n. sp., holotype, male; E, *S. minima* (KLAUSNITZER); F, *S. tsushimensis* YOSHIKOMI, paratype, male; G, *S. protecta* HAROLD; H, *S. dux* (LEWIS).
Sacodes nakanei (KLAUSNITZER)
[Japanese name: Ko-kimune-maruhananomi]
(Fig. 19 A)

Helodes nakanei KLAUSNITZER, 1973 a, 107, figs. 20–25 (Type: Japan, in private collection of Dr. KLAUSNITZER, not examined). — KLAUSNITZER, 1974 a, 479 [phylogenetic: systematic]; 1974 c, 76 [key].
Flavohelodes nakanei: KLAUSNITZER, 1980 a, 61.
Helodes protecta: SATÔ, 1985 b, 421, pl. 77, pl. 7 [misidentification].

Measurement. Male (n = 20): TL 3.3–4.7 (4.1) mm; PL 0.7–1.0 (0.9) mm; PW 1.3–1.7 (1.5) mm; EL 2.8–3.7 (3.2) mm; EW 2.0–2.5 (2.3) mm. Female (n = 20): TL 3.5–4.8 (4.0) mm; PL 0.7–1.0 (0.9) mm; PW 1.3–1.8 (1.6) mm; EL 2.7–3.8 (3.1) mm; EW 2.0–2.6 (2.3) mm.


Sacodes amamiensis (M. SATÔ)
[Japanese name: Katamon-maruhananomi]
(Figs. 19 B, C)

Helodes amamiensis: SATÔ, 1985 b, 421, pl. 77, fig. 6.

Measurement. Male (n = 4): TL 3.0–3.7 (3.4) mm; PL 0.6–0.8 (0.7) mm; PW 1.2–1.5 (1.3) mm; EL 2.4–2.9 (2.7) mm; EW 1.7–2.1 (1.9) mm. Female (n = 4): TL 3.0–3.7 (3.4) mm; PL 0.7–0.8 (0.8) mm; PW 1.2–1.5 (1.4) mm; EL 2.3–2.9 (2.6) mm; EW 1.7–2.1 (1.9) mm.


Sacodes okinawana YOSHITOMI, n. sp.
[Japanese name: Okinawa-kimune-maruhananomi]
(Figs. 19 D, 20)

Description. Male. Body oval, moderately convex above, closely covered with yellowish-white hairs. Head, antennae, elytra and metathorax black, except for antennal segments I–III yellowish; labrum, mandibles and maxillary palpi yellow; scutellum fuscous yellow; legs yellow, but middle areas of tibiae and proximal three segments of tarsi fuscous;
ventral surface of pro- and meso-thorax yellow; abdomen black.

Head large, slightly convex. Eyes large, prominent; the distance between eyes about 2.0 times as long as the diameter of an eye. Antennae moderate in length, slightly serrate in segments IV–X, reaching about proximal 1/3 of elytra; approximate ratio of antennal segment (n = 1) as 3.8 : 2.0 : 1.0 : 3.8 : 3.5 : 3.5 : 3.5 : 3.5 : 3.8 : 4.2. Pronotum semicircular, broadest at the base; PW/PL 1.8. Scutellum triangular, sparsely covered with short hairs. Elytra oblong-oval, broadest at the middle; EL/EW 1.4; EL/PL 3.3; EW/PW 1.3; TL/EW 1.9. Ventral surface of body closely covered with short and fine hairs.

Apical margin of sternite VII shallowly concave. Tergite VIII widened trapezoidal, closely covered with minute setae and spines in posterior part, with short spines on posterior margin; sternite VIII broad Y-shaped, with a pair of minute setae on apical margin of each arm; tergite IX elongated trapezoidal, sparsely punctate in the middle area, with minute spines on caudal part; sternite IX oval, covered with short setae in about caudal 1/2. Tegmen oblong, moderately sclerotized, broadest at proximal 1/3, sparsely punctate in apical part. Penis well sclerotized, prolonging in caudal part; dorsal piece ovate in anterior part, parallel-sided, curved dorsally in caudal part; ventral piece protruding posteriorly, pointed at apex.

Female and immature stages unknown.

**Measurement.** Male (n = 1): TL 3.4 mm; PL 0.8 mm; PW 1.4 mm; EL 2.6 mm; EW 1.8 mm.

**Variation.** The paratype is different from the holotype in the coloration and the body size, but the genital characteristics cannot be distinguished from each other. The followings are the different point in the paratype: body size large; legs yellow; elytra brownish-black; pronotum and scutellum fuscous yellow; approximate ratio of each antennal segment as 4.0 : 2.0 : 1.0 : 4.4 : 4.8 : 5.0 (segments VII–XI missing); TL 4.2 mm; PL 1.0 mm; PW 1.7 mm; EL 3.2 mm; EW 2.2 mm.

**Material examined.** One male holotype and one male paratype.


**Distribution.** Japan: Ryukyu Isls. (Okinawa-jima, Ishigaki-jima).

**Biological notes.** Only two specimens were collected from the Ryukyu Isls. in early spring, and the biological information is very scarce now.

**Remarks.** Judging from the similarity of the male genital features, this species is closely related to *Sacodes amamiensis* (M. SATÔ) distributed sympatrically. The coloration and external feature are also similar to *Sacodes minima* (KLAUSNITZER) and *Sacodes taiwanensis* (YODSITOMI et M. SATÔ). But it is easily distinguishable from them by the prolonging penis and yellowish scutellum.

**Etymology.** This species is named after the type locality, Okinawa-jima.
Sacodes minima (Klausnitzer)
[Japanese name: Hime-kimune-marukanomimi]
(Fig. 19 E)

Helodes minima Klausnitzer, 1973 a, 107, figs. 14–19 (Type: Japan, in BMNH, not examined). —
Klausnitzer, 1974 a, 484 [phylogenetic systematic]; 1974 c, 76 [key].
Flavohelodes minima: Klausnitzer, 1980 a, 61.
45.

Measurement. Male (n = 6): TL 2.2–2.9 (2.7) mm; PL 0.4–0.6 (0.6) mm; PW 0.8–1.2
(1.1) mm; EL 1.8–2.3 (2.2) mm; EW 1.2–1.6 (1.5) mm. Female (n = 15): TL 2.8–4.1 (3.2) mm; PL 0.6–0.9 (0.7) mm; PW 1.1–1.7 (1.3) mm; EL 2.2–3.2 (2.5) mm; EW 1.5–2.3 (1.8) mm.

Distribution. Japan: Hokkaido, Honshu, Shikoku, Kyushu; Kuril Archipelago (Kunashir Is.).

**Sacodes tsushimensis** YOSHI TOMI

[Japanese name: Tsushima-kimune-maruhananomi]

(Fig. 19 F)

_Sacodes tsushimensis_ YOSHI TOMI, 1997, 399, fig. 32 (Type: in NSMT, examined). — YOSHI TOMI, 2000, 80.

*Measurement. Male (n = 4): TL 2.9–3.4 (3.3) mm; PL 0.6–0.8 (0.8) mm; PW 1.1–1.5 (1.4) mm; EL 2.3–2.6 (2.5) mm; EW 1.7–1.9 (1.8) mm. Female (n = 2): TL 3.3 & 4.0 mm; PL 0.8 & 0.9 mm; PW 1.3 mm; EL 2.5 & 3.1 mm; EW 1.7 & 2.2 mm.*

*Distribution. Japan: Tsushima.*

**Sacodes protecta** HAROLD

[Japanese name: Kimune-maruhananomi]

(Fig. 19 G)


_Elodes flavicollis_ PIC, 1914, 22.

_Helodes flavicollis_ LEWIS, 1895, 106.

_Helodes protecta_ KLAUSNITZER, 1973 a, 106, figs. 1–6 [redescription]; 1974 a, 484 [phylogenetic systematic]; 1974 c, 76 [key]; 1977, 167.

_Flavohelodes protecta_ KLAUSNITZER, 1980 a, 61; 1995, 287.

*Measurement. Male (n = 4): TL 4.5–6.0 (5.2) mm; PL 1.0–1.5 (1.3) mm; PW 2.1–2.5 (2.3) mm; EL 3.5–4.5 (3.9) mm; EW 2.5–3.8 (2.9) mm. Female (n = 4): TL 4.7–6.2 (5.3) mm; PL 1.1–1.5 (1.3) mm; PW 2.2–2.8 (2.4) mm; EL 3.6–4.7 (4.1) mm; EW 2.6–3.4 (3.0) mm.*

*Distribution. Japan: Hokkaido, Honshu, Kyushu; Far East of Russia (Primorskij).*

**Sacodes dux** (LEWIS)

[Japanese name: Ruisu-kimune-maruhananomi]

(Fig. 19 H)

_Helodes dux_ LEWIS, 1895, 106 (Type: Japan, Hitoyoshi, in BMNH, not examined); KLAUSNITZER, 1973 a, 106, figs. 7–13 [redescription]; 1974 a, 484 [phylogenetic systematic]; 1974 c, 76 [key].

_Elodes dux_ PIC, 1914, 22.

_Flavohelodes dux_ KLAUSNITZER, 1980 a, 61.

Prionocyphon sp.: Hayashi, 1957, 48, figs. 1a–1g [description of larva].
Elodes flavicollis: Nakane, 1963 a, 140, pl. 70, fig. 17.

Measurement. Male (n = 3): TL 3.7–4.8 mm; PL 0.9–1.2 mm; PW 1.5–2.0 mm; EL 2.8–3.6 mm; EW 2.3–4.8 mm. Female (n = 4): TL 4.4–6.0 (5.0) mm; PL 1.0–1.4 (1.1) mm; PW 1.7–2.5 (2.1) mm; EL 3.4–4.6 (3.9) mm; EW 2.5–3.5 (2.9) mm.


Sacodes sp. (immature larvae)
(Figs. 21–23)

Diagnostic description. Closely related to the larva of S. nakanei (Klausnitzer), but the following characteristics are different: labrum more transverse; setae on keel-sclerite longer. The characteristics of shorter antennae (about 20 segmented) and lacking terminal tooth of mandible are probably not the specific but the immature larval feature.

Measurement of larva (n = 1). TL: 5.0 mm; HW: 0.9 mm; PL: 0.6 mm; PW: 1.2 mm; TW: 1.4 mm (in posterior margin of mesonotum).


Remarks. These larvae were collected from tree holes of Castanopsis sieboldii ssp. lutchuensis (Koidz.). Judging from the collecting locality, it is probable that these are the larvae of S. amamiensis (M. Satô). The fully description based on the mature larva and the specific determination are needed.
Fig. 21. Larva of *Sacodes* sp., habitus in dorsal view.
Fig. 22. Larval mouth parts of *Sacodes* sp. ——— A, Epipharynx; B, left mandible in ventral view; C, hypopharynx; D, left maxillary palpus in dorsal view; E, ditto in ventral view.

Fig. 23. Abdominal segments VIII–IX of *Sacodes* sp., larva. ——— A, tergite VIII; B, sternite VIII; C, tergite IX; D, sternite IX.
Genus *Hydrocyphon* Redtenbacher, 1858

[Japanese name: Keshi-maruhananomi Zoku]


Type species: *Cyphon deflexicollis Müller*, 1821 (by original designation).

**Key to the Japanese species of the genus Hydrocyphon**

(Male)

1. Body oval, shining; sternite VII shallowly concave. .................................................. (renati species-group) .................................................................................................................. 2

- Body oblong, strongly shining; sternite VII deeply concave. ........................................ (kambaiticus species-group) ................................................................................................. *H. nakanei* Yoshitomi

2. Penis elongated in parameroids. ................................................................. *H. iriomotensis* Yoshitomi

- Penis shorted in parameroids. ......................................................................................... *H. satoi* Yoshitomi

Up to the present, key to species in the female cannot be presented.

The renati species-group

[Japanese name: Keshi-maruhananomi Shugun]

This species-group is a well-defined group chiefly characterized by the structure of the aedeagus, and consists of eight species known from the Oriental Asia (Nyholm, 1981; Yoshitomi, 2001; Yoshitomi & Klausnitzer, 2003; Yoshitomi & Satô, 2005).

*Hydrocyphon satoi* Yoshitomi, 2001

[Japanese name: Keshi-maruhananomi]

(Fig. 24 A)


Measurement. Male (n = 4): TL 1.80–1.97 (1.90) mm; PL 0.30–0.35 (0.32) mm; PW 0.70–0.78 (0.74) mm; EL 1.50–1.64 (1.58) mm; EW 1.10–1.36 (1.21) mm. Female (n = 5): TL 1.70–1.86 (1.78) mm; PL 0.26–0.32 (0.360) mm; PW 0.66–0.75 (0.73) mm; EL 1.44–1.55 (1.48) mm; EW 1.00–1.86 (1.78) mm.

Fig. 24. Habitus of *Hydrocyphon* spp. ——— A, *H. satoi* YOSHITOMI; B, *H. iromotensis* YOSHITOMI; C, *H. nakanei* YOSHITOMI.

*Hydrocyphon iromotensis* YOSHITOMI, 2001
[Japanese name: Iriomote-keshi-maruhananomi]
(Fig. 24 B)

*Hydrocyphon iromotensis* YOSHITOMI, 2001, 98 (Type: Iriomote-jima, NSMT, examined).

*Measurement*. Male (*n = 1*): TL 1.87 mm; PL 0.32 mm; PW 0.90 mm; EL 1.55 mm; EW 1.04 mm.

The *kambaiticus* species-group

(=* nakanei* species-group, sensu YOSHITOMI, 2001)

[Japanese name: Naga-keshi-maruhananomi Shugun]

This species-group is characterized by the following characteristics: sternites VIII and IX rod-like; parameres of tegmen slender or short; symmetrical penis, with distinct parameroids; indistinct preheusor (YOSHITOMI, 2001; YOSHITOMI & SATÔ, 2005).

*Hydrocyphon nakanei* YOSHITOMI, 2001
[Japanese name: Naga-keshi-maruhananomi]
(Fig. 24 C)


*Measurement*. Male (*n = 3*): TL 1.90–2.01 (1.95) mm; PL 0.29–0.31 (0.30) mm; PW 0.70–0.81 (0.75) mm; EL 1.60–1.70 (1.65) mm; EW 1.04–1.16 (1.11) mm. Female (*n = 5*):
TL 2.01–2.30 (2.15) mm; PL 0.32–0.37 (0.34) mm; PW 0.76–0.86 (0.80) mm; EL 1.68–1.95 (1.81) mm; EW 1.19–1.30 (1.23) mm.


Distribution. Japan: Honshu, Shikoku (new record), Kyushu, Tsushima.

Genus *Scirtes* Illiger, 1807
[Japanese name: Tobiiro-marubanomizoku Zoku]

*Scirtes* Illiger, 1807, 301. — PIC, 1914, 40.


Type species: *Eloides hemisphaericus* Linnaeus, 1767 (designated by Thomson, 1859).

Redescription. Adults. Body small to moderate in size, about 2.0–5.0 mm, covered closely with hairy setae. Coloration of body various, yellowish-brown to black; several species with maculation in dorsal surface.

Head moderate to large in size, longer than wide, slightly convex above; eyes moderate to large in size. Labrum simply transverse. Antennae filiform, moderate in length, smallest in segments II–III. Maxillary palpi moderate in length; segments I–III almost same length; IV longest. Mandibles broad, symmetrical and subtriangular, covered with short setae in dorsal surface of interior part. Labial palpi with elongated segment II, arising III from the inside of II. Pronotum transverse, slightly depressed in lateral part; anterior margin almost straight; anterior angles slightly projecting towards; posterior margin gently arcuate. Scutellum triangular, as long as wide. Elytra oval to oblong, slightly convex above, absent any markings consisted of irregular setae. Mesosternal process long, separating mesocoxae, excised at apex. Metasternal longitudinal suture short, reaching about caudal 1/2; metacoxal plates subquadrate, not on same plane as intercoxal process of abdomen. Hind coxae meeting along full length of median line; hind margins jointly forming a subquadrate plate which is not on same plane as intercoxal process of abdomen. Legs normal in fore and middle, capable for jumping using hind legs; metatibia with two pairs of long and distinct spurs at the tip; metafemora enlarged, having very large metatibial extensor muscle and metatibial extensor tendons (Furth & Suzuki, 1990).

Male genitalia. Tergite VIII well scleritized, with a pair of short apodemes; sternite VIII small, reverse U-shaped, tergite IX lightly sclerotized, with a pair of long apodemes; sternite IX weakly sclerotized, oblong. Tegmen well sclerotized; parameres well developed. Penis well sclerotized, symmetrical or asymmetrical; parameroids long, well developed; trigonium provided with one or two projections projecting posteriad, indistinct anteriad.

Female genitalia. Tergite VIII moderately sclerotized, with a pair of long apodemes; sternite VIII lightly sclerotized, oblong. Ovipositor with long baculus; prehensor distinct or indistinct.

Larvae. Body well sclerotized, elongated campodeiform. Head visible in dorsal aspect. Antennae long, more than 100 segment, attaining to abdominal segment. Labrum projecting anteriad in ventral lobes, with a pair of long and stout pectinate setae at apical part of ventral lobes. Mandibles with terminal teeth bi- or multicornuted, normal or pectinated bristles bearing in interior part. Segment IV of maxillary palpus short, about 1/6 times as long as III. Hypopharynx with fused keel-sclerite and socket of tooth-bristles; cushion area

closed; comb-tooth bearing a pair of finger shaped processes in connecting part. Thorax gently widened to posteriad. Abdomen gently tapered posteriad; tergite and sternite IX with pectinate setae on posterior margin; anterior margin of tergite VIII biconvex in the middle; mesal part of anterior margin of tergite IX projecting anteriad.

Pupae. Body very soft, covered with short fine setae throughout; a pair of long spines on anterior margin of pronotum. Hind femur enlarge.

**Biological notes.** The larval habitat is stagnant water biotope, e.g. pond, marsh, and lake, and larvae are frequently live in a eutrophic biotope. Adults are collected around the larval habitat by sweeping, beating and light trap.

**Remarks.** This genus shows the sister-group relationship with the genus *Ora*, and is distinguished from it by the hind coxal plate distinctly projecting posteriorly.

It seems that the monophyly of this genus is uncertain. In the future, closer examination about both larvae and adults in the world species will be needed.
In this paper, four species under the three species-group are recognized from Japan.

Key to the Japanese species of the genus Scirtes*

1. Elytra oval; TL about 3.0 mm. .......................................................... S. sobrinus Lewis
2. Elytra oblong; TL about 3.0–4.0 mm. .................................................. 2

2. TL small, about 3.0 mm; elytra yellowish-brown, with fuscos marking in apical portion. ................................................................. S. tsumaguro M. SATÔ et CHÛJÔ

- TL moderate in length, about 3.0–4.0 mm; coloration of body brown to blackish brown evenly. ................................................................. S. japonicus KIESENWETTER

* Scirtes ovatulus Lewis is omitted in this key.

The japonicus species-group

[Japanese name: Tobiiro-maruhananomi Shugun]

This species-group was characterized by NYHOLM (2002) based on the following characteristics: body elongate with sides of elytra slightly rounded; coloration uniformly lighter or darker brown; male genitalia very characteristic built; tegmen anteriory with a deep median sinuation, side margins strongly sclerotized, in posterior half provided with a lateral lobe on each side, which is separated for most of its length; penis with a short and broad pala; parameroids right from the base cleft longitudinally in two part: a lower one forming a continuation of the pala-side and and such rather strongly sclerotized, and a feebly sclerotized upper one which extends backwards at least beyond the middle of lower one; trigonium with a triangular basal part and a very long and slender projection. The following four species known from East Asia are included in this species-group: Scirtes japonicus KIESENWETTER, 1874 (East Asia); Scirtes elongatus WATERHOUSE, 1880 (Hong Kong); Scirtus ussuriensis NYHOLM, 2002 (Russia); Scirtes unicolor PIC, 1914 (Cambodia).

Scirtes japonicus KIESENWETTER, 1874
[Japanese name: Tobiiro-maruhananomi]
(Figs. 25 A, 26–30)

Scirtes (1) japonicus KIESENWETTER, 1874, 244 (Type: not examined).

Redescription. Adults, male. Body oblong, moderately convex above, closely covered with easily removable yellowish-white setae regularly in dorsal surface. Coloration of body variable from blackish brown to light brown, but mouthparts, proximal segment of antennae, elytral suture and legs somewhat paler.

Head moderate in size; eyes large, strongly prominent; the distance between eyes about 2.0 times as long as the diameter of an eye. Antennae moderate in length, reaching about
proximal 1/4 of elytra; approximate ratio of each segment (n = 1) as 2.0 : 1.2 : 1.0 : 1.7 : 1.7 :

Fig. 26. *Scirtes japonicus* Kiesenwetter, male. —— A, Antenna; B, sternites V–VII; C, tergite VIII; D, sternite VIII; E, tergite IX; F, sternite IX; G, tegmen in ventral aspect; H, tegmen in lateral aspect; I, penis in ventral aspect; J, penis in lateral aspect; K, apical part of penis.
1.6 : 1.6 : 1.6 : 1.5 : 1.6 : 2.0. Pronotum slightly convex above, clearly tapered anteriorly in lateral margin; PW/PL 2.29–2.91 (2.54). Scutellum subtriangular, with almost straight lateral margins. Elytra elongated, slightly convex above, widest at middle; EL/EW 1.40–1.60 (1.52); EL/PL 4.67–6.09 (5.21); EW/PW 1.21–1.43 (1.36); TL/EW 1.70–1.92 (1.81). Hind coxal plate distinct, deeply concave in posterior margin. Hind femur large, about 1.8 times as long as wide. Hind tibial spur long; dorsal ones about 2.5 times as long as ventral ones, as long as segment I of hind tarsus, gently curved exteriorly. Ventral surface of abdominal segments covered evenly with fine short setae, except for anterior part of segments IV–V glabrous.

Apical margin of abdominal sternite VII shallowly concave. Tergite VIII moderately
sclerotized, trapezoidal, closely covered with long and stout spines in caudal part; sternite VIII reverse U-like shaped, lightly sclerotized; tergite IX lightly sclerotized, with a pair of long stout apodemes which are well sclerotized; sternite IX lightly sclerotized, closely covered with short setae in apical part. Tegmen well sclerotized in lateral and proximal parts, widely membranous in the middle part, almost parallel-sided, concave in proximal margin; lateral margin curved intero-ventrally in apical 1/5, pointed at apex. Penis symmetrical, longer than tegmen, semicircular in anterior part, broadest at proximal 1/9; trigonium prolonging toward posteriorly, pointed at apex, serrate in just behind apex; parameroids somewhat shorter than projection of trigonium, pointed at apex.

Female. The external feature is almost same as in male. Approximate ratio of each antennal segment as 2.1 : 1.1 : 1.0 : 1.6 : 1.6 : 1.5 : 1.5 : 1.5 : 1.5 : 2.0 (n=1). PW/PL 2.27–2.82 (2.48); EL/EW 1.47–1.65 (1.55); EL/PL 4.63–6.00 (5.18); EW/PW 1.28–1.42 (1.35); TL/EW 1.76–1.93 (1.85).

Apical margin of abdominal sternite VII gently arcuate. Tergite VIII oblong, with a pair of very long apodemes protruding from anterior corners; sternite VIII oblong, covered with fine punctures in apical part, with short spines on posterior margin. Ovipositor very long; approximate ratio of the lengths of stylus, coxite and baculus as follows (n = 1): – 1.0 : 9.0 : 88.2. Prehensor as shown in figure.

Measurement. Male (n = 20): TL 3.73–4.60 (4.16) mm; PL 0.55–0.75 (0.67) mm; PW 1.60–1.87 (1.70) mm; EL 3.13–3.85 (3.49) mm; EW 2.00–2.55 (2.30) mm. Female (n = 20): TL 3.80–4.90 (4.34) mm; PL 0.55–0.80 (0.70) mm; PW 1.55–1.95 (1.74) mm; EL 3.20–4.10 (3.63) mm; EW 2.00–2.70 (2.34) mm.

Mature larva. Coloration of body almost brown, but legs and ventral surface of body paler.

Head transverse, with short setae on lateral margin and around the stemmata, two non-melanized stemmata situated on each antero-lateral corner of head, confluent on each side. Antennae very long, reaching abdominal segment V in fully expanded body; scape short, curved posteriorly; pedicel almost straight, as long as scape; flagellum very long, about 120–140 segmented. Labrum covered with four pairs of long setae in each lateral side. Epipharynx with five pairs of stout setae on inner margins of ventral lobes, with a pair of long pectinate setae in anterior parts of ventral lobes; ventral setae long situated outer sides. Mandibles with two terminal teeth. Maxillary palpi long and slender; segment I covered with spinous short setae and punctures, with some long setae in outer part; segment II sparsely covered with minute setae and punctures, with a long setae in dorsal surface; segment III sparsely covered with minute setae, with seven sensory organs situated in ventral surface, with short stout seta at apical margin of dorsal surface; segment IV short, with sensory organs in apical part and dorsal surface; approximate ratio of respective segments (I–IV) as 6.5 : 5.0 : 5.5 : 1.0. Hypopharynx with contiguous keel-sclerite and socket of tooth-bristles; a pair of setae on keel-sclerite wide, serrate at the ends; tooth-bristles wide, bicornute at ends.

Thorax widest at metanotum, bearing long and short setae on lateral margin; pronotum with long setae near each corners; meso- and metanotum with three pairs of long setae along anterior margin, with two pairs of long setae along posterior margin.

Abdomen with short spinous setae bearing from lateral margins of tergites; tergites III–VII closely covered with spinous short setae. Tergite VIII trapezoidal, with a pair of long setae near postero-lateral corners and just behind the middle, bicornuate at middle of anterior margin; sternite VIII transversal trapeziform, covered with very long setae in caudal part, with short spinous setae along posterior margin; tergite IX arch-like shaped, with paripinnate
Fig. 28. Larva of *Scirtes japonicus* KIIESENWETTER, habitus in dorsal view.
Fig. 29. Larval mouth parts of *Sectes japonicus* Kiesenwetter. —— A, Epipharynx; B, left mandible in ventral view; C, hypopharynx; D, left maxillary palpus in dorsal view; E, ditto in ventral view.
Fig. 30. Abdominal segments VIII–IX of *Scirtes japonicus* Kiesewetter, larva.——

A, tergite VIII; B, sternite VIII; C, tergite IX; D, setae in ditto; E, sternite IX; F, setae in ditto.

Setae along antero-ventral margin, apical part projecting posteriorly, with a pair of long setae in postero-lateral corners, projecting anteriorly at the middle of antero-dorsal margin; sternite IX semicircular, bearing pectinate setae on posterior margin.

*Measurement of the larvae* (n = 3). TL 9.3–11.8 (10.6) mm; HW 1.2–1.4 (1.3) mm; PW 1.8–2.2 (2.0) mm; PL 1.0–1.2 (1.1) mm; TW 2.2–2.5 (2.3) mm.

*Pupae*. Coloration of body white; pronotum with a pair of long spines on anterior margin; hind femur large. TL 5.0–5.4 mm; TW 2.2 mm.


Distribution. Japan: Hokkaido, Honshu, Shikoku, Kyushu, Ryukyu Isls. (Tokara-nakanoshima, Okinawa-jima, Minamidaito-jima, Kume-jima, Ishigaki-jima, Iriomote-jima, Yonaguni-jima); Russia; China; Taiwan; Korea.

Biological notes. It is well known that the adults of this species frequently utilize under bark of living tree as hibernaculum in mainland Japan.

Remarks. This is widely distributed throughout the East Asia, and most common in Japan. It is distinguishable from the relative species by the male and female genitalia.

The hemisphaericus species-group

[Japanese name: Hime-maruhananomi Shugun]

This species-group is characterized by the following characteristics: body oval, convex above; parameres simple; penis symmetrical, with long and slender pala.

This following species must be member of this species-group: Scirtes hemisphaericus (Linnaeus, 1767) (Europe); S. ovatulus Lewis, 1895 (Japan); S. sobrinus Lewis, 1895 (Japan); S. rufonotatus Pic, 1915 (Taiwan); S. nigricans Waterhouse, 1880 (China).

Scirtes ovatulus Lewis, 1895

[Japanese name: Hakodate-maruhananomi]

Scirtes ovatulus Lewis, 1895, 105 (Type: Hakodate, in BMNH, not examined). — Pic, 1914, 43.

Remarks. I have not examined the type and the additional specimens of this species. Judging from the original description (Lewis, 1895), this seems to be the same species of the following species.

Scirtes sobrinus Lewis, 1895

[Japanese name: Hime-maruhananomi]

(Figs. 25 B, 31–35)

Scirtes sobrinus Lewis, 1895, 105 (Type: Bukonjii, near Yokohama, in BMNH?, not examined). — Pic, 1914, 44. — Nakane, 1963 a, 139, pl. 70, fig. 4. — Satô, 1985 b, 423, pl. 77, fig. 29. — Takakura, 1987, 41.

Scirtes sakishimanus M. Satô et Chûjo, 1972, 20–21, fig. 2 (Type: Hamida, Is. Iriomote, in NWU, examined). NEW SYNONYM.
Redescription. Adults, male. Body oval, strongly convex above, shining, closely covered with yellowish-white setae throughout. Head, pronotum, scutellum and elytra blackish-brown, but around the margin of pronotum and scutellum and elytral suture somewhat reddish; mouth parts and antennae yellowish-brown, but antennal segments IV–XI darker; trochanter, tibiae and tarsi yellowish-brown; femora dark brown, except for brown apical part; ventral surface of body almost brown, but hind coxal plates paler.

Head moderate in size, slightly convex above, closely covered with small punctures; eyes moderate in size, prominent, the distance between eyes about 1.7 times as long as the diameter of an eye; frons wide; clypeus with gently arcuate front margin. Antennae stout and short.

