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注　意

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STUDIES ON THE HONEY BEE, WITH SPECIAL REFERENCE TO THE JAPAESE HONEY BEE.

BY

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(With plate I & II.)

蜜蜂特に日本種に關する研究

徳田義信

(第一、第二圖版)

INTRODUCTORY.

Setting aside the brief accounts of the Japanese honey bee given by the Japanese writers such as TAMARI (1889) and others, RADOSZKOWSKY (1887) was the first who deals with the systematic position of the bee and regards it as *Apis mellifica* L. var. *japonica*, as following lines show: "Elle se distingue de l'abeille ordinaire en ce que les bases des segments portent des bandes formées de poils couchés blanchâtres et que les segments ventraux sont d'une couleur pâle et garni de poils long sâles. Cette variété se trouve aussi aux environs de Wladiwostok. Jokohama."[1]

According to v. BUTTEL-REEPEN (1906) *Apis mellifica* is classified into 3 subspecies: 1) *mellifica* proper, 2) *unicolor* from Africa, and 3) the Asiatic which merits the name of *indica*, and our native bee is regarded by him as a variety of the last named subspecies, i. e. as *Apis mellifica*, st. *indica-japonica* Rad[2] This view on *indica* is based chiefly upon the criterion to this variety, as pointed out by KOSCHENIKOW (1900), which consists in the plorongation of the cubital

1) Probably *et* is dropped between the two localities, Wladiwosock and Jokohama, by misprint.

2) v. BUTTEL-REEPEN (1906) says that he found in the collection from Japan in the Zoological Museum of Berlin, etc., some examples of *indica-peroni*, 6 of *indica-sinensis* and 3 of *indica-japonica*, and regards the latter as the bastard between *sinensis*-variety and a dark variety of *indica*-subspecies.

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vein beyond the medial cell in the hind wings, as his lines go: "Hintetflügel Kubitalader über Medianzelle bedeutend hinausrangend" (p. 170). In addition to this the author gives two further characteristics of *indica*: 1) "Männchen: Tibie III an der dorsalen Seite ausgebuchtet und seitliche äussere Wölbung abgeplattet" (p. 169); 2) "Mandibeln und Labrum stets heller (meist rostrot) gefärbt als der Thorax" (p. 190).

From the statement given above, we see that the Japanese bee has been put by v. BUTTEL-REEPEN for the first time in relation to *indica* established by FABRICIUS (1798) as the independent species. BINGHAM (1897), KOSCHEVNIKOW (1900), MATSUMURA (1911) and recently v. BUTTEL-REEPEN (1915, 1918) also recognise *indica* as the independent species.

According to BINGHAM (1897), however, *indica* can not sharply be distinguished from, but "merges into common *A. mellifica* Linn., the honeybee par excellence of Europe." KOSCHEVNIKOW (1900) also says: "*A. indica* und *A. mellifica* zeigen viele Ähnlichkeiten miteinander; die Varietäten dieser beiden Arten zeigen noch mehr Übereinstimmung als die typischen Formen." FRIESE (1920, 1922) puts *indica* among *mellifica* on account of his opinion, according to which in the honey bee only 3 species are to be admitted. If I understand correctly the lines given by FRIESE in this regard, his view, by which various forms of the honey bee are comprised in the 3 species known as *dorsata*, *florea* and *mellifica*, is established on 2 points: firstly, the alterations affected by the domestication and adaptation are so great that celebrated systematists such as BINGHAM, SMITH and RADOSZKOWSKY put *unicolor* from Africa together with the Asiatic *indica* (BINGHM) and classify likewise the Asiatic *sinensis* (SMITH) and *japonica* (RADOSZKOWSKY) with the European *mellifica;* secondly, the 2 forms of the 3 specise, *dorsata* and *florea*, which stand morphologically very distinct not only from each other, but also from *mellifica*, can not be crossed with the last named species, while *indica* is crossed with *mellifica* successfully. He also says: "*Apis indica* und *mellifica* sich derart auch biologisch nahestehen, dass wir sie auch unter einen morphologischen Speziesnamen vereinigen können" (1923, p. 344). "Die Honigbiene *(A. mellifica)* ist nur wenig grösser als die *A. indica*, der sie namentlich in ihren afrikanischen Abaraten wie *A. adansoni* und *unicolor* täuschend ähnlich sieht" (loc. cit., p. 357).

The specific value of *indica* and *mellifica* is, therefore, still not clear enough. The present investigation has been carried out with the Japanese bee, and so far as possible, extended to the Corean, Chinese and European bees, so as to enable to compare the anatomical as well as the biological data of the insects from these localities with one another. According to the results arrived at, there is recognised a great similarity among the bees of Japan, Corea and China on one hand and among those from Europe on the other, while the eastern bees show a sharp contrast against the western, so that the latter represented by *A. mellicfia* can by no means be mixed with the former which is accordingly to be recognised as a distinct species and signifies as *A. indica* according to BINGHAM (1887), especially to FABRICIUS (1798). As the descriptions show, to the species criterions of *indica* pointed out by KOSCHEVNIKOW and v. BUTTEL-REEPEN are to be added further distinct characteristic made out in our bee in the present work: the abdominal down bands, a peculiar pore on the drone cocoon, the modification of male organs, etc., inasmuch as there is no room to doubt in recognizing the Japanese bee as a variety of *A. indica.*

The present author is placed in a convenient position in procuring the material not only from the colonies of the bees kept by himself in the Experiment Station, but also because he has connections with his friends and beekeepers affording to him the specimens from several localities of this country. He is moreover well acquainted with several races of the European species, *A. mellifica*, such as the Italian, Carniolans and Dutch bees imported from America and their native places by beekeepers as well as by the Government Industry Department.

In addition to this, Dr. L. H. GOUGH, Director of the Entomological Section, the Ministry of Agriculture, Cairo, Egypt, was so kind to send me 6 specimens of the queen, worker and drone of the Egyptian bees, collected by himself in 1912 and 1913, so as to enable me to extend the anatomical comparison of the present results into the Egyptian bees.

The author will be permitted to express in this place his hearty thanks to DR. S. HATTA, the professor of the Imperial University, Sapporo, for his kindness in giving voluable advices in the course of the work. My obligations are also due to several other gentlemen for their kindness shown to me in sveral ways.

I. MORPHOLOGICAL CHARACTERISTICS

1. Color of the Skin

As is well known, the workers of the Japanese bee are generally blackish in color with brown markings of several systems, which are not other than the zones of the ground color turned lighter. The shade of the colors varies according to the age and also to the localities, from which the specimens are collected: young individuarls are lighter in color, and the specimens from some localities are so dark that the brown markings come forth hardly.

In the *head* which comes first in notice, the mandible and labrum are rust-red in color as v. BUTTEL-REEPEN (1906) mentions of all varieties of *indica*, including *japonica*; some examples have the labrum of lighter color extending to the clypeus. The *scutellum* of the mesothorax ranges in color from yellowish to black; even the individuals from one and the same hive differ in this respect, although sometimes there are found colonies which contain uniformly black bees.

