RECORDS AND DESCRIPTIONS OF JAPANESE TIPULIDÆ (DIPTERA), PART I

THE CRANE-FLIES OF SHIKOKU, I

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RECORDS AND DESCRIPTIONS OF JAPANESE TIPULIDÆ (DIPTERA), PART I

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TWO PLATES AND THREE TEXT FIGURES

INTRODUCTION

During forty years of intensive work on the Tipulidæ of the Japanese Empire, numerous records have accumulated and in order to add to our still insufficient knowledge of seasonal and geographical distribution it seems advisable to publish these data. Accordingly I have planned a series of papers to be issued under the present title where the crane-fly fauna of the four major Japanese islands, together with Formosa, will be considered. The species of each individual island will be numbered consecutively throughout the part or parts devoted to them. By such a method it will be possible at any time to determine the total number of species so listed for the island in question and to refer to any particular species by its number in subsequent parts. It is planned to supply the original reference and basic synonymy only in conjunction with the first inclusion of a species and not to repeat this as the same insect is discussed for a different island and at a later date. Keys to the various genera and species will be provided in the fascicles covering the eastern Palaearctic species of the family being prepared by the writer for Erwin Lindner's great work *Die Fliegen der Palaearktishen Region* (Stuttgart).

The Japanese Empire is divided politically in two different manners or categories, the more ancient usage being into Prefectures (Ken), the more recent (since 1871) into Provinces (Kuni). For greater exactness in this series of papers I am using the latter category. As was explained to me many years ago by my dear friend Professor Teiso Esaki, distinguished Head of the Entomological Laboratory of Kyushu University, Fukuoka, zoogeographers in Japan prefer the use of Provinces for the following reasons:

1. More accurate than Prefectures (73 instead of 47).
2. More dependent on geographical features.
3. Always different from the names of cities or towns included in them.

Hokkaido constitutes one of the 47 Prefectures, being further subdivided into 14 sub-Prefectures. As regards Shikoku, this is divided into four Provinces that correspond exactly in boundaries to four Prefectures, as follows: *Awa* (Tokushima); *Iyo* (Ehime); *Sanuki* (Kagawa), and *Tosa* (Kochi). Place names will be spelled in accordance with usage recommended by the National Geographic Society, following their latest and most detailed map.[1] Marked variation is shown in the spelling of Japanese place names, as for example, Shikoku or Sikoku; Mount Ishizuchi, highest mountain in the latter island, spelled variously Ishitsuchi, Ishizuchi or Isizuti.

From its geographical position along the eastern coast of Asia and extending southward almost to the 30th parallel of North Latitude, the Japanese islands possess a most intriguing combination of elements in the Tipulidæ, the most interesting of which are as follows:

1. *Species derived from the west-Europe and western Asia.*—As has been indicated in other papers, certain European crane-flies extend across Eurasia and into the Japanese islands unchanged or virtually so. Others, while evidently at least subspecifically distinct, show unquestioned affinities with the western Palaearctic region. In such cases the spread of the group or species in question may have been from Japan and eastern China westward into Europe, or in the reverse direction, depending upon the center of origin. Very probably certain of the groups of crane-flies characteristic of the European fauna had their origins in eastern Eurasia, as for example, *Dictenidia*, *Tipula* (*Acutipula*), *Limnophila* (*Adelphomyia*), and others.

2. *Species derived from the east.*—Alaska and Arctic North America. As is well known, during geologic time the narrow Bering Strait has proved scarcely to be a barrier to the free dispersal of most forms of plant and animal life, this including the Tipulidæ. A number of species have spread over the entire north temperate region and thus have a true Holarctic distribution but a very few others seem to have spread more locally across Bering Strait, either from North America to Japan or in the reverse direction.

3. *Species derived from the south.*—The Oriental fauna is well represented in Japan, particularly at the lower altitudes and in some instances has spread farther to the north along the

[1] National Geographic Society, Washington, D. C. Map of Japan and Korea. National Geographic Magazine, December, 1945.

mainland, as to the Ussuri country in Siberia or even beyond. The most conspicuous of these Oriental groups are *Pselliophora, Limonia* (*Libnotes*), *Limonia* (*Thrypticomyia*), *Conosia, Trentepohlia, Gymnastes,* and *Styringomyia.*

4. *The endemic fauna.*—Many of the species, particularly in the mountains, appear to be restricted to the islands. A considerable number of other forms recur in Korea and Manchuria, while a few others extend far to the south, usually at higher and higher altitudes in the mountains.

There are a few genera that from their known distribution might be expected to occur in Japan yet have not been taken to this date, the most noteworthy being *Phyllolabis* Osten Sacken. This includes rather numerous species in western China and the Himalayas and about a dozen others in western North America, a distribution that might well include Japan. Another missing element that from its known range in Eurasia might be expected in Japan is *Thaumastoptera.* Groups that are well represented in these islands and in North America but not or only poorly in Europe include *Limnophila* (*Prionolabis*), *Limnophila* (*Dicranophragma*), *Ulomorpha, Hexatoma* (*Eriocera*), *Cladura,* and others. Attention should also be called to the subgenus *Oropeza,* genus *Dolichopeza,* which has a type of distribution shown by many plant genera and species occurring in eastern North America and again in Japan and eastern Asia while being quite lacking in western North America.

As a brief summary, the following generic and subgeneric groups include those most characteristic of the Japanese fauna.

Tipulinæ. *Dolichopeza, Nephrotoma, Tipula, Ctenophora, Dictenidia, Tanyptera.* From the south: *Ctenacroscelis, Pselliophora, Tipula* (*Tipulodina*), *Tipula* (*Indotipula*). From the north and west: *Tipula* (*Vestiplex*), *Tipula* (*Oreomyza*).

Cylindrotominæ. *Liogma, Triogma, Cylindrotoma.*

Limoniinæ.

Limoniini. *Limonia* (*Limonia*), *Limonia* (*Discobola*), *Limonia* (*Discranomyia*), *Limonia* (*Geranomyia*), *Antocha, Elliptera, Helius, Dicranoptycha.* From the south: *Limonia* (*Libnotes*), *Limonia* (*Thrypticomyia*), *Limonia* (*Euglochina*).

Pediciini. *Pedicia* (*Pedicia*), *Pedicia* (*Tricyphona*), *Dicranota* (*Dicranota*), *Dicranota* (*Eudicranota*), *Dicranota* (*Rhaphidolabis*), *Ula.* From the south and endemic: *Heterangæus, Nipponomyia.*

Hexatomini. *Paradelphomyia, Epiphragma, Austrolimnophila, Pseudolimnophila, Dactylolabis, Limnophila* (*Eutonia*), *Limnophila* (*Limnophila*), *Limnophila* (*Adelphomyia*), *Limnophila* (*Prionolabis*), *Limnophila* (*Phylidorea*), *Limnophila* (*Elæophila*), *Limnophila* (*Dicranophragma*), *Pilaria, Hexatoma* (*Eriocera*). From the east:

Ulomorpha. From the south: *Atarba* (*Atarbodes*), *Elephantomyia* (*Elephantomyia*), *Elephantomyia* (*Elephantomyodes*).

Eriopterini. *Cladura*, *Chionea*, *Gnophomyia*, *Gonomyia*, *Lipsothrix*, *Rhabdomastix*, *Erioptera* (*Erioptera*), *Erioptera* (*Psiloconopa*), *Erioptera* (*Empeda*), *Ormosia*, *Molophilus*. From the south: *Conosia*, *Trentepohlia*, *Gymnastes*, *Styringomyia*.

Our knowledge of the Tipulidæ of the Japanese Empire has been developed through the friendly interest and cooperation of very many entomologists and collectors who are named in the historical account following this introduction. My deepest and heartfelt thanks are extended to these many friends and colleagues for their vastly appreciated assistance in making known the rich crane-fly fauna of their country. Through their generosity the types of various new species are preserved in my collection.

HISTORICAL DEVELOPMENT OF OUR KNOWLEDGE OF THE CRANE-FLIES OF JAPAN

THE NINETEENTH CENTURY

Prior to the coming of Commodore Perry to Japan in 1853 there seems to be no single record of any member of this family of flies from any part of the Empire. In 1858, Loew [2] described as new two species of the genus *Tipula* (as *japonica* and *parva*), that unfortunately have not been definitely recognized in recent years. In 1876, Westwood [3] described two further species, captured by Fortune (*Ctenacroscelis mikado*, as *Tipula*; *Limnophila satsuma*, as *Limnobia*), both of which are now known to be widely distributed in the islands. The next addition to our knowledge came following the World's Columbian Exposition in Chicago, 1893, when Professor Mitsukuri, in charge of the exhibit of natural history objects from Japan, generously presented these materials to the United States National Museum. As concerns the Diptera, which were treated in an important paper by Coquillett,[4] these totalled 124 species of which no fewer than 54 were new; in the Tipulidæ, 9 species, with 5 new. Of interest is the estimate given by Coquillett that there were possibly about 1,000 species of Diptera to be expected in Japan, a preposterously low figure that may well be found to be equalled in the Tipulidæ alone when the fauna is fully known, particularly if Formosa is included in this count. Early collectors whose

[2] Loew, Hermann. Wien. Ent. Monatschrift 2 (1858) 101–102.
[3] Westwood, J. O. Ent. Soc. London Trans. (1876) 504–505.
[4] Coquillett, D. W. U. S. Nat. Mus. Proc. 21 (1898) 301–340.

materials are to be found in various European museums include Leech, Drouart de Lezey, Hilgendorf, and others. In the Japanese fauna there occur various other crane-flies described by older authors (as *Conosia irrorata* Wiedemann) but such forms were described from other countries and were found in Japan at a later date.

THE TWENTIETH CENTURY

The first paper to be published in this later period was one entirely in Japanese by the distinguished entomologist, Doctor Shonen Matsumura [5] in 1905, wherein two new species were included, these being *Ctenophora yezoana* and *Tipula longicauda*.

In 1912 I received from the late Dr. S. I. Kuwana an extensive series of Japanese crane-flies, virtually all from the immediate vicinity of Tokyo, that were described in 1913 and 1914 [6] and constituted a basis for subsequent work on the fauna. In 1916 Matsumura [7] published his second and major contribution to the subject, describing several new genera and species, some of which have subsequently fallen into synonymy or been reduced to subgeneric status, though most of the species are valid and include some of the most conspicuous elements in the Japanese tipulid fauna. Matsumura served on the staff of the Hokkaido University from the time of his graduation there in 1895 until his retirement as emeritus professor in 1934. During this long period and following his retirement Matsumura published a vast amount of work on the insect fauna of Japan.[8] He now lives in Tokyo, where he celebrated his 80th birthday on March 6, 1952.

In 1917 I became acquainted with Akio Nohira who earlier had sent materials to Matsumura and through him obtained several of the species described by the latter, including virtual paratypes of certain of the species. In 1919, through Ryoichi Takahashi, large and important series of these flies became

[5] Matsumura, Shonen. Thousand Insects of Japan 2 (1905) 121–124, *pl. 29, figs. 5, 6.*

[6] Alexander, C. P. Canad. Ent. 45 (1913) 197–210, 285–295, 313–322; 46 (1914) 157–164, 205–213, 236–242.

[7] Matsumura, Shonen. Thousand Insects of Japan, Additamenta 2 (1916) 447–474, *pl. 24, figs. 10–17; pl. 25, figs. 1–13.*

[8] List of publications of Dr. S. Matsumura in entomology. Matsumushi 3 (1949) 94–96, 125–128; portrait. (Commemoration numbers dedicated to Matsumura on the occasion of his seventy-seventh birthday; Insecta Matsumurana Association, Entomological Institute, Hokkaido University.)

Uchida, T., and C. Watanabe. Brief account of life of Matsumura. Insecta Matsumurana 17 (1949) ii.

available, chiefly from near Tokyo and from Chichibu, in the nearby mountains of Saitama. At this same time correspondence began with Cho Teranishi, Kichizo Takeuchi, and especially with Satoru Kuwayama, distinguished economic entomologist of the Hokkaido Agricultural Experiment Station.

In 1920 and shortly thereafter, friendship began with Teiso Esaki, Jiro Machida, Tokuichi Shiraki, and others of the leading entomologists of Japan. Of extreme importance were the collections of Esaki (Hokkaido and Karafuto, 1922; Formosa, 1923; Central Honshu, 1923; Japanese South Pacific Mandated Islands, 1936–1938; Shikoku, 1951; as well as collections throughout Kyushu), Machida (abundant materials from the mountains near Tokyo and from the Japanese Alps) and Shiraki, who for much of his life was chief entomologist at the Agricultural Experiment Station in Formosa and the country's outstanding student of the Diptera (earliest materials from Formosa, collected by Nitobe and himself, were sent to Edwards; later series, from 1920 on to me, including specimens chiefly from Formosa and Honshu). In 1923 and thereafter, extensive collections were received from S. Sakaguchi, then residing in Okinawa, including materials from the Ryukyus islands and later from Kii and Yamoto, Honshu. Other correspondents and colleagues of this period of the mid-1920's included Naoto Ishimori and Kota Monzen, of Morioka; Chukichi Harukawa, of the Ohara Institute, Kurashiki; Hiroshi Hori, of Kukuoka; Tenji Uye, in Oitaken, Kyushu, and some others.

In 1927 there began a long friendship and correspondence with Syuti T. Issiki, who has added vastly to our knowledge of the Tipulidæ of Formosa, especially of the higher mountains, and has also collected in virtually all parts of the main islands of Japan (Hokkaido, Honshu, Shikoku and Kyushu, including Yakushima). In recent years, Issiki has collected in northern Honshu and in Shikoku, as recorded elsewhere in this report.

During the decade that began about 1930, new correspondents included especially Masaaki Tokunaga, brilliant student of the Diptera and author of 85 papers concerning them, including several of unusual value on the Tipulidæ and other families of crane-flies. Since 1951 Tokunaga has been Dean of the Agricultural College of Saikyo University. I am indebted to Hiromu Yamamoto, who secured valuable materials in Rikuchiu Province in 1935 and again in 1947. Others of this decade included in Korea, Jujiro Masaki, Tabashi and Takeya; in Honshu, Takeo Kato, in Morioka; Hibi, in Hoki Province,

especially Mount Daisen; K. Imanishi, K. Kamiya, Toyoji Nakamura, Masuzo Ueno, and others, chiefly in the Japanese Alps, Bunkichi Oda and K. Yokouchi; in Hokkaido, Ichiji Okada, who made important studies on the Mycetophilidæ and other families in the Nematocerous Diptera.

Special acknowledgement is made to Shojiro Kariya, whose early work on the Japanese Tipulidæ was outstanding, and who generously presented me with extensive series of Tipulidæ, chiefly from Honshu and Hokkaido, prior to his going to Manchuria in January, 1935, where he remained until 1945.

In this same decade, materials were received from D. Miyadi, taken in the northern Kurils (Chishima Retto) in 1934. Important series of these flies came from Mr. E. Suenson, of Shanghai, taken at Unzen, in Kyushu, and at Kamikochi in the northern Alps, as well as in eastern China. Particular attention is called to the work of Alexander M. Yankovsky in northern Korea, between 1937 and 1941, briefly discussed by me in another paper.[9] These collections are incomparably the finest series of Tipulidæ ever taken in Korea. In July and August 1940, Doctor Kuwayama and Y. Sugihara secured an interesting series of these flies in the southern Kurils, on the islands of Kunashiri and Etorofu, the results of which will be published by Kuwayama. Dr. J. Linsley Gressitt collected abundant materials in various parts of China and Japan, both before and following World War II. His materials from Formosa and the Ryukyus (Ishigaki and Iriomote, in Yaeyama Retto) are of particular value in this survey.

With the oncoming of the war, all such work and progress ceased abrubtly but following the close of hostilities, friendship and correspondence were resumed with many of the above named colleagues. Among the younger workers of the present decade, particular thanks are due to Syusiro Ito, who while associated with Issiki, has made very important collecting trips to Shikoku and to northern Honshu. Ito has published on the Tipulidæ and still earlier on the Rhopalocera; at present he is undertaking detailed work on the Japanese Trypetidæ. Mr. Eiji Kawase, of Niigata, has made important collections in his vicinity and generously sent his materials to me for study. He is engaged in a study of the biology and distribution of the family. Toshiro Haruta and Hiroshi Inoue collected materials on Mount Takao, near Tokyo, while the latter made large and

[9] Alexander, Charles P. Royal Ent. Soc. London Trans. 95 (1945) 227–228.

valuable collections in the northern Alps in the summer of 1951. Of particular interest and value to the present study is the work of members of the Matsuyama Agricultural College and Shikoku Entomological Society, particularly Professor Tamotsu Ishihara and his colleagues Mutsuo Miyatake and Toshiro Yano, together with further students who are mentioned later in the report. Dr. Siro Kitakami, authority on the Blepharoceridæ, has collected in many parts of Japan and elsewhere in Asia.

With the occupation of Japan and Korea by American troops following the war, it was expected that abundant materials in this family of flies might be collected by such American entomologists. This did not prove to be the case and only small collections have become available from this source, chiefly through the interest of two former students, Dr. Sol Kramer, in Korea, and Major Hanssen Schenker, in Honshu.

A summary of the principal collectors in the various parts of the former Japanese Empire is as follows:

Manchuria—Michael Weymarn and associated Russian entomologists; very large and valuable series, still chiefly unworked.

Korea—Yankovsky; Kitakami; Machida, Masaki, Tabashi, Takeya; Kramer.

Kurils—Miyadi; Kuwayama, Sugihara.

Karafuto—Esaki, Kitakami, Kuwayama, Paul Labbé.

Hokkaido—Esaki, Hori, Issiki, Kitakami, Kuwayama, Matsumura.

Honshu—Esaki, Inoue, Issiki, Ito, Kawase, Kariya, Kato, Kuwana, Oda, Machida, Sakaguchi, Suenson, Takahashi, Takeuchi, Teranishi, Tokunaga, Yamamoto; Hibi, Imanishi, Ishimori, Kitakami, Masaki, Monzen, Mutuura, Nakahara, Okada, Shiraki, Tanaka, Ueno, Yuasa.