Fig. 31. *Scirtes sobrinus* Lewis, male. ——— A, Antenna; B, abdominal sternite; C, tergite VIII; D, sternite VIII; E, tergite IX; F, sternite IX; G, tegmen; H, penis in ventral aspect; I, penis in lateral aspect.
Fig. 32. *Scirtes sobrinus* Lewis, female. —— A, Antenna; B, sternites V–VII; C, tergite VIII; D, sternite VIII; E, ovipositor; F, prehensor.

reaching about proximal 1/5 of elytra; approximate ratio of each antennal segment (n = 1) as 2.7 : 1.7 : 1.0 : 2.2 : 2.3 : 2.0 : 2.2 : 2.0 : 2.0 : 2.0 : 2.7. Pronotum convex above in mesal part of disk, punctate same as in head; anterior margin almost straight; antero- and postero-lateral corners almost right-angled, but anterior ones somewhat projecting antero-laterally; lateral margins almost straight, tapered gently to anteriorly; posterior margin gently arcuate; PW/PL 2.30–2.70 (2.50). Scutellum large, subtriangular, finely and sparsely punctate. Elytra oval, strongly convex above in mesal part, widest at the middle, closely and regularly punctate, closely covered with short regular setae throughout; EL/EW 1.15–1.28 (1.24); EL/PL 4.00–4.65 (4.33); EW/PW 1.33–1.52 (1.40); TL/EW 1.40–1.59 (1.53). Hind coxal plates
large and distinct, right-angled in postero-lateral corners, slightly concave in posterior margin. Legs short and robust; hind femora very large, about 1.5 times as long as wide; hind tibial spurs long, dorsal ones about 2.5 times as long as ventral ones; segment I of hind tarsus long, as long as the total length of remaining tarsal segment. Ventral surface of abdominal segments closely covered with short setae, but glabrous in lateral parts of segments IV–V.

Apical margin of sternite VII shallowly concave. Tergite VIII semicircular, moderately sclerotized in caudal part, widely membranous in proximal part, covered with short and long setae in apical part; sternite VIII weakly sclerotized, widely U-shaped; tergite IX lightly sclerotized, trapezoidal, with a pair of short and stout apodemes, covered with long setae and short spines in apical part; sternite IX lightly sclerotized, oblong, deeply excised in the middle of posterior margin, covered with short setae in apical part. Tegmen pentagonal, broadest at about proximal 1/3, shallowly concave in anterior margin, sparsely covered with punctures, serrae and setae in throughout except for anterior part; parameres with obtuse apex. Penis symmetrical, as long as tegmen, subparallel-sided; anterior part elongated semicircular; trignonum prolonging posteriad, pointed at apex which curved dorsally, serrate in just behind apex; parameroid as long as the projection of trignonum, pointed at apex.

Female. The external feature is almost same as in male. Approximate ratio of each segment of antenna \((n = 1)\) as \(2.0 : 1.4 : 1.0 : 1.9 : 1.9 : 1.6 : 1.7 : 1.7 : 1.7 : 2.3; PW/PL 2.42–3.00 (2.62); EL/EW 1.17–1.39 (1.27); EL/PL 4.04–5.00 (4.58); EW/PW 1.18–1.50 (1.38); TL/EW 1.46–1.69 (1.54). Apical margin of sternite VII shallowly concave. Tergite VIII lightly sclerotized, covered with fine punctures in apical part, with short spines on apical margin; sternite VIII moderately sclerotized, notched in apical margin, which bearing short setae, with long and thin apodemes protruding antero-lateral corners. Ovipositor long; approximate ratio of the lengths of stylus, coxite and baculus as follow \((n = 1): - 1.0 : 6.8 : 44.3.\) Prehensor as shown in figure.

Measurement. Male \((n = 6): TL 2.50–3.07 (2.90) mm; PL 0.50–0.60 (0.55) mm; PW 1.15–1.45 (1.36) mm; EL 2.00–2.52 (2.36) mm; EW 1.60–2.20 (1.90) mm. Female \((n = 11): TL 2.70–3.37 (2.95) mm; PL 0.45–0.60 (0.53) mm; PW 1.20–1.50 (1.38) mm; EL 2.22–2.77 (2.42) mm; EW 1.77–2.20 (1.91) mm.

Mature larva (by association). Body subparallel-sided, covered densely with short fine setae throughout; coloration almost brown.

Head transverse, with a pair of non-melanized stigmata in dorso-lateral part, bearing long setae on lateral margin, with two pairs of long setae along anterior part of epicranial suture. Antennae moderate in length, exceeding abdominal segment II; scape curved posteriorly; pedicel straight, about 1.2 times as long as scape; flagellum 58–65 segmented \((n = 2).\) Labrum transverse, protruding antero-laterally, with feathered short setae bearing from anterior margin. Epipharynx with five pairs of stout setae along inner margins of ventral lobes, with a pair of long pectinate setae in apex of ventral lobes; ventral setae short. Mandibles with 6 or more teeth in row; feathered bristles somewhat short, anterior ones stout and pectinate. Maxillary palpi moderate in length; segments I–II covered sparsely with short setae and punctures; segment III with 10 independent sensory organs, 5 distributed in somewhat outer part of ventral surface, 3 in introto-lateral part, remaining 2 in distal part of dorsal surface; segment IV very short, with sensory organs in apical part; approximate ratio of respective segments I–IV as 7.0 : 5.3 : 6.8 : 1.0. Hypopharynx typical form of the genus, with five comb-teeth. Thorax almost parallel-sided, widest at posterior margins.
Fig. 33. Larva of *Scirtes sobrinus* Lewis, habitus in dorsal view.
of meso- and metanotum, with irregular setae on lateral margin.

Abdomen gently narrowed posteriorly; segments I–VII with irregular setae near postero-lateral corners, with small stout setae on lateral margin of tergites and sternites; tergite VIII trapezoidal, with two pairs of short stout setae on lateral margin, with a pair of long setae projecting from near postero-lateral corners, biconvex at the middle of anterior margin; sternite VIII transversal trapeziform, covered with long stout setae in lateral part, with short setae along posterior margin, its lateral ones stout, bearing a pair of very long setae protruding from near postero-lateral corners; tergite IX arch-like shaped, with a pair of
long setae bearing from postero-lateral corners, with pectinate setae along antero-ventral margin in row, convex at the middle of antero-dorsal margin; sternite IX semicircular, bearing pectinate setae along posterior margin.

**Measurement of the larvae** (n = 1). TL 7.7 mm; HW 1.1 mm; PW 1.6 mm; PL 0.9 mm; TW 1.9 mm.


Biological notes. This is common species in the all around Japan. The adults are collected from marsh by sweeping and light trap. In Nishihirose, Aichi, the larvae were collected from paddy field which have not been cultivated for a long time. The over wintering stage is unknown in mainland Japan.

Remarks. It is distinguished from the related species by their distribution areas and male genitalia, and from S. ovatus LEWIS by the more ovate body (after LEWIS, 1895).

The tsunaguro species-group

[Japanese name: Tsumaguro-maruhananomi Shugun]

This species-group is characterized by the following characteristics: body oblong; a pair of small concavities (sensory organ?) situated in antero-mesal part of abdominal sternite IV; penis asymmetrical; trignon with two projection; parameroids indistinct.

Scirtes tsunaguro M. SATÔ et CHÛJO, 1972

[Japanese name: Tsumaguro-maruhananomi]

(Figs. 25 C, 36)

Scirtes tsunaguro M. SATÔ et CHÛJO, 1972, 21–22, fig. 3. — SATÔ, 1985 b, 2: 423, pl. 77, f. 27.


Head large, slightly convex above, closely covered with small punctures; eyes moderate in size, slightly prominent, the distance between eyes about 2.2 times as long as the diameter of an eye; front margin of clypeus shallowing concave. Antennae short and slender, reaching about proximal 1/4 of elytra; approximate ratio of each antennal segments (n = 1) as 9.0 : 5.0 : 5.0 : 7.0 : 7.5 : 7.5 : 7.0 : 7.0 : 6.0 : 6.0 : 7.0. Pronotum transverse, strongly convex above in mesal part of disk, closely punctate; antero- and postero-lateral corners almost right-angled, slightly projecting anteriorly in anterior ones; anterior margin gently arcuate; lateral margins gently arcuate, slightly tapered anteriad; posterior margin gently arcuate; PW/PL 2.00–2.20 (2.12). Scutellum small, subtriangular, closely punctate. Elytra oblong,
Fig. 36. *Scirtes tsumaguro* M. SATÔ et CHÊJÔ, male. —— A, Antenna; B, abdominal sternites; C, concavity on sternite IV; D, tergite VIII; E, tergite IX; F, sternite IX; G, tegmen; H, penis.

Widest at just behind the middle, narrowed in basal part, distinctly and closely punctate; EL/EW 1.33–1.66 (1.53); EL/PL 4.00–4.70 (4.34); EW/PW 1.17–1.50 (1.39); TL/EW 1.67–2.05 (1.88). Hind coxal plates large and distinct, projecting posteriorly in postero-lateral corners. Legs relatively long, slender; hind femora large, about 2.0 times as long as wide; hind tarsal segment I long, longer than the total length of the remaining tarsal segments. Abdominal sternites III–IV covered sparsely with short setae irregularly; a pair of small concavities (sensory organ?) situated in antero-mesal part of IV, bearing minute extra setae. Sternites V–VII closely covered with short setae.

Apical margin of abdominal sternite VII shallowly concave. Tergite VIII moderately sclerotized, trapezoidal, closely covered with short setae in apical part, bearing minute spines in mesal part; sternite VIII indistinct; tergite IX lightly sclerotized, bearing short spines on posterior margin, with a pair of long and stout apodemes protruding from antero-lateral corners; sternite IX lightly sclerotized, oblong, covered with short setae in apical part. Tegmen well sclerotized; anterior half elongate semicircular; posterior half (parameres) bilobed, sparsely covered with shallow and large punctures in apical part, pointed at apex. Penis asymmetrical, as long as tegmen, ovate in pala, broadest at proximal 1/10; trigonium
contains two pieces, left one large, curved laterad, obtused at apex, right one small, almost straight, pointed at apex.

Female. The external feature almost same as in male; PW/PL 2.00–2.15 (2.08); EL/EW 1.32–1.42 (1.37); EL/PL 3.73–4.37 (4.05); EW/PW 1.42–1.43 (1.42); TL/EW 1.67–1.74 (1.71).

Measurement. Male (n = 4): TL 2.82–3.00 (2.89) mm; PL 0.50–0.60 (0.54) mm; PW 1.10–1.20 (1.15) mm; EL 2.30–2.40 (2.34) mm; EW 1.40–1.80 (1.55) mm. Female (n = 2): TL 2.79–2.84 (2.82) mm; PL 0.52–0.60 (0.56) mm; PW 1.12–1.20 (1.16) mm; EL 2.24–2.27 (2.26) mm; EW 1.60–1.70 (1.65) mm.


Biological notes. Biological information is very scarce. Adults were collected by a light trap near seashore, and therefore the larval habitat is maybe reedy shore on a river mouth.

Remarks. This is very remarkable species in Japan, and easily distinguishable from the other species. The characteristics of the concavities on sternite IV and asymmetrical penis are very unique, and more close examination including larval stage will be needed.

Scirtes spp.
● : S. japonicus
▲ : S. sobrinus
■ : S. tsunaguro

Fig. 37. Distribution map of Scirtes spp.
Genus *Ora* CLARK, 1865  
[Japanese name: Kemadara-maruhananomi Zoku]

*Ora* CLARK, 1865, 385. — CHAMPION, 1897, 602; 1918, 95. — PIC, 1914, 39 [world list].  
Type species: *Ora grayii* CLARK, 1865 (by original designation).

Redescription. Adults. Body moderate in size, about 3.0–5.0 mm, circular and strongly convex above, densely covered with short or long setae throughout. Coloration of body blackish-brown to brown. Head large, transverse; anterior part of gula deeply concave, covered with short setae. Eyes large, prominent, situated lateral part of head. Labrum transverse, covered with somewhat long setae. Antennae long and slim, filiform; segment II small; segment III shorter than II. Maxillary palpi long, almost same length in segments II–IV. Mandibles broad in proximal part, with some short setae in interior part of dorsal surface. Labial palpi long, segment III small, thumb-like shaped, arising from inside of segment II. Pronotum obviously transverse; anterior margin almost straight; anterior corners distinctly projecting anteriad; posterior margin slightly bisinuous; posterior corners almost right-angle. Scutellum triangular, as long as wide. Elytra semicircular, strongly convex above, closely covered with easily removable setae. Mesosternum deeply excised in mesal part of anterior margin; mesosternal process long, separated mesocoxae. Metasternal longitudinal suture long, exceeding posterior half. Hind coxae touching each other only anteriorly, arcuately diverging posteriorly where they are about on a plane with the abdominal process which separates them. Legs normal in fore and middle; metafemora enlarged, capable for jumping. Metatibiae expanding laterally at middle, with two pairs of long and distinct tibial spur at the tip.

Male genitalia. Tergite VIII well sclerotized, with a pair of short apodemes; sternite VIII small, reverse U-shaped, tergite IX lightly sclerotized, with a pair of long apodemes; sternite IX weakly sclerotized, oblong. Tegmen tending to reduce; basal part arch-like shape, uncovered with penis; apical part (parameres) connected with penis, enlarged, sparsely covered with punctures, short setae and spines. Penis separatable to both side; basal part (pala) flat; apical part (parameroids) consisting of a pair of projections.

Female genitalia. Tergite VIII moderately sclerotized, with a pair of long apodemes; sternite VIII lightly sclerotized, oblong. Ovipositor long; baculus very long, with a short branchlet in posterior part; prehensor distinct.

Larva. Similar to *Scirtes*; body well sclerotized, elongated campodeiform. Head visible in dorsal aspect. Antennae very long, exceeding half of body; scape slightly curved posteriorly; pedicel almost straight, two times as long as scape; flagellum more than 100 segments. Labrum distinctly protruding anteriorly in ventral lobes, with a pair of long and simple setae at apical part of ventral lobes. Mandibles with obtused terminal tooth; bristles feathered. Maxillary palpi 4-segmented; segment III short, expanded interiorly in distal part, with sensory organs in ventral surface; segment IV long, about as long as III. Hypopharynx similar to that of *Scirtes*, but more transverse; setae of keel-sclerite and tooth-bristles almost standing in line. Thorax wider than abdomen, gently widened to posteriad. Abdomen gently tapered posteriad; tergites and sternites VIII similar to those of *Scirtes*, but anterior margins of tergites VIII–IX not protruding anteriorly.

Biological notes. The larvae inhabit in mainly phytotelmata (tree-holes), and sometimes in puddle and small pond in forest.

Remarks. This genus is mainly distributed in the tropical rain forests of the Nearctic,
Neotropical, Oriental and African Regions, and is represented by 40 species. The larva of this genus has already been figured by BERTLAND (1972).

**Key to the Japanese species of the genus Ora**

1. Body yellowish-brown, with black maculations in elytra. .......... *O. mawatarii* (NAKANE)
   - Body brown, without maculation in elytra. ........................................ 2
2. TL large, about 4.0–5.0 mm; zigzag markings of elytra composed irregular silver long setae. .................................................. *O. okinawana* (NAKANE)
   - TL small, about 4.0 mm; zigzag markings on elytra distinct. ....... *O. yayeyamana* (M. SATÔ et CHÛJÔ)

*Ora okinawana* (NAKANE, 1963), n. comb.
[Japanese name: Kemadara-maruhananomi]
(Figs. 25 D, 38–41)

*Scirtes okinawanus* NAKANE, 1963 a, 139, pl. 70, fig. 6 (Type: see below, examined). — SATÔ, 1985 b, 423, pl. 77, fig. 26.

Redescription. Adult, male. Body semicircular, strongly convex above, closely covered with easily removable setae. Coloration of body brown to blackish brown, but tarsi, elytral suture and abdominal sternites paler.

Head large, closely covered with yellowish-white and blackish-brown setae; eyes large prominent, the distance between eyes about 2.2 times as long as the diameter of an eye. Antennae long and slim, reaching about proximal 1/3 of elytra; approximate ratio of each segment (n = 1) as 1.9 : 1.2 : 1.0 : 1.8 : 1.9 : 1.9 : 1.8 : 1.7 : 1.7 : 1.5 : 1.7. Pronotum closely covered with yellowish-white and blackish-brown setae; PW/PL 2.86–3.23 (3.08). Scutellum large, closely covered with yellowish-white fine setae. Elytra semicircular, well convex above, with three pairs of distinct costae running from near base to proximal 2/3, depressed laterally in posterior part of shoulder, closely covered with yellowish-white and blackish-brown fine setae; zigzag markings composed irregular silver setae distinct; EL/EW 1.13–1.26 (1.17); EL/PL 5.43–6.23 (5.80); EW/PW 1.52–1.68 (1.60); TL/EW 1.33–1.46 (1.38). Abdominal sternites III–IV sparsely covered with short setae irregularly, extra long setae bearing from antero-mesal part of segment IV; sternites V–VII closely covered with short setae.

Apical margin of sternite VII shallowly concave. Tergite VIII semicircular, moderately sclerotized in posterior part, widely membranous in anterior part; sternite VIII U-shaped; tergite IX lightly sclerotized, bearing short spines on apical margin, with somewhat short apodemes; sternite IX lightly sclerotized, oblong, notched in apical margin, sparsely covered with short setae and punctures in apical part. Tegmen connecting with penis in posterior part, unseparable. Penis complicated; caudal part bilobed, pointed at apex.

Female. The external feature is almost same as in male. Approximate ratio of each antennal segment (n = 1) as 2.0 : 1.0 : 1.0 : 2.0 : 1.8 : 1.8 : 1.7 : 1.7 : 1.7 : 1.5 : 1.7. PW/PL 2.65–3.25 (2.94); EL/EW 1.12–1.25 (1.20); EL/PL 5.21–6.17 (5.68); EW/PW 1.52–1.73 (1.61); TL/EW 1.32–1.49 (1.41).
Measurement. Male (n = 6): TL 3.95–5.03 (4.45) mm; PL 0.55–0.73 (0.66) mm; PW 1.75–2.20 (2.02) mm; EL 3.40–4.30 (3.79) mm; EW 2.70–3.70 (3.24) mm. Female (n = 13): TL 3.80–5.45 (4.38) mm; PL 0.60–0.85 (0.66) mm; PW 1.70–2.25 (1.929 mm; EL 3.20–4.60 (3.72) mm; EW 2.65–3.67 (3.10) mm.

Mature larva. Coloration of body almost blackish-brown, with black spotted markings on the dorsal surface of thorax and abdomen; antennae (except for scape), maxillary palpi and legs paler. Dorsal surface covered densely with fine hairy setae.

Head transverse, with a pair of non-melanized stemmata on dorso-lateral corners, bearing spinous setae on lateral margin. Antennae very long, reaching abdominal segment VII in fully expanded body; scape short, curved posteriorly; pedicel straight, about 2.5 times as long as scape; flagellum very long, about 140–200 segmented. Labrum as long as wide, protruding anteriorly in antero-lateral part, covered with long setae in anterior part. Epipharynx with a pair of long stout setae at apex of ventral lobes, with five pairs of short stout setae on interior margin of ventral lobes. Mandible absent obviously terminal tooth; bristles feathered, but anterior ones stout and pectinate. Maxillary palpus long; segment I stout, closely covered with spinous setae in dorsal surface; segment II sparsely covered with

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Fig. 38. *Ora okinawanus* (NAKANE), male (A, C–H) and female (B). ——— A–B, Antennae; C, abdominal sternites; D, tergite VIII; E, sternite VIII; F, tergite IX; G, sternite IX; H, tegmen and penis.
Fig. 39. Larva of *Ora okinawanus* (NAKANE), habitus in dorsal view.
Fig. 40. Larval mouth parts of *Ora okinawanus* (NAKANE). ——— A, Epipharynx; B, left mandible in ventral view; C, hypopharynx; D, left maxillary palpus in dorsal view; E, ditto in ventral view.
short setae, with a long setae in dorsal surface; segment III gently expanded interiorly in distal part, with many sensory organs distributed in antero-lateral part of ventral surface; segment IV long, with many basiconic sensilla throughout, covered with sensory organs in apical part; approximate ratio of respective segments (I-IV) as 1.6 : 0.8 : 0.8 : 1.0. Hypopharynx transverse; keel-sclerite and socket of tooth-bristles completely fused; setae in keel-sclerite serrate at interior ends; tooth-bristles with one serra in proximal part of interior end; comb plate bearing 7 claw teeth, connected with each other, bearing finger-like shaped processes in connecting part.

Thorax sparsely covered with short stout setae on dorsal surface, widest at posterior margin of metanotum, with spinous long and short setae on lateral margins.

Abdomen a little narrower than thorax, sparsely covered with short stout setae on dorsal surface of segments I-VII, with spinous short setae on lateral margins. Tergite VIII trapezoidal, with a pair of long setae near postero-lateral corners; anterior margin straight; sternite VIII transversal trapeziform, densely covered with long hairy setae in lateral and middle parts. Tergite IX arch-like shaped, bearing paripinnate setae along antero-ventral
margin, with a pair of long setae in postero-lateral corners; antero-dorsal margin concave uniformly. Sternite IX semicircular, bearing pectinate setae and a pair of long setae on posterior margin.

Measurement of the larvae (n = 3). TL 13.2–14.2 (13.6) mm; HW 1.7–2.1 (1.9) mm; PW 2.5–2.8 (2.7) mm; PL 1.2–1.4 (1.3) mm; TW 3.2–3.4 (3.3) mm.


Measurement of pupa (n = 1). TL 5.4 mm; TW 3.0 mm.

Type material. Holotype: 1 male, "III–24–1953, Ryukyu Is., T. Shiraki", "Okinawa Is., Ginama", "70–6", pink label, this label is plate and figure number of NAKANE (1963 a).


Biological notes. Biological information is very scarce. The adults are collected by beating in a natural forest. Larvae are collected from tree-holes, puddle, small pond and marsh in forest. Pupation was easily carried out on the under surfaces of container top and fallen leaves under the rearing condition. Pupal period was 1 or 2 days in 25 °C condition.

Remarks. This species is closely related to O. yayeyamana (M. SATÔ et CHÛJÔ) distributed allopatrically, but is distinguish from it by the larger body, coloration, distinct zigzag markings on elytra and male and female genitalia.

Ora yayeyamana (M. SATÔ et CHÛJÔ, 1972), n. comb.
[Japanese name: Yayeyama-kemadara-maruhananomi]
(Figs. 25 E, 42–43)

Scirtes okinawanus yayeyamana M. SATÔ et CHÛJÔ, 1972, 21 (Type: see below, in NWU, examined).
Fig. 42. Ora yayeyamanus (M. SATÔ et CHÛTÔ), male. ——— A, Antenna; B, abdominal sternite; C, tergite VIII; D, sternite VIII; E, tergite IX; F, sternite IX; G, tegmen; H, penis.


Head large, closely covered with yellowish-white setae; eyes large, prominent, the distance between eyes about 2.0 times as long as the diameter of an eye. Antennae long and slim, reaching about proximal 1/4 of elytra; approximate ratio of each segment (n = 1) as 2.0 : 1.2 : 1.0 : 2.0 : 2.0 : 1.8 : 2.0 : 1.8 : 1.8 : 1.6 : 1.8. Pronotum and scutellum covered closely with yellowish-white setae; PW/PL 2.64–3.00 (2.81). Elytra semicircular, well convex above, slightly depressed from laterally in posterior part of shoulder, closely covered with yellowish-white setae regularly; EL/EW 1.19–1.22 (1.21); EL/PL 5.04–5.72 (5.35); EW/PW 1.53–1.62 (1.58); TL/EW 1.40–1.46 (1.43). Abdominal sternites III–IV covered sparsely with short setae irregularly, extra long setae bearing from antero-mesal part of IV; sternites V–VII closely covered with short setae regularly.

Apical margin of sternite VII shallowly concave. Tergite VIII moderately sclerotized in posterior part, widely membranous in anterior part, covered with long setae in apical part, with a pair of long and stout setae protruding from antero-lateral corners; sternite
Fig. 43. *Ora yayeyamanus* (M. SATÔ et CHUÔ), female. —— A, Abdominal sternite; B, tergite VIII; C, sternite VIII; D, ovipositor; E, prehensor.
VIII widely membranous, lightly sclerotized around posterior and lateral margins; tergite IX lightly sclerotized, bearing short spines on apical margin, with a pair of long and stout apodemes; sternite IX lightly sclerotized, oblong, notched in apical margin, sparsely covered with short setae and punctures in apical part. Tegmen and penis similar to those of *O. okinawana* (NAKANE), but tegmen and penis easily separable.

Female. The external feature is almost same as in male; PW/PL 2.93–3.40 (3.16); EL/EW 1.31–1.33 (1.32); EL/PL 5.79–7.06 (6.42); EW/PW 1.49–1.59 (1.54); TL/EW 1.49–1.56 (1.53). Apical margin of sternite VII shallowly concave. Tergite VIII elongate trapezoidal, with a pair of long apodemes; sternite VIII oblong, covered with short spines on apical margin and in mesal part. Ovipositor very long; approximate ratio of the lengths of stylus, coxite and baculus as follow (n = 1): 1.0 : 5.0 : 39.0. Prehensor as shown figure.

**Measurement.** Male (n = 4): TL 3.95–4.25 (4.12) mm; PL 0.60–0.70 (0.65) mm; PW 1.78–1.85 (1.82) mm; EL 3.35–3.55 (3.47) mm; EW 2.75–2.95 (2.87) mm. Female (n = 2): TL 4.03 & 4.75 mm; PL 0.50 & 0.70 mm; PW 1.70 & 2.05 mm; EL 3.53 & 4.05 mm; EW 2.70 & 3.05 mm.

**Immature larvae.** Closely similar to that of *O. okinawana*, but the following external features are different: setae on dorsal surface and lateral margin longer; antenna shorter; pedicel as long as scape; mandible with obtuse terminal tooth; segment IV of maxillary palpus short, about 1/5 times as long as segment III. But all the above characteristics are probably not specific character. Description and illustration based on the last instar larva will be shown in the future.

**Type material.** Holotype: 1 male, Takeda, Ishigaki-jima, 2–V–1963, Y. ARITA leg. (NWU).


**Distribution.** Japan: Ryukyu Isls. (Ishigaki-jima, Iriomote-jima).

**Biological notes.** Biological information is very scarce. The adults are collected by beating in the natural forest, and are sometimes attracted to light. Larvae were collected from tub-like (opened above) tree-holes in the natural forest.

**Remarks.** This species has been treated as a subspecies of the previous species, but is treated here an independent species based on the differences between their male and female genitalia. Different points between the above species are shown in the key.

**Ora mawatarii** (NAKANE, 1958), n. comb.

[Japanese name: Obimon-maruhananomi]  
(Figs. 25 F, 44–45)

**Scirtes mawatarii** NAKANE, 1958, 90 (Type: see below, in NT, examined). —— NAKANE, 1963 a, 139, pl. 70, fig. 5. —— HIRANO, 1994, 36–37.

**Redescription.** Adult, male. Body oval, strongly convex above, shining, closely covered
with easily removable yellowish setae. Coloration of head, antennae, pronotum and scutellum brown, but antennal segments V–XI fuscous. Elytra pale brown, with three pairs of black large markings along elytral suture, which are variable in individuals; the anterior ones situated behind base, produced outwards and then backwards along outer margin, forming a broad longitudinal stripe; the middle ones subquadrate, situated on the middle; the posterior ones semicircular, situated near elytral apex. Legs and ventral part of body almost brown. Head moderate in size, flattened above; eyes moderate in size, prominent, the distance between eyes about 2.3 times as long as the diameter of an eye; frons wide; front margin of clypeus almost straight. Antennae slim, moderate in length, reaching about proximal 1/3 of elytra; approximate ratio of each antennal segment (n = 1) as 2.0 : 1.0 : 1.0 : 2.0 : 1.8 : 1.8 : 1.8 : 1.8 : 1.8 : 1.5 : 2.0. Pronotum wide, slightly convex above in mesal part; antero-lateral corners distinctly projecting anteriorly; anterior margin almost straight; lateral margins gently and evenly arcuate; postero-lateral corners obtuse; posterior margin gently arcuate, clearly longer than anterior one; PW/PL 2.69. Scutellum subtriangular, relatively wide. Elytra oval, well convex above, widest just behind the middle; humeral part somewhat

Fig. 44. *Ora mawatarii* (NAKANE), male. ——— A, Antenna; B, abdominal sternites; C, tergite VIII; D, tergite IX; E, sternite IX; F, tegmen and penis.
Fig. 45. *Ora mawatarii* (NAKANE), female. — A, Sternites V−VII; B, tergite VIII; C, sternite VIII; D, ovipositor; E, prehensor.

projecting laterally; EL/EW 1.14; EL/PL 5.26; EW/PW 1.71; TL/EW 1.36. Legs moderate in length. Abdominal sternites III−IV sparsely covered with short setae irregularly, with extra minute setae in antero-mesal part of sternite IV; sternites V−VII closely covered with short setae regularly. Apical margin of sternite VII gently arcuate. Tergite VIII semicircular, covered with long setae in postero-mesal part, bearing short setae in antero-lateral part, with a pair of short apodemes; sternite VIII indistinct; tergite IX lightly sclerotized, covered with short spines on posterior margin; sternite IX oblong, notched in apical margin, covered with somewhat long setae in apical part. Tegmen unique shaped; proximal part simply U-shaped; caudal part (parameres) stout, curved to interiorly, closely covered with short setae. Penis unique shaped, asymmetrical; anterior part (pala) bilobed, connected with each other in proximal 1/5; posterior part (parameroids) bilobed, prolonging obviously, pointed at apex.