Secondly, the *abdomen* is pale yellowish ventrally, as described by RADOSZKOWSKY (1887), v. BUTTEL-REEPEN (1906) and MATSUMURA (1911), shading lighter into the ventral parts of the dorsal plates. It is worth of notice that in some examples the ventral side of abdomen is turned into blackish when killed, while in life it is brownish. I mention this, because this change of color misleads often one to recognize the black abdomened specimen of the Japanese race as a normal example; v. BUTTEL-REEPEN (1906), who has 6 examples of *sinensis* from Japan, seems likely to have been misled by this abnormality.[1] In realty, the pale coloring on the ventral side is to be recognized as one of the important characteristics of the Japanese bee.

Turning to the dorsal plates of abdomen, 2 transverse zones are distinguished on each plate: the posterior broad zone is blackish, while the anterior narrow patch is lighter in color, so far as it is usually overlapped, so as to be hidden by the hind margin of the preceding plate, and becomes visible only when the abdmen is much distended (Fig. 1), so that the characteristic markings are in

1) I have experienced that some yellowish examples from a central locality (Kanagawa), for instance, have become deep black when they are dead; furthemore black types from a northern locality (Aomori) were stiil further blackened when killed.

the ordinary position of the body out of notice of an observer, especially in the case of specimens which are shrinked. BINGHAM (1897) notes on *indica* simply: "The scutellum and basal five segments of the abdomen testaceous yellow"; BENTON (1896) says, on the other hand, "The abdomen is yellow underneath. Above it presents a ringed appearance, the anterior part of each segment being orange yellow, while the posterior part shows bands of brown of greater or less width and covered with whitish-brown hairs; tip black." The observation of the last named author is accordingly in this respect in accordance with the results of the present investigation.

The markings on the dorsal plates just referred to are the constant occurence to all the worker bees, though there are naturally some divergencies in shading of color. The second plate is excepted in its being furnished with a striking brownish mark of varying shape and area which occupies the larger or smaller part of the black area (see *k*, Fig. 2), but is entirely lost not unfrequently. There are rarely colonies, the whole members of which lack the mark in question.

Thirdly, the *legs* are black, with a brown oblique streak on the outside of the middle portion of the tibia of hind legs. The black pigment grows more scanty towards the proximal joints, especially on their inner side, being caused by lacking the pigment. The coxa, trochanter and femur of the legs, especially those of the hind legs, look on this account more or less translucent and are turned brownish and opaque, when the bees are dead and dried. The above mentioned streak as well as the brown shading just referred to are not constant; some individuals have legs lacking entirely the streak and brown areas, the whole body being blackened.

The following table (Table I) is intended to show the number of bees with the markings from several localities of this country as well as those from Corea and China. In some examples the brown markings are extremely distinct because the fundamental black color is lighter, while in another lot they are diffused owing to the latter which is intensified; there are of course individuals standing in this respect in the midway between the two lots, ranging to both the extremities. The variation is to some extent due to the geographical position of the localities. So far as proved, the bees from the southern localities such as Fukuoka and Kumamoto are lighter in color, as compared with those

from Hondo or the Main land and from Shikoku (Kôchi and Tokushima).

TABLE I. The worker bee individuals with markings, from sveral localities.

Localities	Total number of the worker bees observed	Individuals with scutellum brownish	Individuals with brownish marking on the 2nd abdominal segment	Individuals with brownish markings on the 3rd tibia
Hondo:				
Aomori	510	0	4	0
〃	20	19	17	14
〃	7	7	7	7
Akita	5	5	5	1
Fukushima	5	0	2	0
Ibaraki	2	2	2	1
Nagano	17	5	6	1
Mie	15	10	11	10
〃	11	11	7	8
〃	9	8	9	8
Kanagawa	15	3	2	3
Gifu	6	3	3	2
Yamaguchi	9	1	8	4
Shikoku:				
Tokushima	24	1	4	2
〃	100	0	0	100
Kôchi	693	0	0	0
〃	6	2	0	0
Kyushû:				
Tsushima Is.	7	7	4	7
Fukuoka	64	61	59	55
Kumamoto	22	0	22	18
Miyasaki	23	0	18	10
Corea:				
Seoul	24	24	24	15
Kôryo	20	19	15	3
China:				
Manchuria (Chiko-shan)	7	7	7	5
Peking	9	9	9	1
〃	7	7	7	7
Hankau	21	20	21	14

Next come in consideration the queen and drone, in which the coloring is generally simple. In the *queen*, the head, thorax and abdomen are brownish black; legs are translucent, fuscous and sometimes mottled blackish. Scapus of antenae is often dark brown. Scutellum is black. The anterior half of the abdominal segment is shiny black; its posterior half exposed is not shiny, being covered with finest brownish pubescence. The ventral plates of the abdomen are black, each ranging posteriorly into fuscous. The *drones*: the head, thorax, abdomen and legs are all black, excepting the surroundings of the anal opening which are brown.

2. Pubescence of the Jappanese Bee

The hair bush between compound eyes is not scanty in the Japanese bee, as compared, for instance, with *A. mellifica*. In this respect, our bee can not be distinguished from the specimens from Corea (Seoul and Kôryo), Manchuria (Chiko-shan), Peking and Hankau, which agree again in resembling each other. This fact disproves the statement by v. BUTTEL-REEPEN (1906), which runs as follows, "Das Fehlen des Stirnhaarschopfes und spärlichere Behaarung sowie die hellere Abdomen-Unterseite (in the Japanese bee) unterscheiden sie von der *Sinensis*." About the color the blackishness of the ventral plates of the abdomen can not be accepted, as we have already dealt with in the preceding paragraph; what the hair-tuft is concerned, I do not hesitate to assume that it is lost or diminished owing to some artificial causes.

The second lot of hairs are represented by the hair bands of the abdomen, which are of constant occurence and merit accordingly the valuable species criterion. According to the previous authors these hair bands are present in the varieties, such as *peroni*, *picea*, *sinensis* and *japonica* only three in number, occuring on respective segments from the 3rd to 5th. I have detected one more band on the 6th segment of the Japanese bee (*b*, Fig. 1); this band may probably be overlooked in shrinked specimens, because it is found on the hindmost segment of the body which is often concealed in such spesimens. Nevesthless, it is an important characteristic not only of the Japanese bee, but also of the bees from Corea and China, in which I have proved this, while *mellifica* is destitute of it. This result suggests further that all other varieties

of *indica* possess the same structures. The hair band in question is yellowish in color and narrow in shape and is found on the basal margin of the black region of each segment.

Now we have in total 4 hair bands distributed respectively on the segments from the 3rd to 6th; it is these white hair bands by which a ringed appearance of the abdomen is distinctly expressed, especially when the abdomen is distended by some causes.

As the third lot of hairing I am going to describe the hairs of the remaining parts of the body. The hairs of the thorax are brownish gray on the backside, becoming whitish on its ventral side and on the legs. From the coxa to the tibia whitish hairs are present; the tarsus is provided with brownish hairs.