Shikoku—Harukawa, Ishihara, Issiki, Ito, Miyatake, Mutuura, Yano; Esaki, Hagimori, Ishimaru, Kobayashi, Koyama, Tomari, Yatsuzuka.

Kyushu—Esaki, Hori, Issiki, Kitakami, Suenson, Yasumatsu; Cho, Fujino, Hashimoto, Takeya, Torikata, Uye.

Ryukyus—Sakaguchi; Gressitt, Issiki.

Formosa—Esaki, Gressitt, Inamura, Issiki, Kitakami, Maa, Maki, Nitobe, Shiraki, Sonan, Takahashi, Takeuchi, Wileman, Yoshino.

Japanese Mandated South Sea Islands (Palau, Caroline and Marianna Groups)—Esaki, Murakami; Fulloway, Swezey, Dybas.

I have never had the privilege of corresponding with Matsumura but many others of the leading entomologists of Japan have been friends and correspondents during the past forty years. A few I have met personally, Nakahara and Yuasa while students in American universities; Esaki, Ishimori and Kuwayama while on visits to America, including Amherst.

In summarizing the past and present work on the Tipulidæ of Japan, attention should be directed to Mr. Shozaburo Yama-

mura, whose life had been discussed by me in an earlier paper.[10] Yamamura was only 21 years of age when he died in Korea (in 1915) yet already had given decided promise of becoming a leading student of the group. Other native students, in addition to Matsumura, who have published important papers on the taxonomy of the group include Ito, Kariya, Masaki, and, especially, Tokunaga. A great amount of work has been accomplished on certain economic species, particularly on the biology and control of *Tipula* (*Yamatotipula*) *aino* Alexander, ranked by Kuwayama as being among the ten leading pests of rice in Japan. Apparently the earliest paper on this pest was one by S. Onuki, published in 1905, while perhaps the latest was the well prepared report on the fly, its ecology and control, in Toyama by H. Sekiya in 1950, its young author dying this same year. Other students who have done work on various phases of the group include Okada, who studied the species occurring in fungi; Kawase, Masaki, and Hiroo Sugawara. It is to be hoped and expected that very important work will be accomplished in the future by the group of brilliant young workers who have already made such excellent beginnings. I would emphasize the great importance of detailed work that is needed on the biology and ecology of virtually all of the Tipulidæ of Japan. Except for the oustanding work by Tokunaga on the marine Tipulidæ, and by other authors on the economic species such as *Tipula aino* and *Nephrotoma virgata*, scarcely anything has been published on this wonderfully interesting fauna. It is certain that some very striking life histories remain to be discovered among the Japanese Tipulidæ. As a basis for such studies, interested students may consult the papers by Tokunaga, or an early report by the present writer.[11] For more advanced students, attention is called to the detailed reports on the tipulid fauna of eastern North America by Dr. J. Speed Rogers, Director of the Museum of Zoology, University of Michigan, Ann Arbor, Michigan, or by Mr. George W. Byers, of the same address, who has done outstanding work on the American species of the genus *Dolichopeza*. Doctor Rogers has found and reared a considerable proportion of the species

[10] Alexander, Charles P. New and little-known Tipulidæ from eastern Asia (Diptera), part I. Philip. Jour. Sci. 31 (1926) 363–383.

[11] Alexander, Charles P. The crane-flies of New York. Part II. Biology and phylogeny. Cornell University (N. Y.) Memoir 38 (1920) 691–1133, *pls. 11–97*.

occurring in eastern North America, including all critical genera and subgenera.

In concluding this brief history of work on the Japanese Tipulidæ two further subjects should be noted. The first concerns certain local lists that have been published that include numerous distribution records that need not be repeated. The second matter concerns the illustrations of the various species that are available in various major publications in Japan.

All of the local lists above mentioned were published in the *Philippine Journal of Science* in connection with descriptions of new species, appearing between 1924 and 1934. These lists include the following stations:

Karafuto and Hokkaido—Philip. Jour. Sci. 24 (1924) 531–534, including the itinerary of Teiso Esaki. Issiki collections 53 (1934) 267.

Honshu—Japanese Alps (Shinano), collections by Machida and Nakamura 44 (1931) 339–340; 51 (1933) 369–370; Shimotsuke, collections by Issiki 53 (1934) 268; Kazusa, materials taken by Bunkichi Oda 53 (1933) 370.

Kyushu—Kirishima collection by Issiki 42 (1930) 507–508; Yakushima, by Issiki 42 (1930) 508.

Formosa—Arisan, Issiki 42 (1930) 508–509; Hassensan, Issiki 43 (1930) 507–509.

The second subject, of illustrations available in Japanese works, concerns, in the first instance, two important works by Matsumura.

Thousand Insects of Japan, 12 volumes; Basic 4, Additamenta 4, Supplementa 4. The volume that concerns the Tipulidæ is Additamenta 2, published in 1916, as already mentioned. In this, Matsumura describes and figures 20 species, of which 18 are considered as being new. The present arrangement of these species is as follows:

Pselliophora hoppo MATSUMURA, l.c., pp. 447–448, *pl. 24, fig. 11* (whole ♂) ..... *Pselliophora.*

Dictenidia horikawæ MATSUMURA, l.c., pp. 449–450, *pl. 24, fig. 12* (whole ♂) ..... *Pselliophora.*
(synonym of *bifascipennis* BRUNETTI, 1911.)

Xiphusa jozana MATSUMURA, l.c., pp. 450–451, *pl. 24, fig. 13* (whole ♀). *Tanyptera.*
(Probably same as *Tanyptera macra* LOEW, in Matsumura 1911).

Ctenophora nohiræ MATSUMURA, l.c., pp. 451–453, *pl. 24, fig. 14* (whole ♂) ..... *Ctenophora.*
(includes *C. hilgendorfi* ENDERLEIN, 1921).

Ctenophora isshikii MATSUMURA, l.c., pp. 453–454, *pl. 24, fig. 15* (whole ♀) ..... *Ctenophora.*

Ctenophora biguttata MATSUMURA, l.c., pp. 454–455, *pl. 24, fig. 16* (whole ♀) *Ctenophora.*

Formotipula holoserica MATSUMURA, l.c., pp. 455–547, *pl. 24, fig. 17* (whole ♂) *Tipula* (*Formotipula*).

Nippotipula nubifera COQUILLETT, l.c., pp. 457–458, *pl. 25, fig. 1* (whole ♀) *Tipula* (*Nippotipula*) *coquilletti* Enderlein.

Platytipula moiwana MATSUMURA, l.c., pp. 458–459, *pl. 25, fig. 2* (whole ♀) *Tipula* (*Tipula*) *moiwana* Matsumura.

Tipula quadrifasciata MATSUMURA, l.c., pp. 459–460, *pl. 25, fig. 3* (whole ♀) *Tipula* (*Oreomyza*) *quadrifasciata* Matsumura.

Yamatotipula nohiræ MATSUMURA, l.c., pp. 460–462, *pl. 25, fig. 4* (whole ♀) *Tipula* (*Yamatotipula*) *nova* Walker.

Daimiotipula daimio MATSUMURA, l.c., pp. 462–464, *pl. 25, fig. 5* (whole ♀) *Pedicia* (*Pedicia*) *daimio* (Matsumura).

Togotipula pulverosa MATSUMURA, l.c., pp. 464–465, *pl. 25, fig. 6* (whole ♀) *Longurio* (*Longurio*) *pulverosa* (Matsumura).

Pachyrhina makiella MATSUMURA, l.c., pp. 465–466, *pl. 25, fig. 7* (whole ♀) *Nephrotoma makliella* (Matsumura).

Libnotes undulatus MATSUMURA, l.c., pp. 467–468, *pl. 25, fig. 8* (whole ♀). *Limonia* (*Libnotes*) *undulata* (Matsumura).

Eriocera morosa OSTEN SACKEN, l.c., p. 468, *pl. 25, fig. 9* (whole ♂). *Hexatoma* (*Eriocera*) *morosa* (Osten Sacken).

Eriocera alboguttata MATSUMURA, l.c., pp. 468–469, *pl. 25, fig. 10* (whole ♀) *Hexatoma* (*Eriocera*) *alboguttata* (Matsumura).

Globericera moriokana MATSUMURA, l.c., pp. 469–471, *pl. 25, fig. 11* (combined figure, body ♀, antennæ ♂). *Hexatoma* (*Eriocera*) *moriokana* (Matsumura).

Gagamba takei MATSUMURA, l.c. ,pp. 471–473, *pl. 25, fig. 12* (whole ♂). *Limnophila* (*Eutonia*) *satsuma* (Westwood).

Ptychoptera scutellaris MATSUMURA, l.c., pp. 473–474, *pl. 25, fig. 13* (whole ♀) *Ptychoptera scutellaris* Matsumura.

Matsumura, among several other books on the insects of Japan, likewise published *6,000 Illustrated Insects of Japan Empire* (6,085 species; 6,768 figures; 10 colored plates; 1,496 pp.; in Japanese).

A further major work published in Japanese but with excellent figures of thousands of insects is by Teiso Esaki and 24 other authors. This is the *Nippon Konchu Zukan* (*Iconographia Insectorum Japonicorum*), the first edition of which appeared in 1932. A second revised edition has now been prepared (1950). The Tipulidæ that are illustrated in the first edition are as follows:

Dolichopeza (*Nesopeza*) *albitibia* (Alexander)
Dolichopeza (*Nesopeza*) *geniculata* (Alexander)
Dolichopeza (*Oropeza*) *candidipes* (Alexander)
Dolichopeza (*Oropeza*) *satsuma* (Alexander)
Pselliophora isshikii (Matsumura)

Tanyptera jozana (Matsumura)
Dictenidia pictipennis fasciata Coquillett
Ctenophora nohiræ Matsumura
Ctenacroscelis mikado (Westwood)
Longurio pulverosa (Matsumura)
Longurio rubriceps Edwards
Nephrotoma virgata (Coquillett)
Nephrotoma sinensis (Edwards)
Nephrotoma cornicina (Linnæus)
Nephrotoma minuticornis (Alexander)
Nephrotoma takeuchii Alexander
Nephrotoma stygia Alexander
Tipula (*Oreomyza*) *quadrifasciata* Matsumura
Tipula (*Indotipula*) *yamata* Alexander
Tipula (*Schummelia*) *nipponensis* Alexander
Tipula (*Yamatotipula*) *aino* Alexander
Tipula (*Yamatotipula*) *latemarginata* Alexander
Tipula (*Oeomyza*) *taikun* Alexander
Tipula (*Acutipula*) *bubo* Alexander
Tipula (*Acutipula*) *kuzuensis* Alexander
Tipula (*Acutipula*) *turbida* Alexander
Tipula (*Yamatotipula*) *nova* Walker
Tipula (*Tipula*) *moiwana* (Matsumura)
Tipula (*Nippotipula*) *coquilletti* Enderlein
Cylindrotoma japonica Alexander
Triogma kuwanai (Alexander)
Liogma serraticornis Alexander
Limonia (*Libnotes*) *nohiræ* Alexander
Limonia (*Metalimnobia*) *annulus truncata* Alexander
Limonia (*Limonia*) *nubeculosa* Meigen (as *subnubeculosa* Alexander)
Limonia (*Limonia*) *neonebulosa* Alexander
Limonia (*Libnotes*) *nigriceps* (van der Wulp)
Limonia (*Limonia*) *tanakai* Alexander
Limonia (*Limonia*) *angustistria* Alexander
Limonia (*Dicranomyia*) *mesosternata* Alexander
Limonia (*Dicranomyia*) *takeuchii* (Alexander)
Limonia (*Dicranomyia*) *immodestoides* (Alexander)
Limonia (*Dicranomyia*) *takahashii* (Alexander)
Limonia (*Rhipidia*) *lecontei* (Alexander), subsp. (as *maculata* Meigen)
Antocha (*Proantocha*) *serricauda* Alexander
Antocha (*Antocha*) *satsuma* Alexander
Helius tenuirostris Alexander
Pedicia (*Pedicia*) *daimio* (Matsumura)
Pedicia (*Tricyphona*) *grandior* (Alexander)
Nipponomyia trispinosa Alexander
Dicranota (*Rhaphidolabis*) *gibbera* (Alexander)
Epiphragma subfascipennis Alexander
Epiphragma subinsignis Alexander
Pseudolimnophila inconcussa (Alexander)
Limnophila (*Limmophila*) *japonica* Alexander
Limnophila (*Eutonia*) *satsuma* (Westwood)

Limnophila (*Elæophila*) *formosa* Alexander
Limnophila (*Elæophila*) *formosa* Alexander
Limnophila (*Prionolabis*) *auribasis* Alexander
Hexatoma (*Eriocera*) *longifurca* (Alexander)
Hexatoma (*Eriocera*) *lygropis* (Alexander)
Hexatoma (*Eriocera*) *moriokana* (Enderlein)
Elephantomyia (*Elephantomyia*) *hokkaidensis* Alexander
Conosia irrorata (Wiedemann)
Dasymallomyia signata Brunetti
Atarba (*Atarbodes*) *pallidicornis* Edwards
Gymnastes flavitibia (Alexander)
Gymnastes shirakii Alexander (apparently in error)
Ormosia takeuchii Alexander
Ormosia tokionis Alexander
Erioptera (*Psiloconopa*) *asiatica* Alexander
Erioptera (*Psiloconopa*) *asymmetrica* Alexander
Erioptera (*Symplecta*) *hybrida* (Meigen)
Gonomyia (*Idiocera*) *subpruinosa* Alexander
Ptychoptera japonica Alexander

THE ISLAND OF SHIKOKU

Shikoku is the smallest of the four major Japanese islands, totalling about 7,000 square miles. The land is mostly of low relief, with only about one-quarter of the area exceeding

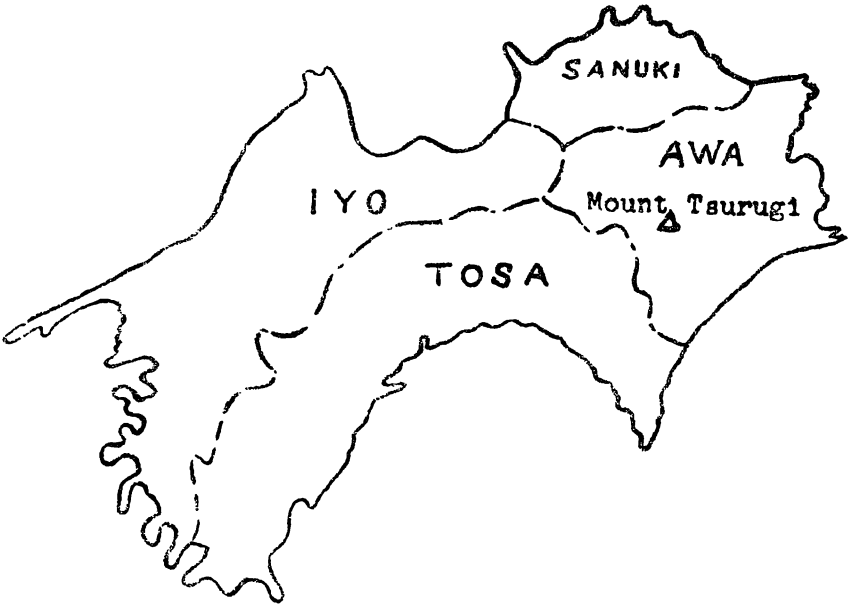

FIG. 1. Outline map of Shikoku, showing the four provinces.

800 meters. The mountains are mainly of crystalline schists, with two summits exceeding 1,950 meters (Ishizuchi, in Iyo, 1,981 meters; Tsurugi, in Awa, 1,955 meters). According to Lyde [12] this mountain fold is a direct continuation of the Nan-shan (Himalayas) while the more northern or Chugoko fold, in northwestern Honshu, with marginal cones such as Daisen, Dogo and Azuma, is a continuation of the Tsin-ling (Kun-lun). This may explain in part certain peculiarities of the crane-fly fauna that are beginning to appear as detailed collections come to hand. Shikoku lies just south of the western peninsula of Honshu, being separated therefrom by the narrow Seto Naikai (Inland Sea).

As regards its crane-fly fauna, Shikoku until very recently had been the least known of the major Japanese islands. The earliest materials in this group were taken by Harukawa in August, 1925, chiefly on Mount Ishizuchi, and included one or two species that have not yet been rediscovered. In May and June, 1950, Issiki and Ito made a very important collection of crane-flies, chiefly centering around these two highest mountains, Ishizuchi and Tsurugi, as shown by the itinerary added later. In 1951, Issiki, Ito, and Mutuura returned to

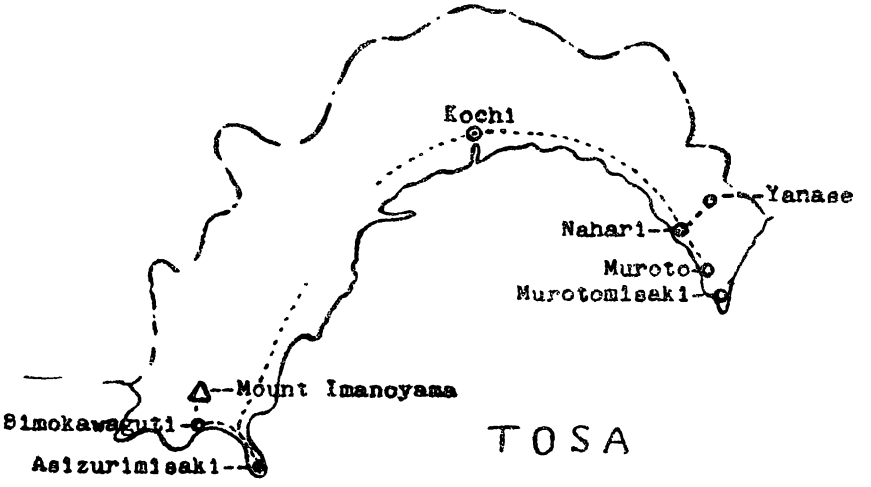

FIG. 2. Outline map of Province of Tosa, showing the route of the Issiki-Ito-Muturra 1951 Expedition.