Female. The external feature is almost same as in male. PW/PL 3.00−3.33 (3.12); EL/EW 1.25−1.34 (1.28); EL/PL 5.71−6.33 (5.99); EW/PW 1.48−1.53 (1.50); TL/EW 1.44−1.56 (1.49). Apical margin of sternite VII shallowly concave. Tergite VIII moderately sclerotized, with long and thin apodemes; sternite VIII lightly sclerotized, oblong, covered
with short setae in apical part. Ovipositor long, with thin baculus; approximate ratio of the lengths of stylus, coxite and baculus as follow (n = 1): – 1.0 : 6.0 : 48.3; prehensor as shown in figure.

*Measurement.* Male (n = 1): TL 4.88 mm; PL 0.78 mm; PW 2.10 mm; EL 4.10 mm; EW 3.60 mm. Female (n = 4): TL 4.40–4.90 (4.71) mm; PL 0.60–0.70 (0.68) mm; PW 2.00–2.20 (2.10) mm; EL 3.80–4.20 (4.04) mm; EW 3.05–3.27 (3.16) mm.

*Type material.* Holotype (TN): 1 male, Tanabu, Shimokita, Honshu, Japan, 30–VII–1956, T. NAKANE leg. (this collecting data have been traced over the original description, because the specimen lacks the collecting data label). Paratypes (TN): 8 exs., same data as for the holotype.


*Distribution.* Japan: Hokkaido, Honshu.

*Biological notes.* Biological information is very scarce. The adults were collected from marsh by sweeping.

*Remarks.* There is no allied species in Japan, and is easily distinguishable from other species by coloration and the male and female genitalia.

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Fig. 46. Distribution map of *Ora* spp.
Genus *Prionocyphon* REDTENBACHER, 1858

[Japanese name: Edahige-maruhananomi Zoku]

Type species: *Cyphon serricornis* MÜLLER, 1821 (by original designation).

Redescription. Adults. Body oval to oblong, well convex above, closely covered with short removable setae. Coloration yellowish-orange to black, variable in species. Head large, transverse. Eyes large, notably prominent to antero-laterally. Labrum longer than wide, closely covered with long setae. Antennae moderate in length; scape large, protruding exteriorly in distal angle, with diagonal distal margin; pedicel small and oval; III smallest, short and with diagonal distal margin in male; IV–X serrate, pectinate or bipectinate in male; normally filiform in female. Maxillary palpi moderate in length, longest in segment II, almost same length in III–IV. Mandibles asymmetrical; right one provided with denticle on inner margin; left one lacking denticle; molar area slender, lacking bristles; apex pointed, projecting intero-anteriorly. Labial palpi with large distal segment, arising from inside of penultimate segment. Pronotum strongly transverse; anterior and posterior corners distinct. Scutellum triangular, longer than wide. Elytra oval, strongly convex above. Mesosternal process long and slender, separating mesocoxae, excised at apex; anterior margin of mesosternum normally arcuate. Metasternal longitudinal suture long, about 0.6 times sternal length. Legs moderate in length; tibiae stout, with distinct carinae; tarsi short, segment I as long as II plus III. Abdominal sternite VI of female with extra bristle in the middle.

Male genitalia. Tergite VIII moderately sclerotized, semicircular, with a pair of short apodemes protruding antero-lateral corners; sternite VIII lightly sclerotized, U-shaped; tergite IX lightly sclerotized, with a pair of long and stout apodemes; sternite IX lightly sclerotized, oblong. Tegmen well sclerotized, with distinct and long parameres. Penis well sclerotized, symmetrical; parameroids well developed, long; trigonium well developed, with long projection protruding posteriorly, with distinct median plate.

Female genitalia. Tergite VIII moderately sclerotized, trapezoidal, with a pair of very long apodemes protruding from antero-lateral corners; sternite VIII lightly sclerotized, oblong. Ovipositor long; baculus long, with a short branchlet in posterior part; prehensor distinct.

Larva. Body weakly sclerotized, elongated camptodeiform. Head transverse, visible in dorsal aspect. Antennae long; pedicel small, almost straight; flagellum more than 100 segments. Labrum distinctly projecting anteriad in ventral lobes, with a pair of long and stout pectinate setae at apical part of ventral lobes. Mandibles with normal terminal teeth, bearing normal or pectinate bristles in interior part. Maxillary palpi 4-segmented; I longest; III with sensory organs not so developed and independent in ventral surface; IV distinct, about 0.4 times as long as length of segment III. Hypopharynx longer than wide, with fused keel-sclerite and socket of tooth-bristles; tooth-bristles simple; keel-bristles simple or double-tipped; cushion area closed. Thorax almost parallel-sided, almost as wide as abdomen. Abdomen almost parallel-sided, gently tapered to posteriorly; tergite VIII trapezoidal, with two pairs of short projections on anterior margin; sternite VIII strongly transverse; tergite IX with normal or double-tipped setae along posterior margin; sternite IX with normal or double-tipped setae along posterior margin.
Fig. 47. Habitus of *Prionocyphon* spp. —— A, *P. ovalis* KIESENWETTER, male; B, ditto, female; C, *P. sexmaculatus* LEMS, male; D, ditto, female.
Fig. 48. Extra setae on female sternite VI, *Prionocyphon sexmaculatus* Lewis.

**Biological notes.** Larvae live in phytotelmata (reported in *P. serricorne*, *P. niger* and *P. sexmaculatus*). They may eat fallen leaves and other organic matters. Adults are collected from forest by beating and sweeping.

**Remarks.** This genus is represented by 16 species distributed in Europe, Asia, North America and Australia (Yoshitomi & Satō, 2003). But it is probable that the Australian species, *Prionocyphon niger* Kitching & Allsopp, 1987 belongs to the different genus.

**Key to the Japanese species of the genus Prionocyphon** *

1. Elytra evenly yellowish-orange to blackish brown, without maculation; antennae serrate in male, filiform in female. ........................................... *P. ovalis* Kiesenwetter

2. Elytra yellowish-orange, with distinct six black maculation; antennae pectinate in male, filiform in female. ........................................... *P. sexmaculatus* Lewis

*Prionocyphon fuscipennis* Kiesenwetter is omitted in this key, but it may be similar to *P. ovalis* Kiesenwetter.

**Prionocyphon fuscipennis** Kiesenwetter, 1874

[Japanese name: Kiesenwetter-maruhananomu]

*Prionocyphon fuscipennis* Kiesenwetter, 1874, 244 (Type: in BMNH?, not examined). — PtC, 1914, 37 [list].

**Remarks.** I could not examine the type and the additional specimens of this species. Judging from the original description (Kiesenwetter, 1874), this species seems to be a junior synonym of *Prionocyphon ovalis* Kiesenwetter.
Distribution. Japan (?).

Prionocyphon ovalis Kiesenwetter, 1874
[Japanese name: Sedaka-maruhananomi]
(Figs. 47 A, B, 49–54)


Head very large, as wide as PW, slightly convex above; eyes large, the distance between eyes about 4.0 times as long as the diameter of an eye; anterior margin of clypeus almost straight. Antennae stout, distinctly serrate in segments IV–X, reaching about proximal 1/5 of elytra; scape large, elongated in antero-distal corner; pedicel ovate, smaller than scape; segment III smallest, with diagonal distal margin; segment IV longest; segment XI oblong, pointed at apex; approximate ratio of each segment (n= 1) as 3.8 : 2.5 : 1.0 : 6.0 : 4.3 : 4.3 : 4.3 : 3.8 : 3.5 : 3.5 : 5.3. Pronotum strongly transverse, with almost straight anterior margin; antero-lateral angles obtuse, slightly projecting anteriorly; lateral margins slightly arcuate; postero-lateral angles obtuse; posterior margin gently arcuate; PW/PL 2.00–2.60 (2.28).

Fig. 49. Prionocyphon ovalis Kiesenwetter, male (A, C) and female (B, D, E). —— A–B, antennae; C–D, abdominal sternites; E, extra setae in female sternite VI.
Scutellum about 1.2 times as long as wide. Elytra semicircular, strongly convex above, widest at the middle; EL/EW 1.11–1.29 (1.20); EL/PL 3.33–4.17 (3.70); EW/PW 1.21–1.50 (1.35); TL/EW 1.44–1.65 (1.53). Tibiae stout, flattened in dorsal surface.

Apical margin of sternite VII arcuate, but somewhat pointed. Tergite VIII semicircular, covered sparsely with minute spines in posterior part, with minute spines along posterior margin, with short and stout apodemes protruding from antero-lateral corners; sternite VIII weakly sclerotized, U-shaped, expanding in apical part, with three pairs of long setae along apical margin; tergite IX weakly sclerotized, semicircular, covered with short spines along apical margin; sternite IX weakly sclerotized, oblong, covered with short setae in apical part. Tegmen large, about 1.3 times as long as penis, widest at proximal 1/5; parameres narrow, closely covered with minute stout setae, pointed at apex. Penis widest at the base, with almost straight in posterior margin of pala; parameroids long, sparsely punctate in proximal part, with minute denticles in lateral margin of apex; median projection of trigonium long, reaching about proximal 4/5 of parameroids, with minute denticles in ventral margin of apex; median plate of trigonium long, distinct.

Female. Sexual dimorphism distinct in the following external characteristics: body larger; the distance between eyes about 5.0 times as long as the diameter of an eye; antennae filiform in segments IV–X, larger and longer than male in segment III, obtuse at apex in segment XI; approximate ratio of each antennal segment (n = 1) as 3.7 : 1.5 : 1.0 : 1.7 : 1.7 : 1.9 : 1.8 : 1.8 : 1.9 : 2.3. PW/PL 2.20–2.50 (2.35); EL/EW 1.15–1.32 (1.24); EL/PL 3.50–4.29 (3.83); EW/PW 1.25–1.41 (1.32); TL/EW 1.45–1.68 (1.57).

Abdominal sternite VI with extra bristle (bearing densely about 20 setae) in the middle; apical margin of sternite VII arcuate. Tergite VIII trapezoidal, covered with minute setae and punctures in posterior part, with minute spines on posterior margin, with long and thin apodemes protruding from antero-lateral corners; sternite VIII oval, covered with minute setae and punctures in posterior part, with minute spines on posterior margin. Ovipositor long, covered with fine setae and punctures in coxite and caudal part of baculus; approximate ratio of stylius, coxite and baculus as 1.0 : 3.0 : 15.0. Prehensor composed two sclerite; dorsal one oblong, closely covered with serra in lateral part; ventral one composed two plate-like sclerite, serrated.

**Measurement.** Male (n = 16): TL 2.50–3.80 (3.04) mm; PL 0.50–0.80 (0.65) mm; PW 1.20–1.80 (1.48) mm; EL 2.00–3.00 (2.39) mm; EW 1.70–2.40 (1.99) mm. Female (n = 6): TL 2.90–4.50 (3.75) mm; PL 0.60–1.00 (0.78) mm; PW 1.50–2.20 (1.82) mm; EL 2.30–3.50 (2.97) mm; EW 2.00–2.80 (2.38) mm.


Fig. 50. Prionocyphon ovalis KIESENWETTER, male. ——— A, Tergite VIII; B, sternite VIII; C, tergite IX; D, sternite IX; E, tegmen in ventral view; F, penis in ventral view; G, penis in lateral view.
Fig. 51. Prionocyphon ovalis KIESENWETTER, female. —— A, Tergite VIII; B, sternite VIII; C, ovipositor; D, prehensor.

<Kagoshima Pref.> 1 male & 1 female, Sata, Ohsumi, 26–V–1952, T. NAKANE leg. (female had been figured in NAKANE, 1963, pl. 70, fig. 16); 1 male, Bohnotsu, 5–VI–1981, T. & T. NAKANE leg. [Ryukyu Isls.] <Amami-Ōshima> 1 male, Sumiyo-son, 2–V–1993, M. KIMURA leg. (genit. s. nos. HY 427, 428)

Biological notes. Biological information is scarce. The adults inhabit in the laurel forests, and are obtained by beating or light trap.

Remarks. This species is related to *P. serricornis* MÜLLER which is distributed in Europe and is the type species of the genus, in the general appearance and the male genital feature.

**Prionocyphon sexmaculatus** Lewis, 1895

[Japanese name: Mutsuboshi-maruhananomi]

(Figs. 47 C, D, 52–57)

*Prionocyphon sexmaculatus* Lewis, 1895, 105 (Type: Nikko, in BMNH, not examined). — Pic, 1914, 38 [list]. — Nakane, 1963 a, 139, pl. 70, fig. 7. — Sarô, 1985 b, 423, pl. 77, fig. 25. — Ohmomo, 1993, 46.

Redescription. Adult, male. Body oval, convex above, shining, closely covered with short yellowish-white setae. Coloration of body yellowish-orange, with three pairs of black markings on elytra; anterior ones oblong, situated near scutellum; middle ones semicircular, smallest, situated near lateral margin of proximal 1/3; posterior ones oval, largest, situated in

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Fig. 52. *Prionocyphon sexmaculatus* Lewis, male (A, C) and female (B, D, E). ——— A–B, antennae; C–D, abdominal sternites; E, extra setae in female sternite VI.
middle part from proximal 5/11 to 8/11.

Head large, slightly convex above; eyes large, the distance between eyes about 3.0 times as long as the diameter of an eye. Antennae long and slender, paripinnate in segments IV–X; scape large arcuate in anterior margin, elongated in antero-distal corners; pedicel ovate, smaller than scape; segment III smallest, with diagonal distal margin; segments IV–X shorter than those of respective rami which are stretched from base; segment XI long and slim; approximate ratio of each segment (n = 1, each ramus in parentheses) as 14.0 : 6.0 : 1.0 : 17.0 (20.0, 17.5) : 15.5 (20.0, 23.0) : 14.0 (22.5, 25.0) : 15 (23.0, 24.0) : 16.0 (23.5, 24.3) : 15.7 (21.0, 22.5) : 17.0 (19.5, 20.3) : 23.0. Pronotum convex above in mesal part; anterior margin almost straight; antero-lateral angles obtuse, gently projecting anteriad; lateral margins almost straight; postero-lateral angles obtuse; posterior margin gently arcuate; PW/PL 1.90–2.33 (2.18). Scutellum about 1.5 times as long as wide. Elytra oblong, convex above, widest at just behind the middle; EL/EW 1.39–1.50 (1.44); EL/PL 4.30–5.00 (4.63); EW/PW 1.43–1.58 (1.48); TL/EW 1.70–1.80 (1.75).

Apical margin of sternite VII arcuate. Tergite VIII trapezoidal, covered with minute setae in apical part, with minute spines along posterior margin, with short and stout apodemes; sternite VIII weakly sclerotized, hexagonal, bearing some short setae from near postero-lateral corners; tergite IX lightly sclerotized, semicircular, with long thin apodemes; sternite IX lightly

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Fig. 53. *Prionocyphon sexmaculatus* LEWIS, male. ——— A, Tergite VIII; B, sternite VIII; C, tergite IX; D, sternite IX; E, tegmen in dorsal view; F, apical part of tegmen in ventral view; G, penis in dorsal view; H, ditto in lateral view; I, ditto in ventral view.
Fig. 54. *Prionocyphon sexmaculatus* Lewis, female. —— A, Tergite VIII; B, sternite VIII; C, ovipositor; D, prehensor.
sclerotized, closely covered with short setae in apical part. Tegmen large, ovate, about 1.4 times as long as penis, widest at proximal 1/3; parameres closely covered with minute setae and punctures, its apex expanding laterad and flattened in apical margin, with some long setae in apical part of ventral surface. Penis large, very specialized; pala ovate, widest at proximal 1/5; parameroids closely punctate in apical part, arcuate at apex; median projection of trigonium long, exceeding apex of parameroids, pointed and serrate at apex; median plate of trigonium absent.

Female. The external feature is almost same as in male. PW/PL 2.00–2.33 (2.21); EL/EW 1.30–1.41 (1.38); EL/PL 4.25–4.80 (4.55); EW/PW 1.38–1.62 (1.49); TL/EW 1.59–1.73 (1.68). Sternite VI with extra bristles (bearing densely about 10 setae) in middle; apical margin of sternite VII arcuate. Tergite VIII trapezoidal, covered with minute setae and punctures on posterior part, with minute spines on posterior margin, with a pair of long thin apodemes protruding from antero-lateral corners; sternite VIII oval, weakly sclerotized, covered with minute setae and punctures in apical part. Ovipositor somewhat short, closely covered with minute setae and punctures in coxite, approximate ratio of stylus, coxite and baculus as follow: 1.0 : 6.0 : 21.0; prehensor distinct, composed plate-like sclerites, serrate in both pieces.

Measurement. Male (n = 3): TL 3.60–5.60 (4.83) mm; PL 0.60–1.00 (0.87) mm; PW 1.40–2.30 (1.87) mm; EL 3.00–4.60 (3.97) mm; EW 2.00–3.30 (2.77) mm. Female (n = 9): TL 4.20–7.60 (5.86) mm; PL 0.80–1.40 (1.06) mm; PW 1.60–3.20 (2.34) mm; EL 3.40–6.20 (4.80) mm; EW 2.50–4.40 (3.48) mm.

Mature larvae (by association). Body weakly sclerotized, subparallel-sided, closely covered with short fine setae; coloration almost white.

Head transverse, with a pair of non-melanized stemmata on lateral part of head just behind antennal cavity. Antennae long, reaching abdominal segment IV in fully expanded body; scape slightly curved posteriorly; pedicel straight, almost same length as in scape; flagellum very long, about 121–128 segmented (n = 3). Labrum as long as wide, protruding anteriorly in antero-lateral part, with four pairs of long setae bearing from antero-lateral part. Epipharynx covered with about 15 stout setae in interior part of ventral lobe, with a pair of long stout setae at apices of ventral lobes, the setae ramose in proximal part; ventral setae long. Mandible with simple bristles which are somewhat short; apex with small obtuse terminal tooth. Maxillary palpus long; segments I–II sparsely covered with setae and punctures; segment III covered sparsely with short setae and punctures in dorsal surface, with two stout setae on anterior margin of dorsal surface, with five independent sensory organs in middle part of ventral surface, with a row of sensory organs located on antero-ventral margin; segment IV covered with sensory organs in apical part; approximate ratio of each segments as 2.5 : 1.9 : 1.8 : 1.0. Hypopharynx typical form of the genus; tooth-bristles stout and simple; a pair of setae on keel-sclerite stout, bicornate at apex; comb plate with short 19 claw teeth.

Thorax widest at posterior margin of metanotum, covered with irregular setae on lateral margin, but lacking in middle part of lateral margin; pronotum bearing a pair of long setae from respective parts of near anterior margin and near the middle of lateral and posterior margins; meso- and metanotum with a pair of long setae in lateral part.

Tergites I–VII almost parallel-sided, covered with a long setae and a few short setae on lateral margin, with two pairs of long setae near posterior margin. Tergite VIII trapezoidal, closely covered with short setae in antero-lateral part, with long setae along the middle of lateral margin; anterior margin with two pairs of processes. Sternite VIII semicircular,
closely covered with short setae in antero-lateral part, with long setae along anterior margin. Tergite IX arch-like shaped, covered closely with short setae along lateral margin, with a pair of long setae in posterior corner. Sternite IX arch-like shaped, with short spines along

Fig. 55. Larva of Prionocyphon sexmaculatus LEWIS, habitus in dorsal view.
Fig. 56. Larval mouth parts of *Prionocyphon sexismaculatus* Lewis. ——— A, Epipharynx; B, left mandible in ventral view; C, hypopharynx; D, left maxillary palpus in dorsal view; E, ditto in ventral view.
posterior margin.

Measurement of larvae (n = 2). HW: 1.2–1.4 mm; PL: 0.8–1.0 mm; PW: 1.6–2.0 mm; TL: 8.7–10.3 mm; TW: 1.9–2.4 mm.


Biological notes. The larvae were collected with the larvae of *Sacodes dux* (LEWIS) from a tree hole (on Mt. Hakusan) and from a rotten wood hole filled with stagnant water and fallen leaves (at Hiwada). In this paper I identified the larvae on the basis of the following reasons: there is no other species of the genus in the mountain to subalpine zones, and I have collected the adults in the same site where the larvae had been collected. The adults are collected in mountain to subalpine zones (mainly in ca. 1,000–2,000 m), and they are generally rare.

Remarks. This is very remarkable species in having the bipectinated male antennae, the elytral markings and the unique male genitalia. Particularly the bipectinate antennae are known in only this species and *Prionocyphon discoideus* SAY distributed in North America.
Fig. 57. Abdominal segments VIII–IX of *Prionocyphon sexmaculatus* Lewis, larva.
— A, Tergite VIII; B, sternite VIII; C, tergite IX; D, sternite IX.
Fig. 58. Distribution map of Prionocyphon spp.
The Genus *Cyphon* PAYKULL, 1799
[Japanese name: Chibi-maruhananomi Zoku]

*Cyphon* PAYKULL, 1799, 117. — PIC, 1914, 37. — SASAGAWA, 1985, 33
Type species: *Cyphon coarctatus* PAYKULL, 1799 (followed by WESTWOOD, 1838 and SASAGAWA, 1985, see the under remarks of the genus)

*Redescription.* Adults. Body small to large size, about 1.0–7.0 mm, closely covered with hairy setae. Coloration of body yellowish-brown to black, lacking distinct markings in most species. Head moderate to large in size, longer than wide, slightly convex above; genal ridges pointed and projecting triangularly at the tip. Eyes moderate to large in size, prominent. Labrum transverse. Antennae moderate in length, normally filiform; scape oval, slightly wider than the other segments; pedicel oblong, almost as long as the other segments; segment III oblong, almost as long as the other segment. Maxillary palpi moderate in length; distal segment conical, pointed at apex, longest. Mandibles symmetrical or asymmetrical, form 4 or 5 (see morphology part of the family). Labial palpi with segment III arising from anterior margin of segment II. Pronotum transverse, variable in shape along species-group. Scutellum triangular, length as long as width. Elytra oval or oblong, weakly to strongly convex above. Mesosternal process long and wide, excised at apex; anterior margin of mesosternum normally arcuate. Metasternal longitudinal suture short; anterior margin of metasternum simply arcuate. Legs moderate in length; tarsal segment I short, as long as the combined length of segments II–IV.

Male genitalia. Male genitalia very diversiform along species and species-group. Tergite VIII well sclerotized in general, plate-like or rod-like hemitergite; sternite VIII moderately to weakly sclerotized, tending to reduction; tergite IX weakly to well sclerotized, plate-like or rod-like hemitergite; sternite IX weakly sclerotized in general, tending to reduction. Tegmen well sclerotized, plate- to rod-like, connecting with penis in some species; parameres indistinct in most species. Penis well sclerotized; trigonium distinct or indistinct, with one or two projections; parameroids distinct or indistinct.

Female genitalia. Tergite VIII well sclerotized, with a pair of long apodemes; sternite VIII weakly to well sclerotized, oblong in general. Ovipositor with long baculus, having a short branchlet in posterior part of baculus. Prehensor distinct or indistinct.

Larvae. Body weakly sclerotized, elongated campodeiform. Head visible from above, slightly transverse. Antennae long, about 100 segmented. Labrum transverse, with five pairs of stout setae on interior margin of ventral lobes; a pair of long and stout pectinate setae at apical part of ventral lobes. Mandibles with simple terminal teeth; bristles pectinated. Maxillary palpi long, 4-segmented; sensory organs well developing in ventral surface of segment III; segment IV short, about 1/5 times as long as the length of segment III. Hypopharynx longer than wide, with fused keel-sclerite and socket of tooth-bristles; tooth- and keel- bristles divided into several tips at anterior ends; cushion area opened. Thorax almost parallel-sided, almost as wide as abdomen. Abdomen subparallel-sided, gently tapered posteriorly; tergite VIII trapezoidal, with almost straight anterior margin; sternite VIII semicircular, with almost straight anterior margin; tergite IX arch-like shaped, with pectinate minute setae on posterior margin; sternite IX semicircular, with pectinate minute setae on posterior margin.

*Biological notes.* The larval habitat is standing water, i.e., marsh, pond and pool. KLAUSNITZER & POSPIŠIL (1991) reported that the larvae of *Cyphon* sp. have been collected
from ground water. The adults are riparian, and collected from near larval habitat by sweeping, beating and light trap.

**Remarks.** The type species of this genus has been still problematically and unsolved (POPE, 1976). In this paper, I regard *Cyphon coarctatus* PAYKULL, 1799 as the type species of this genus after WESTWOOD (1838) and SASAGAWA (1985).

*Cyphon*, the largest genus in the family Scirtidae, is represented about 300 species from all over the world. However, as already have been indicated by HANNAPEL & PAULUS (1987) and NYHOLM (2000), it is probable that the genus is paraphyletic judging from the characters of mouthparts, antennae, and male and female genitalia. In the present paper, I follow the customary treatment of the genus. Although the genus is divided into two subgenus, *Cyphon* (s. str.) and *Dermestocyphe* PIC (1918), of which the latter consists of two Asian species, *C. (D.) driotant* PIC, 1918 from Yunnan and *C. (D.) beattyi* PIC, 1918 from Japan, these subgenera are not referred in the present paper because of the above reason.

The Japanese species treated in this paper are divided into seven species-groups as shown in the following key, and some subgroups are recognized under some species-groups.

**Key to the species-groups of the genus *Cyphon***

1. Body slender and elongate, slightly convex above, almost parallel-sided in elytra; anterior angles of pronotum broadly rounded. ..................................................2
   - Body oval to oblong, distinctly convex above, lateral margin of elytra arcuate, anterior angles of pronotum projected forwards in most species. ..................................................3

2. Body large; TL about 5.0–7.0 mm; antennal segments II–III distinct smaller than the other segments; tergites and sternites VIII–IX completely presented, plate liked; penis with distinct trigonium. .................................................................beattyi species-group
   - Body moderate in size; TL about 2.0–5.0 mm; antennal segment II a little smaller; sternites VIII–IX reduced in male; penis without distinct trigonium. .................................................................
     - collaris species-group

3. Body very small; TL about 1.5–2.5 mm; coloration black, strongly shining; tegmen Y-shaped; penis rod-like. .................................................. chlorizans species-group
   - Body moderate in size; TL about 2.0–3.5 mm; coloration black to brown, shining; tegmen and penis various shape, but not Y-shaped in tegmen. ........................................4

4. Body strongly ovate and convex above; scape very large; sternites V–VI with shallow concavities in female. .................................................. hashimotorum species-group
   - Body normally oval and convex above; scape normal sized; sexual dimorphism indistinct in sternites V–VI. .................................................................5

5. Pronotum shorter, strongly arcuate in posterior margin; each elytron furnished with three costae; penis with distinct parameroids and trigonium. .................japonica species-group
   - Pronotum moderate in length, evenly arcuate in posterior margin; elytral costae indistinct; penis without distinct parameroids. ..................................................6

6. Tergites VIII–IX normally plate liked in male; prehensor bearing many spines. .................................................. coarctatus species-group
   - Tergites VIII–IX rod-like hemitergite in male; prehensor various shape. .................................................. variabilis species-group
The *hashimotorum* species-group

[Japanese name: Hashimoto-chibi-maruhananomi Shugun]

This species-group is characterized by the following characteristics: large and strongly ovate body; large scape; the shallow concavities on abdominal sternites V–VI of female; U-shaped tegmen; H-shaped penis. Thirteen species distributed on the Oriental Region have been included in this species-group (Yoshitomi & Satô, 2004).

*Cyphon hashimotorum* Yoshitomi, 1998

[Japanese name: Hashimoto-chibi-maruhananomi]

(Fig. 59 A)

*Cyphon hashimotorum* Yoshitomi, 1998, 155, figs. 1–3 (Type: Ohtake, Ishigaki-jima, in NSMT, examined).

*Measurement.* Male (*n* = 8): TL 3.05–3.30 (3.18) mm; PL 0.70–0.75 (0.73) mm; PW 1.60–1.80 (1.72) mm; EL 2.35–2.55 (2.45) mm; EW 1.90–2.40 (2.12) mm. Female (*n* = 2): TL 2.70 & 3.10 mm; PL 0.55 & 0.60 mm; PW 1.35 & 1.55 mm; EL 2.15 & 2.49 mm; EW 1.90 & 2.10 mm.


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Fig. 59. Habitus of *Cyphon hashimotorum* Yoshitomi, paratype, male (A) and *Cyphon beattyi* Pte, male (B).
The *beattyi* species-group
[Japanese name: Oh-chibi-maruhananomi Shugun]

This species-group is very remarkable, and characterized in having the following characteristics: body large, elongate; antennal segments II–III smaller than the other segments; tergites and sternites VIII–IX completely present in male; tegmen with distinct parameres; penis with distinct parameroids and trigonium.

*Cyphon beattyi* Pic, 1918
[Japanese name: Oh-chibi-maruhananomi]
(Figs. 59 B, 60–61)

*Cyphon (Dermestocyphon) beattyi* Pic, 1918 b, 18 (Type: Japon, in MNHP, not examined).


Head large, transverse, about 0.5 times as wide as the length of pronotum, closely covered with fine punctures; posterior part covered limitedly with pronotum; front margin of clypeus slightly arcuate. Labrum transverse, about 3.5 times as wide as long; front margin somewhat arcuate. Terminal segment of labial palpus large, arising from the lateral side of penultimate segment. Eyes moderate in size, prominent; the distance between eyes about 4.0 times as long as the diameter of an eye. Antennae moderate in length, reaching proximal 1/3 of elytra; scape large and ovate; pedicel small; III small, with distal margin diagonal; approximate ratio of each segment (n = 1) as 2.0 : 1.0 : 1.0 : 2.2 : 1.8 : 1.8 : 1.7 : 1.8 : 1.8 : 1.8 : 2.3. Pronotum near trapezoidal, almost straight in anterior margin, gently arcuate at lateral margins, slightly binusious in posterior margin, broadest about anterior 1/3; anterior corners rounded; posterior corners almost right-angled; PW/PL 2.0–2.3 (2.1). Mesosternum shallowly concave in anterior margin. Elytra oblong, subparallel-sided near shoulder to caudal 1/4; EL/EW 1.7–2.0 (1.9); EL/PL 4.5–5.4 (5.0); EW/PW 1.2–1.3 (1.2); TL/EW 2.1–2.4 (2.3). Ventral surface of body closely covered with short hairs.