As to the hairing of the *queen* the caput is provided with long brownish black hairs, but on the face short black hairs are seen; on the dorsal and ventral sides of the thorax as well as on the legs brownish hairs are present; the abdomen is grown with brownish finest pubescence.

The *drone:* the face is provided with black, the thorax with brownish black, the distal end of the thorax and the basal margin of the abdomen with grayish white hairs; the abdomen is grown with whitish hairs ventrally and with long brownish hairs distally. The coxa, trochanter and femur of the foreand middle legs are provided with whitish hairs, the tibia and tarsus being furnished with brownish long hairs; the hind legs lack hairs from femur to the tip.

3. Wings

The wings are in the three forms hyaline; in the queen they are often more or less darker in color. The wings of drones are irridescent.

The criterion given by KOSCHEVNIKOW (1900) of the venation on *indica*, that consists in the prolongation of the radial and cubital veins beyond the medial cell in the hind wings, is also valid of the hind wings of all over the worker, queen and drone bees (Figs. 3, 4, 5).

Hooklets of the hind wings of the Japanese bee show greatly numerical divergence. The following table (Table II, a, b, c) are intended to show the number of these hooklets in the workers, queens and drones of the Japanese bees from several localities.

3. On the Siza and Shape of the Body.

The Japanese bee is in the dry specimens 9–12 mm in length. But the plump bees attain so greater length, that they are 14 mm or more in total length.

TABLE II.

a.—Workers [1]

	Aomori		Mie		Tokushima		Fukuoka	
	Left	Right	Left	Right	Left	Right	Left	Right
1	16	18	18	18	18	17	15	16
2	18	18	19	18	18	17	16	15
3	18	18	18	19	17	19	16	17
4	18	18	17	20	17	19	16	17
5	18	19	17	20	18	18	17	17
6	17	21	20	18	18	19	18	16
7	19	19	19	20	19	18	18	17
8	19	20	20	19	19	19	18	18
9	20	20	21	18	19	19	17	20
10	20	21	22	20	20	20	18	20

b.—Queens

	Mie		Fukuoka		Kôchi	
	Left	Right	Left	Right	Left	Right
1	18	17	15	15	16	16
2	—	—	19	19	—	—

c.—Drones

	Gumma		Kôchi		Tokushima		Aomori	
	Left	Right	Left	Right	Left	Right	Left	Right
1	17	17	16	17	17	17	17	17
2	17	19	20	22	20	20	—	—
3	—	—	20	21	18	18	—	—

1) The figures are from 10 bees taken at random.

In an example of the Japanese bee it is 0.0636 gr[1] in weight, in another one 0.07835 gr,[2] while a bee of the Italian race weighs 0.0725 gr[3] and another one of the latter 0.0875 gr.[4]

The queen of the Japanese bee is relatively large; it is on the dry specimens 13–17 mm in length; during spawning season, living queen grows as large as 20 mm in length, weighing 0.21185 gr for instance. The drone, on the other hand, is relatively small in size; it is 12–13 mm in length on the dry specimens, but in living ones it is 14.8 mm and 0.124 gr.[5]

The tongue of the worker is 3 mm in length, 0.5 mm or more shorter than that of the Italian.

BUTTEL-REEPEN (1906) mentions that the distal, dorsal margin of the third tibia is in the drone of *indica* strikingly projected (j, Fig. 7), while it is in the mellific drone almost straight (Fig. 8). The stiff hairs of the planta of the first tarsal joint are in 12 rows, 2 of which are obscure.

4. On the Male Copulatory Organs.

Now let us turn to the male copulatory organs which show a great deal of characteristics distinguishing our bees from *mellifica*. For the sake of convenience the description will be commenced with the organ everted. It is simply not other than a membranous, tubular, hollow pouch bent dorsally, and consists of 2 portions, the proximal and the distal: the latter is smooth on its surface (except *mellifica* in which a pair of so-called symmetrical chitinous plates (*s*, Figs. 16, 18) are to be seen in the wall of the pouch, at the dorsal aspect of the bending); the former is provided, on the other hand, with a series of appendages which are named by SHAFER (1917) respectionely as the doubly pinnate-lobed projection, the cross-striped chitinous ridges, the ventral quadrangular plate, the triangular plate and a pair of pneumophyses.

In the distal part, the Japanese drones are distinguished from *mellifica*, in the first place, by the neck-like narrowance of the tube (*c*, Figs. 14, 15, 17), by which the proximal portion is demarkated against the distal, while in *mellifica* they pass from one to the other; in the second place, the so-called

1, 2, 3, 4) The bees alarming at the entrance were taken to the weight.

5) It is the average number of 11 drones.

symmetrical chitinous plates are sometimes nearly lost in the Japanese bee (Figs. 15, 17), or are represented simply by a group of slight thickenings of the membranous wall (*s*, Figs. 14, 20), which are melt together in *mellifica* into a pair of hard chitinous plates in the dorsal wall of the penis tube (*s*, Figs. 16, 18). In this respect, the Chinese drone can not be distinguished from the Japanese, showing a slight thickenings of the membranous wall instead of the hard symmetrical chitinous plates. The thickenings are only a ring zone formed of minute outgrowths of the penis wall. The lateral and dorsal views of the zone are shown in Figs. 14 and 20 (*s*) respectively.

In the proximal portion the so-called pinnately lobed projection shows a fan-shaped arrangement of lobes around the axis (*l*, Figs, 15, 21), instead of the pinnate structure in *mellifica*, in which the lobes are arranged principally on each side of the axis, whence the terminology of the organ is derived (*l*, Figs. 16, 22). What is the cross-striped ridges concerned, the grooves separating them are more depressed than in *mellifica*. so that the ridges are expressed distinctly (*r*, Figs. 14, 15, 17). The ridges are furthermore provided with the spinules or hairs, the growth of which is in particular denser and more vigorous towards those in the proximal part; in *mellifica* they are separated not only by the relatively inconspicuous depressions, but the spinules are most vigorous in the middle ones, as seen in the penis everted. The ventral quadrangular region is very thin in structure and clad with spinules very weakly (*q*, Figs. 15, 17), connecting with the well developed proximalmost ridge (r_1, Figs. 15, 17), while in *mellifica* the former is thick and vigorously haired and set off from the latter by a strong constriction (*q*, *c*, Fig. 16). The dorsal triangular region, on the other hand, is larger and more haired in the Japanese drone than in *mellifica* (*t*, Figs. 14, 15, 17).

In the pneumophyses I have detected great divergencies from those of *mellifica*. They are represented by a pair of conical tubes found on each side (*p*, Figs. 14, 15, 17, 23, 24). They have 3 likewise conical, tubular, accessory outgrowths of unequal length at its basal part ($p_{2, 3, 4}$ Figs. 14, 15, 17, 23, 24); the proximal one is the longest (p_2, Figs. 23, 24) and produces some minute accessory outgrowths, while the distal as well as the shortest middle tubes are simple. The homologous structures are rudimentary in *mellifica*, being repre-

sented simply by 2 wart-like elevations at the corresponding part of each pneumophysic tube everted. In the resting state, the principal horns are 4-6 mm in length, which are only 3-4 mm in *mellifica*.