Shikoku, collecting in Tosa Province from May 1 to 13. Particular attention was devoted to Mount Imanoyama in southern Tosa, where for some years preceding Issiki had suspected

[12] Lyde, Lionel W. The continent of Asia. N. Y., Macmillan (1933) i-xxii, 1-777 pp., 143 figs.

certain peculiarities of the insect fauna, since while the mountain is of low altitude (865 meters) it is situated on the southwestern peninsula of the island and isolated from the major mountains to the north. It is covered with a dense forest of broad-leaved hardwoods which were not destroyed in the recent war. Issiki found peculiarities in the Micropterygidæ (Lepidoptera) and in the Panorpidæ (Mecoptera), groups in which he had made special studies. In the Tipulidæ, a few species were taken only on and near this mountain but at this early date it is inadvisable to make any further generalizations. On this same trip, materials were taken in southeastern Tosa, particularly in the vicinity of Yanase, where some further interesting species were taken. The itinerary of the 1951 trip is shown on the sketch map provided by Professor Ito.

COLLECTIONS OF SYUTI ISSIKI AND SYUSIRO ITO

May 29 to June 11, 1950

Date	Provi	Localities
May 29	*Awa* (Mount Tsurugi and vicinity)	Kawati, on Mount Tsurugi, 400 meters
May 30		Kawati to Minokosi, 1,400 meters
May 31		Mount Tsurugi, 1,400 to 1,955 meters
June 1		Minokosi (1,400) to Nagoro (900 meters)
June 2		Nagoro, 900 meters
June 3		Nagoro to Sugeoi
June 4		Sugeoi
June 5		Otiai
June 6		Kyozyo
June 7	*Iyo* (Mount Ishizuchi and vicinity)	Koguti, 300 meters
June 8		Koguti to Mount Ishizuchi 1,400 meters
June 9		Mount Ishizuchi, 1,400 to 1,981 meters
June 10		Mount Ishizuchi, 1,400 meters
June 11		Mount Ishizuchi (1,400) to Koguti (300 meters)

COLLECTIONS OF SYUTI ISSIKI, SYUSIRO ITO AND AKIRA MUTUURA

May 1–13, 1951

(All in the Province of Tosa)

Date	Locality	Altitudes
May 1	Nahari	
May 2	Totidani, near Yanase	300 to 400 meters

Date	Locality	Altitudes
May 3	Nisigawa, near Yanase	700 to 1,000 meters
May 4	Nisigawa to Kokusen, near Yanase	500 to 700 meters
May 5	Kokusen, near Yanase	500 meters
May 6	Murotomisaki	
May 7	Muroto	
May 10	Asizuri-misaki, Simokawaguti	
May 11	Iwai, near Imanoyama	100 to 200 meters
May 12	Mount Imanoyama	200 to 865 meters
May 13	Iwai, near Imanoyama	200 to 100 meters

A further major addition to our record of Shikoku Tipulidæ was received from Professor Tamotsu Ishihara, of the Matsuyama Agricultural College, based on collections made by himself and other staff members and students, particularly Professor Mutsuo Miyatake and Yoshiro Yano. Most of these specimens were taken in Iyo and chiefly in the vicinity of Matsuyama but with important materials from the mountains and mountain passes south and southeast of Matsuyama. A sketch map supplied by Ishihara showing the relative positions of the more important stations is reproduced herewith.

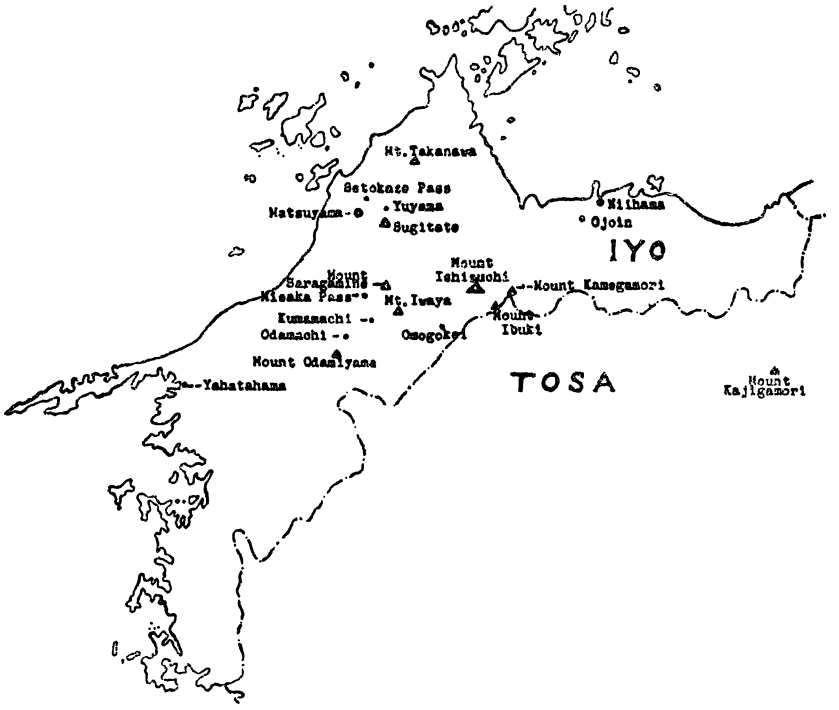

FIG. 3. Outline map of Province of Iyo, showing the more important stations of Ishihara and co-workers.

SUMMARY OF STATIONS IN SHIKOKU INCLUDED IN THE PRESENT REPORT

Station	Province	Altitudes (in meters)	Collector
Asizuri-misaki	Tosa	sea-level	Issiki-Ito
Ibuki (Mount)	Iyo	1,503	Ishihara et al.
Imanoyama (Mount)	Tosa	200 to 865	Issiki-Ito
Ishizuchi (Mount)	Iyo	1,400 to 1,980	Issiki-Ito, Ishihara et al.
Iwai	Tosa	100 to 200	Issiki-Ito
Iwaya (Mount)	Iyo	600	Ishihara et al.
Iwazeki, near Matsuyama	Iyo		Ishihara et al.
Kajigamori (Mount)	Tosa	1,400	Ishihara et al.
Kawati (Tsurugi)	Awa	400	Issiki-Ito
Koguti (Ishizuchi)	Iyo	300	Issiki-Ito
Kokusen, near Yanase	Tosa	500	Issiki-Ito
Koti (Kochi)	Tosa		Issiki-Ito
Kyozyo (Tsurugi)	Awa		Issiki-Ito
Minokosi (Tsurugi)	Awa	1,400	Issiki-Ito
Misaka-toge (pass)	Iyo	716	Ishihara et al.
Muroto	Tosa		Issiki-Ito
Muroto-misaki	Tosa	sea-level	Issiki-Ito
Nagoro (Tsurugi)	Awa	900	Issiki-Ito
Nahari	Tosa		Issiki-Ito
Nisigawa, near Yanase	Tosa	700 to 1,000	Issiki-Ito
Odamachi-mura	Iyo		Ishihara et al.
Odamiyama	Iyo		Ishihara et al.
Ojoin, near Niihama	Iyo		Ishihara et al.
Omogokei (valley)	Iyo		Ishihara et al.
Otiai (Tsurugi)	Awa		Issiki-Ito
Saragamine (Mount)	Iyo	1,271	Ishihara et al.
Setokaze-toge (pass)	Iyo	212	Ishihara et al.
Simokawaguti	Tosa	sea-level	Issiki-Ito
Sugeoi (Tsurugi)	Awa		Issiki-Ito
Sugitate	Iyo		Ishihara et al.
Takanawa (Mount)	Iyo	986	Ishihara et al.
Totidane, near Yanase	Tosa	300 to 400	Issiki-Ito
Tsurugi (Turugi) Mount	Awa	1,400 to 1,955	Issiki-Ito
Yanase	Tosa	400	Issiki-Ito
Yuyama	Iyo		Ishihara et al.

My sincere thanks are due to Messrs. Esaki, Harukawa, Ishihara, Issiki, Ito, Miyatake, Mutuura, Yano, and others, who have made such an excellent start on the list of the Tipulidæ of Shikoku. From being the least known of the Japanese islands, this bids fair to becoming the best known and supporting one of the richest faunas.

RECORDS OF DISTRIBUTION

TIPULINÆ

1. LONGURIO (LONGURIO) PULVEROSA (Matsumura).

Togotipula pulverosa MATSUMURA, Thous. Ins. Japan Addit. 2 (1916) 464–465, *pl. 25, fig. 6* (whole ♀).

Longurio pulverosa ALEXANDER, Philip. Jour. Sci. 43 (1940) 382.

Longurio pulverosa ESAKI, et al., Icon. Insect, Japan. Ed. 2 (1950) 1513, *fig.*

Originally described from Kyoto, Honshu, collected by Nohira. Widespread in the major Japanese islands.

AWA: Kawati, altitude 400 meters, May 29, 1950 (*Issiki-Ito*).

IYO: Omogo, July 25, 1947 (*Takashi Kobayashi*).

TOSA: Asizuri-misaki, May 10, 1950 (*Issiki-Ito*); Iwai, Mount Imanoyama, altitude 200 meters, May 13, 1951 (*Issiki-Ito*).

Shikoku, without exact data, July 4, 1926 (*Issiki*).

2. LONGURIO (LONGURIO) YANOI sp. nov. **Plate 1, figs. 1, 3.**

General coloration of head and thorax orange, unpatterned; femora brownish yellow, clearer basally, the tips blackened; wings brownish yellow, the prearcular field and cell Sc yellow; stigma dark brown, very conspicuous; wing tip narrowly but conspicuously brown, extending from the stigma to beyond Cu; abdomen orange, the basal rings of the tergites slightly more pruinose; segments eight and nine black; male hypopygium with the beak of the inner dististyle relatively stout, spines of the style three or four in number.

Male.—Length, about 18 millimeters; wing, 17; antennæ, about 1.3.

Frontal prolongation of head yellow; palpi brown. Antennæ shorter than the palpi; scape and pedicel yellow, flagellum brown; first flagellar segment enlarged and partially united into a fusion-segment. Head orange.

Thorax uniformly orange, unpatterned. Halteres yellow. Legs with the coxæ and trochanters orange; femora brownish yellow, clearer basally, the tips blackened; tibiæ brown basally (remainder of all legs broken). Wings (Plate 1, fig. 1) brownish yellow, the prearcular field and cell Sc yellow, cell C more infuscated, especially on basal portions; stigma dark brown, very conspicuous; wing tip narrowly but conspicuously brown, extending from the stigma to beyond vein Cu, darkest and broadest at and near the apex; narrow to scarcely indicated dark seams over the cord and outer end of cell first M_2;

veins brown, Sc and the prearcular veins yellow. Venation: Rs arcuated, slightly longer than R_{2+3}; m-cu about one-sixth its length beyond the base of vein M_4.

Abdomen elongate, orange, the basal rings of the tergites slightly more pruinose; segments eight and nine, including the remainder of hypopygium black. Male hypopygium (Plate 1, fig. 3) with the beak of the inner dististyle, *d*, relatively stout; spines on face of style variable in number, in the unique type there being four spines on one side, three on the other.

Habitat.—Japan (Shikoku).

Holotype, male, Omogokei, Iyo, July 24, 1947 (*Kazuo Ishimaru*).

This interesting crane-fly is named for Mr. Yoshiro Yano, who has added several species of these flies to the Shikoku list. It is very different from the only other regional described member of the genus, *Longurio* (*Longurio*) *pulverosa* (Matsumura), especially in the coloration of the body and the very different male hypopygium. In its general appearance it is more like *L.* (*L.*) *fulvus* Edwards, of Formosa and eastern China, differing in the coloration of the body and wings, and in the details of structure of the male hypopygium.

3. CTENACROSCELIS MIKADO (Westwood).

Tipula mikado WESTWOOD, Ent. Soc. London. Trans. (1876) 504.
Ctenacroscelis mikado ALEXANDER, Philip. Jour. Sci. 43 (1940) 382.
Ctenacroscelis mikado ESAKI, et al., Icon. Insect. Japon. Ed. 2 (1950) 1531, *fig.*

IYO: Dogo, Matsuyama, July 30, 1948 (*Yano*); Mount Saragamine, altitude 1,271 meters, July 22, 1949 (*Ishihara*), August 17, 1950 (*Miyatake*); Mount Ishizuchi, altitude 800 meters, August 10, 1925 (*Harukawa*).

TOSA: Iwai, Mount Imanoyama, altitude 200 meters, May 13, 1951 (*Issiki-Ito*).

4. CTENOPHORA ISHIHARAI sp. nov.

Allied to *nohiræ;* flagellar branches of male shorter, the longest approximately two and one-half times as long as the segment; posterior tibia of both sexes slender and unmodified; male hypopygium on either side with a pencil of very long setæ, these hanging pendant.

Male.—Length, about 16 millimeters; wing, 14.5; antenna, about 7.

Female.—Length, about 22 millimeters; wing, 17.

Male.—Frontal prolongation of head, with the front, yellow; palpi black. Antennæ with the scape obscure yellow beneath,

the remainder brownish black to black; first flagellar segment produced into a triangular tooth beyond midlength of lower face; longest branch approximately two and one-half times the segment. Head above black, the genæ yellow.

Thorax black; dorsopleural membrane conspicuously yellow. Halteres obscure yellow, the knobs weakly more brownish yellow. Legs with the fore and middle coxæ yellow, narrowly lined with blackish on anterior face of basal half, posterior coxæ black; trochanters orange yellow; femora orange yellow, the tips broadly blackened, on the posterior legs including about the outer fourth; fore and middle tibiæ brownish yellow, the tips narrowly brownish black; tarsi black, the basitarsi more brightened at proximal end; posterior tibiæ yellow basally and on posterior half, alternating with black rings before midlength and at apex, the latter narrowest; no modified swollen area on posterior tibia of male, the condition being essentially as in the female. Wings with the base and stigmal region light yellow, the remainder of ground color grayish, including the posterior border and apex; a very broad blackened band before the cord and a smaller area at and beyond this, extending posteriorly to include the outer half of cell 1st M_2 and the bases of cells M_1 and 2nd M_2, the two darkened areas separated by a narrow pale yellow band at and before the cord, this being a posterior continuation of the more brightly colored stigma; veins brown, more yellowed in the brightened fields. Venation: Rs long, subequal to the distal section of R_{4+5}; cell M_1 broadly sessile.

Abdomen with the first tergite black, with a yellow spot on either side at base; second tergite chiefly yellow, its apical fourth black; segments three and four black, fifth and sixth chiefly orange; outer segments, including the hypopygium, black; sternites with the second segment yellow, the third and base of fourth black; remainder of fourth and all of fifth and sixth orange, the remainder black. Male hypopygium large and massive, with a pencil of very long setæ on either side, hanging pendant, this apparently lacking in *nohiræ*. Due to the condition of the unique type male I do not consider it advisable to dissect and mount the hypopygium for more detailed study.

Female.—Generally as in the male, differing in the sexual characters and in details of coloration. Frontal prolongation of head blackened, the remainder of head chiefly black, the pale color reduced. Antennæ black throughout; flagellar segments

simple, their lower faces slightly to scarcely produced. Abdomen with fourth and fifth segments broadly blackened basally, their outer ends orange. Ovipositor with the basal shield black; cerci relatively short and straight, dark reddish horn color.

Habitat.—Japan (Shikoku).

Holotype, male, Mount Ishizuchi, Iyo, July 26, 1947 (*Miyatake*). Allotopotype, female, July 25, 1947 (*Ishihara*).

I take unusual pleasure in naming this distinct fly for Professor Tamotsu Ishihara, authority on the Hemiptera of Japan and Formosa. The species is closest to *Ctenophora nohiræ* Matsumura, being quite distinct in the unmodified posterior tibiæ of the male and in other characters diagnosed above. The genus *Cnemoncosis* Enderlein[13] was proposed for the supposed new species, *C. hilgendorfi* Enderlein, from an unknown locality in Japan. The genus was differentiated from *Pselliophora* solely by the presence of a large swelling or enlargement on the basal half of the posterior tibia of the male. In the light of the discovery of the present fly it seems obvious that there is no sufficient basis for separating the genus from *Ctenophora* Meigen or maintaining the species *hilgendorfi* as distinct from the earlier *nohiræ* Matsumura. As regards the use of strictly sexual characters for the differentiation of genera and subgenera in this group of Tipulidæ, attention should be called to *Ctenophora tricolor* Loew, of eastern Siberia, which shows an even more striking enlargement of the posterior femur in the male yet for which no generic or subgeneric term has ever been deemed necessary.

5. DICTENIDIA PICTIPENNIS FASCIATA Coquillett.

Dictenidia fasciata COQUILLETT, U.S. Nat. Mus. Proc. 21 (1898) 304.

Ctenophora pictipennis PORTSCHINSKY, Horae Soc. Entomol. Ross. 21 (1887) 3, *pl. 1, fig. 1* (typical form of species).

Dictenidia pictipennis fasciata ALEXANDER, Philip. Jour. Sci. 60 (1936) 170.

Dictenidia fasciata ESAKI, et al., Icon. Insect. Japon. Ed. 2 (1950) 1530, *fig.; pl. 15, fig. iii* (color).

AWA: Kyozyo, June 6, 1950 (*Issiki-Ito*); Otiai, June 5, 1950 (*Issiki-Ito*); Nagoro to Sugeoi, June 3, 1950 (*Issiki-Ito*); Sugeoi, June 4, 1950 (*Issiki-Ito*).

IYO: Matsuyama, April 19, 1949 (*Miyatake*); Mount Saragamine, altitude 1,271 meters, May 23, 1950 (*Miyatake*).

TOSA: Mount Kajigamori, altitude 1,400 meters, May 20, 1951 (*Miyatake*).