Apical margin of sternite VII arcuate. Tergite VIII semicircular, covered with minute spines, with some short setae in caudal part; sternite VIII broadly V-shaped, with long setae and minute punctures in caudal part; tergite IX similar to tergite VIII in the shape, covered with short spines in caudal margin and lateral part, with some minute setae on postero-lateral corners; sternite IX oblong, with short setae in caudal part. Tegmen large, well sclerotized, broadest at the middle, with strong and short extra setae in 1/3 and 2/3 to 5/6 part of ventrad; parameres short rounded at apex, punctate on apical parts, with strong and short extra setae in the middle part of lateral margin. Penis well sclerotized, a little longer than tegmen, broadest at about proximal 1/8, slightly tapered from about proximal 1/8 to 3/8 and from 5/8 to apex; a long projection protruding postero-dorsally from trigonium, bifurcated in apex; parameroids tapered evenly apicad, pointed at apex, with minute punctures in apical part; median plate indistinct.

Female. The sexual dimorphism indistinct in external features, but apical margin of sternite VII gently rounded; approximate ratio of each antennal segment (n = 1, segment XI
missing) as 2.1 : 1.0 : 1.1 : 2.0 : 1.8 : 1.8 : 1.8 : 1.8 : 1.8. PW/PL 1.9–2.0 (2.0); EL/EW 1.9–2.0 (1.9); EL/PL 4.7–5.2 (4.9); EW/PW 1.3; TL/EW 2.3–2.4 (2.3).

Tergite VIII moderately sclerotized, elongated trapezoidal, with a pair of long and slender apodemes, with short spines on proximal margin, covered with minute punctures and setae in caudal part; sternite VIII lightly sclerotized, oblong, sparsely covered with irregularly setae in caudal part, with minute spines on posterior margin. Ovipositor very long; coxite with two pairs of apical setae; stylus closely covered with minute punctures, with some minute setae in posterior part; approximate ratio of the length of coxite, stylus and baculus as follows (n = 1): - 1.0 : 6.0 : 31.0; prehensor distinct, composed a pair of well

Fig. 60. *Cyphon beattyi* PtC, male. ——— A, Antenna; B, sternite VII; C, tergite VIII; D, tergite IX; E, sternite VIII; F, tergite IX; G tegmen in dorsal view; H, penis in dorsal view.
sclerotized plates, which bearing about 100 long spines.

_Measurement._ Male (n = 4): TL 4.80–6.35 (5.29) mm; PL 0.80–1.15 (0.89) mm; PW 1.60–2.30 (1.84) mm; EL 4.00–5.20 (4.40) mm; EW 2.00–3.00 (2.30) mm. Female (n = 3): TL 4.95–5.70 (5.42) mm; PL 0.85–1.00 (0.92) mm; PW 1.70–1.90 (1.80) mm; EL 4.10–4.70 (4.50) mm; EW 2.20–2.50 (2.33) mm.

_Distribution._ Japan: Honshu.

Biological notes. Biological information is very scarce. The adults are collected in short period from late of April to early of May.

Remarks. This species is related to the North American species *Cyphon brevicollis* LeConte, 1865 in the following characteristics: body large, oblong; antennal segments II–III somewhat smaller than the other segments; male genital features.

Fig. 62. Distribution map of *Cyphon beattyi* Pic and *C. hashimotorum* Yoshtomi.
The *collaris* species-group

[Japanese name: Hoso-chibi-maruhananomi Shugun]

This species-group (= *collaris* species complex) have been defined by YOUNG & STREIBLING (1990). They reviewed four North American species of this species-group, and included two Japanese species (*C. ainu* NAKANE and *C. hasegawai* NAKANE) into this species-group. YOSHITOMI (1996) followed them, and added two Japanese species (*C. sanno* NAKANE and *C. sannoides* YOSHITOMI) to this species-group. Formerly this group had treated as a member of subgenus *Dermestocyphon* by Japanese author (NAKANE, 1963 a; SASAGAWA, 1985; SATÔ, 1985 b), but I don't treat this subgenus (the reason have been previously referred).

This species-group can be easily differentiated from other species-group of the genus by the following characteristics: body elongated, subparallel-sided; coloration blackish brown, but in some species having orange pronotum; pronotum transverse, anterior angles broadly rounded; sternites VIII–IX lacking; tergites VIII–IX more or less reduced, frequently becoming rod-like hemitergites; tegmen not plate-like, surrounding penis. In the American species of this species-group, prehensor of the female genitalia are presented, but indistinct in the Japanese species.

Following is the list of Japanese species. Thirteen species are recognized from the mainland Japan (Hokkaido to Kyushu), and these are separatable by the following five subgroups on the basis of the male genital features.

Subgroup A: *Cyphon ainu* NAKANE, 1963; *Cyphon hasegawai* NAKANE, 1963; *Cyphon sanno* NAKANE, 1963; *Cyphon aomorianus* YOSHITOMI, n. sp.; *Cyphon tohokuanus* YOSHITOMI, n. sp.

Subgroup B: *Cyphon proprius* YOSHITOMI, n. sp.

Subgroup C: *Cyphon seryu* NAKANE, 1963; *Cyphon sannoides* YOSHITOMI, 1996; *Cyphon vulgaris* YOSHITOMI, n. sp.; *Cyphon uenoi* YOSHITOMI, n. sp.; *Cyphon occidens* YOSHITOMI, n. sp.

Subgroup D: *Cyphon ohayashii* YOSHITOMI, n. sp.

Subgroup E: *Cyphon kyushuanus* YOSHITOMI, n. sp.

**Key to species of the *Cyphon collaris* species-group of Japan**

(Male)

1. Coloration of body almost yellowish-orange throughout; distributed in Hokkaido. .......... 
   ................................................................. *C. ainu* NAKANE

   - Coloration of body almost blackish-brown throughout, but some species have yellowish-orange in pronotum only; distributed in Honshu, Shikoku and Kyushu. .......... 
   ................................................................. 2

2. Tergite VIII distinctly reduced in median plate, with rod-like long lateral projections (hemitergite); tegmen H-shaped, slightly connected with penis; coloration of pronotum frequently orange; distributed in Honshu (Tōhoku, Kantō districts). .... subgroup A .... 3

   - Tergite VIII wide and not reduced in median plate; tegmen rod-like, connected with penis in anterior part; coloration of pronotum same as in elytra. ........................................ 6

3. Tergite VIII somewhat wide in median plate; penis wide in proximal part; distributed in Northern part of Tōhoku district (Aomori Pref.). ...................................... *C. aomorianus* n. sp.
Fig. 63. Type series of Cyphon collaris species-group. — A, C. aitu Nakane, above: holotype, below: allotype (!); B, ditto, labels; C, C. hasegawai Nakane, holotype; D, ditto, labels; E, C. sanne Nakane, holotype; F, ditto, labels; G, C. seryu Nakane, holotype; H, ditto, labels; I, C. sanroides Yoshitomi, paratype; J, C. aomorianus Yoshitomi n. sp., holotype.
Fig. 64. Cyphon collaris species-group, holotype, male. —— A, C. tohokuanus n. sp.; B, C. proprius n. sp.; C, C. uenoii n. sp.; D, C. vulgaris n. sp.; E, C. occidentis n. sp.; F, C. ohbayashii n. sp.; G, C. kyushuanus n. sp.

4. Tegmen long, about 4/5 times as long as penis; distributed in Tōhoku district (Iwate and Miyagi Prefectures). .............................................................. C. tohokuanus n. sp.

5. Penis with a pair of large teeth-like projections on lateral margin of apical 1/4; distributed in Tōhoku and Kantō districts (Fukushima, Tochigi, Gunma Prefectures). ....

................................................................................................................. C. sauno NAKANE

6. Tegmen very short, about 0.3 times as long as penis; apical part of penis with plate-like projection protruding ventrally. ..... subgroup B ....................................................... C. proprius n. sp.

7. Apical part of penis serrate or providing dent-like projections. .... subgroup C .............. 8

8. Apical part of penis lacking serrae or dent-like projections. ........................................ 12
8. Apical part of penis with a pair of denticle projections. ........................................... 9
9. Apical part of penis serrate. ......................................................................................... 10

9. Apical margin of abdominal sternite VII concave; apical part of penis with a pair of large
projection, anchor-like shape; distributed in Shinshū district (Gifu and Nagano
Prefectures). ................................................................................................................. C. sannoides YOSHIKOMI

10. Apical margin of abdominal sternite VII arcuate; apical part of penis with a pair of small
denticle projection; distributed in Kantō and Shinshū districts (Tochigi, Niigata,
Nagano Prefectures) ................................................................................................. C. uenoi n. sp.

11. Apical part of penis expanding distinctly laterally in just behind apex, subtriangular,
covered with large serrae. ......................................................................................... 11

11. Apical part of penis expanding slightly dorsally, covered with small serrae; distributed
widely in Kantō, Shinshū and Chūbu districts. ......................................................... C. vulgaris n. sp.

12. Apical margin of abdominal sternite VII arcuate; lateral projection of tergite VIII
curved interiorly and pointed at apex; distributed in Kansai district (Shiga and Kyoto
Prefectures). ............................................................................................................... C. seryu NAKANE

11. Apical margin of abdominal sternite VII concave; lateral projection of tergite VIII almost
straight and plate-like; distributed in Kansai district (Gifu, Kyoto and Okayama
Prefectures). ............................................................................................................... C. occidentis n. sp.

12. Tergite VIII developed in median plate, pentagonal, pointed at apices in lateral lobes;
tergite IX bifurcated in apical part; penis long, subparallel-sided; distributed in Honshu
(Chūgoku district) and Shikoku. ............................................................................... C. ohbayashi n. sp.

12. Tergite VIII reduced in median plate, semicircular, obtuse at apices in lateral lobes;
tergite IX simply pointed at apices; penis relatively short, expanded laterally in
proximal 3/5; distributed in Honshu (Chūgoku district) and Kyushu.
................................................................................................................................. C. kyushuanus n. sp.

Subgroup A

This subgroup comprises five species distributed in Northern part of Japan. This
subgroup is characterized by the following characteristics: tergite VIII reduced in median
plate, with rod-like long lateral projections; tergite IX almost same length as to tergite VIII,
connected by membrane with each sides of hemitergites; tegmen H-shaped, slightly
connected with penis; coloration of pronotum orange, but sometimes brown which is the
same color as in elytra.

Cyphon ainu NAKANE, 1963

[Japanese name: Ainu-chibihara-maruhananomari]
(Figs. 63 A, B, 65–66)

Cyphon ainu NAKANE, 1963 b, 31 (Type: see below, in TN, examined). — Sasagawa, 1985, 34, figs.
24, 41a, b; SATō, 1985 b, 421, pl. 77, fig. 8.

Cyphon kerzhneri KLUSNOWITZER, 1982, 283 (Type: Kunashir, ZIL, examined). Synonymized by

Redescription. Adult, male. Body oblong, slightly convex above, shining, closely
covered with yellowish-white setae throughout. Coloration of body almost yellowish-orange,
but head, antennal segments IV–XI, maxillary palpi and ventral surface of thoraces and abdomens blackish-brown; elytra sometimes fuscous in lateral parts.

Head moderate in size, slightly convex above, finely and closely punctate; eyes moderate in size, prominent, the distance between eyes about 3.0 times as long as the diameter of an eye; clypeus short, with almost straight front margin. Antennae moderate in length, reaching about proximal 1/5 of elytra; approximate ratio of each antennal segment (n = 1) as 1.6 : 1.0 : 1.1 : 1.6 : 1.5 : 1.4 : 1.4 : 1.3 : 1.3 : 1.2. Pronotum strongly transverse, slightly convex above in mesal part, punctate same as in head; antero-lateral corners obtuse, not extended anteriorly; front margin almost straight; lateral margins gently arcuate; postero-lateral corners obtuse, slightly projecting postero-laterally; posterior margin gently arcuate; PW/PL 2.1–2.4 (2.2). Scutellum subtriangular,

Fig. 65. Cyphon ainau NAKANE, male. ——— A, Antenna; B, sternites V–VII; C, tergite VIII; D, tergite IX; E, tegmen and penis in ventral aspect; F, ditto in lateral aspect.
punctate same as in pronotum. Elytra elongate, subparallel-sided from proximal 1/5 to caudal 1/4, closely covered with small and shallow punctures; EL/EW 1.4–1.8 (1.7); EL/PL 4.9–6.0 (5.5); EW/PW 1.3–1.7 (1.5); TL/EW 1.7–2.2 (2.0). Ventral surface of body covered sparsely with fine punctures.

Apical margin of sternite VII gently arcuate. Tergite VIII conspicuously reduced in median plate, which reaching about proximal 1/2 of lateral projections, with a pair of long membrane plates protruding from proximal parts of lateral projections; tergite IX longer than tergite VIII, slender in apical part. Tegmen about 3/5 times as long as penis, finely punctate in apical part. Apical part of penis expanding laterad, fan-shaped, covered with minute punctures.

Female. Sexual dimorphism indistinct in external feature. Approximate ratio of each antennal segment (n = 1) as 1.3 : 1.0 : 1.0 : 1.1 : 1.3 : 1.3 : 1.2 : 1.2 : 1.2 ; PW/PL 1.7–2.6 (2.2); EL/EW 1.7–1.9 (1.8); EL/PL 4.8–6.2 (5.5); EW/PW 1.3–1.8 (1.4); TL/EW 2.0–2.2 (2.1).

Apical margin of sternite VII arcuate. Tergite VIII sparsely covered with minute setae
and punctures, with short spines along apical margin; sternite VIII lightly sclerotized, with short setae in apical part.

**Measurement.** Male (n = 20): TL 3.0–4.6 (3.7) mm; PL 0.5–0.8 (0.6) mm; PW 1.0–1.7 (1.3) mm; EL 2.5–3.9 (3.1) mm; EW 1.5–2.4 (1.8) mm. Female (n = 9): TL 3.1–4.2 (3.6) mm; PL 0.5–0.7 (0.6) mm; PW 1.0–1.4 (1.2) mm; EL 2.6–3.5 (3.0) mm; EW 1.5–2.0 (1.7) mm.

**Type material.** Holotype (TN): 1 male, Shikaribetsu, 27–VII–1954, T. NAKANE leg. Allotype (TN): 1 male (!), same data as for the holotype, pinned up with holotype.


**Distribution.** Japan: Hokkaido; Kuril Archipelago (Kunashir Is.); Sakhalin.

**Biological notes.** This is one of the most common species of this genus in Hokkaido. The adults are usually collected by beating and sweeping in a forest.

**Remarks.** This species is easily distinguishable from other species by the coloration and specialized male genital structure.

By the examination of the type materials, it is proved that the all type specimen are male.

**Cyphon hasegawai** NAKANE, 1963

[Japanese name: Kimune-hosho-chibi-maruhananomi]  
(Figs. 63 C, D, 67)

**Cyphon hasegawai** NAKANE, 1963 b, 139, pl. 70, f. 13. (Type: see below, in TN, examined)

Fig. 67. *Cyphon hasegawai* Nakane, holotype, male. ——— A, sternites V–VII; B, tergite VIII (left part broken); C, tergite IX; D, tegmen and penis in ventral view; E, ditto in lateral view.

Head moderate in size, slightly convex above, finely punctate; clypeus gently arcuate in front margin. Eyes moderate in size, prominent; the distance between eyes about 3.0 times as long as a diameter of an eye. Antennae moderate in length, reaching about proximal 1/4 of elytra. Pronotum strongly transverse, finely punctate; antero-lateral corners obtuse; front margin almost straight; lateral margins almost straight, gently tapered anteriad; postero-lateral corners almost right-angle; posterior margin gently arcuate; PW/PL 2.0. Scutellum subtriangular, punctate same as in pronotum. Elytra elongate, subparallel-sided from near base to apical 1/6, closely covered with small and shallow punctures; EL/EW 1.7–2.0 (1.9); EL/PL 4.6–4.8 (4.7); EW/PW 1.1–1.4 (1.3); TL/EW 2.1–2.4 (2.2).

Apical margin of sternite VII gently arcuate. Tergite VIII slender in median plate and lateral projection; median plate covered with short spines along apical margin; lateral
projection about 1.2 times as long as median plate, covered with minute setae on throughout. Tergite IX lightly sclerotized, closely covered with short setae at apical part. Tegmen somewhat wide, about 1/2 times as long as penis, pointed at apex. Penis long, cutting down at apex, with a pair of small teeth on lateral part of apex.

Femal unknown.

**Measurement.** Male (n = 2): TL 3.5 & 3.9 mm; PL 0.6 & 0.7 mm; PW 1.2 & 1.4 mm; EL 2.9 & 3.2 mm; EW 1.6 & 1.7 mm.

**Type material.** Holotype: 1 male, Shizu, W. Oitama, Yamagata Pref., 26–VI–1955, H. HASEGAWA leg. (genit. s. nos. HY 455–457).


**Distribution.** Japan: Honshu (Tohoku district).

**Biological notes.** Biological information is very scarce.

**Remarks.** This species is closely related to *Cyphon sanno* NAKANE and *C. aomoriamus* YOSHITOMI n. sp. in general appearance and male genitalia, but is distinguished by the shape of penis. SASAGAWA (1985) had figured the male genitalia of this species, but this figure was *Cyphon sanno* NAKANE.

**Cyphon sanno** NAKANE, 1963

[Japanese name: Hoso-chibi-maruhananomi]

(Figs. 63 E, F, 68)

*Cyphon sanno* NAKANE, 1963 a, 139, pl. 70, f. 12 (Type: see below, in TN, examined).

*Cyphon hasegawai*: Sasagawa, 1985, 36, figs. 12, 22, 43 a, b; SATÔ, 1985 b, 421, pl. 77, fig. 10 [misidentification].

**Redescription.** Male. Body oblong, slightly convex above, shining, covered closely with yellowish-white short setae throughout. Coloration of body brown to blackish-brown, but antennal segments II–IV, mouth parts, along the lateral margin of pronotum and legs paler. One specimen collected from Sugenuma with orange pronotum.

Head moderate in size, slightly convex above, sparsely covered with fine punctures irregularly; clypeus relatively short, gently tapered anteriad, with almost straight front margin. Eyes moderate in size, prominent; the distance between eyes about 3.0 times as long as a diameter of an eye. Antennae short, reaching about proximal 1/6 of elytra. Pronotum transverse, convex above in the middle part of disk; finely and sparsely punctate; front margin almost straight; antero-lateral corners obtuse; lateral margins almost straight, gently convergent anteriad; posterior margin arcuate; postero-lateral corners almost right-angle; PW/PL 2.0–2.6 (2.3). Elytra elongate, subparallel-sided near base to apical 1/5, closely covered with shallow small punctures; EL/EW 1.7–1.9 (1.7); EL/PL 4.8–6.0 (5.4); EW/PW 1.3–1.5 (1.4); TL/EW 2.0–2.2 (2.1).

Apical margin of sternite VII gently arcuate. Male genital organ closely related to *C. hasegawai* NAKANE; median plate of tergite VIII more reduced, pointed at apex; penis slender, rounded at apex, with a pair of distinct projections on apical 1/4 of lateral margin.
Fig. 68. Cyphon sanno NAKANE, male. ——— A, Antenna; B, sternites V–VII; C, tergite VIII; D, tergite IX; E, tegmen and penis in ventral view; F, ditto in lateral view.

Female. Sexual dimorphism indistinct in external feature, not examined in genitalia.

Measurement. Male \((n = 7)\): TL 2.4–4.1 (3.4) mm; PL 0.4–0.7 (0.5) mm; PW 0.8–1.5 (1.2) mm; EL 2.0–3.4 (2.8) mm; EW 1.2–1.9 (1.6) mm.


Biological notes. Biological information is very scarce.

Remarks. This species is closely related to Cyphon hasegawai NAKANE and C. aomorianus YOSHITOMI n. sp. in the general appearance and the male genitalia, but is
distinguished by the shape of penis.

*Cyphon aomorianus* YOSHITOMI, n. sp.
[Japanese name: Aomori-hosochibi-maruhananomi]
(Figs. 63 J, 69)

Description. Adult, male. Body oblong, slightly convex above, shining, closely covered with yellowish-white setae throughout. Coloration of head and ventral surface of body blackish-brown; mouth parts, antennae and legs pale brown, but the middle parts of femora fuscous; pronotum yellowish-orange; scutellum and elytra brown, but the humeral parts of elytra somewhat yellowish.

Head moderate in size, slightly convex above, covered with fine punctures; clypeus short, with gently arcuate front margin. Eyes moderate in size, prominent; the distance between eyes about 2.8 times as long as a diameter of an eye. Antennae moderate in length, somewhat stout, reaching about proximal 1/4 of elytra. Pronotum transverse, slightly convex above in the middle part of disk, punctate same as in head; front and lateral margins almost straight; antero-lateral corners obtuse; sides gently convergent anteriorly; postero-lateral corners right-angle; posterior margin arcuate; PW/PL 1.9. Scutellum small, subtriangular. Elytra elongate, subparallel-sided near base to apical 1/4, closely covered with shallow and small punctures irregularly; EL/EW 1.6; EL/PL 4.4; EW/PW 1.4; TL/EW 2.0.

Apical margin of sternite VII arcuate. Tergite VIII wide in median plate, with short and stout apodemes; lateral projection about 1.2 times as long as median plate, with a row of minute serrae on apical 1/3 of ventral surface; covered with short setae in apical 1/2. Tergite IX almost same length as in tergite VIII, expanding laterally in caudal 1/2, with short setae in apical 1/3. Tegmen about 3/5 times as long as penis, curved ventrally in apical part; apex curved proximally. Penis wide, notched at apex, projecting triangularly in apical 1/7, punctate in apical part.

Female unknown.

Measurement. Male (n = 1): TL 3.8 mm; PL 0.7 mm; PW 1.3 mm; EL 3.1 mm; EW 1.9 mm.


Remarks. This species is closely allied to *C. tohokuanus* YOSHITOMI, n. sp., *C. sanno NAKANE* and *C. hasegawai NAKANE* in the male genitalia, but is separated by the wide median plate of tergite VIII and the shapes of penis.

Etymology. The species name is named after the type locality.

*Cyphon tohokuanus* YOSHITOMI, n. sp.
[Japanese name: Touhouk-hosochibi-maruhananomi]
(Figs. 64 a, 70)

Description. Adult, male. Closely related to *C. aomorianus* YOSHITOMI, n. sp. and *C. hasegawai NAKANE* in external feature; coloration of pronotum orange, but sometimes fuscous in the middle part of disk. Approximate ratio of each antennal segment as (n = 1)
Fig. 69. *Cyphon aomorianus* YOSHITOMI, n. sp., holotype, male. ——— A, sternites V–VII; B, tergite VIII; C, left piece of tergite IX; D, tegmen and penis in ventral view.

1.5 : 1.0 : 1.4 : 1.8 : 1.5 : 1.5 : 1.5 : 1.4 : 1.3 : 1.9. PW/PL 2.1–2.6 (2.3); EL/EW 1.6–1.9 (1.7); EL/PL 4.9–6.0 (5.4); EW/PW 1.2–1.5 (1.4); TL/EW 1.9–2.3 (2.0).

Apical margin of sternite VII gently arcuate. Tergite VIII elongated and
smart in median plate; lateral projection about 1.5 times as long as median plate, with a row of minute serrae at apical 1/4 of ventral surface, covered with short setae in apical 1/2.

Tergite IX similar to that of *Cyphon tohokuanus* YOSHITOMI, n. sp. Tegmen long and slender, about 4/5 times as long as penis, abruptly curved interiorly from apical 3/10, pointed at apex. Penis similar to that of *C. aomoriyanus* YOSHITOMI, n. sp., but more slender.

Female not examined.

**Measurement.** Male (n = 7): TL 2.4–3.8 (3.1) mm; PL 0.4–0.6 (0.5) mm; PW 0.9–1.3 (1.1) mm; EL 2.0–3.2 (2.6) mm; EW 1.1–1.9 (1.5) mm.

**Type material.** Holotype: 1 male, Near Hachimantai (ca. 1,000–1,300 m), Ashiro-chô,


Biological notes. This species is known from mountain zone in Tôhoku district, and the other biological information is absent now.

Remarks. This species is easily distinguished from the allied species by the slender and elongated tegmen and penis.

Etymology. The species name is named after the distribution area Tôhoku district.

Subgroup B

This subgroup is characterized by the following characteristics: tergite VIII wide in median plate; tergite IX longer than tergite VIII; tegmen short, connected with penis in dorsal part; penis bilobed in apical part, with a plate-like projection protruding ventrally.

Cyphon proprius YOSHITOMI, n. sp.

[Japanese name: Hokuriku-hosochibi-maruhananomi]

(Figs. 64 B, 71)

Description. Adult, male. Body oblong, slightly convex above, shining, closely covered with yellowish-white setae throughout. Coloration of body almost blackish-brown, but elytra somewhat paler; antennal segments I–IV, mouth parts, forelegs and middle and hind tibiar and tarsi brown.

Head moderate in size, slightly convex above, shallowly and indistinctly concave in the middle part, closely covered with fine punctures; clypeus relatively long, gently tapered apically, with almost straight front margin. Eyes moderate in size, prominent; the distance between eyes about 3.0 times as long as a diameter of an eye. Antennae moderate in length, somewhat stout, reaching about proximal 1/5 of elytra. Pronotum transverse, slightly convex above in the middle part of disk, finely punctate; antero- and postero-lateral corners obtuse; front margin almost straight; lateral margin gently arcuate; posterior margin slightly arcuate; PW/PL 2.2–2.8 (2.4). Scutellum small, subtriangular, punctate same as in pronotum. Elytra elongate, almost parallel-sided near base to apical 1/4, covered with shallow punctures; EL/EW 1.6–1.8 (1.7); EL/PL 5.0–6.1 (5.5); EW/PW 1.3–1.5 (1.4); TL/EW 1.9–2.1 (2.0).

Apical margin of sternite VII arcuate. Median plate of tergite VIII pentagonal, covered sparsely with short setae and minute spines in caudal part; lateral projection fan-like shaped. Tergite IX about 1.5 times as long as tergite VIII; apex bifurcated and pointed. Tegmen reduced, about 0.3 times as long as penis, connected with penis in proximal 1/4 of dorsal part. Penis bilobed in apical part, with plate-like projection protruding ventrally from proximal 4/7 to 6/7, finely punctate in apical part and ventral part of projection.

Female. The sexual dimorphism of external feature indistinct. PW/PL 2.0; EL/EW 1.7; EL/PL 4.6; EW/PW 1.4; TL/EW 2.0. Genitalia not examined.

Measurement. Male (n = 12): TL 2.8–3.7 (3.1) mm; PL 0.4–0.6 (0.5) mm; PW 1.0–1.4 (1.2) mm; EL 2.3–3.1 (2.6) mm; EW 1.4–1.9 (1.6) mm. Female (n = 1): TL 3.7 mm; PL 0.7
mm; PW 1.3 mm; EL 3.0 mm; EW 1.8 mm.


_Distribution._ Japan: Honshu (Tôhoku, Hokuriku and Shinshû districts).

_Biological notes._ The adults were collected from marsh by sweeping. This species is widely distributed in Tôhoku, Hokuriku and Shinshû districts. In Togakushi, this species was
found with *C. uenoii* YOSHITOMI, n. sp.

*Remarks.* This species is easily distinguished from the other species by the unique shape of penis.

*Etymology.* The species name, "*proprius*" means "characteristic" in Latin, and is based on its distinct shape of penis.

**Subgroup C**

This subgroup is characterized by the following characteristics: tergite VIII wide in median plate; tergite IX almost same length as in tergite VIII, completely separate laterally, with a membrane plate in apical part; tegmen connected with penis in dorso-lateral part, rod-like, about 2/3 times as long as penis, serrate at outer margin of apex; penis with a serrae or dent-like projection in apical part.

*Cyphon seryu* NAKANE, 1963

[Japanese name: Naga-chibi-maruhananomi]

(Figs. 63 G, H, 72)

*Cyphon seryu* NAKANE, 1963 a, 139, pl. 70, f. 14 (Type: in TN, examined, see below).

*Redescription.*** Adult, male. Body oblong, slightly convex above, shining, closely covered with yellowish-white setae throughout. Coloration of body almost blackish-brown, but legs, mouth parts and antennal segments I–V brown.

Head moderate in size, slightly convex above, very finely punctate; clypeus rather short, with almost straight front margin. Eyes moderate in size, prominent; the distance between eyes about 3.5 times as long as a diameter of an eye. Antennae moderate in length, slender, reaching about proximal 1/4 of elytra. Pronotum transverse, slightly convex above in the middle part of disk, very finely punctate; front margin almost straight; antero- and postero-lateral corners obtuse; lateral margins slightly tapered anteriad; posterior margin slightly arcuate; PW/PL 2.1–2.2. Scutellum small, subtriangular, punctate same as in pronotum. Elytra elongate, covered with shallow punctures, almost parallel-sided near base to apical 1/5, then abruptly convergent apicad; EL/EW 1.6; EL/PL 4.7; EW/PW 1.4; TL/EW 2.0.

Apical margin of sternite VII gently arcuate. Tergite VIII pentagonal, covered with minute setae in along posterior margin; lateral projection rod-like, curved interiorly and pointed at apex. Tergite IX a little longer than tergite VIII. Tegmen about 1/2 times as long as penis, connected with penis in proximal 1/3. Penis expanding triangularly in apical 1/5 of ventro-lateral part; apical 1/3 of dorso-lateral parts serrate at lateral margin.