Now the bees from Fgypt, Madagascar and Mauritius come in consideration; they are altogether taken by v. BUTTEL-REEPEN (1906, 15) as *unicolor*, a subspecies of *A. mellifica*, whereas those from the two latter localities BINGHAM (1897) puts in *A. indica*. According to the present investigation the Egyptian bee can hardly be, however, distinguished from *mellifica* proper, so far as the structure of the male copulatory organ is concerned (Fig. 19).

II. BIOLOGICAL CHARACTERISTICS

1. Habit of Life

The colony of the Japaness bee is inferior to *mellifica* in population. The hive or box is built accordingly abot 33 × 33 × 100 cm. Besides the fixed hive, a mavable hive was offered by TAMARI (1889), but is not in usual use, for the experience has proved the bees like better the fixed hive. When taken in a new box, the colony established very fine combs from ceiling downwards, arranged vertically and in parallel. According to our old custom, a honey dealer who visits the bee-yard, takes out the honey, cutting across the height of the upper half the combs of the honey store opened from the roof. The remaining half of the store is left for the bees' support. In each hive the honery harvest is said to yield about 1 to 3 *kwan* (4-12 kg) of honery per colony.

If the ecological conditions are unfavourable, the bees abandon frequently their hive. I observed case of the migration of the colony from Kumamoto, the members of which were prepairing to abandon the hive in the course of about a month in the summer dearth. Almost all cells were full of honey, but the queen was very small in body size and no brood was found. The bees were placed in so restless condition to run out of the entrance when the hive was opened. I found after about 30 days that the hive was vacant, when the day of August 21st of 1922 broke. The propensity of migration may be taken

as a characteristic of the Japanese bees and shows a similarity to the Indian bees, as GHOSH (1920?) gives on the bees of Ceylon; he says: "These bees are very prone to swarming and are found to migrate as well to some extent." Our bees cast only 2 or 3 swarms a year, though they build often 10 or more queen cells. The absconding is very often caused by the wax moths which attack almost always the hive of our bees.

As to the mode of ventilation, our bees differ from *mellifica*. Whilst the latter fan at the alighting board facing inwardly, our bees sit likewise at the entrance, but their heads are turned away from it (Fig. 6). This has been well known in our country, and recently the same habit of *indica* in Ceylon is reported by DRIEBERG (1922). According to my observation, the fanning bees are resting, however, rather more in number on the upper vertical wall of the hive body than on the bottom board in front of the entrance, as shown in Fig. 6. In addition to this, those of the outside from unbroken rows together with those of inside which are likewise fanning, scattered on the bottom and combs.

Another contrast of the Japanese bee to *mellifica* consists in that in the case destitute of their queen the workers are not capable to rear a queen from a worker egg or larva. It is not long after departure of the queen that many fertile workers lay eggs in cells (especially, soon the bees from Fukuoka) which produce always the drone bees. If fertilized eggs or larvae are experimentally put in cells before fertile wokers appear, they are not cared. But I have met with several cases of queen cells which are built on the drone larvae layed by the fertile workers. If the introduction of a queen is done in a queen cage, she is usually abandoned without regards. It follows that a colony once left by the queen is connected with a great difficulty to recover its previous normal condition. Some one reports on the other hand on *indica* of Ceylon that the bees "are able to raise queens from eggs or larvae when suddenly deprived of the reigning queen."[1] If this is proved true, our bees diverge in this respect from those of Ceylon. The union of the Japanese bee with *mellifica* in a colony, whether the latter is introduced in the former or inversed, is likewise by no means easy, although sometimes a few of cases of success are

1) Reffer to DRIEBERG (1922).

reported. I have an experience, that the mellific intruders in autumn were shut in a colony of the Japanese bees accidentally by snowfall and cold climate and were found living in harmony with each other in the colony in the following spring.

Lastly, our bee is contrasted to *mellifica* concerning the position of the eggs deposited in the cells. The eggs lie, in the Japanese bee, so inclined on the bottom of the cell that they are almost in parallel with the comb surface with their tip pointed downwards, while in *mellifica* the tip of the eggs is directed towards cell mouths, so as to be placed vertical to the surface referred to.

In connection with the behavior of the workers against the queen, on that against the drone a brief accounts will be given, as seen during a dearth of nectar. Usually the drones are not more reared in the season of a dearth and meantime they disappear in the hive. Among others, I mention a case in which a few drone larvae were reared; they were found crushed at the head before their maturity is attained; the waxy covers were scraped off, and the characteristic cocoons were gnawed roundly at the cell mouths, falling in the shape of a small disc, smaller than those cut down by the emerging drones themselves; this is in the case in the bees from Kumamoto and Kôchi. On the contrary, I observed a single case in the bees from Aomori, in which a few drones were almost always being raised up beyond the flowering season until late autumn or early winter.

Still further contrast of our bee to *mellifica* is seen in a queen in which the anterior half of the fore wing is clipped in order to keep her in the colony at swarming time; meanwhile she disappears, probably being killed and cast away from the nest by the workers. It is, therefore, obvious, that in the Japanese bee the artificial enforcing in the treatment of the queen is not easily accepted by the workers of a colony.

As already referred to, FRIESE (1920, 1922) and others maintain that *indica* crosses with *mellifica*. We can not, however, confirm this statement from our experience with the Japaneses bee in more than twenty years, during which we did not recognise the successful results of the crossing.

The Japanese bees are mild in nature and shy and timid in character. They rarely sting weakly and bite their tormentor in some measure, often

crawling in the inside of the clothes. They avoid enemies instead of struggling against them, though they sometimes dash upon. And also GHOSH (1920?) says of *indica*: "They can not defend themselves against enemies so well as the Italian bees, and the Wax Moth plays hevoc among them." During a dearth *mellifica* invade the colony of the Japanese bee without much resistance and rob away all the store. The Japanese bees disregard the invaders, even show no sight of hate or struggle against them inside of the hive as if they know nothing about the matter and leave in fact their store upon deprivance of the robbers.

There is a further fact that *mellifica* and the Japanese bee do not flourish with harmony in one and the same locality. The government statistics gives the following numbers, showing the Japanese bee diminishing year after year in number of the colonies in consequence of the struggle against *mellifica*; it is principally due to the deprivance of the store by the latter.

	Japanese bee	*millifica*
1913	84.997	48.054
1916	63.735	49.703
1917	46.000	52.604
1918	44.946	58.865

The Japanese bees produce a peculiar noise of wings like *ss* all at once at every slight stimulation. This may be assumed as their mutual alarm and is naturally due to timid or irritable nature. They are placed in restless movement, when the irritation is strong; they run about, leaving the brood nest, to hang then at the edge of comb or at the entrance in group. In this respect, the bees from Fukuoka are more irritable than from Aomori and Kôchi.