[13] Enderlein, Günther. Zool. Anzeiger 52 (1921) 219–232.

6. DICTENIDIA MIYATAKEI sp. nov. **Plate 1, fig. 2.**

General coloration of head and thorax black; abdomen black, with segments two to four inclusive chiefly orange; femora yellow, the tips blackened, on the posterior legs including about the outer fourth; tibia with about the central half yellow, the base narrowly, the apex more broadly blackened; wings with the restricted prearcular field yellow, followed by a very broad blackened band that extends distad to the level of the stigma or shortly beyond the cord, the outer end of the wing hyaline with a scarcely indicated darkening in extreme outer ends of cells R_3 to M_1, inclusive; no macrotrichia in outer wing cells; cell M_1 nearly twice its petiole.

Male.—Length, about 13 millimeters; wing, 12; antenna, about 5.

Frontal prolongation of head black, nasus stout; palpi with basal segments pale, the terminal one abruptly blackened. Antennæ black, the apices of the proximal seven or eight flagellar segments narrowly yellow, the branches black; branches relatively long and conspicuous, the longest nearly three times the segment; branches not greatly unequal, the outer one being about seven-eighths the basal one and more slender. Head black.

Thorax black, the surface polished. Halteres blackened. Legs with the coxæ black, sparsely dusted with brown pollen; trochanters dark, obscure brownish yellow at tips; femora yellow, the tips blackened, on the posterior legs including about the outer fourth; tibia with about the central half yellow, the base narrowly, the apex more broadly blackened; tarsi black. Wings (Plate 1, fig. 2) with the restricted prearcular field, including the veins, yellow, followed by a very broad blackened band that extends distad to the level of the stigma or shortly beyond the cord; certain of the cells with pale central streaks; wing beyond the darkened band hyaline, involving nearly the outer third of wing, with a very narrow darkening in extreme outer ends of cells R_3 to M_1, inclusive; stigma oval, slightly darker than the blackened band; veins dark brown. No macrotrichia in outer wing cells. Venation: R_8 very long, exceeding R_3; cell M_1 nearly twice its petiole.

Abdomen with the basal segment black, narrowly pale basally; tergite two orange yellow, the apex darkened; tergite three similar, the darkened band subapical, the extreme apex yellowed; tergite four brownish orange, the apex narrowly yellow;

sternites two and three obscure orange; fifth and succeeding segments, including the hypopygium, black.

Habitat.—Japan (Shikoku).

Holotype, male, Mount Ishizuchi, Iyo, July 28, 1951 (*Miyatake*).

This distinct species is named for Professor Mutsuo Miyatake who has added materially to our knowledge of the Tipulidæ of Shikoku. The fly is quite distinct from the only species known from the main islands of Japan, *Dictenidia pictipennis* Portschinsky, and its subspecies *fasciata* Coquillett, differing in the pattern of the body, legs and wings, and in the lack of macrotrichia in the outer wing cells. In this latter regard it is closer to the extralimital *D. glabrata* Alexander and *D. inæquipectinata* Alexander, which are quite different in coloration and in details of structure.

7. TANYPTERA JOZANA JOZANA (Matsumura).

Xiphusa jozana MATSUMURA, Thous. Ins. Japan Addit. 2 (1916) 450–451, *pl. 24, fig. 13* (whole ♀).

Tanyptera jozana ALEXANDER, Philip. Jour. Sci. 60 (1936) 174.

Mesodictenidia macræformis MATSUMURA, 6,000 Illus. Ins. Japan Empire (1931) 395, *fig.* (whole ♂).

Tanyptera jozana ESAKI, et al., Icon. Insect. Japon. Ed. 2 (1950) 1530, *fig.*

AWA: Mount Tsurugi, Kawati to Minokosi, 1,400 meters, May 30, 1950 (*Issiki-Ito*).

In the second Matsumura reference above cited, the supposed new genus and species, *Mesodictenidia macræformis* was proposed. I am greatly indebted to Doctor Kuwayama for translating this description from the Japanese and for making an examination of the type specimen, preserved in Sapporo. This translation is as follows:

"Seguro-kushihige-gaganbo—(257). Body polished black; maxillary palpi and antennae yellow, excepting the basal part of the latter which is blackish. Anterior margin and lateral stripes of notum and the lateral borders of the scutellum yellow. Wings hyaline, faintly tinged with yellow. Abdomen and halteres yellow, the dorsal stripe of the former being dark brown. Legs yellow, the half of the apical part of the hind tibia light colored. Length circa 17 millimeters. Common in the vicinity of Sapporo.

Distribution—Hokkaido."

Under date of June 20, 1939, Dr. Kuwayama supplied me with a very carefully executed figure of about the fifth flagellar segment of the antenna of the type, this showing a perfectly normal *Tanyptera*, evidently of the present species.

7a. **TANYPTRA JOZANA FUMIBASIS** Alexander.

Tanyptera jozana fumibasis ALEXANDER, Ann. and Mag. Nat. Hist. (9) 15 (1925) 392.

IYO: Mount Takanawa, April 29, 1948 (*Takashi Kobayashi*); Yuyama, May 9, 1948 (*Miyatake*).

8. **TIPULA (NIPPOTIPULA) COQUILLETTI** Enderlein.

Tipula nubifera COQUILLETT, U. S. Nat. Mus. Proc. 21 (1898) 305–306.

Tipula coquilletti ENDERLEIN, Zool. Jahrb., Syst. 32 (1912) 7.

Nippotipula nubifera MATSUMURA, Thous. Ins. Japan Addit. 2 (1916) 457–458, *pl. 25, fig. 1* (whole ♀).

Tipula (*Nippotipula*) *coquilletti* ALEXANDER, Philip. Jour. Sci. 57 (1935) 92.

Tipula coquilletti ESAKI, et al., Icon. Insect. Japon. Ed. 2 (1950) 1537, *fig.*

IYO: Kuma, May 22, 1949 (*Takashi Kobayashi*); Matsuyama, April 21, 1951 (*Miyatake*), October 11, 1948, at light trap (*Ishihara-Miyatake*); Odamachi-mura, Kamiukeana-gun, May 1, 1945 (*Akio Yatsuzuka*); Sugitate, May 24, 1947 (*Miyatake*).

TOSA: Nisigawa, near Yanase, altitude 700 to 1,000 meters, May 3, 1951 (*Issiki-Ito*).

9. **TIPULA (TRICHOTIPULA) POLITONIGRA** sp. nov. Plate 1, fig. 4.

General coloration of head and thoracic pleura gray, the præscutum and scutal lobes polished black; antennæ black throughout; wings weakly brownish yellow, stigma dark brown; abundant macrotrichia in cells beyond cord; vein R_{1+2} atrophied; basal abdominal sternites more or less yellowed, the outer segments blackened; male hypopygium with the gonapophysis appearing as a broadly flattened dark-colored blade, its stem very short.

Male.—Length, about 9.5 to 10 millimeters; wing, 11.5 to 12; antenna, about 4 to 4.5.

Frontal prolongation of head gray; nasus elongate; palpi black. Antennæ (male) of moderate length, approximately one-third as long as wing, black throughout; flagellar segments very vaguely to scarcely incised, subcylindrical, considerably longer than their verticils. Head light gray, with a very poorly indicated capillary darker median line; no vertical tubercle; anterior vertex very broad, approximately five times the diameter of scape.

Pronotum obscure yellow medially, dark gray in front and on sides. Mesonotal præscutum and scutal lobes entirely polished black, the median region of scutum restrictedly obscure yellow; scutellum somewhat less intensely black, para-

scutella brownish black; postnotum and pleura gray pruinose; dorsopleural membrane light yellow. Halteres yellow, the knobs more saturated yellow. Legs with the coxæ light gray pruinose; trochanters yellow; femora yellow, the tips broadly black, including about the outer fourth of the fore pair, and outer fifth of posterior femora; tibiæ and tarsi black; claws (male) simple. Wings weaky tinged with brownish yellow, the prearcular field and cell Sc clearer yellow, cell C a trifle darker; a vague and narrow darkening around the apical wing margin; stigma oval, dark brown; a restricted brown seam on outer side of anterior cord in cells R_3 and R_5; veins and macrotrichia dark brown, the prearcular veins and Sc yellowed. Abundant macrotrichia in cells beyond cord and in the outer ends of cells R, Cu, first A and second A, the other cells of basal half of wing glabrous. Venation: Sc_2 ending about opposite three-fourths the length of Rs; R_{1+3} atrophied; petiole of cell M_1 about three times m; m-cu oblique, subequal in length to or a trifle shorter than Rs.

First abdominal segment dark brown, the second tergite chiefly yellow, darkened medially on posterior ring; tergites three to five dark brown, the lateral borders broadly, the posterior margins narrowly yellow; outer segments more extensively blackened, with narrow yellow margins; basal sternites yellow, the outer segments brownish black, four to seven, inclusive, with narrow yellow posterior borders; hypopygium black. Male hypopygium (Plate 1, fig. 4) with the ninth tergite, *9t*, transverse, produced into two very low black lobes, the surface of which is microscopically roughened; lobes separated by a very small U-shaped notch. Outer dististyle, *d*, appearing as a slender clavate blade. Inner dististyle small and compact, the beak blunt, heavily blackened, the lower beak lacking; across face of style with a serrated blackened flange; base of style with an obtuse flattened lobe or blade. Ædeagus, *a*, small and simple, yellow, the apex narrowed to a slender point. Gonapophysis, *g*, appearing as a very broadly flattened dark-colored blade, subcircular in outline, its greatest width being nearly equal to the length, the stem very short.

Habitat.—Japan (Honshu, Shikoku).

Holotype, male, Mount Tsurugi, Awa, Shikoku, altitude 1,400 to 1,955 meters, May 31, 1950 (*Issiki-Ito*). Paratopotype, male. Paratypes, ♂, Nisigawa to Yanase, Tosa, Shikoku, altitude 600 meters, May 4, 1951 (*Issiki-Ito*); ♂, Kuroyu, Akita, Honshu, altitude 850 meters, June 14, 1951 (*Issiki-Ito*).

Tipula (*Trichotipula*) *politonigra* is the first species of the subgenus to be found in the main islands of Japan. It is entirely different in coloration and structure from the various species known from Formosa and China, including *T.* (*T.*) *haplotricha* Alexander, *T.* (*T.*) *longifimbriata* Alexander, *T.* (*T.*) *mallophora* Alexander, and *T.* (*T.*) *polytricha* Alexander, the intensely blackened and polished thoracic dorsum being particularly conspicuous and distinctive.

10. TIPULA (SCHUMMELIA) JOCOSIPENNIS Alexander.

Tipula jocosipennis ALEXANDER, Philip. Jour. Sci. 51 (1933) 374–376, *pl. 1, fig. 4* (venation), *pl. 2, fig. 28* (♂ hypopygium).

Tipula (*Schummelia*) *jocosipennis* ALEXANDER, Philip. Jour. Sci. 57 (1935) 102.

IYO: Koguti to Mount Ishizuchi, altitude 1,400 meters, June 8, 1950 (*Issiki-Ito*); Mount Ishizuchi, altitude 1,400 to 1,980 meters, June 9 to 10, 1950 (*Issiki-Ito*).

11. TIPULA (SCHUMMELIA) MACROTRICHIATA Alexander.

Tipula macrotrichiata ALEXANDER, Ent. Soc. America Ann. 17 (1924) 443–444.

Tipula (*Schummelia*) *macrotrichiata* ALEXANDER, Philip. Jour. Sci. 57 (1935) 102.

IYO: Koguti to Mount Ishizuchi, altitude 1,400 meters, June 8, 1950 (*Issiki-Ito*).

12. TIPULA (YAMATOTIPULA) TSURUGIANA sp. nov. **Plate 1, fig. 6.**

Belongs to the *iroquois* group; general coloration of head and thorax light gray, the præscutum with three slightly darker stripes that are narrowly bordered by brown; nasus lacking; antennæ black, pedicel obscure brownish yellow; halteres yellow; legs black, with about the proximal half of the femora yellowed; wings subhyaline, restrictedly patterned with brown, including the tips; basal abdominal tergites chiefly yellow, the third and succeeding ones dark brown with broad yellow lateral borders; male hypopygium black; tergite at apex produced into two slightly decurved blades; outer dististyle elongate; gonapophysis short-stemmed, the darkened apical blade subcircular in outline.

Male.—Length, about 13 millimeters; wing, 14; antenna, about 5.

Frontal prolongation of head elongate, sloping gradually to the vertex, black, heavily pruinose basally, less so at the apex; nasus lacking; palpi black. Antennæ moderately long; scape black, sparsely pruinose, pedicel obscure brownish yellow, flagellum black; flagellar segments very vaguely incised, the basal enlargement being scarcely indicated; verticils shorter

than the segments. Head gray, lighter on the orbits; vertical tubercle scarcely developed.

Pronotum gray. Mesonotum light gray, the præscutum with three slightly darker gray stripes that are narrowly bordered by brown, the latter obsolete or virtually so on anterior third of median stripe; very vague indications of a dark dividing line on central stripe, this obsolete in front; pseudosutural foveæ very small, comma-shaped, black; scutal lobes with similar darker brownish gray centers. Pleura and pleurotergite clear light gray; dorsopleural membrane yellow. Halteres yellow. Legs with all coxæ light gray; trochanters yellow; femora yellow basally, with about the outer half brownish black; tibiæ and tarsi brownish black to black; claws (male) with small basal tooth. Wings subhyaline, the prearcular and costal fields light yellow, especially the former; stigma oval, dark brown; wing tip narrowly but distinctly dark brown; vague dark clouds over the anterior cord and along more than the outer half of vein Cu; veins dark brown, yellow in the flavous portions. Veins beyond cord with abundant trichia; about three scattered trichia in distal end of cell R_5. Venation: A faint spur of vein Sc_1 far before end of Sc_2; Rs about twice m-cu; R_{1+2} preserved; petiole of cell M_1 more than one-half longer than m; m-cu relatively long, at fork of M_{3+4}.

First abdominal tergite gray, yellow laterally; second tergite chiefly yellow, darker subterminally, the lateral borders broadly yellow; third and succeeding tergites dark brown, the lateral borders broadly yellow, the posterior margins very narrowly so; basal sternites pale yellow; outer segments, including hypopygium, black. Male hypopygium (Plate 1, fig. 6) with the suture between the tergite and sternite complete; basistyle and sternite fused the apex of the former extended caudad beyond the level of the tergite or sternite, with the dististyles at apex. Ventral region of ninth sternite, *9s*, extensive, separated from the basistyle by a distinct notch, its lower angle produced ventrad into a low lobe that is provided with short black setæ. Ninth tergite, *9t*, black, extensive, the apex rounded, its central portion produced into an obscure yellow lobe that divides into two deep, slightly decurved points or blades. Outer dististyle, *d*, unusually long and slender, gradually narrowed to the obtuse tip. Inner dististyle, *d*, subquadrate in its general outline, the beak short and stout; outer margin of style a conspicuously blackened blade; face of style bearing a strong acute spine. Gonapophysis, *g*, short-stemmed, the dark colored

blades subcircular or short-oval in outline. Eighth sternite unarmed.

Habitat.—Japan (Shikoku).

Holotype, male, Mount Tsurugi, Awa, altitude 1,400 to 1,955 meters, May 31, 1950 (*Issiki-Ito*).

The closest described relative is *Tipula* (*Yamatotipula*) *sempiterna* Alexander, of the Japanese Alps, Honshu, which is quite distinct in the structure of the male hypopygium, particularly the ninth tergite, both dististyles, and the blade of the gonapophysis. Even closer is the fly next described as *T.* (*Y.*) *misakana* sp. nov., which is compared with this species at that point. As has been indicated earlier, the flies of the present group seem to be most nearly allied to a small aggregation of forms in eastern North America that center about *T.* (*Y.*) *iroquois* Alexander, including about half a dozen species, most of which are restricted to the southern Appalachian mountains, as *T.* (*Y.*) *brevifurcata* Alexander, *T.* (*Y.*) *catawbiana* Alexander, and *T.* (*Y.*) *nephophila* Alexander. It seems probable that these included forms were more wide-spread in past ages and that their present concentration in the southeastern United States results from the action of glaciers during the recent Wisconsin Ice Age. All members of the group live close to small mountain streams and, where known, have an aquatic larva. The Japanese members of the *iroquois* group may have similar habits and habitats.

13. TIPULA (YAMATOTIPULA) MISABANA sp. nov. Plate 1, fig. 7.

Belongs to the *iroquois* group, allied to *tsurugiana;* general coloration gray, the præscutum with four scarcely differentiated darker stripes that are separated by narrow darker lines; antennæ black, the pedicel reddish brown; nasus lacking; legs black, the femoral bases extensively brown, including about the proximal third on the fore femora, more extensive on the other legs; wings weakly tinged with brown, patterned with darker, including the apex; basal abdominal segments light brown, darker posteriorly; outer segments, including the hypopygium, black; male hypopygium with the tergite produced into two slightly divergent blades, without teeth; ninth sternite at base of median notch with a pair of rounded hairy lobes; outer dististyle long and narrow; inner dististyle with the beak elongate, the outer basal lobe developed into a powerful outwardly-directed lobe that terminates in a stout blackened spinous point; blade of gonapophysis darkened.

Male.—Length, about 14 millimeters; wing, 15.5; antenna, about 5.8.

Frontal prolongation of head elongate, without nasus, approximately equal to the remainder of head, light gray; prolongation merging gradually with the remainder of front without a marked angle; palpi dark brown. Antennæ (male) relatively long, black, scape sparsely pruinose; pedicel reddish brown; flagellar segments weakly incised, the intermediate ones longer than the verticils. Head gray; anterior vertex broad, without a distinct tubercle.