Female. Sexual dimorphism indistinct in external feature; PW/PL 2.2–2.4 (2.3); EL/EW 1.5–1.6; EL/PL 5.2–5.3; EW/PW 1.4–1.5; TL/EW 1.8–1.9. Female genitalia not examined.

*Measurement.*** Male (n = 2): TL 3.2 mm; PL 0.5 & 0.6 mm; PW 1.1 & 1.2 mm; EL 2.6 mm; EW 1.6 mm. Female (n = 2): TL 2.9 & 3.1 mm; PL 0.5 mm; PW 1.1 mm; EL 2.4–2.6 mm; EW 1.6 mm.

Fig. 72. *Cyphon seryu* NAKANE, male. ——— A, Antenna; B, sternites V–VII; C, tergite VIII; D, left piece of tergite IX; E, tegmen and penis in ventral aspect; F, ditto in lateral aspect.


Distribution. Japan: Honshu (Kansai district).

Biological notes. Biological information is very scarce in now. The adults are collected from the mountain zone (ca. 500–1,000 m in altitude, in deciduous broad leaved forests) in end of May to early June.

Remarks. This species is closely allied to *C. occidens* YOSHITOMI, n. sp. in male genitalia.

*Cyphon sannoides* YOSHITOMI, 1996

[Japanese name: Kiso-hoso-chibi-maruhananomi]

(Fig. 63 I)

*Cyphon sannoides* YOSHITOMI, 1996, 97 (Type: Hiwada, Gifu Pref., in NWU, examined).
The close description has already shown by the original description (Yoshitomi, 1996).

**Measurement.** Male (n = 9): TL 3.3–3.8 (3.5) mm; PL 0.5–0.6 (0.6) mm; PW 1.2–1.4 (1.3) mm; EL 2.8–3.2 (3.0) mm; EW 1.7–1.9 (1.8) mm. Female (n = 10): TL 3.4–3.7 (3.6) mm; PL 0.5–0.6 (0.5) mm; PW 1.2–1.4 (1.3) mm; EL 2.9–3.2 (3.1) mm; EW 1.7–1.9 (1.8) mm.

**Additional material.** <Nagano Pref.> 1 female, Kiso-komagatake (ca. 1,400 m), 4–7–1993, H. Yoshitomi leg.

**Distribution.** Japan: Honshu (Shinshu district).

**Biological notes.** The distribution area is very limited in the subalpine zone (ca. 1,400–2,000 m) of Mts. Kiso-Ontake, Kiso-Komagatake and Norikuradake. The adults can be collected from around the marsh and small spring. Particularly many individuals are collected in cloudy day. Fright period is June and July.

**Remarks.** This species is easily distinguishable from other species by the concave sternite VII in male, the very characterized anchor-shaped penis, and the well sclerotized tergite VIII and sternite VIII in female.

In BMNH, there is one specimen labeled "holotype of Cyphon kamikochiensis Armstrong", and this is the same species. But *C. kamikochiensis* is an invalid name, because this species has not been described and published yet.

**Cyphon vulgaris** Yoshitomi, n. sp.

[Japanese name: Kanto-hosochibi-maruhana-nomi]

(Figs. 64 D, 73)

**Description.** Adult, male. Body oblong, slightly convex above, shining, closely covered with yellowish-white setae which are somewhat longer and denser than the other species. Coloration of body almost blackish-brown, but antennal segments II–IV and legs paler.

Head moderate in size, slightly convex above, finely punctate; Clypeus short, with arcuate front margin. Eyes moderate in size, prominent; the distance between eyes about 2.7 times as long as a diameter of an eye. Antennae moderate in length, reaching about proximal 1/5 of elytra. Pronotum transverse, strongly depressed from above in lateral part, punctate same as in head; antero- and postero-lateral corners obtuse; front margin almost straight; lateral margins slightly arcuate, tapered anteriad; posterior margin arcuate; PW/PL 2.0–2.4 (2.2). Scutellum small, subtriangular, punctate same as in pronotum. Elytra elongate, almost parallel-sided near base to apical 1/4, irregularly covered with shallow and small punctures; EL/EW 1.6–1.8 (1.7); EL/PL 4.7–5.8 (5.1); EW/PW 1.3–1.5 (1.4); TL/EW 1.9–2.1 (2.0).

Apical margin of abdominal sternite VII arcuate. Median plate of tergite VIII transverse, gently arcuate in posterior margin; sparsely covered with short setae; lateral projection widely membranous, short, not exceeding posterior margin of tergite VIII. Tergite IX longer than tergite VIII. Tegmen long, about 0.6 times as long as penis, connected with penis in proximal 1/5 of dorsal part; apex expanding interiorly. Penis flattened vertically, expanding ventrally in proximal 1/3, which is serrate; apex expanding dorso-ventrally, serrate at dorsal margin.

Female. Sexual dimorphism indistinct in external feature; PW/PL 2.2–2.5 (2.3); EL/EW 1.5–1.8 (1.6); EL/PL 4.9–5.6 (5.3); EW/PW 1.4–1.5 (1.5); TL/EW 1.7–2.1 (1.9). Female genitalia not examined.
Fig. 73. *Cyphon vulgaris* YOSHTOMI, n. sp., paratype, male. ——— A, Stermites V–VII; B, tergite VIII; C, left piece of tergite IX; D, tegmen and penis in ventral aspect; E, ditto in lateral aspect.

**Measurement.** Male (n = 8): TL 2.8–3.4 (3.1) mm; PL 0.5–0.6 (0.5) mm; PW 1.0–1.4 (1.1) mm; EL 2.3–2.9 (2.6) mm; EW 1.4–1.8 (1.6) mm. Female (n = 5): TL 2.6–3.3 (2.8) mm; PL 0.4–0.5 (0.5) mm; PW 1.0–1.1 (1.0) mm; EL 2.2–2.8 (2.4) mm; EW 1.4–1.6 (1.5) mm.


Biological notes. This species is widely distributed from northern part of Kantô to eastern part of Chûbu districts. In Kantô district, this is a common species collected from plains to the mountain zone. On the other hand, in Shinshû and Chûbu districts, this species lives limitedly in the mountain zone (mainly over ca. 1,000 m).

Remarks. This species is closely allied to C. uenoi YÔSHITÔMI, n. sp. in the male genital features, but distinguishable from the latter by the shapes of apical part of penis.

_Cyphon uenoi_ YÔSHITÔMI, n. sp.

[Japanese name: Shinshû-hosochibi-maruhananomi]

(Figs. 64 C, 74)

Description. Adult, male. Closely similar to _Cyphon vulgaris_ n. sp. in the external feature, but pubescence of elytra is somewhat shorter; PW/PL 2.0–2.4 (2.2); EL/EW 1.3–1.8 (1.6); EL/PL 4.6–5.5 (5.1); EW/PW 1.3–1.6 (1.5); TL/EW 1.6–2.1 (1.9). Apical margin of sternite VII arcuate.

Tergite VIII pentagonal, with long apodemes; median plate with minute setae on posterior margin; lateral projection widely membranous. Tergite IX somewhat longer than tergite VIII. Tegmen long, about 0.75 times as long as penis, connected with penis in proximal 1/5 of dorsal part. Penis flattened vertically, serrate in proximal 3/5 to 4/5 of dorso-lateral part; apex tapered posteriorly, with a pair of serraé in dorsal part.

Female. Sexual dimorphism indistinct; PW/PL 2.1–2.5 (2.3); EL/EW 1.4–1.7 (1.5); EL/PL 4.9–5.7 (5.2); EW/PW 1.3–1.6 (1.4); TL/EW 1.7–2.1 (1.8).

Measurement. Male (n = 9): TL 2.8–4.0 (3.6) mm; PL 0.5–0.7 (0.6 ) mm; PW 1.2–1.4 (1.3) mm; EL 2.3–3.4 (3.0) mm; EW 1.7–2.2 (1.9 ) mm. Female (n = 5): TL 3.7–4.1 (3.9) mm; PL 0.6–0.7 (0.6) mm; PW 1.4–1.5 (1.5) mm; EL 3.1–3.4 (3.3) mm; EW 1.9–2.4 (2.2) mm.

Type material. Holotype: 1 male, Midori-ike (ca. 2,000 m), Kouno-chô, Nagano Pref., 16–VII–1999, M. HINAKURA leg. Paratypes: <Tochigi Pref.> 1 male, Karikomi, Oku-Nikko,
Fig. 74. Cyphon uenoisi Yoshitomi, n. sp., paratype, male. ——— A, Antenna; B, sternites V–VII; C, tergite VIII; D, left piece of tergite IX; E, tegmen and penis in dorsal aspect; F, ditto in ventral aspect; G, ditto in lateral aspect.


Biological notes. This species lives in the subalpine zone limitedly. The adults generally occur in June and July, and are collected from the around marsh. In Togakushi, this species was collected with Cyphon proprius Yoshitomi n. sp.

Remarks. This species is closely related to C. vulgaris n. sp. judging from similarity of the male genitalia, and distinguished from it by the characteristics of penis, which is serrated dorso-laterally and tapered apically.

Etymology. This species is named for Dr. Shun-Ichi Ueno, who is one of the famous entomologist and has given me the useful advices.
**Cyphon occidens** YOSHITOMI, n. sp.

[Japanese name: Kinki-hosochibi-maruhananomi]

(Figs. 64 E, 75)

*Description.* Adult, male. The external feature is very similar to *Cyphon seryu* NAKANE and *C. sannooides* YOSHITOMI; PW/PL 2.2–2.4 (2.3); EL/EW 1.7–1.8 (1.8); EL/PL 5.1–5.9 (5.5); EW/PW 1.3–1.5 (1.4); TL/EW 2.0–2.2 (2.1).

Sternite VII clearly concave in posterior margin, with well sclerotized plate in internal part of apex, its plate projecting antero-dorsally in middle part. Tergite VIII covered with fine setae and punctures in posterior part of median plate; lateral lobe long, exceeding posterior margin of median plate, rod-like shaped, pointed at apex, densely covered with short setae in apical part. Tergite IX as long as tergite VIII. Tegmen long, about 0.6 times as long as penis, connected with penis in proximal 1/5 of dorsal part. Penis expanding and serrate laterally in proximal 9/16 to 11/16 of ventral part and proximal 6/8 to 7/8 of dorsal part, covered with fine setae in apical part.

Female unknown.

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**Fig. 75.** *Cyphon occidens* YOSHITOMI, n. sp., paratype, male. ——— A, Sternites V–VII; B, tergite VIII; C, left piece of tergite IX; D, tegmen and penis in ventral view; E, ditto in lateral view.
Measurement. Male (n = 3): TL 3.1–3.9 (3.5) mm; PL 0.5–0.6 (0.5) mm; PW 1.1–1.3 (1.2) mm; EL 2.6–3.3 (2.9) mm; EW 1.5–1.9 (1.7) mm.


Distribution. Japan: Honshu (Kansai district).

Biological notes. The collecting sites are in the mountain zone. The other biological information is not available.

Remarks. This species is similar to C. sannoës YOSHITOMI and C. seryu NAKANE in the male genital features, particularly similar to the former in the concave sternite VII and the shape of tergite VIII, and the latter in the shape of penis. These three species, however, are distinguishable easily by the shapes of apical part of the penis.

Subgroup D

This subgroup is characterized by the following characteristics: tergite VIII wide in median plate; tergite IX distinctly longer than tergite VIII, bifurcated at apex; tegmen composed a pair of rod-like pieces, without serra in apical part; penis without serra and dent-like projection.

Cyphon ohbayashi YOSHITOMI, n. sp.
[Japanese name: Shikoku-hosonibī-marulanonomi]
(Figs. 64 F, 76–77)

Cyphon sanno: SASAGAWA, 1985, 35, fig. 42 [a part, misidentification]; SATÔ, 1985 b, 421, pl. 77, fig. 9 [misidentification].

Description. Adult, male. Body oblong, slightly convex above, shining, closely covered with yellowish-white setae throughout. Coloration of body brown to blackish-brown, but legs paler.

Head moderate in size, slightly convex above, finely punctate; clypeus short and rather wide, with almost straight front margin. Eyes moderate in size, prominent; the distance between eyes about 2.4 times as long as the maximum diameter of an eye. Antennae moderate in length, slender, reaching about proximal 1/4 of elytra; approximate ratio of each antennal segment as (n = 1, paratype) 1.3 : 1.0 : 1.3 : 1.5 : 1.4 : 1.1 : 1.2 : 1.1 : 1.1 : 1.6. Pronotum transverse, strongly depressed from above in lateral parts, punctate as in head; antero-lateral corners obtuse; front margin almost straight; lateral margins slightly arcuate, gently tapered anteriorly; posterolateral corners almost right-angle; posterior margin binuous; PW/PL 2.2–3.1 (2.6). Scutellum small, subtriangular, punctate as in pronotum. Elytra elongate, almost parallel-sided near base to apical 1/5, closely covered with shallow and small punctures; EL/EW 1.5–1.8 (1.7); EL/PL 5.0–7.3 (6.1); EW/PW 1.3–1.5 (1.4); TL/EW 1.8–2.1 (2.0).
Fig. 76. *Cyphon ohbayashii* YOSHITOMI, n. sp., male. ——— A, Antenna; B, sternites V–VII; C, tergite VIII; D, tergite IX; E, tegmen and penis in ventral aspect; F, ditto in lateral aspect.

Sternite VII shallowly concave in apex, with well sclerotized wide plate situated in internal part, its plate with long carina protruding from apex to just behind anterior margin of sternite VII. Tergite VIII pentagonal, clearly projecting in middle of posterior margin, closely covered with minute setae and fine punctures in posterior part of median plate; lateral lobe spatulate in posterior part, pointed at apex, densely covered with minute spines in apical part. Tergite IX long, about 1.4 times as long as tergite VIII, bifurcated at apex, sparsely covered with fine spines. Tegmen long, about 0.6 times as long as penis, connected with penis in
proximal 1/3 of dorsal part, gently expanding posteriorly; apex obtuse, abruptly curved ventrad. Penis flattened vertically; apex obtuse, lacking any projections, somewhat expanding ventrally, sparsely punctate.

Female. Sexual dimorphism indistinct in external feature; approximate ratio of each antennal segment (n = 1, paratype) as 1.4 : 1.0 : 1.2 : 1.4 : 1.3 : 1.2 : 1.2 : 1.1 : 1.2 : 1.6. Apical margin of sternite VII somewhat pointed. Tergite VII distinctly concave in caudal margin; tergite VIII lightly sclerotized, with a pair of long apodemes, bearing short spines in apical part; sternite VIII large, well sclerotized, hexagonal, covered with long and short setae in apical part. Ovipositor relatively long; relative length of stylus, coxite and baculus as follows: 1.0 : 6.3 : 30.0; prehensor indistinct.

Measurement. Male (n = 17): TL 2.6–3.5 (3.1) mm; PL 0.4–0.5 (0.4) mm; PW 1.0–1.3 (1.1) mm; EL 2.2–3.0 (2.7) mm; EW 1.3–1.7 (1.6) mm.

Type material. Holotype (EUM): 1 male, Mt. Tsurugi, 6–VI–1970, M. SAKAI leg. Paratypes (EUM, NSMT, NMW): <Hiroshima Pref.> 6 males & 2 females, Oasa, Oasa-chō, 28–29–V–1994, M. KAWANABE leg. (male genit. s. nos. HY 498–499); <Tokushima Pref.> 16 males & 24 females, same data as for the holotype (KS s. nos. 49, 85); 1 female, same locality as for the holotype, 3–VI–1957, T. ISHIHARA leg.; 1 male & 2 females, ditto.

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Fig. 77. *Cyphon ohbayashii* YOSHITOMI, n. sp, paratype, female. ——— A, Antenna; B, sternites V–VII; C, tergite VII; D, sternite VIII; E, tergite VIII; F, ovipositor.

Distribution. Japan: Honshu (Chugoku district), Shikoku.

Biological notes. This is common species in the mountain zones of Shikoku.

Remarks. This is very remarkable species in having the unique shape of the male genitalia.

Etymology. The specific name is given after Dr. Nobuo Ohashi of EUM in expressing my sincere gratitude for his continuous guidance.

Subgroup E

This subgroup is constituted by only one species distributed in Kyushu and western part of Honshu. This subgroup is very specialized in the species-group as follow: tergite VIII reduced in median plate and lateral projection, with long thin apodemes; tergite IX screw-like shape, longer than tergite VIII; tegmen composed a pair of rod-like pieces, connected with penis in dorsal part, lacking serra in apical part; an apical part of penis plate-like shape projection, lacking serra and small projection.

Cyphon kyushuana Yosithomi, n. sp.

[Japanese name: Kyushu-hosochibi-maruananomi]

(Figs. 64 G, 78)

Description. Adult, male. Body oblong, slightly convex above, shining, closely covered with yellowish-brown setae throughout. Coloration of body blackish-brown, but antennal segments II–III and legs are paler.

Head moderate in size, slightly convex above, finely and sparsely punctate; clypeus short and somewhat wide, with almost straight front margin. Eyes relatively small, prominent; the distance between eyes about 2.7 times as long as the maximum diameter of an eye. Antennae moderate in length, reaching about proximal 1/5 of elytra. Pronotum transverse, slightly depressed from above in lateral part, punctate as in head; antero- and postero-lateral corners obtuse; front margin straight; lateral margins almost straight, gently tapered anterior; posterior margin evenly arcuate; PW/PL 2.0–2.6 (2.3). Scutellum small, subtriangular, punctate as in pronotum. Elytra elongate, subparallel-sided near base to apical 1/4, closely covered with shallow and small punctures; EL/EW 1.7–1.8 (1.7); EL/PL 4.9–6.0
Apical margin of sternite VII arcuate. Tergite VIII semicircular, sparsely covered with minute setae and punctures in posterior part, with short setae on apical margin, with long thin apodemes. Tergite IX somewhat longer than tergite VIII, screw-like shaped, pointed at apex. Tegmen short, about 0.3 times as long as penis, connected with penis in proximal 1/4 of dorso-lateral part; apex bifurcated, pointed, curved interiorly. Penis very specialized, expanding laterally in proximal 3/5; apical 2/5 flattened vertically, plate-like shaped, lacking serra and projection, covered with punctures in apical part.

Fig. 78. Cyphon kyushuanus YOSHITOMI, n. sp., paratype, male. ——— A, Sternites V–VII; B, tergite VIII; C, left piece of tergite IX; D, tegmen and penis in ventral aspect; E, ditto in lateral aspect.
Female and immature stages unknown.

**Measurement.** Male (n = 5): TL 3.3–3.6 (3.4) mm; PL 0.5–0.6 (0.5) mm; PW 1.1–1.3 (1.2) mm; EL 2.7–3.0 (2.9) mm; EW 1.5–1.8 (1.7) mm.


**Distribution.** Japan: Honshu (Chugoku District), Kyushu.

**Biological notes.** The collecting sites of the type series were in the mountain zone. The other biological information is quite absent now.

**Remarks.** In the male genital structures, this species is quite different from the other species of this species-group, and there is no close relatives.

**Etymology.** Named after the type locality, Kyushu.
Fig. 79. Distribution map of Cyphon collaris species-group.
The chlorizans species-group
(= sinusus species-group, sensu YOSHITOMI, 2002 b)
[Japanese name: Minami-chibi-maruhananomimi Shugun]

This species-group is characterized by the following external characteristics: body small, strongly shining; coloration almost black. Male genital features are as follows: tergite VIII trapezoidal, with short apodemes protruding from antero-lateral corners; sternite VIII reduced, small or absent; tergite IX trapezoidal, with long apodemes protruding from antero-lateral corners; sternite IX absent; tegmen long, Y-shaped; penis long, rod-like shaped, with trigonium protruding posteriorly from proximal 1/2 of dorsal surface.

Judging from the male genital features, eleven species known from Asia are included into this species-group (YOSHITOMI, 2002 b; RUTA, 2004).

Key to the Japanese species of Cyphon chlorizans species-group

1. Parameroids of penis distinctly paired; sternite VII protruding anteriorly in inner part of apex; distributed in Yayeyama Isls. .......................... C. yayeyamanus YOSHITOMI, n. sp.
   - Parameroids confused each other, plate-like shaped; inner margin of sternite VII normal. ........................................... 2

2. Tergite IX more than 2.0 times as long as tergite VIII; sternite VIII longer than tergite VIII. .................................................. 4
   - Tergite IX a little longer than tergite VIII; sternite VIII shorter than tergite VIII. ........................ 3

3. Parameroids of penis covered with spinous setae in lateral margin; trigonium curved antero-dorsally; distributed in Yayeyama Isls. ..................... C. spinifer YOSHITOMI, n. sp.
   - Parameroids of penis anchor-like shaped, lacking spinous setae; trigonium projecting evenly posteriorly; distributed in Honshu. .................. C. honshuanus YOSHITOMI, n. sp.

4. Apical 1/3 of tegmen bifid; distributed in Amami-Ōshima. ................................................................. C. amami YOSHITOMI, n. sp.
   - Apical 1/2 of tegmen bifid. ............................................................... 5

5. Tergite IX very long, about 1.5 times as long as tegmen; distributed in Tokunoshima. ..... ......................................................... C. sinusus K. SASAGAWA
   - Tergite IX very long, about 1.2 times as long as tegmen; distributed in Okinawa-jima. ..... ................................................................. C. okinawanus YOSHITOMI, n. sp.

Cyphon sinusus K. SASAGAWA, 1985
[Japanese name: Tokunoshima-chibi-maruhananomimi]
(Figs. 80 A, 81)

Cyphon sinusus K. SASAGAWA, 1985, 36, figs. 18, 35, 44, 45 (Type: Tokunoshima, in NWU, examined). — SATÔ, 1985 b, 422, pl. 77, fig. 21.

Head moderate in size, slightly convex above, minutely and sparsely granulated; clypeus long, emarginate in front margin. Eyes moderate in size, prominent; the distance between eyes about 3.0 times as long as the maximum diameter of an eye. Antennae stout, moderate in length, reaching about proximal 1/5 of elytra; approximate ratio of each segment ($n = 1$) as $2.1 : 1.2 : 1.0 : 1.5 : 1.5 : 1.4 : 1.4 : 1.4 : 1.4 : 1.3 : 1.7$. Pronotum transverse, depressed from above in lateral margin, granulated as in head; front margin almost straight; lateral margins gently arcuate; posterior margin arcuate; antero-lateral corners produced forwards; postero-lateral corners obtuse; PW/PL 1.95–2.23 (2.09). Scutellum small,
subtriangular, sparsely and finely punctate. Elytra oblong-oval, widest at the middle, finely and densely punctate; the sides reflexed; apices rounded; each provided with three distinct costae; EL/EW 1.49–1.52 (1.50); EL/PL 4.50–5.43 (4.96); EW/PW 1.55–1.60 (1.58); TL/EW 1.80–1.82 (1.81). Legs slender, relatively long.

Tergite VIII covered irregularly with long setae along anterior margin, with short spines on anterior margin; tergite IX long, about 2.5 times as long as tergite VIII, 1.5 times as long as tegmen. Tegmen slender, bifid in apical 1/2. Penis long, about 2.0 times as long as tegmen, lacking extra projection in apical part; trigonium protruding postero-dorsally from proximal 4/7, with minute serra in lateral margin of ventral surface.

Female and immature stages unknown.

**Measurement.** Male (n = 2): TL 2.20 & 2.25 mm; PL 0.35 & 0.40 mm; PW 0.78 mm; EL 1.80 & 1.90 mm; EW 1.21 & 1.25 mm.


**Additional material.** 1 male, same data as the holotype. (NWU, KS s. nos. 15, 18). lex., same data as the paratype. (NWU).

**Distribution.** Japan: Ryukyu Isls. (Tokunoshima).

**Biological notes.** The specimens have been collected in March and April, and the biological information is quite absent. It is probable that this species is endemic in Tokunoshima.

**Remarks.** This species seems to be closest to *Cyphon okinawanus* YOSHITOMI n. sp. and *C. amami* YOSHITOMI n. sp., but is distinguished from them in having the prolong apodemes of tergites VIII–IX.

**Cyphon honshuanus** YOSHITOMI, n. sp.  
[Japanese name: Honshû-chibi-marukanomanii]  
(Figs. 80 B, 82)

**Description.** Adult, male. Closely similar to that of *C. simuosus* K. SASAGAWA in the external feature, but the coloration of legs is somewhat darker; antennae stout; approximate ratio of each segment (n = 1) as 2.6 : 1.9 : 1.0 : 1.7 : 1.9 : 1.9 : 1.7 : 1.9 : 2.0. PW/PL 1.75–2.33 (2.04); EL/EW 1.55–1.70 (1.62); EL/PL 4.25–6.00 (4.96); EW/PW 1.43–1.57 (1.50); TL/EW 1.90–2.10 (1.95).

Apical margin of sternite VII arcuate. Tergite VIII trapezoidal, with long and short setae along apical margin; sternite VIII small, trifurcated in apical part, tergite IX long, about 1.6 times as long as tergite VIII, with short spines along apical margin. Tegmen slender, bifid in apical 2/5, pointed at apex. Penis about 1.4 times as long as tegmen, anchor-like shaped in apical part; trigonium wide, protruding postero-dorsally from proximal 3/5, with two rows of serra on ventral surface.

Female and immature stages unknown.

**Measurement.** Male (n = 4): TL 1.90–2.10 (2.05) mm; PL 0.30–0.40 (0.35) mm; PW 0.70 (0.70) mm; EL 1.60–1.80 (1.70) mm; EW 1.00–1.10 (1.05) mm.

**Type material.** Holotype: 1 male, Oshibuchi, Nanseï-chô, Mie Pref., 26–IV–1995, N. NARUKAWA leg. (genit. s. no. HY 53). Paratypes: [Honshû] <Mie Pref.> 8 males, same data.
Fig. 81. *Cyphon sinuosus* K. SASAGAWA, paratype, male. ——— A, Antenna; B, tergite VIII; C, tergite IX; D, tegmen; E, penis in lateral aspect.
Fig. 82. *Cyphon honshuanus* YOSHITOMI, n. sp., paratype, male. ——— A, Antenna; B, sternites V–VII; C, tergite VIII; D, tergite IX; E, sternite IX; F, tegmen; G, penis in ventral aspect.


*Distribution.* Japan: Honshu (Kinki and Chūbu districts).

*Biological notes.* Biological information is very scarce. The specimens from Oshibuchi (type locality) had been captured by a light trap with *Cyphon consobrinus* NYHOLM, *C. fuscomarginatus* NAKANE and *Scirtes japonicus* KIESENWETTER.

*Remarks.* This species is very similar to other species belonging to the *chlorizans* species-group in general appearance, but is easily distinguishable from them by the shape of penis.

*Etymology.* Named after the type locality, Honshu Is.
Cyphon amami YOSHITOMI, n. sp.
[Japanese name: Amami-chibi-maruhananomii]  
(Figs. 80 C, 83)

Cyphon (Cyphon) sinusus: SASAGAWA, 1985, 36 [a part, misidentification].

Description. Adult, male. The external feature is very similar to that of the preceding species; PW/PL 1.75–2.33 (2.13); EL/EW 1.42–1.60 (1.51); EL/PL 4.25–6.00 (4.87); EW/PW 1.33–1.71 (1.51); TL/EW 1.75–1.91 (1.83).

Apical margin of sternite VII gently arcuate. Tergite VIII trapezoidal, with long setae and short spines along apical margin; sternite VIII long, almost same length as in tergite VIII, projecting laterally in apical part; tergite IX very long, about 1.8 times as long as tergite VIII, covered with short spines in apical part. Penis short, a little shorter than tegmen, evenly rounded and finely punctate in apical part; trigonium narrow, protruding postero-dorsally from proximal 5/8, with two rows of minute serrae on ventral surface, covered with minute serrae at apex.

Female and immature stages unknown.

Measurement. Male (n = 5): TL 1.90–2.20 (2.13) mm; PL 0.30–0.40 (0.36) mm; PW 0.70–0.90 (0.76) mm; EL 1.60–1.80 (1.72) mm; EW 1.00–1.20 (1.14) mm.


Biological notes. Biological information is scarce. The adults were collected from around a small river by beating and sweeping of tree leaves. Some specimens were obtained from a flower of Castanopsis sp. (Fagaceae).

Remarks. This species is closely related to C. sinusus K. SASAGAWA and C. okinawanus YOSHITOMI, n. sp. in general appearance and male genital features, but is distinguished by the shapes of tegmen and penis.

Etymology. Named after the type locality, Amami-Ôshima Is.

Cyphon okinawanus YOSHITOMI, n. sp.
[Japanese name: Okinawa-chibi-maruhananomii]  
(Figs. 80 D, 84)

Description. Adult, male. The external feature is similar to that of the preceding species; PW/PL 1.80–2.25 (2.02); EL/EW 1.50–1.62 (1.55); EL/PL 4.00–5.25 (4.58); EW/PW 1.44–1.50 (1.46); TL/EW 1.83–1.92 (1.89).

Apical margin of sternite VII arcuate. Tergite VIII trapezoidal, with long setae and short spines along apical margin; sternite VIII long, bifurcated in apical part; tergite IX very long, about 2.0 times as long as tergite VIII, covered with short spines in apical part. Tegmen long and slender, bifid in apical 1/2, pointed at apex. Penis long, about 1.6 times as long as tegmen, rounded evenly and finely punctate in apical part; trigonium wide, protruding postero-dorsally from proximal 5/8, with two rows of serrae on ventral surface.
Fig. 83. *Cyphon amami* YOSHITOMI, n. sp., paratype, male. ——— A, Sternites V–VII; B, tergite VIII; C, tergite IX; D, sternite IX; E, tegmen; F, penis in ventral aspect.
Female and immature stages unknown.

**Measurement.** Male (n = 3): TL 2.20–2.50 (2.40) mm; PL 0.40–0.50 (0.43) mm; PW 0.80–0.90 (0.87) mm; EL 1.80–2.10 (1.97) mm; EW 1.20–1.30 (1.27) mm.