The Japanese bees defend themselves against the ferocious enemy *Vespa mandarina*, which is a malignant foe of them in this country. *Mellifica* fights against the enemy, but receives nothiag else than disastrous damage, being massacred and annihilated; our Japanese bees behave themselves in this regards quite profitable, taking advantage of their timid character; they withdraw inside the hive, as soon as visited by the enemy, and hide themselves, so long as the latter watches. And, further, the offenders are balled and killed by the

bees, as soon as they dare to intrude the inside of the hive.

2. Wax Secretion and Comb-Building.

Our tribe of bee excels *mellifica*, as it seems to me, in the ability of wax-secretion. Their habit to leave their nest at trifle obstacles seems to stand in connection with this ability of the skillful builders; the cell wall of the combs is gnawn down when not satisfied and the old shallow comb-cells are very often found left unused. In this regard they stand in contrast to *mellifica* which are extremely tenacious to take care for the preservation and utilization of any combs. Peculiar it is that they are very often bearing in their wax pockets wax scales considerably thick, more than 1 mm in thickness, bulging outward the covering plates, while this is not so common in *mellifica*.

If supplied with food, our bees build combs readily in the warm climate when no honey is coming in from natural sources. The newly built combs are white or yellow in color and regular in shape and arrangement and of freshy appearance. The cell wall of the new comb is so thin that it is only 32 μ in thickness. The bees do not use propolis. They disregard mellific combs, when given to them, but use often as those of honey or sometimes as those for the drone brood. The comb foundations of mellific type are usually also disregarded, but rarely utilized by them, building up the cells narrowing the cell mouths; thus intermediate froms of cells are left here and there between the groups of the narrowed ones.

In the followings table I have endeavoured to compare the value of 3 diameters of one cell in the Japanese bee with those in *mellifica*.

TABLE III.

Diameter from side to side	Worker cells		Drone celle	
	Japanese bee (80 cells)	Dutch bee (120 cells)	Japanese bee (60 cells)	Dutch bee (30 cells)
1	4.65 mm	4.98 mm	5.42 mm	6.48 mm
2	4.62 "	4.18 "	5.37 "	6.45 "
3	4.68 "	4.15 "	5.25 "	6.40 "
Mean	4.65 "	5.10 "	5.36 "	6.45 "

From the above figures we see that the drone cells surpass slightly the worker cells of *mellifica* in dimensions.

Queen cells resemble in form those in *mellifica*; in one case I measured it is 18.7 mm in depth and is 9.8 mm in the maximum inside diameter.

It is well known in this country that wax dealers appreciate the Japanese beeswax owing to its superior quality. The chemical and physical properties are seen in the study by SHIBASAKI (1900).

3. On the Peculiar Pore of the Drone Cocoon.

As the characteristic of the drone cocoon comes next in consideration a fine circular pore which I have made out at the elevated out tip of it; it comes into view, when the nurse bees take off the waxy cap sealing each cell which covers the cocoon (Fig. 9). This pore is not detected in *mellifica* at all (Fig. 12), but in our bees it rudiment is already obvious in the cocoon just formed; it is inconspicuous at first, but is recognized at ease by artificial exposition of the tip of the cocoon.

The young drones come out, cutting round the outer cocoon wall circularly, so that it falls in circular disc (Fig. 10, 11). Seen on median transverse section through its pore (Fig. 13), the disc consists of about 10 layers of silky substance which are diminished in number towards the periphery, so as to decrease the disc in thickness, until its sharp edge is brought about. A dark brown substance of unknown matter is deposited along the inner surface of the layered structure just described: it is thicker near the passage of the pore and is thinned out towards the periphery, penetrating probably between lhe layers of the disc.

The pore is nothing other than the outer opening of the passage communicating the interior of the cocoon with exterier. The passage is a straight canal, but becomes constricted at the neck which is surrounded by the dark brown body, so as to be transformed into the funnel-shaped passage which is 0.4 mm in length, 0.4 to 0.6 mm in diameter at outer and 0.25 mm at the inner opening.

Instead of thin and loose structure of the cocoon wall in *mellifica*, it is of a considerable thickness in our bees; the reason why the pore of the cocoon is confined to the latter consists, as I dare to assume, in this thickness of cocoon

wall to facilitate the aeration in the inside of the small chamber.

CONCLUDING REMARKS.

A scope of the external features brought forth in the foregoing descriptions, among which the brown color of the mouth-parts, the distinct banding on the dorsal plates of the abdomen, the pale yellowish coloring of its ventral surface, the peculiar markings and the tibial projection of the drone legs as well as the criterion of the wing-venation are to be enumerated, are so characteriostic to the Japanese bee that it can not be classified with, but is put against *A. mellifica*. A new fact that the toment bands which are made out in the present investigation to be extended into the 6th abdominal segment, enforces furthermore us to assume this view.

What is the anatomical details concerned, there are a series of new facts of prime importance which have been added by the present investigation; in particular they are made out in the male copulatory organ. Striking is the constriction which marks off the proximal portion of the penis from its distal part. The simple thickenings of the penis wall is seen instead of the hard chitinous plates of the dorsal wall in *A. mellifica;* not unfrequently they are even nearly lost. The conspicuous structure is seen in the pneumophyses which are not only represented by the principal horns prolonged, but consists also of the 3 well developed accessory conical tubes of unequal length. The deep grooves separating the cross-ridges from one another as well as the characteristic spining on them and on the ventral quadrangular region stand back by no means to the new facts just mentioned. The palmated structure of the so-called doubly pinnate-lobed projection with the well-developed dorsal triangular region must be added to these important facts.

In the biological habitude of life there is a series of sharp contrast in which the Japanese bees stand to *A. mellifica*. First of all our bees are so coward and helpless that they are defeated, without intending a defence, by formidable offence turned by *A. mellifica* upon. The latter are in their turn offended and damaged by dreadful attack of wild wasps which are, however, powerless on the Japanese bees, because at the offence these shy creatures

retire into the inside of the box instead of risking the struggle and exterminate those fellows of the varacious enemy, which dare to intrude thereinto. It occurs not unfrequently that the cell wall of the old combs is gnawn down by themselves. They abandon their hive at trifle circumstance unfavorable for them; on the other hand, they are skillful in building the nest, each cell of which is in mean 4.65 mm in diamenter and 5.36 mm in depth for the drones, being the latter about equal to that of the worker cell of *A. mellifica*. They are often seen bearing so thick wax-scales, more than 1 mm in thickness in their wax-pockets. The worker bees do not intend to raise the queen either from fertilized egg or from worker larva and become fertile soon, when the latter is lost from their hive. It is, therefore, beyond doubt that a nest in which the queen is once lost, can never be maintained further, so that there happens nothing else than decomposition of the colony.

As further peculialities of the Japanese bees the forward direction of their heads at the entrance of the box, in which they are fanning, and the parts of the latter they rest at fanning are to be mentioned; the arrangement of the eggs along the midrib of the comb, in which they are deposited, is also a striking contrast to that in *A. mellifica*. The circlar pore at the front wall of the drone-cocoon is finally as one of the striking characteriostic of our tribe of bee.