Pronotum light gray. Mesonotum gray, the præscutum with three narrow darker lines representing interspaces between four scarcely differentiated stripes; centers of scutal lobes weakly darkened, vaguely ringed with darker. Pleura clear light gray, the restricted dorsopleural membrane and pretergites more yellowed. Halteres with stem brownish yellow, knob more infuscated. Legs with all coxæ light gray; trochanters yellow; femora brown, passing into black, the latter color more extensive on the fore legs where about the outer two-thirds are included, narrower on the other legs, on the middle femora including about the outer half, the posterior femora the outer two-fifths; tibiæ and tarsi black; claws (male) small, with a reduced basal spine. Wings with a weak brownish ground, the prearcular and costal fields strongly yellowed; stigma oval, dark brown; a conspicuous paler brown pattern, including especially the wing tip, as far basad as the fork of M_{1+2}; narrower seams over the cord and along vein Cu except at base, this pattern in cells M and M_4; veins brown, yellow in the brightened fields. Venation: Rs somewhat longer than in tsurugiana.

Abdomen with the basal tergite brownish gray, margined laterally with obscure yellow; tergites two and three light brown, their posterior ends darker brown, the apices narrowly pale; outer segments gradually deepening to black, including the hypopygium. Male hypopygium (Plate 1, fig. 7) with the ninth tergite, *9t*, broad, its posterior border narrowed, directed caudad and ventrad, terminating in two small blades that are extended laterad into acute points, the blades separated by a U-shaped notch; surface of tergite with numerous setæ, smaller on the blades, with no denticles or serrations. Ninth sternite at base of notch with a pair of conspicuous rounded black lobes, rather closely approximated, directed ventrad and caudad, clothed with coarse black setæ. Outer dististyle, *d*, long and narrow, tapering gradually to the obtuse tip. Inner dististyle,

d, with the beak elongate, obtuse at tip, the dorsal crest low, smooth; the usual outer basal lobe very conspicuous, appearing as a stout lobe that is directed outward, narrowed at apex into a stout blackened spinous point; sensory area on disk of style, including only seven or eight areoles; surface of disk of style with abundant pale setæ. Gonapophysis, *g*, appearing as a dark-colored blade, the stem more slender, slightly exceeding the simple ædeagus.

Habitat.—Japan (Shikoku).

Holotype, male, Misaka-toge (Misaka Pass), Iyo, altitude 716 meters, May 3, 1951 (*Toshiro Yano*).

The nearest ally of the present fly is *Tipula* (*Yamatotipula*) *tsurugiana* sp. nov., which differs evidently in the structure of the male hypopygium, particularly the inner dististyle. The notes supplied under the preceding species should be consulted.

14. TIPULA (YAMATOTIPULA) PATAGIATA Alexander.

Tipula patagiata ALEXANDER, Ann. and Mag. Nat. Hist. (9) 14 (1924) 465–466.

Tipula (*Yamatotipula*) *patagiata* ALEXANDER, Philip. Jour. Sci. 57 (1935) 108.

IYO: Misaka-toge, altitude 716 meters, May 3, 1951 (*Yano*).

15. TIPULA (INDOTIPULA) YAMATA Alexander.

Tipula yamata ALEXANDER, Can. Ent. 46 (1914) 208–209, *pl. 16, fig. 5* (wing), *pl. 17, fig. 3* (♂ hypopygium).

Tipula (*Indotipula*) *yamata* ALEXANDER, Philip. Jour. Sci. 57 (1935) 113.

Tipula yamata ESAKI, et al., Icon. Insect. Japon. Ed. 2 (1950) 1534, *fig.*

AWA: Kawati, altitude 400 meters, May 29, 1950 (*Issiki-Ito*).

TOSA: Asizuri-misaki sea-level, May 10, 1951 (*Issiki-Ito*).

16. TIPULA (VESTIPLEX) SERRIDENS Alexander.

Tipula serridens ALEXANDER, Amer. Ent. Soc. Trans. 46 (1920) 18–19.

Tipula (*Vestiplex*) *serridens* ALEXANDER, Philip. Jour. Sci. 57 (1935) 118.

AWA: Mount Tsurugi, altitude 1,400 to 1,955 meters. May 31, 1950 (*Issiki-Ito*).

17. TIPULA (ACUTIPULA) TOKIONIS Alexander.

Tipula tokionis ALEXANDER, Insec. Inscit. Menst. 8 (1920) 138.

Tipula (*Acutipula*) *tokionis* ALEXANDER, Philip. Jour. Sci. 57 (1935) 109.

AWA: Mount Tsurugi, Kawati to Minokosi, altitude 1,400 meters, May 30, 1950 (*Issiki-Ito*).

IYO: Mount Saragamine, altitude 1,271 meters, August 17, 1950 (*Miyatake*); Mount Ishizuchi, altitude 1,000 meters, August 10, 1925 (*Harukawa*).

TOSA: Mount Imanoyama, Iwai, altitude 200 meters, May 11, 1951 (*Issiki-Ito*).

18. **TIPULA (OREOMYZA) DICHROISTIGMA Alexander.**

Tipula dichroistigma ALEXANDER, Amer. Ent. Soc. Trans. 46 (1920) 20–21.

Tipula (*Oreomyza*) *dichroistigma* ALEXANDER, Philip. Jour. Sci. 57 (1935) 122.

AWA: Mount Tsurugi, Kawati to Minokosi, altitude 1,400 meters, May 30, 1950 (*Issiki-Ito*).

IYO: Mount Ishizuchi, altitude 1,400 meters, June 9, 1950 (*Issiki-Ito*).

19. **TIPULA OREOMYZA FUTILIS Alexander.**

Tipula futilis ALEXANDER, Ann. and Mag. Nat. Hist. (9) 14 (1924) 459–460.

Tipula (*Oreomyza*) *futilis* ALEXANDER, Philip. Jour. Sci. 57 (1935) 122.

AWA: Mount Tsurugi, Kawati to Minokosi, altitude 1,400 meters, May 30, 1950 (*Issiki-Ito*).

20. **TIPULA (OREOMYZA) IMITATOR sp. nov.** **Plate 1, fig. 5.**

Size medium (wing, male, about 15 millimeters); general coloration of head and thorax gray; præscutum with three very poorly indicated darker gray stripes; antennæ black, the scape and pedicel yellow, the former restrictedly darkened at base; femora yellow basally, the tips broadly blackened, tibiæ and tarsi black; wings whitened, the prearcular and costal fields more yellowed; stigma dark brown; disk with extensive pale brown clouds, the wing tip solidly darkened; basal abdominal segments yellow, the tergites with a continuous black central line, the outer segments uniformly blackened; male hypopygium with the tergite large, deeply notched posteriorly, with a very small tooth at the base of the notch; inner dististyle with the lower beak conspicuously bilobed; gonapophysis appearing as a flattened yellow blade, at apex narrowed into a small curved hook.

Male.—Length, about 14 millimeters; wing, 15.5; antenna, about 4.1.

Frontal prolongation of head relatively short and stout, dark brown, pruinose, especially above; nasus long and slender; palpi dark brown. Antennæ (male) of moderate length, as

shown by the measurements; scape yellow, restrictedly darkened at base, pedicel light yellow, flagellum black, the first segment brownish yellow, narrowly darkened apically; flagellar segments beyond the first only feebly incised, much longer than the verticils. Head gray, somewhat clearer on the orbits; a barely indicated capillary dark vitta, extending backward from the low vertical tubercle.

Pronotum dark gray, pale gray on the sides. Mesonotum light gray, the præscutum with three very poorly indicated darker gray stripes, the central one divided behind; each scutal lobe with two poorly indicated darker areas; posterior sclerites of notum gray, parascutella more yellowed; pleurotergite gray, the katapleurotergite paler; dorsopleural membrane pale yellow. Halteres with stem obscure yellow, knob weakly infuscated. Legs with the coxæ light gray; trochanters yellow; femora yellow basally, the tips broadly blackened, the amount subequal on all legs, the fore pair slightly obscured over the central portion; tibiæ and tarsi black; claws (male) toothed. Wings with the ground color whitened, the prearcular and costal fields more yellowed; stigma dark brown; wing tip solidly medium brown, extending as far basad as the outer end of cell 1st M_2; basad of cord with extensive very pale brown clouds, most evident in the outer ends of cells R and M and in the outer half of cell 1st A; restricted slightly darker areas at origin of Rs and over the anterior cord; of the white ground areas, the only one beyond the cord is a complete band that is slightly narrowed at both ends, occupying virtually all of cell 1st M_2; veins brown, yellow in the flavous areas. Venation: Rs about two and one-half times m-cu; R_{1+2}; preserved; m and petiole of cell M_1 subequal.

Abdomen with the basal three or four tergites yellow, with a continuous black central line, the sublateral portions less evidently darkened, posterior borders very narrowly yellow; first tergite sparsely pruinose; basal four sternites yellow; outer segments brownish black. Male hypopygium (Plate 1, fig 5) with the ninth tergite, *9t*, large, gradually narrowed outwardly, the posterior border with two broadly obtuse flattened lobes that are separated by a narrower notch, at base of latter with a microscopic tooth; outer third of tergite obscure yellow, the remainder darkened. Outer dististyle, *d*, relatively long, its lower margin sinuous. Inner dististyle, *d*, with the beak relatively slender, with a strong carina extending from the up-

per part back across the disk of the style; lower beak blackened, conspicuously bilobed; posterior crest a flattened blade that is extended outwardly into a weak point; upper margin of style above the beak with oblique parallel lines or ribs. Gonapophysis, *g*, chitin yellow, appearing as a flattened blade, at apex narrowed into a small curved hook. Aedeagus slender.

Habitat.—Japan (Shikoku).

Holotype, male, Mount Tsurugi, Awa, altitude 1,400 to 1,955 meters, May 31, 1950 (*Issiki-Ito*).

The most similar described regional species include *Tipula* (*Oreomyza*) *pollex* Alexander and *T.* (*O.*) *matsumuriana* Alexander, which differ in the details of coloration and, especially, in the structure of the male hypopygium.

21. TIPULA (OREOMYZA) SETICELLULA Alexander.

Tipula seticellula ALEXANDER, Philip. Jour. Sci. **49** (1932) 106–108, *pl. 1, fig. 2* (venation), *pl. 2, figs. 24–28* (♂ hypopygium).

Tipula (*Oreomyza*) *seticellula* ALEXANDER, Philip. Jour. Sci. **57** (1935) 122.

AWA: Mount Tsurugi, Otiai, June 5, 1950 (*Issiki-Ito*).

The macrotrichia of the wing cells are more reduced in number than in the types, most evident in the distal end of cell R_3.

22. TIPULA (LUNATIPULA) PENDULA Alexander.

Tipula pendula ALEXANDER, Ann. and Mag. Nat. Hist. (9) **14** (1924) 469.

Tipula (*Lunatipula*) *pendula* ALEXANDER, Philip. Jour. Sci. **57** (1935) 131.

AWA: Mount Tsurugi, Kawati to Minokosi, altitude 1,400 meters, May 30, 1950 (*Issiki-Ito*).

23. TIPULA (LUNATIPULA) NAVICULIFER BREVISCAPHA subsp. nov. Plate 2, fig. 9.

Close to the typical form, differing especially in details of structure of the male hypopygium, particularly the ninth tergite and the eighth sternite.

Male.—Length, about 20 millimeters; wing, 22; antenna, about 3.9.

Female.—Length, about 23 millimeters; wing, 27; antenna, about 4.

Frontal prolongation of head brownish black, heavily pruinose; nasus distinct, clothed with golden yellow setæ; palpi black, the outer end of the terminal segment paler. Antennæ with scape and pedicel yellow, flagellum black, the incisures of the more proximal segments restrictedly pale; flagellar segments only moderately enlarged at base, shorter than the lon-

gest verticils. Head behind gray, whitened on the low vertical tubercle and surrounding the antennal bases; posterior vertex with a very delicate blackened median line.

Pronotal scutum gray, more infuscated medially; scutellum chestnut, gray on sides.—Mesonotal præscutum with the ground grayish yellow, with four stripes, the intermediate pair brownish gray, clearer gray on anterior ends, the lateral borders broadly and conspicuously blackened; a capillary pale median vitta; lateral stripes dark gray, their inner margin blackened; posterior sclerites of notum light gray, each scutal lobe with two brown areas; an interrupted brownish black central line on the scutellum and mediotergite; pleurotergite gray, the elevated part of the katapleurotergite yellow. Pleura light gray; dorsopleural membrane light yellow. Halteres with stem yellow, base of knob darkened. Legs with the coxæ light gray; trochanters yellow; femora yellow to brownish yellow basally, passing into yellowish brown, the tips blackened; tibiæ and tarsi black; claws (male) small, simple. Wings pale yellow, with a moderately conspicuous brown pattern that includes washes in the outer radial field, the extreme wing tip and as zigzag areas basad of the cord, the most conspicuous crossing the wing from the origin of Rs, widely expanded in the outer ends of the anal cells; restricted darker brown areas at origin of Rs and along the cord; stigma with the center yellow, the margins brown; prearcular and costal fields deeper yellow than remainder of ground; veins brownish black, more yellowed in the costal and stigmal regions, especially in female. The wing of the female is broader than that of the male, the latter still narrower than in the corresponding sex of typical *naviculifer*. Venation: Rs very long, exceeding two and one-half times m-cu; m subequal to or longer than the petiole of cell M_1.

Abdomen with basal tergite gray pruinose; succeeding tergites yellow, with a brown central stripe; basal sternites yellow; outer segments gradually more darkened, the outer ones chiefly black. In the female, the tergites with three conspicuous blackened stripes, interrupted at the incisures, the lateral borders broadly yellow; sternites likewise patterned with dark brown; pleural membrane yellow, with a continuous dark brown longitudinal stripe; outer segments more uniformly darkened, pruinose. Ovipositor (Plate 1, fig. 10) reduced, fulvous; cerci fleshy, decurved; hypovalvæ, as viewed from the

sides, broadly triangular in outline, the tips obtuse. The related species *shogun* is shown for comparison (Plate 1, fig. 11). Male hypopygium (Plate 1, fig. 9) with the ninth tergite, *9t*, narrowly transverse, the lobes of the posterior border small, directed mesad, provided with short dense black setæ; notch between the lobes broad and shallow. Outer dististyle, *d*, a stout clavate lobe, the apex short and blunt. Inner dististyle, *d*, terminating in a slender blackened beak, with a subapical black blade additional to a slender black spine on face of disk. Appendage of eighth sternite, *8s*, shorter than in typical *naviculifer* especially the yellowed apical portion. In the typical subspecies, *naviculifer* (Plate 1, fig. 8), the ninth tergite, *9t*, is relatively longer, the posterior border with two conspicuous lobes that are separated by a narrow diamond-shaped notch; lobes with very numerous dense black setæ. Outer dististyle, *d*, with the lobe strongly produced laterad into a beak, the actual tip pointed. Inner dististyle, *d*, much as in *breviscapha*, apparently without a subapical blackened blade, as described above. Appendage of eighth sternite, *8s*, elongate, boat-shaped, when flattened on a microscope slide showing the pale whitened part nearly equal in length to the darkened central portion of the ligula.

Habitat.—Japan (Shikoku).

Holotype, male, Mount Tsurugi, Awa, Nagoro, altitude 900 meters, June 2, 1950 (*Issiki-Ito*). Allotopotype, female; in copulation with the type.

Tipula (*Lunatipula*) *shogun* Alexander, of Hokkaido, compared above, is evidently closely allied to the present fly, differing in details of coloration, including the præscutal stripes and the lack of a dark median vitta on the posterior sclerites of the notum. The male sex is still not known to me.

CYLINDROTOMINÆ

24. LIOGMA SERRATICORNIS Alexander.

Liogma serraticornis ALEXANDER, Ent. Soc. America Ann. 12 (1919) 345-346.

Liogma fuscipennis ALEXANDER, Philip. Jour. Sci. 49 (1932) 111–112, *pl. 1, fig. 5* (venation), *pl. 2, fig. 32* (antenna ♂).

Liogma serraticornis ESAKI, et al., Icon. Insect. Japon. Ed. 2 (1950) 1514, *fig.*

AWA: Mount Tsurugi, Kawati to Minokosi, altitude 1,400 meters, May 30, 1950 (*Issiki-Ito*); Minokosi, altitude 1,400 meters, to Nagoro, altitude 900 meters, June 1, 1950 (*Issiki-Ito*).

IYO: Mount Ishizuchi, altitude 1,400 to 1,981 meters, June 9, 1950 (*Issiki-Ito*).

TOSA: Mount Imanoyama, altitude 865 meters, May 12, 1951 (*Issiki-Ito*).

The materials from Mount Tsurugi are almost typical *fuscipennis* while some of the other specimens, as from Mount Imanoyama, closely approach typical *serraticornis*. In the light of this apparently marked range of color of the wing I am placing *fuscipennis* in the synonymy but would indicate the possibility that further study may show that the two forms are separable as subspecies.

25. TRIOGMA KUWANAI (Alexander).

Liogma kuwanai ALEXANDER, Canadian Ent. 45 (1913) 321–322, *pl. 4, fig. 4* (wing), *pl. 10, figs. 13–15* (♂ hypopygium).

Triogma kuwanai ESAKI, et al., Icon. Insect. Japon. Ed. 2 (1950) 1513, *fig.*

IYO: Misaka-toge, altitude 716 meters, May 3, 1951 (*Yano*); Mount Saragamine, altitude 1,271 meters, May 8, 1949 (*Miyatake*); Sugitate, April 8, 1950 (*Miyatake*).

25a. TRIOGMA KUWANAI LIMBINERVIS subsp. nov.

Very similar to the typical form, differing especially in the broad darkened seams over the cord and outer end of cell 1st M_2, and also at the wing tip, continued basad along the posterior wing margin. In its most accentuated condition this is very striking but there is evidence of mergence with the typical form, where the wings are unpatterned or virtually so. Unfortunately no males are available and the hypopygia cannot be compared at this time.