**Distribution.** Japan: Ryukyu Isls. (Okinawa-jima).

**Biological notes.** Biological information is scarce, but the biology may be almost same as in *C. sinuosus* K. SASAGAWA and *C. amami* YOSHITOMI, n. sp. The specimen from Haneji-ōkawa was captured from a flower of *Castanopsis* sp. (Fagaceae).

**Remarks.** This species is distinguished from *C. sinuosus* K. SASAGAWA and *C. amami* YOSHITOMI, n. sp. by the male genital structures.

**Etymology.** Named after the type locality, Okinawa-jima Is.

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**Cyphon spinifer** YOSHITOMI, n. sp.

[Japanese name: Sakitoge-chibi-maruhana-nomi]

(Figs. 80 E, 85)

**Description.** Adult, male. The external feature is similar to that of the preceding species. Antennae stout; approximate ratio of each segment (n = 1, segments V–XI missing) as 3.0 : 1.8 : 1.0 : 1.8 : 0.9. PW/PL 1.75; EL/EW 1.50; EL/PL 4.50; EW/PW 1.71; TL/EW 1.83.

Apical margin of sternite VII arcuate. Tergite VIII trapezoidal, with long setae and short spines along apical margin; sternite VIII small, shorter than tergite VIII, T-shaped; tergite IX broken, but a little longer than tergite VIII. Tegmen long, bifid in apical 1/3, pointed at apices. Penis about 1.2 times as long as tegmen; parameroids widened laterally, with 7/8 long spinous setae bearing from lateral margin, concave in apical margin; trigonium narrow, protruding postero-dorsally from proximal 2/3, curved abruptly antero-dorsally in caudal 1/5. expanded in apical part, concave at apex.

Female and immature stages unknown.

**Measurement.** Male (n = 1): TL 2.20 mm; PL 0.40 mm; PW 0.70 mm; EL 1.80 mm; EW 1.20 mm.


**Distribution.** Japan: Ryukyu Isls. (Ishigaki-jima, Iriomote-jima).

**Biological notes.** Biological knowledge is very little. Only three specimens have been collected from Iriomote-jima and Ishigaki-jima in March and April. The paratype specimen collected on Ishigaki-jima have been attracted to a light trap.

**Remarks.** This species is easily distinguished from other species of the *chlorizans* species-group in having the spinous setae on the apical part of penis. The relationship with other species is not clear, because the phylogenetic consideration have not been done in this species-group yet. In the species-group, however, this species seems to show the sister-group relationship with the other Japanese species except for *C. yayeyamanus* YOSHITOMI, n. sp.

**Etymology.** Referred to presence of the spinous setae on the apical part of penis.
Fig. 84. Cyphon okinawanus YOSHITOMI, n. sp., paratype, male. ——— A, Sternites V–VII; B, tergite VIII; C, tergite IX; D, sternite IX; E, tegmen; F, penis in ventral aspect.
**Cyphon yayeyamanus** YOSHITOMI, n. sp.  
[Japanese name: Yaeyama-chibi-maruhananomi]  
(Figs. 80 F, 86)

*Description.* Adult, male. The external feature is similar to that of the preceding species; PW/PL 2.00; EL/EW 1.45–1.70 (1.58); EL/PL 4.00–4.25 (4.13); EW/PW 1.25–1.38 (1.31); TL/EW 1.82–2.10 (1.96).

Abdominal sternite VII gently arcuate; interior part of apex projecting anteriorly. Tergite VIII wide, with short spines and long setae along posterior margin; tergite IX trapezoidal, covered with short spines in posterior part, with short and stout apodemes; sternites VIII–IX absent. Tegmen long, about 1.3 times as long as penis, with short parameres. Penis widest at middle, gently tapered posteriad, narrowed in proximal 1/4; parameroids consisting of a pair of projections; almost parallel-sided, sparsely punctate, with obtuse apex; trigonium very short, reaching about proximal 3/4, with minute denti-like projections at apex.
Female and immature stages unknown.

*Measurement.* Male (n = 2): TL 2.00–2.10 (2.05) mm; PL 0.40 mm; PW 0.80 mm; EL 1.60–1.70 (1.65) mm; EW 1.00–1.10 (1.05) mm.


*Biological notes.* The biological knowledge is very little. The adults were collected in spring and autumn. Some specimens have been collected by a light trap.

*Remarks.* This species is easily distinguishable from other species of this species-group by the shape of penis in having paired parameroids. Judging from the male genital structures, this species may be the most primitive taxon in this species-group.

*Etymology.* Named after the type locality, Yayeyama Islsl.

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**Fig. 86. Cyphon yayeyamanus** YOSHITOMI, n. sp., paratype, male. ——— A, Sternites V–VII; B, tergite VIII; C, tergite IX; D, tegmen; E, penis in ventral aspect.
Fig. 87. Distribution map of *Cyphon chlorizans* species-group.
The *japonicola* species-group

[Japanese name: Akacha-chibi-maruhahananomi Shugun]

This species-group is characterized by the following characteristics: sternites and tergites VIII–IX complete; tegmen large, very specialized; parameres arm-like shape, covered with spines in apical part; median part of tegmen membranous, projecting posteriorly; penis long and flattened, with a pair of distinct parameroids; trigonium distinct, with one projection protruding posteriorly.

Following three species include in this species-group: *Cyphon comptus* KLAUSNITZER, 1976 (USA); *Cyphon confinis* KLAUSNITZER, 1976 (USA); *Cyphon spinulosus* KLAUSNITZER, 1976 (USA).

KLAUSNITZER (1982) mentioned that *Cyphon obscuratus* KLAUSNITZER is related to *Cyphon ruficollis* (SAY) known from USA and *Cyphon bromelius* KLAUSNITZER described from Cocos Isls., but judging from the illustrations of male genitalia of them (KLAUSNITZER, 1980; YOUNG & STIRLING, 1990), it is probable that these are not related. In this paper, these two species are excluded from this species-group.

**Key to the Japanese species of *Cyphon japonicola* species-group**

1. Body oblong, subparallel-sided near base to apex of elytra; coloration of elytra often bicolored, brown in mesal part, blackish brown in lateral part; apical part of parameres covered with about 100 spines. ........................................ C. *obscuratus* KLAUSNITZER
   - Body oblong-oval, gently arcuate in lateral margin of elytra; coloration of elytra often unicolor, right brown to blackish brown; apical part of parameres covered with about 30 spines. .................................................................................................................. 2

2. Body strongly convex above; coloration of body blackish brown in most specimens; postero-lateral corners of pronotum often rounded; female elytra usually each having two patches which are formed by scale like extra setae; parameres almost straight, shorter than median part. ................................. C. *sasagawai* YOSHIHOMI et KLAUSNITZER
   - Body moderately convex above; coloration of body reddish brown to brown in most specimens; postero-lateral corners of pronotum almost right-angled; female elytra covered with regularly short setae; parameres screwed, longer than median part. ..............
     .......................................................................................................................... C. *japonicola* NAKANE

*Cyphon japonicola* NAKANE, 1963

[Japanese name: Akacha-chibi-maruhahananomi]

(Figs. 88 A, B, E, F, 89, 92 A)

*Cyphon japonicola* NAKANE, 1963 a, 139, pl. 70, fig. 9 (Type: see below, in TN, examined). — SATÔ, 1982, 1–456, figs. 13, 14. — SASAGAWA, 1985, 36, figs. 10, 19, 28, 39. — SATÔ, 1985 b, 421, pl. 77, fig. 11.

**Redescription.** Adult, male. Body oblong, convex above, shining, closely covered with golden hairs. Coloration of body almost reddish pale brown, but sometimes brown in elytra; ventral surface of body paler.

Head slightly convex above, finely granulate in dorsal surface; anterior margin of
Fig. 88. Habitus of Cyphon japonicola species-group. —— A, C. japonicola Nakane, holotype, male; B, ditto, labels; C, C. intermedius Nakane, holotype, male; D, ditto, labels; E, C. japonicola Nakane, male; F, ditto, female; G, C. sasagawai Yoshitomi et Klausnitzer, male; H, ditto, female; I, C. obscuratus Klausnitzer, male.
clypeus gently arcuate; eyes large, prominent; the distance between eyes about 3.6 times as long as the diameter of an eye. Antennae moderate in length, slim, reaching about proximal 1/5 of elytra; approximate ratio of each antennal segment (n = 1) as 11 : 5.5 : 5 : 12 : 10 : 10 : 11 : 10 : 10 : 14. Pronotum strongly transverse, finely but distinctly granulate; anterior and lateral margins almost straight; posterior margin evenly and strongly arcuate; anterior corners distinctly projecting, somewhat pointed; posterior corners obtuse; PW/PL 2.08–2.51 (2.27). Elytra oval, strongly arcuate in lateral margin, strongly convex above, widest about just before the middle; EL/EW 1.38–1.60 (1.49); EL/PL 4.45–5.60 (5.10); EW/PW 1.33–1.65 (1.51); TL/EW 1.69–1.91 (1.78).

Apical margin of sternite VII arcuate. Tergite VIII transversal trapeziform, with caudal margin acute, with a pair of long and slender apodemes, closely covered with short spines in caudal part and on caudal margin; sternite VIII U-shaped, expanded in apical parts which are covered with short setae; tergite IX widely membranous, lightly sclerotized in anterior margin, with a pair of short apodemes; sternite IX weakly sclerotized, oblong, covered with short setae in posterior part. Tegmen concave in anterior margin; parameres long, exceeding median part, screwed and covered with about 30 spines in apical 1/3. Penis long and slender, about 1.2 times as long as tegmen; posterior part suddenly tapered in about proximal 1/4.

Female. The sexual dimorphism indistinct in external feature; body somewhat larger; antennae shorter, reaching about proximal 1/8 of elytra; elytral setae bearing around elytral suture of caudal 1/4 shorter than the other part; PW/PL 2.00–2.21 (2.13); EL/EW 1.49–1.58 (1.54); EL/PL 4.69–5.25 (4.94); EW/PW 1.45–1.58 (1.51); TL/EW 1.80–1.89 (1.85).

Measurement. Male (n = 12): TL 2.85–4.62 (4.11) mm; PL 0.50–0.75 (0.67) mm; PW 1.20–1.80 (1.53) mm; EL 2.35–3.92 (3.44) mm; EW 1.60–2.68 (2.31) mm. Female (n = 4): TL 3.60–4.55 (4.15) mm; PL 0.60–0.80 (0.70) mm; PW 1.20–1.70 (1.49) mm; EL 3.00–3.78 (3.45) mm; EW 1.90–2.47 (2.24) mm.


Fig. 89. Cyphon japonicola Nakane, male. ——— A, Antenna; B, sternites V–VII; C, tergite VIII; D, tergite IX; E, sternite VIII; F, sternite IX; G, tegmen; H, penis.
Biological notes. This is a common species in Japan. The adults are captured from marsh, near stream and small river. Over wintering is carried out in adult stage under the fallen leaves (Sakai, 1995).

Remarks. This species is easily distinguishable from other species of the species-group by the reddish brown coloration and the male and female genitalia.

Cyphon sasagawai YOSHITOMI et KL AusNITZER, 2003
[Japanese name: Usucha-chibi-maruhananomi]
(Figs. 88 C, D, G, H, 90, 92 C, D)

Cyphon sasagawai KL AusNITZER & YOSHITOMI, 2003, 93 [new name for Cyphon intermedius NAKANE, 1963].

Cyphon intermedius NAKANE, 1963 a, 139, pl. 70, fig. 8 (Type: see below, in TN, examined). (nec TOURNIER, 1868, 50, 59, t. 3, f. 14).

Cyphon ishiharai K. SASAGAWA, 1985, 40, figs. 2, 3, 9, 16, 27, 37 (Type: see below, in EUM, examined). — SATÔ, 1985 b, 421, pl. 77, fig. 13. NEW SYNONYMY.

Cyphon satoi K. SASAGAWA, 1985, 38–39, figs. 4, 14, 25, 38 (Type: see below, in EUM, examined). — SATÔ, 1985 b, 422, pl. 77, fig. 20. NEW SYNONYMY.

Redescription. Adult, male. The external feature of this species have already described by SASAGAWA (1985). PW/PL 2.00–2.80 (2.20); EL/EW 1.42–2.07 (1.55); EL/PL 4.83–6.38 (5.41); EW/PW 1.17–1.76 (1.59); TL/EW 1.64–2.48 (1.83).

Apical margin of sternite VII arcuate. Tergites and sternites VIII–IX similar to those of C. japonica NAKANE, but sternite VIII somewhat long and thin. Tegmen concave in anterior margin; parameres almost parallel-sided, shorter than median part, covered with about 30 spines in apical part. Penis broad, about 1.2 times as long as tegmen; lateral sides gently tapered posteriad.

Female. PW/PL 2.00–2.75 (2.19); EL/EW 1.45–1.65 (1.55); EL/PL 5.16–7.00 (5.79); EW/PW 1.67–1.76 (1.71); TL/EW 1.68–1.95 (1.82).

Measurement. Male (n = 20): TL 2.95–4.10 (3.33) mm; PL 0.40–0.65 (0.52) mm; PW 1.03–1.40 (1.15) mm; EL 2.48–3.45 (2.80) mm; EW 1.20–2.27 (1.83) mm. Female (n = 7): TL 2.85–4.00 (3.38) mm; PL 0.40–0.62 (0.50) mm; PW 0.85–1.30 (1.09) mm; EL 2.43–3.40 (2.88) mm; EW 1.50–2.20 (1.87) mm.


Fig. 90. *Cyphon sasagawai* YOSHITOMI et KLAUSNITZER, male. —— A, Antenna; B, sternites V–VII; C, tergite VIII; D, sternite VIII; E, tergite IX; F, sternite IX; G, tegmen; H, penis.


Biological notes. This is common species in Honshu, Shikoku and Kyushu. The adults are collected around marsh, lake and streams in plain to mountain areas.

Remarks. In this paper, I treat Cyphon satoi K. Sasagawa and C. ishikarai K. Sasagawa as junior synonyms of C. sasagawai Yoshitomi et Klaussnitzer, but this species is very variable in the coloration, the body size and the male genitalia. In near future more close examination in both adults and larvae will be needed.

In BMNH, there is a specimen labeled "holotype of Cyphon nakanei Armstrong", but this species is same as C. sasagawai. Unfortunately this name is invalid, because this species has been undescribed and unpublished.

Cyphon obscuratus Klaussnitzer, 1982
[Japanese name: Numa-chibi-maruhananomi]
(Figs. 88 I, 91, 92 B)

Cyphon obscuratus Klaussnitzer, 1982, 275–285, figs. 14–16 (Type: in ZIL, not examined). —
Cyphon paludosus K. Sasagawa, 1985, 39, figs. 5, 15, 29, 40 (Type: see below, in EUM, examined).

Redescription. Adult, male. The external feature had been fully described by Klaussnitzer (1982); PW/PL 2.00–2.40 (2.14); EL/EW 1.56–1.68 (1.62); EL/PL 5.09–6.25 (5.49); EW/PW 1.53–1.67 (1.58); TL/EW 1.83–1.98 (1.92).

Apical margin of sternite VII arcuate. Tergetes and sternites VIII–IX very similar to those of C. japonicola Nakane. Tegmen almost straight in anterior margin; parameres slightly curved inferiorly, shorter than median part, widely covered with about 100 spines. Penis long and slender, about 1.3 times as long as tegmen, tapered posteriorly from proximal 1/4.

Female. The external feature is same as in male. PW/PL 2.50; EL/EW 1.72; EL/PL 6.45; EW/PW 1.50; TL/EW 1.99.

Measurement. Male (n = 6): TL 3.30–3.77 (3.43) mm; PL 0.48–0.60 (0.53) mm; PW 1.08–1.25 (1.13) mm; EL 2.80–3.17 (2.90) mm; EW 1.68–2.00 (1.79) mm. Female (n = 1):
Fig. 91. Cyphon obscursatus KLUSNITZER, male. —— A, Antenna; B, sternites V–VII; C, tergite VIII; D, sternite VIII; E, tergite VIII; F, sternite IX; G, tegmen; H, penis.

TL 2.98 mm; PL 0.40 mm; PW 1.00 mm; EL 2.58 mm; EW 1.50 mm.


Distribution. Japan: Hokkaido (new record), Honshu; Russia.

Biological notes. Biological information is very scarce. The adults are collected from
marsh in forest by beating. This species is rare in Honshu.

Remarks. This species is similar to *C. sasagawai* YOSHITOMI and KLAUSNITZER in coloration, but differ from it by the almost parallel-sided body, and the male and female genitalia.

Fig. 92. Prehensor of *Cyphon japonicola* species-group. ——— A, *Cyphon japonicola* NAKANE; B, *Cyphon obscuratus* KLAUSNITZER; C–D, *Cyphon sasagawai* YOSHITOMI et KLAUSNITZER.
Fig. 93. Distribution map of Cyphon japonicola species-group.
The *coarctatus* species-group

[Japanese name: Chairo-chibi-maruhananomichi Shugun]

This species-group is characterized by the following characteristics: body moderate in size; coloration almost brown in most species; tergites VIII–IX of male normally plate-like; prehensor bearing many spines in most species.

Nyholm (1972 c) described this species-group based on four North European species: *C. coarctatus* Paykull, 1799; *C. palustris* Thomson, 1855; *C. kongsbergensis* Munster, 1924; *C. ochraceus* Stephens, 1830, and divided into two subgroups. In this paper I follow his arrangement as below, but the definition of subgroups is somewhat obscure as for the Japanese species.

**Key to the Japanese species of *Cyphon coarctatus* species-group**

1. Tergites and sternites VIII–IX plate-like; penis well developed in apical teeth (trigonium), oval to subtriangular in basal part (pala). ................................ subgroup 1 ........................................ 2
   2. Tergites and sternites VIII–IX variable in shape; apical teeth of penis lacking or reduced; basal part of penis reduced. ................................ subgroup 2 ........................................ 6
3. Tergite VIII long, variable in shape, bearing spinous setae or large spines. ................................. 5
4. Sternite IX consisting of lateral and mesal projections; tergite IX trapezoidal, distinctly projecting laterally near base of apodemes; apical teeth of penis claw-like shaped. ................................................................. *C. tsushimanus* n. sp.
   4. Sternite IX reverse Y-shaped; tergite IX semicircular, with long apodemes; apical teeth of penis large and stout. ................................................................. *C. yakushimanus* n. sp.
   5. Sternite IX fan-shaped; tergite IX H-like shaped, with hook-like apices; apical teeth of penis claw-like shaped. ................................................................. *C. formosanus* Pic
5. Tergite VIII rod-like, serrate in apical 1/3; sternite IX large, fan-like shaped. ................................................................. *C. puncticeps* Kiesenwetter
   5. Tergite VIII long rod-like, with long spinous setae in posterior margin; sternite IX small, hexagonal. ................................................................. *C. fuscomarginatus* Nakane
   6. Tergite VIII long, bearing many flat large spines in mesal part of posterior margin; sternite IX large, ovate. ................................................................. *C. nipponicus* n. sp.
6. Tegmen ginkgo-leaf shaped; penis simply Y-shaped. ................................ *C. consobrinus* Nyholm
   7. Tegmen V-shaped; penis elongated U-shaped. ................................................................. 7
7. Sternite IX gently curved interiorly in apical part; apical teeth of penis relatively short. ................................................................. *C. magicus* Klausnitzer
   7. Sternite IX abruptly curved interiorly in apical part; apical teeth of penis long. ................................................................. *C. granulosus* K. Sasagawa
Fig. 94. Habitus of Cyphon coarctatus species-group. — A, C. thunbergi NAKANE, holotype; B, ditto, labels; C, C. fuscomarginatus NAKANE, holotype, male; D, ditto, labels; E–G, C. puncticeps KIESEWETTER; H, C. fuscomarginatus NAKANE, male; I, C. nipponicus YOSHITOMI, n. sp, holotype, male.
Fig. 95. Habitus of *Cyphon caeruleatus* species-group. —— A, *C. tsushimaensis* YOSHIKOMI, n. sp., holotype, male; B, *C. yushimensis* YOSHIKOMI, a. sp., holotype, male; C, *C. ozensis* M. SATÔ, paratype, male; D, *C. formosanus* PIC, male; E, *C. consobrinus* NYHOLM, male; F, *C. magicus* KLAUSNITZER, male; G, citto, female; H, *C. granulosus* K. SASAGAWA, male.

The **subgroup 1** (sensu NYHOLM, 1972 c)

This subgroup is characterized by the following genital characteristics: male tergites and sternites VIII–IX plate-like; penis well developed, oval in basal part (= "pala"), with large and well developed apical teeth (= "prosthene"); preensor showing similar structures, bearing many spines (NYHOLM, 1972 c). I recognized the following seven species in the subgroup 1.

*Cyphon puncticeps* KIESEWETTER, 1874

[Japanese name: Hime-chibi-maruhananomi]

(Figs. 94 A–B, E–G, 96–97)

*Cyphon puncticeps* KIESEWETTER, 1874, 245 (Type: not examined). — PIC, 1914, 35; SATÔ, 1985 b, 421, pl. 77, fig. 17.

*Cyphon (Cyphon) puncticeps puncticeps*: K. SASAGAWA, 1985, 45.
Cyphon (Cyphon) puncticeps himatsuzi K. SASAGAWA, 1985, 45 (Type: see below, in EUM, examined).
Cyphon (Cyphon) puncticeps shikokensis K. SASAGAWA, 1985, 45 (Type: see below, in EUM, examined).
Cyphon thunbergii NAKANE, 1963 a, 139, pl. 70, fig. 11 (Type: Fukuoka, in TN, examined). Synonymized by SASAGAWA (1985)

Redescription. Adult, male. Body oval, strongly convex above, shining, closely covered with yellowish white setae throughout. Coloration of body brown, somewhat paler in elytral suture; apical part of antennal segments IV–XI dark brown; elytra frequently dark brown in both sex, but humeral and caudal parts of elytra always brown, seemingly three brown maculations on elytra.

Head slightly convex above, finely granulate in dorsal surface; anterior margin of clypeus wide, gently arcuate; the distance between eyes about 3.5 times as long as the diameter of an eye. Antennae short, reaching about proximal 1/4 of elytra, scape large and strongly ovate; segments II–XI slender; approximate ratio of each segment (n = 1) as 1.8 : 1.2 : 1.0 : 1.0 : 1.0 : 1.0 : 0.8 : 0.9 : 1.2. Pronotum transverse, weakly and finely granulate, strongly depressed in lateral parts; anterior margin almost straight; antero-lateral corners distinctly projecting forward; lateral margins almost straight, subparallel-sided; postero-lateral corners obtuse; posterior margin gently and evenly arcuate; PW/PL 2.07–2.60 (2.36). Elytra strongly convex above, ovate, widest at just behind humeral part, weakly and gently tapered posteriad; EL/EW 1.23–1.38 (1.30); EL/PL 4.13–4.79 (4.40); EW/PW 1.33–1.67 (1.44); TL/EW 1.52–1.71 (1.60).

Apical margin of sternite VII arcuate. Tergite VIII rod-like, serrate in apical 1/5, with pointed at apex; tergite IX simply trapezoidal, with long apodemes; sternite IX fan-like shaped, variable in shape. Tegmen fan-like shaped, closely covered with stout setae in antero-lateral part. Penis variable in shape, with a pair of claw like large apical teeth at apex; parameroids absent.

Female. The external feature almost same as in male; scale-like short extra setae bearing around elytral suture of just behind scutellum and about caudal 1/4, but indistinct in many specimens. Approximate ratio of each antennal segment as 2.0 : 1.2 : 1.0 : 1.4 : 1.2 : 1.2 : 1.0 : 1.2 : 1.0 : 1.2 : – (n = 1). PW/PL 2.38–2.63 (2.45); EL/EW 1.31–1.49 (1.38); EL/PL 4.20–5.31 (4.81); EW/PW 1.32–1.50 (1.42); TL/EW 1.59–1.77 (1.67). Apical margin of sternite VII gently arcuate. Tergite VIII trapezoidal, covered sparsely with fine punctures and minute setae in apical part, with relatively short apodemes; sternite VIII oblong. Ovipositor relatively short, approximate ratio of the lengths of stylus, coxite and baculus as follows: – 1.0 : 6.7 : 32.0 (n = 1). Prehensor distinct, bearing about 40 long spines in anterior part, as shown in figure.

Measurement. Male (n = 7): TL 2.05–2.78 (2.32) mm; PL 0.40–0.48 (0.43) mm; PW 0.88–1.25 (1.02) mm; EL 1.65–2.30 (1.89) mm; EW 1.20–1.80 (1.46) mm. Female (n = 5): TL 2.25–2.65 (2.51) mm; PL 0.40–0.50 (0.43) mm; PW 0.97–1.20 (1.06) mm; EL 1.85–2.23 (2.08) mm; EW 1.40–1.60 (1.51) mm.


Fig. 97. *Cyphon puncticeps* Kiesenwetter, female. ——— A, Antenna; B, sternites V–VII; C, tergite VIII; D, sternite VIII; E, ovipositor; F, prehensor.

Biological notes. This species is collected from marsh by sweeping in early spring to late autumn.

Remarks. Sasagawa (1985) described two subspecies, *hisamatsu* and *shikokensis*, based on the differences of the coloration and the shapes of sternite IX and tegmen. After my examination, however, the color variation among the subspecies is not definite, and the difference of the shapes of tegmen is not clear. The shapes of sternite IX can only be distinguished among them. In the present paper, I don’t refer to these subspecies, and more close examination and review will be made.

*Cyphon fuscomarginatus* NAKANE, 1963
[Japanese name: Kiuro-chibi-marularanomio]  
(Figs. 94 C–D, 98–99)

*Cyphon fuscomarginatus* NAKANE, 1963 a, 139, pl. 70, fig. 10 (Type: see below, in TN, examined). — SATÔ, 1985 b, 422, pl. 77, fig. 19.

*Cyphon aberratus* KLAUSNITZER, 1982, 279, figs. 17–20 (Type: Kunashir, in ZIL, not examined).

Synonymized by KLAUSNITZER & YOSHIHOMI (2003).

*Cyphon ozensis* M. SATÔ, 1982, 389 [a part, misidentification].
Fig. 98. *Cyphon fuscomarginatus* NAKANE, male. ——— A, Antenna; B, sternites V–VII; C, tergite VIII; D, tergite IX; E, sternite IX; F, tegmen; G, penis.
Redescription. Adult, male. Body oval, convex above, rather shining, closely covered with yellowish-white setae. Coloration of body variable, yellowish-orange to brown; proximal part of antennae, mouth parts, surrounding part of elytral suture and legs paler.

Head weakly convex above, obviously granulate in dorsal surface; anterior margin of clypeus gently arcuate; labrum as long as wide; eyes moderate in size, prominent; the distance between eyes about 2.5 times as long as the diameter of an eye. Antennae moderate in length, reaching about proximal 1/4 of elytra; approximate ratio of each segment \( n = 1 \) as 1.8 : 1.2 : 1.0 : 1.3 : 1.2 : 1.2 : 1.2 : 1.1 : 1.2 : 1.7. Pronotum transverse, finely granulate,
strongly depressed in lateral part; anterior margin gently arcuate in middle; anterior and posterior corners about right-angle, not projecting anteriorly; lateral margin almost straight; posterior margin gently and evenly arcuate. PW/PL 2.00–3.00 (2.27), Elytra oval, convex above, widest just before the middle; EL/EW 1.27–1.57 (1.43); EL/PL 3.80–6.00 (4.58); EW/PW 1.27–1.63 (1.42); TL/EW 1.60–1.93 (1.75).

Apical margin of sternite VII gently arcuate. Tergite VIII long, rod-like in lateral parts which apices pointed, covered with long spinous setae in posterior margin; sternite VIII membranous; tergite IX moderately sclerotized, covered with minute spines, with a pair of long and thin apodemes; sternite IX small, lightly sclerotized, with some short setae in posterior part. Tegmen small, simply fan-like, covered with short stout setae in postero-lateral part. Penis small, with a pair of small-claw-like apical teeth at apex; basal part almost straight in lateral and anterior margins, widest just behind anterior margin.

Female. The sexual dimorphism distinct; shallow transversal concavities situated in proximal 1/4 and 3/4 of elytral suture and closely bearing scale-like extra setae; approximate ratio of each antennal segment (n = 1) as 1.6 : 1.0 : 1.0 : 1.4 : 1.1 : 1.0 : 1.1 : 1.1 : 1.1 : 1.6. PW/PL 2.00–2.50 (2.29); EL/EW 1.21–1.69 (1.52); EL/PL 4.00–5.25 (4.69); EW/PW 1.30–1.56 (1.36); TL/EW 1.50–2.08 (1.84).

Apical margin of sternite VII gently arcuate. Tergite VIII trapezoidal, with short spines on posterior margin, covered sparsely with minute setae, with long and thin apodemes protruding from antero-lateral corners; sternite VIII oblong, with short spines on posterior margin. Ovipositor long; approximate ratio of the length of stylus, coxite and baculus as follows: = 1.0 : 5.6 : 30.0 (n = 1); prehensor distinct and well sclerotized, bearing some long spines in antero-lateral part, covered sparsely with short spines in anterior part.

Measurement. Male (n = 20): TL 2.00–2.80 (2.40) mm; PL 0.30–0.50 (0.44) mm; PW 0.80–1.10 (0.98) mm; EL 1.70–2.30 (1.97) mm; EW 1.10–1.50 (1.38) mm. Female (n = 6): TL 2.10–2.70 (2.45) mm; PL 0.40–0.50 (0.43) mm; PW 0.90–1.00 (0.98) mm; EL 1.70–2.20 (2.02) mm; EW 1.30–1.40 (1.33) mm.