All these prominent biological facts gathered from the facts described prove that our bees stand inferior to *A. mellifica* in the zoological scale and can accordingly be not taken together with, but are to be distinguished from the latter. It is, furthermore, reported and has been experienced by myself that crossing of our male and female with those of *A. mellifica* is unsuccessful.

In connection with the anatomical characteriostics, among which the construction of the male copulatory organ is worth of notice, the biological date just referred to afford us the ground which is strong enough to put the Japanese bees on it against *A. mellifica*. On the other hand, our native bees show a series of characteristics in common with *Apis indica*, as pointed out by recent observers such as KOSCHEVNIKOW (1900), v. BUTTEL-REEPEN (1906) and others. FRIESE (1920, 1922, 1923) puts *indica* among *A. mellifica*, but only because his view advanced in order to condense the conception of the species. The results

of the present investigations are, therefore, proved not only to have elucidated the anatomical and biological details which have yet remained obscure, but also to afford the absolutely solid ground, on which the variety of *A. indica* is established for the Japanese honey bee.

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EXPRANATION OF PRATES

List of Abreviations

a. alighting board of the hive.
b. hair band of 6th segment.
c. constriction.
j. projection.
k. marking.
l. lobed projection.
m. brown mass.
o. prore.
p. pneumophyses:
1. principal horn.
2. main branch.
3,4. side branches.
q. ventral quadrangular region.
r. cross striped ridges.
1. proximalmost ridge.
s. symmetrical chitinous plates or slight thickenings of penis wall.
t. dorsal triangular region.
w. vertical wall of the hive.

Plate I

Fig. 1. Individual of Japanese worker bee, abdomen distended, from right side. × 2.5
Fig. 2. Do., bearing a brownish markings on the 2nd segment, dorsal view. × 2.5
Fig. 3. Venation of hind wing, Japanese worker. × 6.6
Fig. 4. Do., Japanese queen. × 6.6
Fig. 5. Do., Japanese drone. × 6.6
Fig. 6. Do., Japanese bee fanning at the entrance of a hive.
Fig. 7. Hind leg, Japanese drone. × 5
Fig. 8. Do, Dutch drone. × 5

Fig. 9. Pore of drone cocoon, exposed by nurse bees, scraping off waxy cover, natural size.

Fig. 10. Scaly cocoon discs cut down by emerging drones themselves, natural size.

Fig. 11. A cocoon disc magnified; Japanese bee. × 5.5

Fig. 12. Do., Italian bee. × 5.5

Fig. 13. Median transverse section of cocoon disc × 16

Plate II

Fig. 14. Copulatory organ of Japanese drone, protruded, lateral view, bearing group of minute outgrouths of distal penis wall. × 9

Fig. 15. Do., showing nearly total absence of minute outgrowths on penis wall. × 9

Fig. 16. Copulatory organ, Dutch drone, everted state. × 7.4

Fig. 17. Do., Japanese drone, resting state. × 11

Fig. 18. Do., Dutch drone. × 7.7

Fig. 19. Do., Egyptian drone. × 7

Fig. 20. Penis-bulb spreaded out, to show distribution of minute outgrowths on penis wall in Japanese drone, dorsal view. × 15

Fig. 21. Pinnately-lobed projection, Japanese drone, facial view. x 10

Fig. 22. Do., Dutch drone. × 10

Fig. 23. Pneumophyses, Japanese drone, resting state. × 11.5

Fig. 24. Do., everted state. × 12.7

摘　　要

本研究ハ日本土產蜜蜂(以下之ヲ日本蜂ト稱ス)ノ利用ヲ圖ランカ爲メニ、先ツ其ノ特徵及特性ノ他種ニ比シテ顯著ナル差異ノ存スル諸點ヲ明ニシ、且ツ其ノ分類學上ノ位置ヲ確立セントシタルモノナリ。

抑モ日本蜂ニ就テハ玉利氏(1889 其ノ他本部諸家ノ之ニ關シ記載セル無キニ非ルモ、之カ分類學上ノ位置ニ付キ初メテ手ヲ染メタルハRadoszkowsky (1887) ヲ以テ嚆矢トス。即チ氏ハ之ヲ Apis mellifica L. var. Japonica Rad. ト命名シ、依テ以テmellifica種ノ一變種ト認メタリ。然ルニ von Buttel-Reepen (1906)ハ先ツmellifica種ヲ分チテmellifica, unicolor, indicaノ三亞種トナシ、Apis mellifica st. indica-japonica Rad.ト命名セリ。即チ氏ハ日本蜂ヲindicaノ一變種トナシタルコトニ於テR.氏ト異ナルモ、此indicaヲmellificaノ一亞種トナシタルカ故ニ、氏モ亦日本蜂ヲmellifica種ニ編入シタルモノト謂フヘシ。

元來indicaヲ獨立ノ種トナシタルハFabricius(1798)ニシテ、Bingham(1897)松村氏(1911)亦之ヲ採用シv. Butte-Reepenハ1906年ニ於テ前記ノ如ク之ヲmellifica種ノ一亞種トナシタルモ、1915年、1918年ニハ同シク之ヲ獨立ノ種トナセリ。獨リFriese (1920)ハ依然トシテindicaヲmellificaニ包含セシムヘキコトヲ主張シ、此意見ハ1922年ニ至ルモ變ラズ。斯ノ如ク論義ノ一致セサルハindicaノ特徵カ未タ十分明瞭ナラサルニ因ルモノニシテ、之カ爲メニナホ分類學諸家ヲシテ、例ヘハ Bingham (1897) ハ亞非利加產 umicolor ヲ indicaノ變種トナシ、Smith (1861)ハ Sinensis ヲ mellificaノ變種トセルカ如キ誤謬ニ陷ラシメタリ。

本著者ハ日本蜂標品ヲ各地ヨリ蒐集シ、且ツ數地方ヨリ其ノ蜂群ヲ得テ自ラ飼養ヲ試ミ、更ニ朝鮮、支那、等ヨリ其ノ土產蜜蜂ノ標品ヲ得、一方ニ於テハ歐羅巴產 mellificaノ內 Carniolan, Italian, Dutch Bee 等ヲ飼用シ、又亞非利加產 unicolorノ標品ヲ得、以テ彼此相比較シ、其ノ間極メテ顯著ナル差異ノ存スルコトヲ明ニシ、斯學ノ欠陷ヲ補フヲ得ルニ至レリ。以下其ノ概要ヲ記サントス。