The wing venation of the type series shows unusual variation in both the radial and medial fields. In the holotype, r–m is preserved as a very short element, m–cu is only about one-third its length beyond the fork of M, and cell 1st M_2 is elongate, nearly as long as vein M_{1+2} is beyond it. In the paratype, R_{4+5} is in direct longitudinal alignment with Rs, r–m being very long, exceeding m; m–cu is just beyond the fork of M, while cell 1st M_2 is about equal in length to the distal section of vein M_3. In the paratype, where the dark wing patern is most reduced, a long fusion of veins R_{4+5} and M_{1+2}, about equal in extent to m, has obliterated the r–m crossvein; m–cu is at near one-third the length of the long cell 1st M_2, or fully its own length beyond the fork of M. Such variation is extreme though indicated in other allied groups in the subfamily Cylindrotominæ.

Habitat.—Japan (Shikoku).

Holotype, female, Nisigawa, Tosa, altitude 700 to 1,000 meters, May 3, 1951 (*Issiki-Ito*). Paratopotype, sex?, badly broken, altitude 800 meters, May 4, 1951 (*Issiki-Ito*). Paratype, a badly damaged male, Mount Tsurugi, Awa, altitude 1,400 to 1,955 meters, May 31, 1950 (*Issiki-Ito*).

26. PHALACROCERRA MIKADO Alexander.

Phalacrocera mikado ALEXANDER, Ent. Soc. America. Ann. 12 (1919) 346.

AWA: Mount Tsurugi, Kawati to Minokosi, altitude 1,400 meters, May 30, 1950 (*Issiki-Ito*).

PEDICIINI

27. PEDICIA (PEDICIA) ISSIKIELLA sp. nov. **Plate 2, fig. 14.**

Size relatively large (wing, male, over 23 millimeters); general coloration of thorax light gray, the præscutum with four darker gray stripes; antennæ 13-segmented, very short, flagellum black; halteres yellow; femora yellow, the tips black, tibiæ and tarsi black; wings with the usual *Pedicia* pattern, the costal border chiefly pale, the dark seam along vein Cu narrow, dark brown, reaching the posterior border; basal abdominal tergites yellow, with a virtually complete black central stripe, outer segments more uniformly blackened, pruinose; male hypopygium with the dististyle terminal, the outer margin with about ten strong blackened spines.

Male.—Length, about 26 millimeters; wing, 23.5; antenna, about 2.

Female.—Length, about 25 millimeters; wing, 20.

Rostrum gray; palpi black. Antennæ 13-segmented, short, as shown by the measurements; scape black, heavily gray pruinose, pedicel dark brown, the apex yellowed, flagellum black, the base of the first segment yellowed; flagellar segments beyond the first short and crowded, with long unilaterally distributed verticils; outer three segments more slender, the long verticils more scattered. Head dark gray.

Pronotal scutum gray, more blackened on sides; posterior border of scutum and sides of scutellum more yellowed. Mesonotal præscutum light gray, with four darker gray stripes, the intermediate pair narrowly separated by a vague capillary pale line; posterior sclerites of notum dark gray, the parascutella pale. Pleura gray, the dorsopleural membrane obscure yellow below, more infuscated dorsally and surrounding the spiracle. Halteres yellow, the apex of knob a trifle more darkened. Legs

with the coxæ yellow, very pale gray pruinose; trochanters yellow; femora yellow basally, passing through brownish yellow, the tips narrowly but conspicuously black; tibiæ and tarsi black, the posterior tibiæ a trifle paler, with blackened tips. Wings with a handsome pattern of the usual *Pedicia* type, the costal border broadly fulvous brown, the remaining pattern dark brown, forming a solid mass in the outer radial field, including all of cells R_2 and R_3; seam along vein Cu narrow to very narrow, only about one-third as extensive as the broad seam over the cord, not or scarcely reaching the wing margin; disk cream-yellow, including the area within the dark triangle and likewise the broad bases of the cells beyond the cord from R_4 to M_4; remainder of wing, including the broad posterior border very pale brown; veins dark brown in the more heavily patterned portions, yellow or brownish yellow in the paler fields. Venation: Cord moderately oblique; cell R_4 merely three times its petiole; petiole of cell M_1 and m subequal.

Abdomen elongate; ground color yellow, the tergites with a conspicuous dorsomedian black stripe, this continuous on the proximal four segments, more expanded at posterior ends of the segments; lateral tergal borders narrowly gray pruinose; basal segment pruinose; sternites yellow, the posterior border of the first segment narrowly black, of the succeeding three narrowly yellow; outer segments more darkened, heavily pruinose; hypopygium black. Male hypopygium (Plate 2, fig. 14) with the dististyle, *d*, single, appearing as a broad flattened terminal blade, closely affixed to the basistyle, *b*, the suture not or scarcely evident; outer edge of dististyle with about ten strong curved black spines, with a few additional smaller ones near the anterior or beak portion, the latter extending over these spinules as an obtuse lobe. Interbase, *i*, appearing as a flattened yellow blade, the tip very obtuse to truncated.

Habitat.—Japan (Shikoku).

Holotype, male, Mount Tsurugi, Awa, Minokosi, altitude 1,400 meters, to Nagoro, 900 meters June 1, 1950 (*Issiki-Ito.*) Allotype, female, Mount Ishizuchi, Iyo, July 26, 1947 (*Takashi Kobayashi*). Paratype, male, Mount Saragamine, Iyo, altitude 1,271 meters, May 13, 1951 (*Miyatake*).

This interesting crane-fly is named for Professor Syuti Issiki, who has added greatly to our knowledge of the Tipulidæ of Japan and Formosa. The most nearly related species include *Pedicia* (*Pedicia*) *gaudens* (Alexander) and *P.* (*P.*) *grandior*

(Alexander), both of which are smaller and with the details of coloration of the body and wings distinct. The general structure of the male hypopygium is much the same in these species but with the details distinct. The male hypopygium of *grandior* is shown for comparison (Plate 2, fig. 15), being based on a somewhat diagrammatic outline of the holotype specimen and may be inaccurate in minor regards since it was made several years ago from the dry specimen. The present fly serves even more effectively to bridge the characters hitherto used to separate the two supposed valid subgeneric groups *Pedicia* and *Tricyphona*. Not only is it becoming increasingly difficult to maintain these as distinct but, further, the characters used to distinguish the genus *Dicranota* Zetterstedt are breaking down in similar manner. All of the supposedly valid Pediciine genera and subgenera are being maintained on very insufficient characters.

28. PEDICA (TRICYPHONA) INSULANA (Alexander).

Tricyphona insulana ALEXANDER, Can. Ent. 45 (1913) 319–320, *pl. 4, fig. 3* (venation).

AWA: Mount Tsurugi, altitude 1,400 to 1,955 meters, May 31, 1950 (*Issiki-Ito*).

TOSA: Totidani, near Yanasi, altitude 300 to 400 meters, May 2, 1951 (*Issiki-Ito*).

29. PEDICA (TRICYPHONA) PECTINATA (Alexander).

Tricyphona pectinata ALEXANDER, Philip. Jour. Sci. 44 (1931) 354, *pl. 1, fig. 10* (venation).

AWA: Mount Tsurugi, Sugeoi, June 4, 1950 (*Issiki-Ito*).

IYO: Mount Ishizuchi, altitude 1,400 meters, June 10, 1950 (*Issiki-Ito*).

30. PEDICA (TRICYPHONA) KIRISHIMENSIS (Alexander).

Tricyphona kirishimensis ALEXANDER, Philip. Jour. Sci. 35 (1928) 474–475, *pl. 1, fig. 6* (venation).

TOSA: Mount Imanoyama, altitude 865 meters, May 12, 1951 (*Issiki-Ito*).

The nearest relatives of the present fly are *Pedicia* (*Tricyphona*) *confluens* (Alexander) and *P.* (*T.*) *patens* Alexander.

31. PEDICIA (TRICYPHONA) FIMBRIATULA sp. nov. **Plate 2, figs. 13, 16.**

Size relatively large (wing, male, over 14 millimeters); mesonotal præscutum gray with four dark brown stripes, the posterior sclerites of the notum and the pleura clear gray; legs black, the femoral bases rather narrowly yellow; wings

brownish yellow, restrictedly patterned with brown; male hypopygium with the caudal margin of the ninth tergite produced medially into a flattened glabrous lobe, subtended on either side by long black lobes that bear very long yellow setæ; outer apical lobe of basistyle unusually slender, with numerous small black spines and with a very dense fringe of setæ down the face; outer end of basistyle with abundant long yellow setæ; dististyle a broadly flattened blade, the obtuse apex more thickened and darkened.

Male.—Length, about 14 millimeters; wing, 14.8; antenna, about 1.5.

Rostrum dark gray; palpi brownish black. Antennæ relatively long, 16-segmented, black throughout; basal flagellar segments cylindrical, the outer ones more elongate, well-constricted. Head grayish brown, the anterior vertex and narrow orbits light gray.

Pronotum dark gray. Mesonotal præscutum gray, with four dark brown stripes, the intermediate pair separated by a capillary dull gray line; scutal lobes with darkened centers; scutellum, postnotum and pleura clear gray. Halteres with stem pale yellow, knob weakly infuscated. Legs with the coxæ light gray; trochanters brown; remainder of legs black, the femoral bases rather narrowly brownish yellow. Wings (Plate 2, fig. 16) brownish yellow, the base light yellow; a restricted brown pattern, including the stigma and small seams at Sc_2, origin of Rs, R_2, and outer end of cell 1st M_2; a narrow but complete crossband at cord, reaching the stigma in front; extreme wing tip darkened; veins brown, those in prearcular field and basal half of Sc yellow. Venation: Rs relatively long, square and spurred at origin; m approximately its own length beyond the fork of M_{1+2} m-cu more than one-half its length beyond the fork of M_{3+4}.

Abdominal tergites dark brown, their posterior borders more pruinose; basal sternites darkened, the succeeding ones chiefly yellow; outer segments, including the hypopygium, blackened. Male hypopygium (Plate 2, fig. 13) with the caudal margin of the tergite, *9t*, produced medially into a flattened obtuse glabrous plate, subtended on either side by long black lobes that bear very long yellow setæ on their outer faces. Outer apical lobe of basistyle, *b*, unusually slender, with numerous small blackened spines, the mesal face with a fringe of rusty brown setæ arranged in a single very dense row; outer surface of basistyle before the lobe with abundant long yellow setæ,

the punctures close together. Interbase, *b*, stout, narrowed to an apical beak which is slightly upturned at tip. Dististyle, *d*, a broadly flattened blade, the obtuse apex more thickened and darkened, with several erect setæ.

Habitat.—Japan (Shikoku).

Holotype, male, Mount Tsurugi, Awa, Minokosi, altitude 1,400 meters, to Nagoro, 900 meters, June 1, 1950 (*Issiki-Ito*).

The most similar described regional species is *Pedicia* (*Tricyphona*) *seticauda* (Alexander), which differs evidently in the structure of the male hypopygium, particularly the tergite and basistyle.

32. PEDICA (TRICYPHONA) SETICAUDA (Alexander).

Tricyphona seticauda ALEXANDER, Ann. and Mag. Nat. His. (9) 15 (1925) 77–78.

IYO: Omogokei, July 26, 1947 (*Kazuo Ishimaru*).

More material may show that the present fly is at least subspecifically distinct from *seticauda*.

33. PEDICA (NASITERNELLA) VARIINERVIS HOKKAIDENSIS Alexander.

Limnobia variinervis ZETTERSTEDT, Dipt. Scandinaviæ 10 (1851) 3813.

Amalopis variinervis OSTEN SACKEN, Monog. Dipt. N. Amer. 4 (1869) 264.

Nasiterna variinervis WALLENGREN, Ent. Tidskr. 2 (1881) 191.

Pedicia (*Nasiternella*) *hokkaidensis* ALEXANDER, Philip. Jour. Sci. 53 (1934) 278–279, *pl. 1, fig. 7* (venation), *pl. 2, fig. 29* (♂ hypopygium).

AWA: Mount Tsurugi, altitude 1,400 to 1,955 meters, May 31, 1950 (*Issiki-Ito*).

Hitherto known from Hokkaido and northern Korea.

34. HETERANGÆUS JAPONICUS (Alexander).

Polyangæus japonicus ALEXANDER, Ent. Soc. America. Ann. 12 (1919) 342.

Heterangæus japonicus ALEXANDER, Ann. and Mag. Nat. Hist. (9) 15 (1925) 79.

AWA: Mount Tsurugi, Kawati to Minokosi, altitude 1,400 meters, May 30, 1950 (*Issiki-Ito*).

IYO: Omogokei, July 22, 1949 (Miyatake); Mount Ishizuchi, altitude 1,400 to 1,981 meters, June 9, 1950 (*Issiki-Ito*).

TOSA: Imanoyama, altitude 865 meters, May 12, 1951 (*Issiki-Ito*).

35. DICRANOTA (RHAPHIDOLABIS) CLAUSA Alexander. **Plate 2, fig. 17.**

Dicranota (*Rhaphidolabis*) *clausa* ALEXANDER, Philip. Jour. Sci. 66 (1938) 115–117, *pl. 1, fig. 13* (venation), *pl. 3, fig. 38* (♂ hypopygium).

AWA: Mount Tsurugi, Kawati to Minokosi, altitude 1,400 meters, May 30, 1950 (*Issikiti-Ito*).

One female, very similar to the type except in slight details of venation (Plate 2, fig. 17). Cell R_3 sessile, there being a short element R_{4+5}; cell M_1 deeper, about one-third to one-half longer than its petiole.

36. DICRANOTA (RHAPHIDOLABIS) GIBBERA (Alexander).

Rhaphidolabina gibbera ALEXANDER, Ent. Soc. America. Ann. 14 (1921) 121.

Dicranota (Rhaphidolabis) gibbera ALEXANDER, Arkiv för Zoologi (2) 42 A (1949) 18.

Amalopina gibbera ESAKI, et al., Icon. Insect. Japon. Ed. 2 (1950) 1521, *fig.*

IYO: Mount Ishizuchi, altitude 1,400 meters, June 10, 1950 (*Issiki-Ito*). An unusually large female specimen.

By my latest key to the subgenera of the genus *Dicranota* Zetterstedt,[14] the present fly is included in the subgenus *Rhaphidolabis* Osten Sacken.

37. DICRANOTA (RHAPHIDOLABIS) IDIOPYGA sp. nov. **Plate 2, fig. 12.**

Size small (wing, male, 5.7 mm); mesonotum obscure brownish yellow, darker medially, especially on the gibbous præscutum; legs obscure yellow, the outer tarsal segments weakly distinct, longer than the R_{2+3+4} infuscated; wings subhyaline; R basal section of R_5; m-cu nearly its own length beyond the fork of M; abdomen brown, the genitalia more yellowed; male hypopygium with the tergite very large, each outer lateral angle produced into a flattened sclerotized plate that is extended into a slender rod, the median region of tergite with a conspicuous narrow lobe; outer apical angle of basistyle produced laterad into a strong point; interbase short and compact, at apex split into two strong teeth.

Male.—Length, about 4.6 millimeters, wing, 5.7; antenna, about 0.6.

Female.—Length, about 5 millimeters; wing, 6.

Rostrum light brown; palpi darker. Antennæ apparently 12-segmented, brownish black; flagellar segments oval, a little exceeding the longest verticils. Head dark gray.

Pronotum brownish yellow, paler on sides. Mesonotum obscure brownish yellow laterally, darker brown medially, especially on the unusually high and gibbous præscutum. Pleura and pleurotergite brownish yellow. Halteres with stem yellow,

[14] Alexander, C. P. Arkiv för Zoologi (2) 42 A (1949) 17–18.

knob weakly infuscated. Legs with the coxæ brownish yellow; trochanters yellow; remainder of legs obscure yellow, the outer tarsal segments weakly infuscated. Wings subhyaline, the stigma not or scarcely darkened; veins pale brown. Venation: Sc_2 very far basad, at about one-third the distance between arculus and origin of Rs; R_2 transverse, longer than R_{1+2}; R_{2+3+4} present, longer than the basal section of R_5; m-cu nearly its own length beyond the fork of M.

Abdomen brown, the genitalia more yellowed. Male hypopygium very distinctive (Plate 2, fig. 12). Ninth tergite, *9t*, very large, each outer lateral angle produced into a flattened sclerotized plate that is extended into a slender rod, the mesal margin near base with a smaller fingerlike lobe; at base of notch with the usual tergal lobe, this relatively long, parallel-sided, its apex with numerous strong setæ that are directed caudad. Basistyle, *b*, with the outer apical angle produced laterad into a strong point. Interbase very short and stout, the apex divided into two (or possibly three) strong teeth. Dististyles, *d*, apparently two, the outer a narorw lobe that is densely set with spinulose setæ; inner style a flattened blade, the apex obtuse, nearly glabrous except for a small marginal group of setæ near apex and more numerous and conspicuous setæ over the basal part; it is possible that this latter structure is actually an inner apical blade of the basistyle rather than being a dististyle.

Habitat.—Japan (Shikoku).

Holotype, male, Mount Tsurugi, Awa, Kawati to Minokosi, altitude 1,400 meters, May 30, 1950 (*Issiki-Ito*). Allotopotype, female, Minokosi, altitude 1,400 meters, to Nagoro, 900 meters, June 1, 1950 (*Issiki-Ito*).

In its general appearance this very distinct fly suggests species such as *Dicranota* (*Rhaphidolabis*) *consors* Alexander, differing from all in the entirely different male hypopygium.

38. DICRANOTA (EUDICRANOTA) DICRANOTOIDES (Alexander).

Rhaphidolabina dicranotoides ALEXANDER, Ent. Soc. America. Ann. 17 (1924) 72-73.

Dicranota (*Eudicranota*) *dicranotoides* ALEXANDER, Arkiv för Zoologi (2) 42 A (1949) 18.

IYO: Mount Iskizuchi, altitude 1,400 meters, to Koguti, 300 meters, June 11, 1950 (*Issiki-Ito*).

39. ULA (ULA) CINCTA Alexander.

Ula cincta ALEXANDER, Philip. Jour. Sci. 24 (1924) 573.

AWA: Mount Tsurugi, Minokosi, altitude 1,400 meters, to Nagoro, 900 meters, May 30, 1950 (*Issiki-Ito*).