Type material. Holotype: 1 male, Ohnuma, 25–VI–1958, T. NAKANE leg. (TN; genit. s. no. HY 640)


Distribution. Japan: Hokkaido, Honshu; Kuril Archipelago (Kunashir and Iturup Isls.).
Fig. 100. Distribution map of *Cyphon puncticeps* KIESENWETTER and *C. fuscomarginatus* NAKANE.

**Biological notes.** The adults are collected from marsh by sweeping.

**Remarks.** This species can be easily distinguished from other species by the long and unique shaped tergite VIII of male, but the external feature is very similar to *C. consobrinus* NYHOLM, *C. ozensis* M. SATÔ and *C. nipponicus* YOSHIKOMI, n. sp.

Frequently, apical part of tergite VIII is projected externally exceeding the elytral apex, and is visible from above.

**Cyphon nipponicus** YOSHIKOMI, n. sp.

[Japanese name: Nippon-chibi-maruhananomi]

(Figs. 94 l, 101)

*Cyphon intermedium* SASAGAWA, 1985, 37, figs. 6, 20, 26, 60, 61 [a part, misidentification].

**Description.** Adult, male. Body oval, convex above, shining, closely covered with yellowish-white setae. Coloration of body pale brown to brown throughout.

Head large, as wide as PW, almost straight in anterior margin of clypeus; the distance between eyes about 3.5 times as long as the diameter of an eye. Antennae moderate in length, slim, reaching about proximal 1/5 of elytra; approximate ratio of each segment (n = 1, segment XI missing) as 1.3 : 1.1 : 1.0 : 1.5 : 1.2 : 1.2 : 1.2 : 1.1 : 1.1 : 1.2. Pronotum
transverse; anterior margin gently arcuate anteriad; antero-lateral corners almost right-angle, slightly projecting anteriorly; lateral margins gently arcuate; postero-lateral corners obtuse; posterior margin gently arcuate; PW/PL 1.84–2.41 (2.10). Elytra oblong, gently convex above, widest at middle; EL/EW 1.39–1.53 (1.45); EL/PL 3.33–4.71 (4.08); EW/PW 1.28–1.41 (1.34); TL/EW 1.73–1.89 (1.81).

Apical margin of sternite VII arcuate. Tergite VIII well sclerotized, long, distinctly projecting posteriorly in mesal part of posterior margin which bearing many flat large spines, with short apodemes protruding from antero-lateral corners; sternite VIII indistinct; tergite IX lightly sclerotized, oval, covered with short spines in apical part, with long and rather stout apodemes; sternite IX oval, moderately sclerotized in lateral part, lightly sclerotized in mesal part, covered closely with short setae in apical part. Tegmen small, broadly Y-shaped, covered closely with minute stout setae in postero-lateral part. Penis small and simple, with small and simple apical teeth; palae distinctly widened in anterior part.

Female and immature stages unknown.

Measurement. Male (n = 8): TL 2.68–3.27 (3.01) mm; PL 0.49–0.75 (0.60) mm; PW 1.10–1.38 (1.25) mm; EL 2.18–2.58 (2.41) mm; EW 1.55–1.80 (1.66) mm.


Biological notes. The biological information is very scarce. The adults are collected from reedy shore of a pond and a marsh by sweeping. Holotype and some paratypes were obtained by a light trap.

Remarks. This species is closely related to *C. inustulatus* KLASNITZER, 1980 known from Vietnam in the peculiar shapes of tergite VIII and sternite IX. It is distinguished from it by the shapes of tegmen and penis.

Etymology. This species is named after the country name of Nippon (= Japan).

Fig. 101. *Cyphon nipponicus* YOSHITOMI, n. sp., paratype, male. ——— A, Antenna; B, sternites V–VII; C, tergite VIII; D, tergite IX; E, sternite IX; F, tegmen; G, penis.
**Cyphon tsushima**nus YOSHITOMI, n. sp.

[Japanese name: Tsushima-chibi-maruhananomi]

(Figs. 95 A, 103)

*Description.* Adult, male. Body oval, gently convex above, shining, closely covered with yellowish-white setae. Coloration of head, pronotum, legs and epipleura reddish-brown; elytra and ventral surface of thoraces and abdomens dark brown.

Head moderate in size, with almost straight in anterior margin of clypeus; the distance between eyes about 3.0 times as long as the diameter of an eye. Antennae moderate in length, rather stout, reaching about proximal 1/3 of elytra; approximate ratio of each segment (n = 1, holotype) as 1.7 : 1.0 : 1.0 : 1.5 : 1.2 : 1.2 : 1.2 : 1.2 : 1.2 : 1.7. Pronotum finely granulate in dorsal surface; anterior margin gently arcuate anteriad; antero-lateral corners almost right-angle, slightly projecting anteriorly; lateral margins gently arcuate; postero-lateral corners obtuse; posterior margin gently and evenly arcuate; PW/PL 3.10. Elytra oblong, gently convex above, subparallel-sided from proximal 1/3 to 2/3; EL/EW 1.56; EL/PL 4.17; EW/PW 1.25; TL/EW 1.94.
Fig. 103. *Cyphon tsushimanus* YOSHITOMI, n. sp., holotype, male. ——— A, Antenna; B, sternites V–VII; C, tergite VIII; D, sternite VIII; E, tegmen; F, penis.
Apical margin of sternite VII arcuate. Tergite VIII wide, trapezoidal, covered closely with short spines in posterior part, with rather short apodemes; sternite IX lightly sclerotized, oval, bearing short setae in posterior part. Tegmen large, unique shaped; anterior part fan-like shaped, arcuate in anterior margin; posterior part wide, covered closely with short stout setae in lateral part. Penis large, with a pair of thumb-like projections at apex; basal part widest just behind anterior margin; median plate long and distinct; parameroids absent.

Female and immature stages unknown.

**Measurement.** Male (n = 1): TL 3.10 mm; PL 0.60 mm; PW 1.28 mm; EL 2.50 mm; EW 1.60 mm.

**Type material.** Holotype (EUM): 1 male, Ariake-san, Izu-hara-chō, Tsushima, 9-V-1996, H. YOSHIOTOMI leg. (genit. s. no. HY 631).

**Distribution.** Japan: Tsushima.

**Biological notes.** Biological information is very scarce now. Type specimen was collected by beating foliages in a natural forest of laurel trees.

**Remarks.** This species is distinguished from the other Japanese species by the coloration and male genitalia. Judging from the features of male genitalia, this species is closely related to *C. palustris* THOMSON distributed in Europe and *C. coarctatus* PAYKULL in Europe and Siberia, but is differ from them by the shapes of tegmen and penis.

**Etymology.** The species is named after the type locality, Tsushima Is.

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**Cyphon yakushimanus** YOSHIOTOMI, n. sp.  
[Japanese name: Yakushima-chibi-maruhana-nomi]  
(Figs. 95 B, 103)

**Description.** Adult, male. Body strongly ovate, slightly shining, closely covered with yellowish-white setae. Coloration of body pale brown throughout, but head somewhat darker.  
Head large, slightly convex above, arcuate in anterior margin of clypeus; the distance between eyes about 3.0 times as long as the diameter of an eye. Pronotum almost straight in anterior margin, gently arcuate in posterior margin; antero- and postero-lateral angles obtuse, not projecting; lateral margins gently arcuate; PW/PL 2.07. Elytra oval, gently convex above, widest at the middle; EL/EW 1.35; EL/PL 3.74; EW/PW 1.34; TL/EW 1.71.

Apical margin of sternite VII gently arcuate. Tergite VIII moderately sclerotized, trapezoidal, with short spines on posterior margin, covered with short setae in posterior part, bearing minute setae in anterior part, with long and slender apodemes. Sternite VIII moderately sclerotized, very specialized; anterior part peg-like; posterior part wide, with gently curved posterior margin, projecting laterally in apical 1/3, with some short setae and punctures in postero-lateral part. Tergite IX slightly sclerotized, distinctly projecting laterally near bases of apodemes, covered with short spines in apical part. Sternite IX well sclerotized, very specialized, consist of lateral and mesal projections; lateral ones protruding anteriorly and posteriorly, semicircular, closely covered with minute serrae; mesal ones protruding posteriorly. Tegmen well sclerotized, large, fan-like shaped; posterior part trapeziform, closely covered with short setae in posterior part; antero-lateral corner projecting anteriorly, with minute stout setae. Penis well sclerotized, as long as tegmen; a pair of horn-like projections protruding from postero-lateral corners.

Female and immature stages unknown.

**Measurement.** Male (n = 1): TL 2.56 mm; PL 0.54 mm; PW 1.12 mm; EL 2.02 mm; EW
1.50 mm.


Biological notes. Biological information is very scarce. Type series designated above were captured in a natural forest of the laurel trees.

Remarks. Judging from the strange structures of sternite IX and penis, this species is related to three species: *C. setulosus* KLAUSNITZER, 1973; *C. postcornutus* KLAUSNITZER, 1973; *C. hiekei* KLAUSNITZER, 1973 distributed in the Philippine Isls., but is distinguished from them by the shapes of sternite IX, tegmen and penis.

Etymology. This species is named after the type locality, Yaku-shima Is.

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Fig. 104. *Cyphon yakushimanus* YOSHITOMI, n. sp., paratype, male. ——— A, Sternites V–VII; B, tergite VIII; C, sternite VIII; D, tergite IX; E, sternite IX; F, tegmen; G, penis.
*Cyphon ozensis* M. SATÔ, 1982

[Japanese name: Oze-chibi-maruhananomi]

(Figs. 95 C, 105)

*Cyphon ozensis* M. SATÔ, 1982, 389, figs. 11–14 (Type: see below, in NSMT, examined). — SATÔ, 1985 b, 422, pl. 77, f. 23.

Redescription. Adult, male. The good description about the external feature was shown by the original description (SATÔ, 1982). PW/PL 2.14; EL/EW 1.31; EL/PL 4.05; EW/PW 1.44; TL/EW 1.63.

Apical margin of abdominal sternite VII arcuate. Tergite VIII semicircular, well sclerotized in mesal part and around caudal margin, with shallow longitudinal concavity in the middle, covered with minute setae in apical part, bearing short spines on apical margin and in proximal part; tergite IX semicircular, widely membranous, covered with short spines in apical part, well sclerotized in caudal part of long apodemes; sternite IX well sclerotized, reverse Y-shaped, pointed at apex, with hairy short spines in caudal part. Tegmen lightly sclerotized, but well sclerotized in mesal part, fan shaped, distinctly projecting posteriorly in caudal margin; scale-like small setae closely bearing except for mesal part, its setae somewhat smaller in lateral part. Penis large, well sclerotized, about 2.0 times as long as wide; apical teeth large and stout, concave at apex; basal part trapezoidal, evenly tapered anteriorly.

Female and immature stages unknown.

Measurement. Male (n = 1): TL 2.12 mm; PL 0.42 mm; PW 0.90 mm; EL 1.70 mm; EW 1.30 mm.


Biological notes. Biological information is very scarce. The type series had been collected from Ozegahara, a large and very famous highland moor, in central Honshu.

Remarks. This species is very similar to *Cyphon fuscomarginatus* NAKANE, 1963 in the external feature, but is easily distinguishable from it by the characteristics of male genitalia, especially in penis.

*Cyphon formosanus* PIC, 1918

[Japanese name: Taiwan-chibi-maruhananomi]

(Figs. 95 D, 106)

*Cyphon formosanus* PIC, 1918, 5 (Type: in MNHP?, not examined). — SATÔ & CHÛJO, 1972, 19–23; SASAGAWA, 1985, 47, fig. 64–67; SATÔ, 1985 b, 422, pl. 77, fig. 18.

Fig. 105. Cyphon ozensis M. SATÔ, holotype, male. ——— A, Sternites V–VII; B, tergite VIII; C, tergite IX; D, sternite IX; E, tegmen; F, penis.

Head slightly convex above, with almost straight in anterior margin of clypeus; the distance between eyes about 3.0 times as long as the diameter of an eye. Pronotum transverse, with gently arcuate anterior margin; antero-lateral corners almost right-angle, slightly projecting anteriorly; lateral margins almost straight; postero-lateral corners obtuse; posterior margin somewhat bisinuous; PW/PL 2.40–2.80. Elytra oval, convex above, widest at middle; EL/EW 1.38–1.41; EL/PL 4.58–5.38; EW/PW 1.36–1.39; TL/EW 1.68.

Apical margin of sternite VII gently arcuate. Tergite VIII subtriangular, covered with
short spines and setae in apical part, with long spines along apical margin, with stout apodemes; tergite IX large, H-like shape, hook-like shape at apex; sternite IX fan shaped, with long setae on posterior margin. Tegmen large; anterior part peg-like shape; posterior part oval, densely covered with short stout setae, but posterior and lateral ones minute and fine. Penis slender and long, almost as long as tegmen; apical teeth curved evenly to interiorly.

Female and immature stages unknown.

Fig. 106. *Cyphon formosanus* PtC, male. ——— A, Sternites V–VII; B, tergite VIII; C, tergite IX; D, sternite IX; E, tegmen; F, penis.
**Measurement.** Male (n = 2): TL 2.55 & 2.68 mm; PL 0.40 & 0.48 mm; PW 1.12 & 1.15 mm; EL 2.15 & 2.20 mm; EW 1.52 & 1.60 mm.


**Distribution.** Japan: Honshu, Shikoku, Ryukyu Isls.(Ishigaki-jima, Iriomote-jima), Taiwan.

**Biological notes.** Biological information is very scarce. The adults are collected near marsh by sweeping and a light trap.

**Remarks.** This is very remarkable species in having the unique shaped sternite IX and tergite, but is closely resemble to other species in the external feature.

The tergite IX is sometimes projecting from abdominal apex, and visible from dorsad.

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**Fig. 107.** Distribution map of *Cyphon tsushimanus* Yoshitomi, n. sp., *C. yakushimanus* Yoshitomi, n. sp., *C. ozensis* M. Sato and *C. formosanus* Pic.
The subgroup 2 (sensu Nyholm, 1972 c)

This subgroup differs from the subgroup 1 in the following genital characteristics: penis transformed, reduced in basal part, lacking or reduced in apical teeth; tergites VIII-IX and sternite IX of male variable in shape; prehensor variable in structure (Nyholm, 1972 c). In the present paper, I recognized the following three species in the subgroup.

*Cyphon consobrinus* Nyholm, 1950

[Japanese name: Chairo-chibi-maruhananomi]

(Figs. 95 E, 108–112)


*Redescription.* Adult, male. Body oval, convex above, shining, closely covered with yellowish-white short setae. Coloration of pronotum, elytra, antennae and legs yellowish-brown, but apical part of antennae fuscous; head and ventral surface of thoraces and abdomens reddish brown.

Head large, finely granulate in dorsal surface; anterior margin of clypeus almost straight; the distance between eyes about 3.0 times as long as the diameter of an eye. Antennae slim, moderate in length, reaching about proximal 1/4 of elytra; approximate ratio of each segment (n = 1) as 1.3 : 1.2 : 1.0 : 1.3 : 1.2 : 1.1 : 1.1 : 0.9 : 0.9 : 1.3. Pronotum transverse, gently and evenly arcuate in anterior, posterior and lateral margins; antero- and postero-lateral corners obtuse, not projecting; PW/PL 1.90–2.38 (2.11). Elytra oval, convex above, widest at middle; EL/EW 1.29–1.44 (1.38); EL/PL 3.64–4.67 (4.06); EW/PW 1.28–1.50 (1.39); TL/EW 1.63–1.81 (1.72).

Apical margin of sternite VII gently arcuate. Tergite VIII moderately sclerotized, with long apodemes, covered with short setae and spines in apical part; tergite IX widely membranous, with short apodemes; sternite IX U-like shaped, gently tapered posteriad in each arm, covered with a few setae in apical part, shortly projecting in posterior part; extra sclerite situated interior part of sternite IX serrate at posterior end and in apical part. Tegmen ginkgo-leaf shaped, covered with minute stout setae in apical part. Penis simply Y-shaped, obtused at apex.

Female. The external feature is almost same as in male. PW/PL 2.08–2.38 (2.18); EL/EW 1.39–1.49 (1.44); EL/PL 3.96–4.88 (4.28); EW/PW 1.31–1.43 (1.37); TL/EW 1.72–1.84 (1.77).

Apical margin of sternite VII arcuate. Tergite VIII trapezoidal, sparsely covered with minute setae in apical part, and with short spines on posterior margin, with long and thin apodemes; sternite VIII lightly sclerotized, with minute setae and spines in apical part. Ovipositor not examined; prehensor well developed and well sclerotized, shown as figure.

*Measurement.* Male (n = 20): TL 2.20–2.98 (2.56) mm; PL 0.40–0.60 (0.51) mm; PW 0.90–1.22 (1.07) mm; EL 1.80–2.38 (2.05) mm; EW 1.30–1.70 (1.48) mm. Female (n = 7): TL 2.47–2.79 (2.63) mm; PL 0.42–0.53 (0.50) mm; PW 1.00–1.18 (1.09) mm; EL 2.05–2.26 (2.13) mm; EW 1.38–1.58 (1.49) mm.

* Mature larvae.* Dorsal surface of body sparsely covered with hairy setae throughout. Coloration of body white to pale brown, but ventral surface paler.
Fig. 108. Cyphon consobrinus NYHOLM, male. —— A, Antenna; B, sternites V–VII; C, tergite VIII; D, tergite IX; E, sternite IX; F, extra sclerite situated in interior part of sternite IX; G tegmen; H, penis.

Head a little transversal trapeziform, with a pair of non-melanized stemmata in dorso-lateral area, bearing some long setae in lateral and anterior areas. Antennae reaching abdominal segment II; scape curved posteriorly; pedicel straight, somewhat longer than scape; flagellum about 70 segmented. Epipharynx with five pairs of stout setae and a pair of long and pectinate setae along interior margins of ventral lobes. Mandible somewhat thin. Maxillary palpi long; segment I with long setae in outer part; segment II covered with minute setae and fine punctures in dorsal and ventral surfaces; dorsal surface of III sparsely covered with minute setae, with a stout setae on apical margin; six lines of sensory organs in ventral surface of III well developed, contiguous with each other; IV shortest, with somewhat long sensory organs in apical part; approximate ratio of respective segments I–IV as 4.7 : 3.7 : 4.7 : 1.0. Hypopharynx longer than wide, typical form of the genus.

Thorax widest at posterior margin of metanotum, bearing long setae in lateral part; pronotum with three pairs of short setae along median line; meso- and metanotum with two pairs of long setae along anterior margin, with two pairs of short (inner one) and long (outer one) setae along posterior margin.

Abdomen with short and long setae in lateral parts; sternites I–VI bearing three pairs of short setae from the middle, with two pairs of long setae along posterior margin; sternite VII
with four pairs of short setae; tergite VIII trapezoidal, covered with long setae in lateral part, with a pair of long setae just behind the middle; sternite VIII semicircular, covered with long and short setae along lateral and posterior margins. Tergite IX arch-like shaped, with short pectinate setae along posterior margin; apical part projecting posteriorly, with a pair of long setae in postero-lateral corners. Sternite IX semicircular, with short pectinate setae along the posterior margin.

**Measurement of the larvae** (n = 2). TL 6.8–7.2 mm; HW 2.7–3.0 mm; PW 3.8–4.2 mm; PL 3.0 mm; TW 4.6–5.1 mm.

Pupa not examined.

Fig. 110. Larva of Cyphon consobrinus NYHOLM, habitus in dorsal aspect.
Fig. 111. Larval mouth parts of *Cyphon consobrinus Nyholm.* —— A, Epipharynx; B, left mandible in ventral aspect; C, hypopharynx; D, left maxillary palpus in dorsal aspect; E, ditto in ventral aspect.

s. nos. HY 615, 676).
Biological notes. This is one of the most common species of the genus in Hokkaido, Honshu and Shikoku. Particularly we can collect many specimens of from a reedy marshes and eutrophic pond by sweeping and a light trap.
The larvae obtained from the reedy shore of eutrophic pond with many larvae of Scirtes japonicus. The pupation was carried out under the fallen leaves and in the dead stems of reed under the room temperature. It seems that the overwintering are done in the adult stage.
Remarks. This species is newly recorded from Japan. This species is closely related to the European species Cyphon kongsbergensis MUNSTER, but differs from it in the shapes of sternite IX, tegmen and penis.

Fig. 112. Abdominal segments VIII–IX of Cyphon consobrinus NYHOLM, larva. ——— A, Tergite VIII; B, sternite VIII; C, tergite IX; D, sternite IX.
Cyphon magicus KLAUSNITZER, 1973
[Japanese name: Minami-marugata-chibi-maruhananomi]
(Figs. 95 F, G, 113–114)

Cyphon magicus KLAUSNITZER, 1973 b, 233 (Type: Taiwan, ?, not examined).

Redescription. Adult, male. The close and very good description has already given by KLAUSNITZER (1973 b). Antennae slim; approximate ratio of each segment (n = 1) as 1.9 : 1.1 : 1.0 : 1.2 : 1.1 : 1.1 : 1.1 : 1.1 : 1.0 : 1.3. PW/PL 1.79–2.45 (2.04); EL/EW 1.33–1.42 (1.38); EL/PL 3.21–4.47 (3.82); EW/PW 1.26–1.46 (1.36); TL/EW 1.71–1.81 (1.74).

Apical margin of sternite VII arcuate. Tergite VIII moderately sclerotized, trapezoidal, closely covered with minute spines in apical part; tergite IX widely membranous; sternite IX large, U-shaped, evenly and gently curved interiad in caudal part, covered with large concavities in apical part, with pointed apices. Tegmen large, V-shaped, sparsely covered with minute setae and punctures in caudal part. Penis elongated U-shaped, as long as tegmen, with two pairs of projections in caudal part; inner ones membranous, covered with minute spines; outer ones rather longer than inner ones, almost straight, pointed at apices.

Fig. 113. Cyphon magicus KLAUSNITZER, male. ——— A, Antenna; B, sternites V–VII; C, tergite VIII; D, tergite IX; E, sternite IX; F, tegmen; G, penis.
Female. Sexual dimorphism of external feature distinct in the following characteristics: body slender; shallow and transversal concavities situated in proximal 1/8 and caudal 1/4 of elytral suture and bearing scale like extra setae; surrounding parts of its concavities somewhat darker; PW/PL 1.88–2.36 (2.04); EL/EW 1.41–1.86 (1.55); EL/PL 3.92–4.90 (4.32); EW/PW 1.17–1.48 (1.37); TL/EW 1.75–2.25 (1.91).

Apical margin of sternite VII arcuate. Tergite VIII trapezoidal, with short spines on caudal margin, sparsely covered with minute setae in apical part, with a pair of slender apodemes protruding from antero-lateral corners; sternite VIII large, oblong, bearing short spines on caudal margin, covered with minute setae in apical part. Ovipositor long;
approximate ratio of the length of stylet, coxite and baculus as follows:—1.0 : 6.0 : 31.0 (n = 1); prehensor distinct, consist of a pair of plate-like oblong sclerites and a shrivelng sclerite, as shown in figure.

**Measurement.** Male (n = 8): TL 2.57–3.24 (2.99) mm; PL 0.47–0.72 (0.63) mm; PW 1.05–1.35 (1.27) mm; EL 2.10–2.52 (2.36) mm; EW 1.50–1.90 (1.72) mm. Female (n = 13): TL 2.84–3.20 (3.00) mm; PL 0.50–0.65 (0.57) mm; PW 1.08–1.30 (1.15) mm; EL 2.29–2.60 (2.44) mm; EW 1.40–1.78 (1.58) mm.


**Distribution.** Taiwan; Japan: Ryukyu Isls. (Amami-Ōshima, Tokuno-shima, Okinawa-jima, Ishigaki-jima, Iriomote-jima).

**Biological notes.** Biological information is very scarce. Many individuals have been collected by a light trap around paddy field (Ohtake, Ishigaki-jima, 27–III–1996).

**Remarks.** This species is newly recorded from Japan and is closely related to *C. granulosus* K. SASAGAWA in the general appearance and the male genital features. These are perhaps distributed allopatrically in Japan.

**Cyphon granulosus** K. SASAGAWA, 1985

[Japanese name: Marugata-chibi-maruhananomi]

(Figs. 95 H, 115)

*Cyphon granulosus* K. SASAGAWA, 1985, 43–44, figs. 7, 21, 31, 55–57 (Type: see below, in EUM, examined).

**Redescription.** Adult, male. The external feature had been already described by SASAGAWA (1985). Antennae slim; approximate ratio of each segment (n = 1) as 2.0 : 1.1 : 1.0 : 1.2 : 1.1 : 1.0 : 1.0 : 1.0 : 1.4. PW/PL 2.28; EL/EW 1.36; EL/PL 3.82; EW/PW 1.23; TL/EW 1.77.

Apical margin of sternite VII gently arcuate. Tergite VIII trapezoidal, covered with minute spines in apical part, with some short setae in apical part; tergite IX widely membranous, with short apodemes. Sternite IX large, V-shaped; caudal part curved interiand, covered with large concavities, with pointed apex. Tegmen widely membranous, punctate in lateral part. Penis U-shaped, with two pairs of projections in caudal part; inner ones membranous, covered with minute spines; outer ones long, slightly curved interiand, pointed at apices.
Female and immature stages unknown.

**Measurement.** Male (n = 1): TL 2.75 mm; PL 0.57 mm; PW 1.30 mm; EL 2.18 mm; EW 1.60 mm.

**Type material.** Holotype (EUM): 1 male, Gokurakuji, Hiroshima Pref., 9–VI–1955, M. Okada leg. Paratypes: 5 males, same data as for the holotype (3 exs. in EUM, 2 exs. in NWU; KS s. nos. 54–57).

**Additional material.** <Hiroshima Pref.> 1 male, Oasa, Oasa-chô, 29–V–1994, K. Aita leg. (genit. s. no. IIY 679).

**Distribution.** Japan: Honshu (Chūgoku district).

**Biological notes.** Biological information is very scarce. Only seven specimens have been collected from a marsh in Hiroshima Prefecture, Chūgoku district.

**Remarks.** This species is closely related to the preceding species, and is distinguished from it by the male genitalia.

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**Fig. 115.** *Cyphon granulosus* K. SASAGAWA, paratype, male. ——— A, Antenna; B, sternites V–VII; C, tergite VIII; D, tergite IX; E, sternite IX; F, tegmen; G, penis.
The variabilis species-group

[Japanese name: Chibi-maruhananomi Shugun]

This species-group is characterized by the following male genital characteristics: tergites VIII–IX rod-like hemitergite; sternite VIII membranous; sternite IX covered with long setae in apical part; tegmen various shaped; penis smaller than tegmen, tending to reduction. The prehensor of female genitalia is various in shape among species, but is not serrated as in the coarctatus species-group.

Nyholm (1972 c) described this species-group based on six North European species: C. variabilis (Thunberg, 1787); C. phragmiteticola Nyholm, 1955; C. pubescens (Fabricius, 1792); C. punctipennis Sharp, 1873; C. padi (Linnaeus, 1758); C. hilaris Nyholm, 1944. The species belonging to this species-group are widely recorded from the world.

Key to the Japanese species of Cyphon variabilis species-group

1. Body small, about 2.0 mm; coloration of body yellowish-brown to black, but frequently blackish-brown. .................................................................................................................... 2
- Body medium size, about 3.0 mm; coloration of body frequently yellowish-brown. ....... 3
2. Body shining; tegmen fan-like shape; penis moderately sclerotized; prehensor jar-like shape, covered with deep furrows in anterior part; distributed in Hokkaido (Dōtō district). ................................................................. C. padi (LINNAEUS)
- Body weakly shining; tegmen slender; penis small, lightly sclerotized; prehensor jar-like shape, covered closely with small serrae in caudal part. ..................... C. mizoro NAKANE
3. Sternite IX of male slender, bicornate in posterior part; prehensor covered closely with small spines; distributed in Hokkaido. ................................. C. variabilis (THUNBERG)
- Sternite IX of male large, trapezoidal; prehensor with a pair of large claw-like projections; distributed in Hokkaido. ................................. C. ussuriicus NYHOLM, 1948

Cyphon variabilis (THUNBERG, 1787)
[Japanese name: Chibi-maruhananomi]
(Figs. 117 A, 118–119)

Cantharis variabilis THUNBERG, 1787, 54 (Type: ?, not examined).
Cyphon variabilis: NYHOLM, 1972 c, 44; SASAGAWA, 1985, 48.

Redescription. Adult, male. The close and very good description has already given by NYHOLM (1972 c). Antennae slim; approximate ratio of each segment (n = 1) as 1.8 : 1.2 : 1.0 : 1.5 : 1.3 : 1.2 : 1.2 : 1.2 : 1.1 : 1.5. PW/PL 2.17–2.40; EL/EW 1.39–1.42 (1.41); EL/PL 4.50–5.00 (4.75); EW/PW 1.46–1.50 (1.48); TL/EW 1.67–1.74 (1.70).

Apical margin of sternite VII gently arcuate. Tergites VIII–IX rod-like hemitergite, long, curved interiorly in apical part of IX. Sternite IX large, well sclerotized, widest in caudal 1/3, tapered in proximal 1/3; posterior part covered with short setae, shallowly concave in apical margin, distinctly projecting posteriad in postero-lateral corners; anterior part ovate. Tegmen large, moderately sclerotized; posterior part trilobate, middle one long, triangular, sparsely covered with short and somewhat stout setae, lateral ones ovate; anterior part oblong-oval. Penis somewhat small, moderately sclerotized, about 0.6 times as long as tegmen, widest at anterior margin, which is concave in the middle; trigonium compose a pair of large apical teeth.

Female. The external feature is almost same as in male. PW/PL 2.50–3.50 (2.83); EL/EW 1.36–1.50 (1.42); EL/PL 5.00–6.75 (5.64); EW/PW 1.29–1.47 (1.41); TL/EW 1.64–1.72 (1.68).