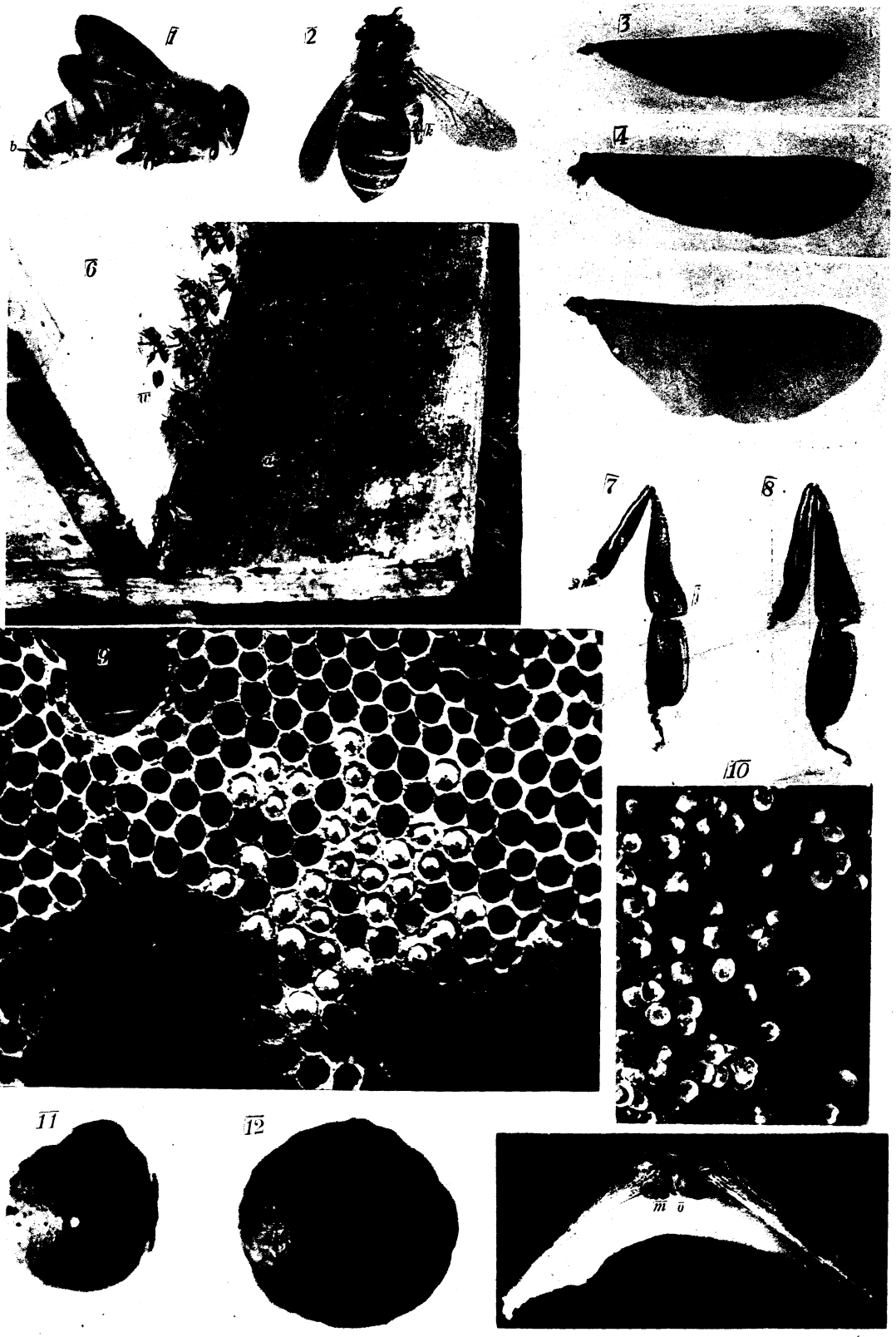
日本蜂ノ体色ニハ其ノ黑色ト相介在セル褐色ノ標徵アリ。其ノ常存スルモノハ口部ノ錆赤色ヲ呈スルコト、腹板ノ淡黃ナルコトノ外、背板各葉ノ前半カ褐色ニシテ後半黑色ナルコトナリ。而シテ屢〻存在スルモノニハ、第二

ニ於ケルヤヤ大形ノ褐斑、第三肢脛節外緣中央ノ褐條、肢ノ基部數節殊ニ其ノ內面ノ淡褐ナルコト等ヲ擧クヘシ。被毛ニ就テハ頭頂ニ叢毛尠シトスルノ說ハ謬ニシテ、第六腹環節背板ニ必ズ一毛條ヲ存スルハ mellifica トノ大ナル差異點ナリトス。日本蜂ノ後翅ニ於テ肘肌ガ中室ヲ越エテ延長スルコトハ朝鮮、支那產ニ於ケルト同樣ナリ。日本蜂ノ働蜂ハ体長 10–13mm, 王蜂 13–17 mm, 雄蜂 12–13 mm ナリ。働蜂ノ舌ノ長サハ 3 mm ニシテ、即チ Italian ノソレヨリモ約 0.5 mm 短シ。雄蜂ノ第三脛節外緣末端ノ凸隆スルハ事實ナリ。雄蜂ノ生殖器ハ日本及支那產ノモノニ於テ相一致シ、又歐羅巴及埃及產ノモノ亦相一致シ、而シテ此二組ノ間ニハ顯著ナル差異アリ。先ツ其ノ体外ニ突出スル時屈曲ノ度ハ日本蜂ノ方鈍角ヲ呈ス、mellificaニアリテハ陰筒ノ脊面ニ著ク發達セル對稱キチン板 (Symmetrical chitinous plate) アリ、日本蜂ニアリテハ之ヲ缺クノミナラス該部ニ近ク括ビレアリ。mellificaニ於ケル羽狀突起 (Doubly pinnate-lobed projection) ハ日本蜂ニアリテハ掌狀ヲ呈ス。又橫隆 (Cross-ridges) ハ mellifica ニ於ケルヨリモ各ノ間ニ深キ溝アリ、且ツ其ノ最基端ノモノ其ノ棘毛ト共ニ最モヨク發達シ、末端ニ進ムニ從ヒ漸次微ナリ。下面方形板 (Ventral quadrangular plate) ハ mellifica ニアリテハ其ノ次ニ位スル橫隆ト顯著ナル溝ニ依リテ境セラルヽノミナラズ、其ノ棘毛ヨリ發達セルニ反シ、日本蜂ニアリテハ橫隆ノ最基端ノモノト連續シ且ツ棘毛モ著シカラス。脊面三角板 (Dorsal triangular plate) ハ日本蜂ニ於テハ mellificaニ於ケルヨリモ比較的大形ニシテ其ノ棘毛モ多シ。又囊狀突起 (Pneumophyses) ハ日本蜂ニ於テハ分岐スルヲ特徵トシ、其ノ主要部ハ体內ニアルトキ 5–6 mm ニシテ甚ダ長ク、之カ体外ニ突出スルトキハ三對ノ小突起ヲ其ノ基部ニ副生ス。