HEXATOMINI

40. LIMNOPHILA (EUTONIA) SATSUMA (Westwood).

Limnobia satsuma WESTWOOD, Ent. Soc. London Trans. (1876) 504, *pl. 3, figs. 5a, 5b* (wing).

Limnophila (Poecilostola) satsuma ALEXANDER, Can. Ent. 45 (1913) 314–316, *pl. 3, fig. 4* (wing), *pl. 10, fig. 11* (♂ hypopygium).

Gagamba Takei MATSUMURA, Thous. Ins. Japan Addit. 2 (1916) 471–473, *pl. 25, fig. 12* (whole ♂).

Limnophila satsuma ESAKI, et al., Icon. Insect. Japon. Ed. 2 (1950) 1523, *fig.*

IYO: Mount Saragamine, altitude 1,271 meters, July 23, 1949 (*Ishihara*).

41. LIMNOPHILA (PRIONOLABIS) RECURVANS sp. nov. Plate 2, figs. 18, 23.

Size small (wing less than 7 millimeters); general coloration black, the surface dull; antennæ 16-segmented, black throughout; halteres yellow; legs black, the posterior femora paler; wings rather strongly infuscated, the prearcular field more yellowed; cell M_1 lacking; male hypopygium with a single subterminal tooth on outer dististyle; inner dististyle unequally bifid at apex; gonapophysis appearing as a slender blackened rod, the apex recurved into a long point, in cases with a smaller hook or blunt point at the bend.

Male.—Length, about 6.5 millimeters; wing 6.5 to 6.8; antenna, about 1.1 to 1.2.

Female.—Length, about 6 millimeters; wing, 6.

Rostrum and palpi black. Antennæ black throughout, 16-segmented; flagellar segments short-oval, less than the verticils. Head dull black.

Thorax almost uniformly dull black, the præscutum faintly nitidous, the pleura more heavily dusted. Halteres pale yellow. Legs black, the posterior pair in cases paler; femora brownish yellow, darkening to brownish black at tips; tibiæ and tarsi dark brown to black. Wings (Plate 2, fig. 18) rather strongly infuscated, the oval stigma a trifle darker, the very restricted prearcular field more yellowed; veins brown, those of the wing base yellow. Venation: R_{2+3+4} and basal section of R_5 subequal; cell M_1 lacking.

Abdomen, including hypopygium, black. Male hypopygium (Plate 2, fig. 23) having the posterior border of the tergite, *9t*, with a U-shaped emargination, subtended by a low broad

lobe on either side. Outer dististyle, *d*, with a single major tooth at near two-thirds the length; outer subtending lobe narrow, outer face of style microscopically scabrous. Inner dististyle unequally bifid at apex. Gonapophysis, *g*, appearing as a slender blackened rod, the apex recurved into a long point, in cases with a smaller hook or blunt point at the bend. Aedeagus, *a*, rather broadly flattened.

Habitat.—Japan (Shikoku).

Holotype, male, Nisigawa to Yanase, Tosa, altitude 600 meters, May 4, 1951 (*Issiki-Ito*). Allotype, female, Iwai, near Imanoyama, Tosa, altitude 200 meters, May 11, 1951 (*Issiki-Ito*). Paratopotype, male, with the holotype.

The present fly is most similar to species such as *Limnophila* (*Prionolabis*) *liponeura* Alexander and *L.* (*P.*) *lipophleps* Alexander, differing in the details of coloration, as of the wings, and especially in the structure of the male hypopygium, particularly the gonapophyses.

42. LIMNOPHILA (PRIONOLABIS) SHIKOKUANA sp. nov. **Plate 2, figs. 19, 24.**

Size small (wing, male, about 6 millimeters); general coloration black; antennæ 16-segmented; halteres yellow; legs black, only the femoral bases narrowly yellow; wings faintly tinged with brown, the prearcular field conspicuously light yellow; cell M_1 lacking; male hypopygium with the outer dististyle a simple blade, without basal lobe; inner dististyle a simple rod, its apical fourth more narrowed; gonapophysis slender at base, before midlength dilated into an oval swelling, thence abruptly narrowed into a long curved black spine, its margins entirely smooth.

Male.—Length, about 6 millimeters; wing, 6.2; antenna, about 1.4.

Female.—Length, about 6.5 millimeters; wing, 7.

Rostrum black, sparsely pruinose; palpi black. Antennæ black throughout, 16-segmented; flagellar segments oval, the terminal one about one-half longer than the penultimate; longest verticils subequal in length to the segments. Head black, sparsely pruinose, more heavily so in front.

Thorax uniformly black. Halteres light yellow. Legs black, the extreme bases of the femora yellow, a trifle more extensive on the fore legs. Wings (Plate 2, fig. 19) with a faint brownish tinge, the prearcular field light yellow; stigma long-oval, pale brown, poorly delimited; veins brown, yellow in the prearcular field. Venation: R_{2+3+4} slightly variable in length, up to

one-half longer than the basal section of R_5; cell M_1 lacking; m-cu at or just before midlength of cell 1st M_2.

Abdomen, including hypopygium, black. Male hypopygium (Plate 2, fig. 24) with the tergite, *9t*, transverse, the caudal margin with two obtuse lobes that are separated by a broad shallow emargination. Outer dististyle, *d*, a simple blade, without outer basal lobe, narrowed gradually into a long black apical spine; outer surface and margin of distal half with microscopic appressed spinulæ. Inner dististyle a simple rod, the apical quarter more narrowed. Gonapophysis, *g*, with the base slender, before midlength conspicuously dilated into an oval swelling, thence abruptly narrowed into a long curved black spine with smooth margins. Aedeagus, *a*, darkened, narrowly compressed-reniform.

Habitat.—Japan (Shikoku).

Holotype, male, Mount Tsurugi, Awa, altitude 1,400 to 1,955 meters, May 31, 1950 (*Issiki-Ito*). Allotype, female, Mount Tsurugi, Minokosi, altitude 1,400 meters, to Nagoro, 900 meters, June 1, 1950 (*Issiki-Ito*).

Limnophila (*Prionolabis*) *shikokuana* is readily told from the other regional members of the subgenus that have lost cell M_1 of the wings by the very distinct structure of the male hypopygium. Such species include *L.* (*P.*) *inermis* Alexander, *L.* (*P.*) *liponeura* Alexander, *L.* (*P.*) *lipophleps* Alexander, *L.* (*P.*) *recurvans* sp. nov., and *L.* (*P.*) *serridentata* Alexander.

43. LIMNOPHILA (DENDROLIMNOPHILA) SHIKOKUENSIS sp. nov.

Plate 2, figs. 20, 25.

General coloration fulvous yellow; antennæ short; legs dirty whitish, the outer tarsal segments darker; wings brownish yellow, veins pale; m-cu at or near midlength of cell 1st M_2; male hypopygium with the tergite produced into two long slender spines; basistyle with a row of about 15 long bristles on mesal face; inner dististyle pale, the lower margin deeply notched at near midlength; phallosome including three sets of spines or blades, additional to the ædeagus.

Male.—Length, about 4.5 to 5 millimeters; wing, 6 to 6.2; antenna, about 1.0 to 1.1.

Female.—Length, about 5 millimeters; wing, 5.5.

Rostrum and palpi yellow. Antennæ short; scape brownish yellow, flagellum dark brown; flagellar segments subcylindrical, shorter than the verticils. Head yellow, sparsely pruinose.

Thorax uniformly fulvous yellow, without pattern. Halteres yellow. Legs obscure dirty whitish, the outer tarsal segments a trifle darker; tibial spurs conspicuous. Wings (Plate 2, fig. 20) almost uniformly brownish yellow to weakly fulvous, unpatterned; veins pale, only a little darker than the ground. Venation: So short, Sc_1 ending some distance before fork of Rs, Sc_2 at its extreme tip; R_{2+3+4} about twice the basal section of R_5; R_2 pale and ill-defined, subequal to R_{1+2} cell M_1 lacking; m-cu at or near midlength of cell 1st M_2.

Abdomen yellow, the hypopygium somewhat paler yellow. Ovipositor with the valves long and nearly straight. Male hypopygium (Plate 2, fig. 25) with the basistyle, *b*, stout, on mesal face at near midlength with a dense longitudinal row of about 15 long yellow bristles; more basad on style with a loose group of smaller setæ; remaining setæ of style scattered. Both dististyles, *d*, terminal, glabrous; outer style slender, the tip narrowed and produced, blackened, the extreme apex shallowly bidentate; at point of narrowing on outer margin with a small blackened tooth; inner style larger, pale, narrowed outwardly, the lower margin at near midlength deeply and narrowly notched. Phallosome, *p*, complex, including stout dusky lateral blades that narrow to an acute point on their inner apical angle; the central phallosomic mass includes, besides the ædeagus, two stouter rods that narrow at apex into long straight spines; in addition two more central acute spinous points. Besides the above, what evidently pertains to the tergite appears as a major pale structure that is produced caudad into two slender spines that gently diverge outwardly (this plate and its spines are not shown in the figure).

Habitat.—Japan (Shikoku).

Holotype, male, Nisigawa to Kokusen, near Yanase, Tosa, altitude 600 meters, May 4, 1951 (*Issiki-Ito*). Allotopotype, female. Paratopotype, 3 males.

The subgenus *Dendrolimnophila* Alexander was based on a single species, *albomanicata* Alexander, known only from the Vancouveran region of the Pacific Northwest of North America.[15] The discovery of a second species is of unusual interest. The two flies while being generally similar and evidently allied, differ conspicuously in the structure of the male hypopygium, including the tergite, basistyle, both dististyles, and the phallosome.

[15] Alexander, C. P. Amer. Midland Nat. 42 (1949) 314, *figs. 44, 47.*

44. ULOMORPHA NIGRICOLOR Alexander.

Ulomorpha nigricolor ALEXANDER, Ann. and Mag. Nat. Hist. (9) 15 (1925) 75–76.

IYO: Mount Ishizuchi, altitude 1,400 meters, to Koguti, 300 meters, June 11, 1950 (*Issiki-Ito*); Yuyama, May 9, 1948 (*Miyatake*).

One of the specimens is larger than the type (wing, female, 9.5 millimeters) and with more strongly infuscated wings; the darker pattern is less evident, cell R_3 entirely sessile; cell 1st M_2 subequal in length to vein M_4.

45. HEXATOMA (HEXATOMA) JAPONICA Alexander.

Hexatoma japonica ALEXANDER, Insec. Inscit. Menst. 10 (1922) 185–186.

IYO: Omogokei, July 26, 1948 (*Isao Tomari*).

46. HEXATOMA (ERIOCERA) ALBOGUTTATA (Matsumura).

Eriocera alboguttata MATSUMURA, Thous. Ins. Japan Addit. 2 (1916) 468–469, *pl. 25, fig. 10* (whole ♀).

Eriocera hilpa ESAKI, et al., (Nec Walker), Icon. Insect. Japon. Ed. 2 (1950) 1524, *fig.*

IYO: Sugitate, September 12, 1951 (*Ishihara*); Mount Takanawa, altitude 986 meters, August 20, 1948 (*Teruo Koyama*).

Originally described from Honshu, Shikoku and Kyushu. The Shikoku material was from Iyo, without more exact data.

47. HEXATOMA (ERIOCERA) STRICKLANDI STRICKLANDI (Edwards).

Eriocera stricklandi EDWARDS, Ann. and Mag. Nat. Hist. (9) 8 (1921) 82.

IYO: Mount Saragamine, altitude 1,271 meters, July 23, 1946, July 22, 1949 (*Ishihara*). Two females, both having extruded great masses of pale-colored eggs.

Edwards' type, a female, was from an unknown locality in Japan (*T. A. G. Strickland*, 1909).

47a. HEXATOMA (ERIOCERA) STRICKLANDI PALLIDIBASIS subsp. nov.

Generally similar to the typical form but with distinctive leg pattern. All femora yellowed basally, with approximately the outer half blackened. In typical *stricklandi*, the blackened tips of the fore and middle femora are narrow and abrupt, involving about the outer fourth, or fifth, posterior femora chiefly black, with about the proximal fifth or less yellowed. The wings are rather heavily seamed with dusky along the veins but this pattern is approached by some specimens of typical *stricklandi* in my collection.

Holotype, female, Mount Ishizuchi, Iyo, July 20, 1948 (*Tokashi Kobayashi*).

48. HEXATOMA (ERIOCERA) LONGIFURCA (Alexander).

Eriocera longifurca ALEXANDER, Amer. Ent. Soc. Trans. 46 (1920) 14.
Eriocera longifurca ESAKI, et al., Icon. Insect. Japon. Ed. 2 (1950) 1524, *fig.*

IYO: Sugitate, April 8, 1950 (*Miyatake*).

ERIOPTERINI

49. CONOSIA IRRORATA (Wiedemann).

Limnobia irrorata WIEDEMANN, Aussereur. zweifl. Ins. 1 (1828) 574.
Conosia irrorata VAN DER WULP, Tijd. voor Ent. 23 (1880) 159.
Conosia irrorata ALEXANDER, Can. Ent. 45 (1913) 293, *pl. 8, fig. 13* (wing).
Limnophila crux DOLESCHALL, Tijd. Nederl. Indie 14 (1857) 388, *pl. 4, fig. 8* (wing).
Limnobia substituta WALKER, List. Dipt. Brit. Mus. (1848) 39.
Conosia irrorata ESAKI, et al., Icon. Insect. Japon. Ed. 2 (1950) 1526, *fig.*

IYO: Dogo, Matsuyama, September 8, 1945 (*Yano*).

50. CLADURA (CLADURA) DECEM-NOTATA Alexander. **Plate 2, fig. 27.**

Cladura decem-notata ALEXANDER, Ent. Soc. America Ann. 17 (1924) 436–437.
Cladura decem-notata ALEXANDER, Philip. Jour. Sci. 40 (1929) 540.

IYO: Sugitate, November 1, 1951 (*Ishihara*).

The types, represented only by females, were from various stations in Kyushu. What was assumed to represent this same species was later (1929) recorded from Formosa, at high altitudes but this was still later found to be erroneous, the latter material being[16] described as a new species under the name *Cladura taiwania*. Since these two species have been confused it seems advisable to provide descriptions of the male hypopygia which provide ready recognition characters.

Cladura decem-notata (Plate 2, fig. 27) has the tergite, *9t*, produced medially, with a very small V-shaped notch, the very broad lobes truncated; surface of tergite with scattered setæ. Basistyle, *b*, relatively slender, without strong concentrations of setæ on mesal face. Dististyle, *d*, deeply split into two apical arms, the axial one more slender, parallel-sided for most of its length; lower arm with setæ but these not forming a distinct marginal fringe. Gonapophysis, *g*, relatively short, produced into three or four small points. Aedeagus, *a*, very long, dilated or provided with a flange on the subapical third.

[16] Alexander, C. P. Ent. Soc. America Ann. 40 (1947) 360–361.

Cladura taiwania Alexander (Plate 2, fig. 28) with the tergite, *9t*, much as in *decem-notata*, the surface with even sparser setæ. Basistyle, *b*, stouter, the mesal face near apex with a concentration of strong setæ, arranged in two more or less distinctly separate groups. Dististyle, *d*, narrowed at base, thence dilated into a triangular blade, the apex shallowly emarginate, the lower lobe fringed with strong setæ along its margin. Gonapophysis, *g*, produced into a narrow blade, on outer margin with a low tooth or flange. Ædeagus, *a*, relatively short and stout, nearly equally dilated or flanged except on the strongly narrowed outer fifth.

51. CLADURA (CLADURA) SERRIMARGO sp. nov. **Plate 2, figs. 21, 25.**

General coloration yellow, unpatterned; femora and tibiæ obscure yellow, the extreme tips darkened; wings whitish, the prearcular field a little more yellowed; macrotrichia of veins, including the costal field, long and conspicuous; r-m long and arcuated; male hypopygium with the caudal margin of tergite produced into two small lobes; dististyle stout, the apex produced into an obtuse beak, the outer or dorsal surface without setæ; gonapophysis appearing as a flattened blade, the outer margin before apex produced into a spinous tooth, back from this point along the margin with five or six small serrations.

Male.—Length, about 7.5 millimeters; wing, 8; antenna, about 1.3.

Rostrum and palpi yellow. Antennæ yellow, the outer flagellar segments slightly darker; verticils long and conspicuous, approximately twice the segments. Head yellow.

Thorax pale yellow, the pleura even paler, more whitened. Halteres yellow. Legs with the coxæ and trochanters yellow; femora and tibiæ obscure yellow, the extreme tips darkened; tarsi brownish yellow, passing into black. Wings (Plate 2, fig. 21) whitish, the prearcular field a little more yellowed, the costal region less evidently so; veins brown, paler in the brightened areas. Macrotrichia of veins long and conspicuous; costal fringe relatively long. Venation: R_{2+3} about one-third to one-half longer than R_{1+2}; inner end of the small cell first M_2 lying some distance beyond the level of cell R_5, r-m being long and arcuated; cell M_1 about three times its petiole; m-cu at or close to fork of M.

Abdomenal tergites chiefly brown, the ninth segment more heavily so on sides; sternites and hypopygium obscure yellow.

Male hypopygium (Plate 2, fig. 25) with the median region of the tergite, *9t*, glabrous, dusky in color, projecting beyond the level of the posterior border as two lobes, separated by a U-shaped notch. Basistyle, *b*, elongate, with abundant setæ on mesal face, including the more protuberant cephalic part. Dististyle, *d*, stout, irregular in outline, the apex produced into an obtuse beak, the surface with abundant setæ that are lacking on the dorsal area. Phallosome simple, the slender ædeagus subequal in length to the gonapophyses, the latter, *g*, appearing as flattened blades, the outer margin before apex produced into a spinous tooth, back from this point along the margin with five or six small serrations; inner apical part of the blade less produced, with delicate setulæ.

Habitat.—Japan (Shikoku).

Holotype, male, Sugitate, Iyo, November 1, 1951 (*Ishihara*).