Apical margin of sternite VII arcuate. Tergite VIII trapezoidal, covered with short spines along apical margin, covered sparsely with punctures in posterior part, with long and slim apodemes protruding from antero-lateral corners; sternite VIII oblong, covered with short spines along apical margin which deeply notched in the middle, covered sparsely with minute setae and punctures in apical part, bearing densely minute spines in mesal part. Prehensor well sclerotized, closely serrate in posterior part, as shown in figure.

Measurement. Male (n = 2): TL 3.00 & 3.30 mm; PL 0.50 & 0.60 mm; PW 1.20 & 1.30 mm; EL 2.50 & 2.70 mm; EW 1.80 & 2.90 mm. Female (n = 3): TL 3.10–3.70 (3.47) mm; PL 0.40–0.60 (0.53) mm; PW 1.40–1.50 (1.47) mm; EL 2.70–3.10 (2.93) mm; EW 1.80–2.20 (2.07) mm.
Fig. 117. Cyphon variabilis species-group. —— A, C. variabilis (THUNBERG), male; B, C. padi (LINNAEUS), male; C, C. mizoro NAKANE; D, ditto, holotype, female; E, ditto, labels; F, C. ussuricus NYHOLM, male.


Distribution. Japan: Hokkaido; Kuril Archipelago; Europe; N. Africa; C. America; N. America; New Zealand.

Biological notes. Biological information is very scarce in Japan. Only some specimens have been collected in a marsh, Dōtō District, Hokkaido.

Remarks. This is world wide distributed species. In the external and male genital features, this species is related to C. ussuricus NYHOLM, and is distinguished from it by the male genitalia including tergites and sternites VIII–IX.
Fig. 118. *Cyphon variabilis* (THUNBERG), male. ——— A, Antenna; B, sternites V–VII; C, left piece of tergite VIII; D, left piece of tergite IX; E, sternite IX; F, tegmen; G, penis.
Fig. 119. *Cyphon variabilis* (THUNBERG), female. ——— A, Sternites V–VII; B, tergite VIII; C, sternite VIII; D, prehensor.

*Cyphon padi* (LINNAEUS, 1758)
[Japanese name: Kita-kurochibi-maruhananomi]
(Figs. 117 B, 120–121)

*Cychsomela padi* LINNAEUS, 1758, 369 (Type; not examined).
*Cyphon padi*: NYHOLM, 1972 c, 60 [redescription].

Redescription. Adult, male. The close and good description has given by NYHOLM (1972 c). Antennae slim; approximate ratio of each segment as 2.1 : 1.4 : 1.0 : 1.6 : 1.1 : 1.1 : 1.1 : 1.3 : 1.1 : 1.6 (n = 1). PW/PL 2.25–2.50 (2.38); EL/EW 1.43–1.46 (1.45); EL/PL 4.75–5.00 (4.88); EW/PW 1.40–1.44 (1.42); TL/EW 1.71–1.77 (1.74).

Apical margin of abdominal sternite VII arcuate. Tergites VIII–IX long, rod-like hemitergite, almost straight in IX. Sternite IX weakly sclerotized, but well sclerotized in anterior and posterior part; posterior part covered with short setae, almost right-angle in postero-lateral corners; anterior part projecting antero-laterally. Tegmen moderately sclerotized, fan-like shaped, closely covered with large punctures in lateral part, covered with minute scale-like setae in posterior part. Penis moderately sclerotized, as long as tegmen, trapezoidal; trigonium long, thumb-like shape, projecting from near postero-lateral corners.
Fig. 120. *Cyphon padi* (LINNAEUS), male. ——— A, Sternites IX–VII; B, right piece of tergite VIII; C, right piece of tergite IX; D, tergite IX; E, tegmen; F, penis.
Fig. 121. *Cyphon padi* (LINNAEUS), female. ——— A, Antenna; B, sternites V–VII; C, tergite VIII; D, sternite VIII; E, ovipositor; F, prehensor.

Female. The external feature is almost same as in male. PW/PL 2.25–3.00 (2.63); EL/EW 1.46–1.50 (1.48); EL/PL 4.75–6.00 (5.38); EW/PW 1.33–1.44 (1.39); TL/EW 1.75–1.77 (1.76).

Apical margin of abdominal sternite VII arcuate. Tergite VIII trapezoidal, with short spines along apical margin, covered sparsely with short setae in caudal part, with long and slim apodemes protruding from antero-lateral corners; sternite VIII oblong, notched deeply at the middle of apical margin which is covered with short spines, bearing minute spines on mesal part. Ovipositor long; approximate ratio of the length of stylus, coxite and baculus as follows (n = 1); 35 : 220 : 980. Prehensor well sclerotized, long, jar-like shape, deeply notched in anterior and posterior margins, covered with deep furrows in anterior part; one slim projection protruding anteriorly to mesal part.
Measurement. Male (n = 2): TL 2.30 & 2.40 mm; PL 0.40 mm; PW 0.90 & 1.00 mm; EL 1.90 & 2.00 mm; EW 1.30 & 1.40 mm. Female (n = 2): TL 2.10 & 2.30 mm; PL 0.30 & 0.40 mm; PW 0.90 mm; EL 1.80 & 1.90 mm; EW 1.20 & 1.30 mm.


Distribution. Japan: Hokkaido (new record); Kuril Archipelago; Europe; N. America.

Biological notes. Biological information is very scarce in Japan. The above specimens have been obtained from a marsh in Dōtō District, Hokkaido by sweeping.

Remarks. This is the first record from Japan. This species is widely distributed in the world, but the distribution area in Japan is limited only Dōtō District of Hokkaido. This species is closely related to the next species in the general appearance and the male and female genitalia.

*Cyphon mizoro* NAKANE, 1963

[Japanese name: Kuro-chibi-maruhananomi]

(Figs. 117 C–E, 122–123)

*Cyphon mizoro* NAKANE, 1963 a, 139, pl. 70, fig. 15 (Type: see below, in TN, examined). — SATŌ, 1985 b, 422, pl. 77, fig. 22.

Redescription. Adult, male. Body oval, convex above, weakly shining, closely covered with yellowish-white setae. Coloration of body black to blackish brown; legs, mouth parts and antennal segments II–III brown; apical part of elytra frequently having obscure brown marking.

Head slightly convex above, finely granulate in dorsal surface; anterior margin of clypeus almost straight. Eyes large, distinctly projecting laterally; the distance between eyes about 2.3 times as long as the diameter of an eye. Antennae short and stout, reaching about proximal 1/8 of elytra; approximate ratio of each segment (n = 1) as 1.9 : 1.2 : 1.0 : 1.2 : 1.0 : 1.1 : 1.1 : 1.0 : 1.4. Pronotum transverse, finely and weakly granulate, strongly depressed in lateral part; anterior margin almost straight; anterior and posterior corners almost right-angle, not projecting anteriorly; lateral margin almost straight; posterior margin gently and evenly arcuate; PW/PL 1.70–2.51 (2.23). Elytra oval, strongly convex above, widest at middle; EL/EW 1.28–1.77 (1.41); EL/PL 3.20–4.76 (4.27); EW/PW 1.12–1.47 (1.37); TL/EW 1.58–2.18 (1.74).

Apical margin of abdominal sternite VII arcuate. Tergite VIII distinctly expanded in apical parts of lateral arms, with mesal arms prolonging from about proximal 1/3 of apodemes; tergite IX as long as tergite VIII, simply rod-like, with pointed apex. Sternite IX large; proximal part rounded; caudal part expanding obviously laterally in about apical 1/3, gently tapered posteriad; apex notched in the middle, covered with long spinous setae. Tegmen large and slender, lightly sclerotized, a little smaller than sternite IX; proximal part simply rounded; caudal part almost parallel-sided from caudal 1/3 to near apex, closely covered with spinous short setae, with almost straight in apical margin. Penis small, lightly sclerotized, about 0.5 times as long as tegmen; trigonium composed a pair of small apical teeth.
Fig. 122. *Cyphon mizoro* NAKANE, male. —— A, Antenna; B, sternites V–VII; C, tergites VIII–IX; D, sternite IX; E, tegmen; F, penis.
Female. The sexual dimorphism indistinct. Approximate ratio of each antennal segment as $1.7 : 1.2 : 1.0 : 1.4 : 1.3 : 1.2 : 1.2 : 1.1 : 1.2 : 1.1 : 1.5$ ($n = 1$). PW/PL 2.04–2.37 (2.22); EL/EW 1.38–1.50 (1.46); EL/PL 4.22–4.71 (4.48); EW/PW 1.33–1.44 (1.39); TL/EW 1.69–1.83 (1.79).

Apical margin of abdominal sternite VII arcuate. Tergite VIII moderately sclerotized, subtriangular, with short spines on apical margin, sparsely covered with minute setae in apical part, with a pair of long and slender apodemes; tergite VIII lightly sclerotized, long, subparallel-sided from near proximal margin to caudal 1/4. Prehensor well sclerotized, jar-like shape, notched deeply in caudal margin which is closely covered with small serrae.

**Measurement.** Male ($n = 10$): TL 1.85–2.42 (2.19) mm; PL 0.35–0.50 (0.42) mm; PW
0.85–1.00 (0.92) mm; EL 1.50–2.00 (1.77) mm; EW 1.10–1.40 (1.26) mm.

Female (n = 4): TL 2.00–2.35 (2.19) mm; PL 0.35–0.45 (0.40) mm; PW 0.83–0.92 (0.88) mm; EL 1.65–1.90 (1.79) mm; EW 1.10–1.30 (1.23) mm.

Type material. Holotype: 1 female, Midorogaike, Kyoto Pref., 5–IV–1952, T. Nakane leg. (TN; genit. s. no. HY 638)


Biological notes. This species can be collected from a marsh by sweeping in early spring to late autumn. Over wintering is perhaps carried out by the adult stage.

Remarks. This species is closely related to Cyphon padii (Linnaeus) in the external character, but differ from it by the male and female genitalia and weak shining body.

Cyphon ussuriicus NYHOLM, 1948
[Japanese name: Usuri-chibi-maruhananomo]
(Figs. 117 F, 124–125)

Cyphon ussuriicus NYHOLM, 1948, 4, figs. 2, 6, 10 (Type: Ussuri, in Lunder Entomological Museum, not examined). — NYHOLM, 1949, 5, fig. 7 [female description].
Cyphon fuscomarginatus: SASAGAWA, 1985, 46, figs. 36, 58–59 [misidentification].

Description. Adult, male. Body oval, shining, closely covered with yellowish-white setae. Head, antennae and ventral surface brownish black, but proximal segment of antennae somewhat paler; pronotum and scutellum reddish-brown; legs and elytra pale brown, but proximal part and suture of elytra somewhat fuscous.

Head slightly convex above, arcuate in anterior margin of clypeus; the distance between
eyes about 3.8 times as long as the diameter of an eye. Pronotum transverse; anterior margin almost straight; antero-lateral angles obtuse, not protruding anteriorly; lateral margins slightly arcuate; posterior margin gently arcuate; postero-lateral angles obtuse; PW/PL 2.33. Elytra oval, convex above, widest at caudal 1/4; EL/EW 1.58; EL/PL 4.73; EW/PW 1.29; TL/EW 1.91.

Apical margin of sternite VII gently arcuate. Tergite VIII rod-like hemitergite, bifid in apical 2/5; tergite IX longer than tergite VIII, rod-like hemitergite, pointed at apex; sternite IX very large and broad, trapeziform, broadest at just behind anterior margin, gently tapered posteriad, concave at posterior margin, closely covered with short setae in apical part. Tegmen very unique shaped; anterior part peg-like shaped, well sclerotized; posterior part oval, widely membranous, but well sclerotized in lateral part. Penis very small, about 1/3 times as long as tegmen, widest at anterior margin; anterior margin projecting posteriad in middle; trigonium simple, small and thin.

Fig. 124. Cyphon ussuriicus Nyholm, male. —— A, Sternites V–VII; B, left piece of tergite VIII; C, left piece of tergite IX; D, sternite IX; E, tegmen; F, penis.
Female The sexual dimorphism indistinct. Approximate ratio of each antennal segment (n = 1) as 115 : 70 : 73 : 90 : 80 : 70 : 70 : 70 : 70 : 70 : 70 : 70 : 100. PW/PL 2.00–2.50 (2.27); EL/EW 1.47–1.50 (1.49); EL/PL 4.42–5.16 (4.87); EW/PW 1.38–1.48 (1.44); TL/EW 1.78–1.83 (1.79). Apical margin of sternite VII arcuate. Tergite and sternite VIII similar to those of *C. mizoro* NAKANE, but apodemes of tergite VIII shorter. Prehensor well sclerotized, large, with a pair of large claw-like projections in caudal part.

Immature stages unknown.

**Measurement.** Male (n = 1): TL 3.15 mm; PL 0.55 mm; PW 1.28 mm; EL 2.60 mm; EW 1.65 mm. Female (n = 4): TL 3.05–3.25 (3.15) mm; PL 0.5–0.6 (0.54) mm; PW 1.18–1.25 (1.22) mm; EL 2.55–2.65 (2.61) mm; EW 1.70–1.80 (1.75) mm.


**Distribution.** Russia :Ussuri; Japan: Hokkaido.

**Biological notes.** Biological information is very scarce. A few adults were collected.
from a marsh in Hokkaido with *C. variabilis* (THUNBERG), *C. consobrinus* NYHOLM and *C. fuscomarginatus* NAKANE.

Remarks. This is very unique species in having very specialized characteristics of the male genitalia, but clearly belongs to the *variabilis* species-group. This species is similar to *C. variabilis* (THUNBERG) in the general appearance and the body size, and distinguishable from it by the shapes of sternite IX and tegmen of male genitalia and by the shape of prehensor of female genitalia.

![Cyphon variabilis species-group](image)

*Fig. 126. Distribution map of *Cyphon variabilis* species-group.*
VII. Phylogeny

In this section, I am going to analyze the phylogenetic relationship among eight Japanese genera of the family. Phylogeny of the sciritid genera has already studied by Klausnitzer (1974 a) and Hannapel & Paulus (1987, 1990). At first, I review the previous cladistic studies before my cladistic analysis.

Klausnitzer (1974 a) has shown two cladograms on six European genera. First cladogram had been made using seven larval characters (see Klausnitzer, 1974 a: Abb. 178). Second cladogram had been made using nine adult characters (see Klausnitzer, 1974 a: Abb. 179). These trees are not isomorphic.

Hannapel & Paulus (1987) analyzed the phylogeny of seven European genera using 47 larval characters, mainly mouthparts and abdominal segments.

Hannapel & Paulus (1990) analyzed the phylogeny of unknown Australian sciritid larvae. This study was followed their previous study.

These cladograms are shown in Fig. 127.

Cladistic analysis

In this paper, I review the phylogenetic relationship in seven sciritid genera based on characters in larval, pupal and adult stages.

The cladistic analysis was undertaken using PAUP4.0b2 (Swofford, 1998), and the production of final cladograms was accomplished using MacClade 3.07 (Maddison & Maddison, 1992).

I selected the other Scirtoidea members of the families, Declinidae, Clambidae and Eucinetidae as the outgroups expediently. The following taxa have been dissected and examined.

Declinidae: Declinia versicolor Sakai & M. Satô; Eucinetidae: Eucinetus haemorrhoidalis (Germar); Clambidae: Clambus sp.


Characters and consideration of the character states

Sixty-seven morphological characters were examined and used for the analysis. The character matrix is shown in Table 1. In the following chapter, I review the apomorphy about each genera in both adult and larval stages. The characters are coded as plesiomorphy (0) and apomorphy (1, 2 or 3).

All characters are equally weighted 1, except for seven characters A-1~A-3 and L-1~L-4 which are considered to be autapomorphy of the family Scirtidae are weighted 5.

Adults

General appearance.
A-1. Body: hard (0); weakly chitinized (1). A weakly chitinized body is an autapomorphy of the family.
Fig. 127. Phylogenetic tree of the scirtid genera in the previous studies. ——— A, KLAUSNITZER (1974 a), based on the larval characters; B, KLAUSNITZER (1974 a), based on the adult characters; C, HANAPPEN & PAULUS (1985), based on the larval characters.
A-2. Genal ridge: absent (0); present (1). The presence of the genal ridge is an autapomorphy of the family.

A-3. Male genitalia: simple trilobe type (0); confused and complicated (1). The confused and complicated male genitalia is an autapomorphy of the family.

Head and mouthparts.

A-4. Segment III of labial palpus: attached to the end of segment II (0); attached to side of segment II (1). After KLAUSNITZER (1974 a: 179-3).

A-5. Mandibular bristles: present in interior margin (0); absent (1). See morphology part. It seems that the form 1 (both mandibles symmetrical; inner margin with long hairy bristles; apex pointed, protruding intero-anteriory; molar area with short bristles) is the most primitive character state in having bristles in inner margin.

A-6. Apex of mandible: simply pointed (0); obtused (1); prolonging antero-interiadi (2).

A-7. Dorsal surface of mandible: without setae (0); covered with setae in interior part (1).

A-8. Interior teeth of mandible: absent (0); present (1).

A-9. Antennae: filiform (0); serrate or pectinate in male (1). This is a synapomorphy of the genus Prionocyphon.

A-10. Flagellum I (antennal segment III): almost same length as in other segment (0); smallest (1).

A-11. Scape: normal (0); enlarged (1). This is a synapomorphy of the genus Prionocyphon.

Thorax, wings and legs.

A-12. Anterior corner of pronotum: present (0); absent (1).

A-13. Hind wing venation: MP, very long, independently running to posteriad, not connected with CuP+AA₃ (form 4) (0); MP₄ very short, connected with CuP+AA₃ in proximal part (form 1) (1); MP₄ long, connected with CuP+AA₃ in caudal part (form 2) (2); CuP+AA₃ indistinct in posterior part from connecting point with MP₄ (form 3) (3). Transformation series of hindwing venation has already discussed in the section of morphology. Judging from the character state of the outgroups (Declinidae and Eucinetidae), I recognize the form 4 as primitive. The Australian genera Pseudomicrocarca and Macrohelodes are included the form 2 (KUKALOVÁ-PECK & LAWRENCE, 1993).

A-14. Hind femur: normal (0); large and capable for jumping (1). After KLAUSNITZER (1974 a: 179-9). FURTH & SUZUKI (1990) mentioned this character state is presented in the genera Scirtes and Cyphon, however, as far as I know, there is no species having capable for jumping in the genus Cyphon.

A-15. Anterior margin of mesosternum: simply arcuate (0); deeply excised posteriad (1).

A-16. Mesocoxae: separated by mesocoxal process (0); attaching each other (1).

A-17. Mesocoxal process: long and excised at apex (0); short and simple (1).

A-18. Metasternal longitudinal suture: long, about 0.6 times sternal length (0); short, less than 0.6 times sternal length (1); very long, reaching at mesocoxal cavity (2). This character state mainly follows after LAWRENCE et al. (1995).

Abdomen.

A-19. Mesal part of sternite III: normal and intercoxal process distinct (0); reduced, almost attached in anterior and posterior margins (1).

A-20. Sexual dimorphism of extra setae on sternite VI: absent (0); present in female (1). The presence of the extra setae on female sternite VI is a synapomorphy of the genus Prionocyphon.

Male genitalia.
A-23. Parameres: distinct (0); indistinct (1). Klausnitzer (1974 a) have already analyzed this character, but his opinion was reverse.
A-24. Dorsal and ventral pieces of penis: indistinct (0); distinct (1). After Klausnitzer (1974: 181-4). This is a synapomorphy of the genus Sacodes.
Female genitalia.
A-25. Preputium: absent (0); present (1). After Klausnitzer (1974 a: 175-7, 179-4), but this character must be not homologous organ. See morphological description part of this paper.
A-26. Ovipositor: a little reduced and short (0); long (1). Klausnitzer (1974 a) have already analyzed this character, but his opinion was reverse. Judging from the character state of the outgroup, short ovipositor is plesiomorphic.
A-27. Baculus: simple (0); with a short branchlet in posterior part (1).

Larva

General appearance.
L-3. Respiration: (0); metapneustic (1). After Hannapel & Paulus (1987: 3, 1991: 3). The metapneustic respiration is a autapomorphy of the family.
Mouth parts.
L-6. Segments number of antennae: more than about 100-segmented (0); less than 50-segmented (1).
L-11. Around the socket of ventral setae: simple (0); granulate (1).
L-14. Sensilla basiconica of maxillary palpi: distributed in pairs throughout the entire 3rd (1).
L-15. Sensory cilia of segment III of maxillary palpus: smaller (0); massively developed (1).
L-16. Lamellae of mandible: whole surface of mola (0); only in dorsal part of mola (1). After
L-17. Number of comb-teeth: increase (0); reduced (1). After HANNAPEL & PAULUS (1987:
L-18. Bearing part of bristles of mandible: two field (0); one large field (1). After
L-19. Feathered bristles of both field: differ in degree of branching (0); uniform (1). After
L-20. Apex of mandible: pointed (0); blunt tip without an incisivus (1); incisivus bearing
   several small spikes (2). unordered. After HANNAPEL & PAULUS (1987: 30, 34, 1991:
   30, 34) and KLUSNITZER (1974: 178-7).
L-21. Feathered bristles of mandible: normal (0); modified (1). After HANNAPEL & PAULUS
L-22. "Cushion area" of hypopharynx: open (0); closed (1). After HANNAPEL & PAULUS
L-23. Sensilla of socket-sclerite: development of four digitiform (0); shaped as four
   semicircular investiguations of the cuticula (1). After HANNAPEL & PAULUS (1987: 8,
   1991: 8).
L-24. Socket-sclerite of the tooth-and keel-bristles: independent (0); fused (1). After
   HANNAPEL & PAULUS (1987: 15, 20, 65-4; 1991: 15, 20) and KLUSNITZER (1974:
   178-3, 178-4, 182-2).
L-25. Tooth bristles: divided into several tips at their ends (0); only double-tipped at their
L-26. Keel-bristles: rod-shaped (0); dorso-ventrally flattened and serrate (1). After
L-28. Claw-teeth: developed (0); reduced (1). After HANNAPEL & PAULUS (1987: 23, 1991:
   a, 1991: 23 a).
L-30. Chitin prominence: planed and smooth dorsally (0); consists of several walls of
L-31. Two campaniform sensilla: situated one behind the other on the socket-sclerite below
   the four invaginations of sensilla (0); variable beyond the four invaginations of sensilla
L-33. Fifth comb-tooth: normal (0); bears finger-shaped processes (1). After HANNAPEL &
L-34. Lateral 2 groups of sensilla located distally from cone-teeth: each with 4 sensilla (0);

Abdomen.
Table 1. Character state matrix for phylogenetic analysis. Taxon abbreviations: "EL" = Elodes; "OD" = Odeles; "SA" = Sacodes; "HY" = Hydrocyphon; "SC" = Scirtes; "OR" = Ora; "PR" = Prionocyphon; "CY" = Cyphon; "DE" = Declinidae; "CL" = Clambidae; "EU" = Eucinetidae.

Symbols: "?" = missing data; "-" = gap.

| A-1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| A-2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| A-3 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| A-4 | 1 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | ? | ? | 0 | 0 | 0 | 0 | 0 | 0 |
| A-5 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | ? | ? | 0 | 0 | 0 | 0 | 0 | 0 |
| A-6 | 2 | 2 | 2 | 1 | 0 | 0 | 2 | 0 | 0 | 0 | ? | ? | 0 | 0 | 0 | 0 |
| A-7 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | ? | ? | 0 | 0 | 0 | 0 | 0 | 0 |
| A-8 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | ? | ? | 0 | 0 | 0 | 0 | 0 | 0 |
| A-9 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| A-10 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | ? | ? | 0 | 0 | 0 | 0 | 0 | 0 |
| A-11 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | ? | ? | 0 | 0 | 0 | 0 | 0 | 0 |
| A-12 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| A-13 | 1 | 1 | 1 | 3 | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| A-14 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| A-15 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| A-16 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| A-17 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| A-18 | 2 | 2 | 2 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| A-19 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| A-20 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| A-21 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| A-22 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| A-23 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| A-24 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| A-25 | 0/1 | 0/1 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| A-26 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| A-27 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| A-28 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| A-29 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| A-30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| A-31 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| A-32 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| A-33 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| A-34 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| A-35 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| A-36 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| A-37 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| A-38 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| A-39 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |


L-37. Anterior margin of tergite IX: evenly convex (0); projecting anteriad in mesal part (1).


Larval habitat.


Pupae

P-1. Pronotal spines: absent (0); a pair presented in posterior margin (1); two pairs presented in anterior and posterior margins (2).
Results

The cladistic analysis resulted in only one most parsimonious tree (midpoint rooting; Fig. 128: L= 120, CI= 0.7833, HI= 0.2167, RI= 0.7739, RC= 0.6062).

The genera Elodes, Odeles and Sacodes are the sister-group relationship with other five genera by many synapomorphies.

The genus Hydrocyphon is the sister-group relationship with the group of (Scirtes + Ora) + (Prionocyphon + Cyphon).

The genera Scirtes and Ora are a remarkable monophyletic group characterized by the enlarged hind femora capable for jumping. In contrast, the monophyly of the remaining genera Prionocyphon and Cyphon are supported by the mainly larval synapomorphic characters. But the monophyly of the genus Cyphon is uncertain and doubtful, so that close reexaminations and phylogenetic analyses including the other relative world genera must be explored in near future.

![Cladogram proposed in the present paper. Showing the character distribution of L-39 (larval habitat). Black colored (2) indicates phytotelmata, grey colored (1) running water, and white colored (0) standing water.](image-url)
It is very interesting that the larval habitat in phytoelmata is independently three times evolved in the monophyletic groups (Elodes + Odeles + Sacodes), (Scirtes + Ora) and (Prionocyphon + Cyphon). On the other hand, the larval habitat of the genus Hydrocyphon is running water, which is an unusual case in the family Scirtidae, because they don’t have adaptive structures for swimming. Thus the difference in the larval habitats has a profound effect on the phylogenetic relationships (Fig. 128).

The cladogram is isomorphic to HANNAPPEL & PAULUS (1987, 1990) based on the larval characters, but don’t support the KLAUSNITZER’s hypotheses (KLAUSNITZER, 1974 a). The following problems are the reasons why the KLAUSNITZER’s hypotheses are not supported by this cladogram. First, it is very difficult to judge the homoplasy of the male genitalic characters which mainly used and analyzed by him, because they are very complicated and diversified. Second, he had made some distinct mistakes in the character analysis of larval stages. This fact has been already pointed out by HANNAPPEL & PAULUS (1987). Third, the characters analyzed by him must be too little in both adult and larval stages. In contrast, the analysis of HANNAPPEL & PAULUS (1987, 1990) is considerably correct and valuable in the following point: the large number of the characters had been used and analyzed; the generic features are more clearly designated to larval characteristics than to adult ones.

The relationship between Scirtidae and the outgroup is uncertain.

IX. Bionomics

The biology of the family has been fragmentarily reported (e.g., KLAUSNITZER, 1996; YOSHITOMI, 1997). In this section, the bionomics of the family Scirtidae is summarized mainly based on the biological information in the Japanese species and previous works reported by many researchers.

The previously known larvae of the family Scirtidae are all aquatic, and inhabit not only stagnant water environment as pond, marsh, pool and phytoelmata, but also running water environment as stream, river and groundwater. The larvae feed on litter and other organic matter. They are found out from the under surfaces of leaves, stones and pieces of wood in the water. Though unable to swim, they are often observed moving in the water in contact with the water surface. The number of larval instars is unclear, but HAYASHI (1957) reported that the mature larva of Sacodes dux (LEWIS) is the fifth instar.

The pupae are terrestrial, except for Hydrocyphon whose pupae are collected from under water. The pupation takes place underside of floating leaves, in dead stems of reed on water surface, in the ground and in very damp rotten trees. Prionocyphon serricornus pupate in the upper dried part of tree-holes (KLAUSNITZER, 1996). Pupal periods are different among genera, i.e. 6–7 days in Odeles, 2–3 days in Sacodes, Hydrocyphon, Scirtes and Cyphon, and 1–2 days in Ora (YOSHITOMI, 1997; 2001).

The adults are riparian and terrestrial ("false water beetles" named by JACH, 1998), and are usually collected from near the larval habitat, i.e., marsh, pond, lake, river side and natural forest by beating and sweeping.

Flight periods are mainly from spring to summer, and the life cycle is one generation per year in most species. However, in some widely distributed species it seems that the number of generation per year differs in the altitude and the latitude. For example, judging from the collecting data of the adults of Scirtes japonicus KIESENWETTER and Hydrocyphon satoi
Yoshitomi, it is considered that these species live one generation per year from Hokkaido to Kyushu. In contrast, some generations per year thought to be passed in the Ryukyu Islands. Over wintering are carried out in the larval or adults stages.

Phototaxis is shown in the adults of most genera and species, and some species are more easily collected by a light trap than by other methods. Klausnitzer (1996) mentioned that the adults of the genera Microcara, Prionocyphon, Cyphon and probably Elodes are predatory judging from the structures of the mouth parts, especially sharp mandibles. However the coleopteran phylogeny and my field observation suggest that the scirtid adult is herbivore. In fact, I have observed some species visiting the flowers of trees and plants in the genera Cyphon, Elodes and Sacodes.

Fig. 129. Immature stages of Scirtes japonicus Kiesenwetter under the rearing condition.

——— A, Larva; B, pupa.
Fig. 130. Habitat of the Japanese scirid larvae. —— A, Phytotelmata (Okinawa-jima), *Sacodes* sp.; B, phytotelmata (Ishigaki-jima), *Ora yayeyamanus*; C, stream (Okinawa-jima), *Hydrocyphon satoi*; D, pond (Ishigaki-jima), *Scirtes japonicus*; E, marsh (Nagoya-shi), *S. japonicus* and *Cyphon consoberinus*; F, marsh (Aichi Pref.), *C. mizoro.*
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