The most similar regional species is *Cladura* (*Cladura*) *autumna* Alexander, which differs chiefly in details of structure of the male hypopygium, as the dististyle and gonapophysis.

52. GYMNASTES (PARAGYMNASTES) FLAVITIBIA (Alexander).

Gymnastes flavitibia ESAKI, et al., Icon. Insect. Japon. Ed. 2 (1950) 1526, *fig.*

Paratropeza flavitibia ALEXANDER, Ent. Soc. America. Ann. 12 (1919) 333–334.

IYO: Omogokei, July 31, 1949 (*Miyatake*); Setokazetoge, altitude 212 meters, July 8, 1949 (*Yano*).

53. ORMOSIA (ORMOSIA) CONFLUENTA Alexander.

Ormosia confluenta ALEXANDER, Insec. Inscit. Menst. 10 (1922) 182–183.

AWA: Mount Tsurugi, altitude 1,400 to 1,955 meters, May 31, 1950 (*Issiki-Ito*).

54. ORMOSIA (ORMOSIA) REMISSA sp. nov. Plate 2, figs. 22, 29.

Belongs to the *similis* group; wings pale yellow, weakly patterned with brown, including the stigma and a narrow seam over the cord; male hypopygium with the ædeagus flanged basally, the outer third very strongly sinuous; three pairs of spinous gonapophyses, the longest produced into a very long slender point.

Male.—Length, about 4.5 millimeters; wing, 5.

Body of type badly crushed and broken. Wings (Plate 2, fig. 22) with the ground color pale yellow, more saturated at base; a restricted dark pattern, including the oval stigma and a narrow seam over the cord; less evident darkenings include

the ends of the longitudinal veins back from the margin, best evidenced by a deepening in color of the otherwise yellow veins; basad of cord darkenings very reduced to virtually lacking. Venation: Sc_1 ending just beyond level of R_2, Sc_2 about opposite one-third the length of Rs; R 1+2 reduced; vein R_3 strongly upcurved at outer end; vein 2nd A strongly sinuous, narrowing the cell on the distal third.

Male hypopygium (Plate 2, fig. 29) with the ninth tergite, *9t*, produced medially, the lobe with a pale central line. Outer dististyle, *d*, much smaller than the inner, with parallel rows of spinous setæ, as in the group; inner dististyle broadly flattened, at apex farther produced into a short fingerlike lobe. Phallosome, *p*, with the ædeagus flanged basally, the slender outer third very strongly sinuous. Gonapophyses, *g*, including three pairs of spines, these being a stout blackened rod, a longer apophysis that is bent virtually at a right angle before midlength, its outer point produced into a very long slender spine, and a short slender blackened spine from a dilated base.

Habitat.—Japan (Shikoku).

Holotype, a broken male, Mount Tsurugi, Awa, altitude 1,400 to 1,955 meters, May 31, 1950 (*Issiki-Ito*).

The present fly is most similar to species such as *Ormosia* (*Ormosia*) *dicax* Alexander and *O.* (*O.*) *seclusa* Alexander, differing evidently in the details of venation and, especially, the structure of the male hypopygium.

55. **ORMOSIA (ORMOSIA) TAKEUCHII Alexander.**

Ormosia takeuchii ALEXANDER, Ent. Soc. America Ann. 14 (1921) 117–118.

Ormosia takeuchii ESAKI, et al., Icon. Insect. Japon. Ed. 2 (1950) 1526, *fig.*

AWA: Mount Tsurugi, Minokosi, altitude 1,400 meters, to Nagoro, 900 meters, June 1, 1950 (*Issiki-Ito*).

IYO: Sugitate, November 1, 1951 (*Ishihara*).

56. **ERIOPTERA (PSILOCONOPA) ASYMMETRICA Alexander.**

Erioptera (*Acyphona*) *asymmetrica* ALEXANDER, Can. Ent. 45 (1913) 289–290, *pl. 3, fig. 15* (wing), *pl. 10, figs. 7–8* (♂ hypopygium).

Erioptera asymmetrica ESAKI, et al., Icon. Insect. Japon. Ed. 2 (1950) 1527, *fig.*

IYO: Matsuyama, April 28, 1947 (*Yano*).

57. **ERIOPTERA (ERIOPTERA) ELEGANTULA Alexander.**

Erioptera (*Erioptera*) *elegantula* ALEXANDER, Can. Ent. 45 (1913) 290–291, *pl. 3, fig. 3* (wing).

IYO: Matsuyama, March 18, 1949 (*Miyatake*).

58. ERIOPTERA (ERIOPTERA) ORIENTALIS Brunetti.

Erioptera orientalis BRUNETTI, Fauna Brit. India, Dipt. Nematocera (1912) 453–454.

Erioptera (Erioptera) dictenidia ALEXANDER, Ent. Soc. America Ann. 14 (1921) 115–116.

IYO: Matsuyama, May 22, 1948 (*Miyatake*).

The species is wide-spread in eastern and southern Asia.

59. MOLOPHILUS (MOLOPHILUS) PEGASUS Alexander.

Molophilus pegasus ALEXANDER, Can. Ent. 45 (1913) 291–293, *pl. 3, fig. 11* (wing), *pl. 10, figs. 3–4* (♂ hypopygium).

IYO: Mount Ischizuchi, altitude 1,400 to 1,981 meters, June 9, 1950 (*Issiki–Ito*).

60. MOLOPHILUS (MOLOPHILUS) ITOANUS sp. nov. Plate 2, fig. 30.

Belongs to the *gracilis* group, general coloration dark gray; halteres blackened; legs black; wings strongly infuscated; male hypopygium with the mesal lobe of the basistyle narrowed into a very long black spine that bears a small acute thorn on outer margin before midlength.

Male.—Length, about 3.8 millimeters; wing, 4.3.

Rostrum and palpi brownish black. Antennæ with the scape and pedicel brownish black; flagellum broken. Head dark gray.

Pronotum dark brown. Thorax uniformly dark gray, the pseudosutural foveæ and tuberculate pits black. Halteres blackened, the base of stem narrowly brightened. Legs with the coxæ brown, gray pruinose; trochanters brownish testaceous; remainder of legs black, the extreme femoral bases vaguely yellowed. Wings strongly infuscated; veins and macrotrichia darker brown, the latter long and conspicuous. Venation: R_2 in transverse alignment with r-m; petiole of cell M_3 nearly three times m-cu; vein 2nd A long and sinuous, ending a short distance beyond m-cu.

Abdomen brownish black, pruinose. Male hypopygium (Plate 2, fig. 30) with the basistyle, *b*, unusually complex; dorsal lobe, *db*, moderately long, narrowed to the obtuse tip, the outer face with scattered very long pale setæ, those at apex much shorter and more delicate; ventral lobe, *vb*, strongly clavate, about one-half broader near apex than at base, the upper surface with scattered setæ of very unusual length, the expanded apical part with numerous yellow setæ that are more or less retrorse; mesal lobe, *mb*, narrowed into a very long slender black spine, its outer margin before midlength with a straight acute thorn.

Outer dististyle, *d*, a sinuous blackened rod that narrows very gradually into a long straight spine. Inner dististyles broken beyond their base, as shown, the part remaining with several strong spines on outer margin. Phallosomic plate oval, the surface with microscopic setulæ. Aedeagus relatively short and stout.

Habitat.—Japan (Shikoku).

Holotype, male, Mount Tsurugi, Sugeoi, Awa, June 4, 1950 (*Issiki–Ito*).

I take unusual pleasure in dedicating this very distinct fly to Professor Syusiro Ito to whom I am indebted for many interesting Tipulidæ from Honshu, Kyushu, and Shikoku. The male hypopygium readily separates the species from all other regional members of the group. It is most similar to species such as *Molophilus* (*Molophilus*) *polycanthus* Alexander but is entirely distinct, particularly in hypopygial characters.

ILLUSTRATIONS

[Legend: *a*, aedeagus; *b*, basistyle; *d*, dististyle; *db*, dorsal lobe of basistyle; *g*, gonapophysis; *i*, interbase; *mb*, mesal lobe of basistyle; *o*, ovipositor; *p*, phallosome; *s*, sternites; *t*, tergites; *vb*, ventral lobe of basistyle.]

PLATE 1

FIG. 1. *Longurio* (*Longurio*) *yanoi* sp. nov.; venation.
2. *Dictenidia miyatakei* sp. nov.; venation.
3. *Longurio* (*Longurio*) *yanoi* sp. nov.; male hypopygium.
4. *Tipula* (*Trichotipula*) *politonigra* sp. nov.; male hypopygium, details.
5. *Tipula* (*Oreomyza*) *imitator* sp. nov.; male hypopygium, details.
6. *Tipula* (*Yamatotipula*) *tsurugiana* sp. nov.; male hypopygium, details.
7. *Tipula* (*Yamatotipula*) *misakana* sp. nov.; male hypopygium, details.
8. *Tipula* (*Lunatipula*) *naviculifer naviculifer* Alexander; male hypopygium, details.
9. *Tipula* (*Lunatipula*) *naviculifer breviscapha* subsp. nov.; male hypopygium, details.
10. *Tipula* (*Lunatipula*) *naviculifer breviscapha* subsp. nov.; ovipositor, dorsal aspect.
11. *Tipula* (*Lunatipula*) *shogun* Alexander; ovipositor, dorsal aspect.
12. *Dicranota* (*Rhaphidolabis*) *idiopyga* sp. nov.; male hypopygium.

PLATE 2

FIG. 13. *Pedicia* (*Tricyphona*) *fimbriatula* sp. nov.; male hypopygium.
14. *Pedicia* (*Pedicia*) *issikiella* sp. nov.; male hypopygium.
15. *Pedicia* (*Pedicia*) *grandior* (Alexander); male hypopygium, styli.
16. *Pedicia* (*Tricyphona*) *fimbriatula* sp. nov.; venation.
17. *Dicranota* (*Rhaphidolabis*) *clausa* Alexander; venation.
18. *Limnophila* (*Prionolabis*) *recurvans* sp. nov.; venation.
19. *Limnophila* (*Prionolabis*) *shikokuana* sp. nov.; venation.
20. *Limnophila* (*Dendrolimnophila*) *shikokuensis* sp. nov.; venation.
21. *Cladura* (*Cladura*) *serrimargo* sp. nov.; venation.
22. *Ormosia* (*Ormosia*) *remissa* sp. nov.; venation.
23. *Limnophila* (*Prionolabis*) *recurvans* sp. nov.; male hypopygium.
24. *Limnophila* (*Prionolabis*) *shikokuana* sp. nov.; male hypopygium.
25. *Limnophila* (*Dendrolimnophila*) *shikokuensis* sp. nov.; male hypopygium.
26. *Cladura* (*Cladura*) *serrimargo* sp. nov.; male hypopygium.
27. *Cladura* (*Cladura*) *decem-notata* Alexander; male hypopygium.
28. *Cladura* (*Cladura*) *taiwania* Alexander; male hypopygium.
29. *Ormosia* (*Ormosia*) *remissa* sp. nov.; male hypopygium.
30. *Molophilus* (*Molophilus*) *itoanus* sp. nov.; male hypopygium.

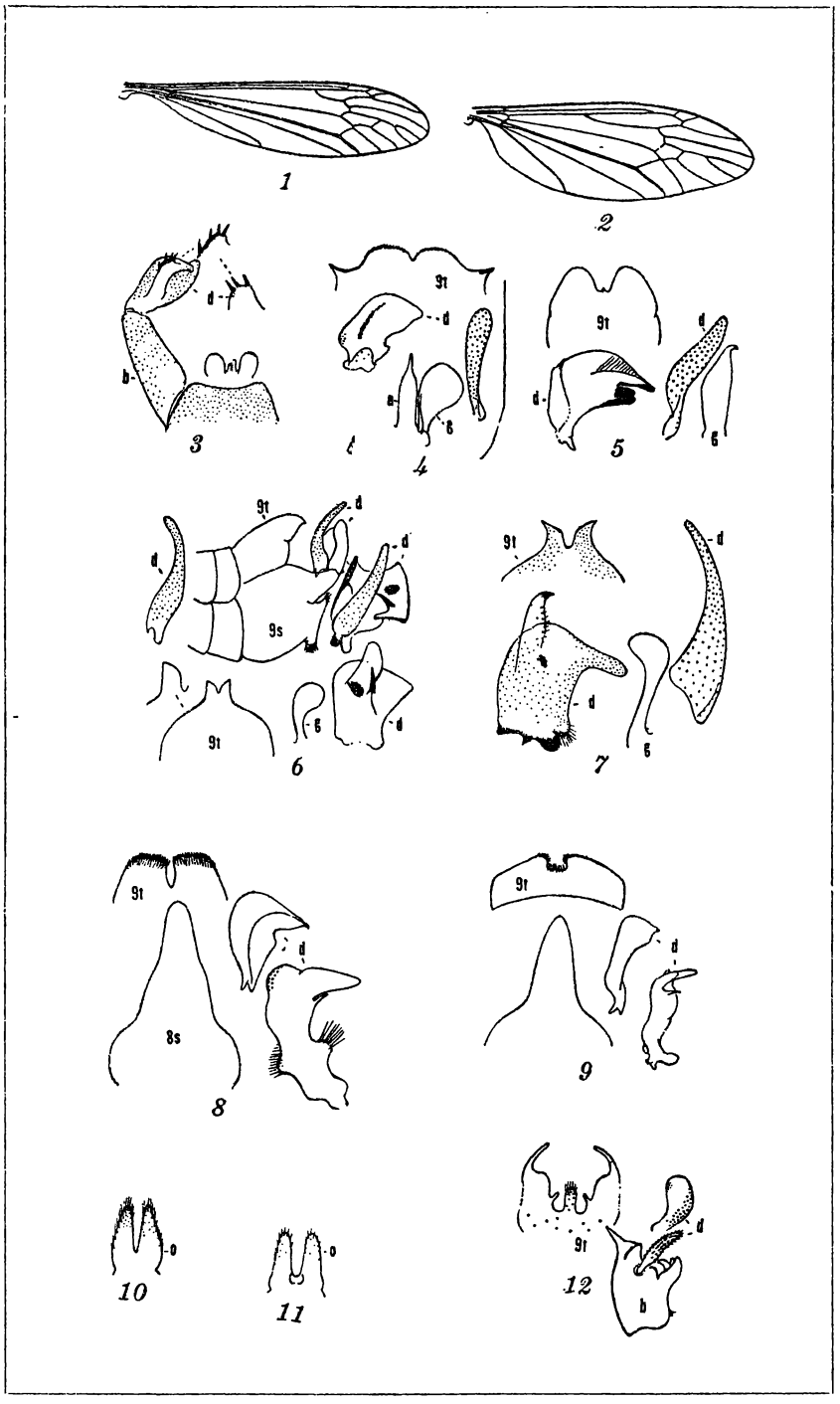
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PLATE 1.

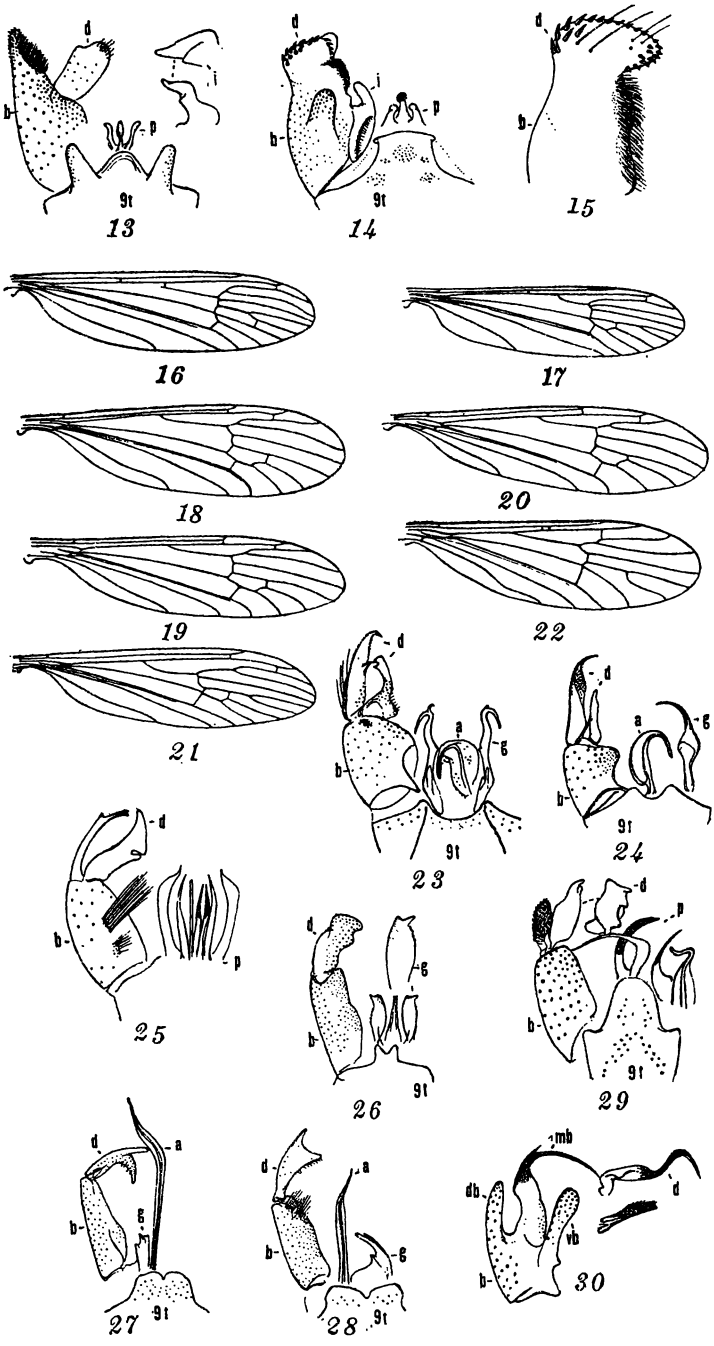

PLATE 2.