生態學的特徵トシテ數フヘキモノ多々アルモ、就中日本蜂ハヨク逃去スル如キ、或ハ巢門ニ於テ mellificaト反對方面ノ体位ヲ持シテ煽風スルカ如キ事實ノ外、ナホ日本蜂ハ無王トナルトキ働蜂卵蛆ヨリ王蜂ヲ養成スルコトヲナサスシテ自ラ產卵スルニ至リ、而モ往々ニシテ此無精卵ヨリ生セル蛆ノ上ニ一時的王臺ヲ設クルカ如キ、又王蜂ノ翅ヲ一部剪ルトキハ久シカラスシテ其ノ亡失ヲ見ルカ如キ、又王蜂ノ產メル卵ハ初メヨリ橫臥セルカ如キ事實アリ。日本蜂ハ又性怯懦ニシテ刺戟ニ應シテヨリ一齊ニ短キ翅音ヲ發シ、刺戟强キトキハ巢面ヲ去リテ一方ニ集合シ、又害敵ニ對シ突進スルヨリモ寧ロ之ヲ避クル傾キアリ、螫サヾルニハ非ルモ又幾分噛ム性アリ、mellificaノ侵入ニ對シテハ强ク防禦セス既ニ內部ニ入リタルモノニ對シ殆ト關知セサルノ態度ヲトリ貯蜜ヲ奪ハレテ遂ニ全滅スルニ至ル。つゞりむしノ害ヲ受クルコト甚シク、

すゞめばちノ攻撃ニ對シ隱匿シテ其ノ危難ヲ免ルヽノ點ハ mellifica ノ擧措ニ比シテ有利ナルコト既ニ知ラルヽ所ナリ。又日本蜂ハヨク巢牌ヲ嚙ミ破リ、或ハ房壁ヲ削レルモノヲ殘存ス。容易ニ蠟ヲ分泌スルノ性ハ一ノ長所ニシテ、其ノ腹板下ニハ屢〻 1mm 以上ノ厚キ蠟鱗ヲ見受ケラル。蜂膠 (propolis) ヲ用ヒス。又房壁甚タ薄ク僅ニ 32μ ニ過キス。巢房小ニシテ働蜂房ハ直徑(邊ヨリ邊ニ至ル)、4.65 mm、雄蜂房ハ 6.36 mm mナリ、即チ雄蜂房ノ大サハ mellifica ノ働蜂房ノソレト相近シ、又日本蜂ノ蛹ハ mellifica ノモノト其ノ化學的及物理學的性狀ニ於テ差異アリ。殊ニ面白キハ日本蜂ノ雄蜂蛆カ成熟シテ結繭スルトキハ其ノ繭ノ房口部ノ中央ニ小孔ヲ設クルコトナリ。雄蜂出房スルトキハ此ノ孔ヲ有スル繭ノ一部ハ小圓板狀ヲナシテ落ツ。該孔ヲ貫キタル繭ノ斷面ヲ見ルニ孔邊ニ近キ所ハ絹層凡ソ十層アリ、漸次周邊ニ向ヒテ其ノ層ヲ減ス。內口緣ニ暗褐色ノ物質ヲ堆積シ、此物質ハ絹層間ニ滲入シテ之ヲ堅緻ナラシム。孔ハ深サ約 0.4 mm、外口直徑、0.4–0.6 mm、內口直徑 0.25 mm ノ漏斗狀ヲナセルモノニシテ、內外空氣ノ流通ニ資セルモノヽ如シ。mellifica ノ繭ニハカヽル小孔ヲ認メサルノミナラス繭層モ亦日本蜂ノソレノ如ク厚カラス、弛緩シテ氣通容易ナルモノヽ如シ。

之ヲ要スルニ日本蜂ノ此等ノ特徵ハ明カニ mellifica ト區別セラルヘキコトヲ證スルモノニシテ、日本蜂ハ朝鮮、支那等ノ產ト相一致シ、又諸家ノ指摘セル indica ノ特徵ヲ有ス。即チ日本蜂ハ indica ノ中ニ編入セラルヘク、又 indica ハ mellifica ト對立スル獨立ノ種タルコトヲ斷定スルヲ得ヘシ。亞非利加產 unicolor ハ屢〻 indica ト近緣ノ如ク考ヘラレシモ今ヤ此ノ兩者ノ間ニハ截然タル解剖學的區別ヲ存シ、mellifica ト unicolor トノ關係ハ mellifica ト indica トノ關係ノ如ク相隔リタルモノニ非ス。



Y. Tokuta photo.



Y. Tokuta photo.

SOME NEW NOTODONTIDAE FROM JAPAN, COREA AND FOMOSA, WITH A LIST OF KNOWN SPECIES.

BY

PROF. S. MATSUMURA.

日本産朝鮮及臺灣産新種の天社蛾科並に既知の天社蛾科目錄

理、農學博士 松 村 松 年

Since 1909 after describing some new species of Notodontidae from Japan in the "Thousand Insects of Japan-Senchuzukai" Suppl. vol. I., I have collected quite a large number of Japanese Notodontidae and described some of them in three parts in the Zoological Magazine, Tokyo[1] (Dobutsugaku-zasshi), and some of them in my Thousand Insects of Japan, Addit. vol. IV (1921). From Japan, Saghalien, Corea and Formosa we know till now about 173 species of Notodontidae. Last year Messrs. Toichi Uchida and Hidezo Takano collected for me a large number of Notodontids moths in Corea, and after studying them thoroughly, I found the following 2 new species, 2 new varieties and 2 unrecorded species as follows:

1. Gangarides puerariae Mell var. coreanus n. var.
2. Coreodonta coreana n. sp.
3. Hyperaeschra nigricosta n. sp.
4. Wilemanus bidentatus Wilem. var. coreanus n. var.
5. Pterostoma griseum Brem.
6. Dudusa sphingiformis Moor.

Further our cabinet is enriched with the following 5 new, one unrecorded species and one new aberration from different parts of Japan and Formosa:—

1. Dicranura formosana n. sp.
2. Gluphisia crenata Esp. ab. infuscata n. ab. Honshiu

1. Zoological Magazine, Tokyo vol. 31. (1918); vol. 32. (1919); vol. 34. (1921).

3.	Notodonta sugitanii	n. sp.	Honshiu
4.	Hiradonta takaonis	n. sp.	Honshiu
5.	Lophopteryx robusta	n. sp.	Hokkaido
6.	Lophopteryx nikkoensis	n. sp.	Honshiu
7.	Odontosia sieversi Mén.		Hokkaido

On this occasion I wish to describe the following 8 new genera belonging to Japanese and Corean Notodontidae :—

1. Nericoides (Type-Nerice bipartita Btlr.)
2. Chadisroides (Type-Ochrostigma ussuriensis Püng.)
3. Coreodonta (Type-Coreodonta coreana Mats.)
4. Hiradonta (Type-Hiradonta takaonis Mats.)
5. Spataliodes (Type-Spatalia dives Oberth.)
6. Stenospatalia (Type-Spatalia jezoensis Wilem. et S.)
7. Eguria (Type-Spatalia ornata Oberth.)
8. Mimopydna (Type-Pydna pallida Wk.)

Descriptions of New Species and Varieties.

1. Wilemanus bidentatus Wilem. var. coreanus n. $var.$

Differs from the type as follows :—

Primaries gray, with a light shade of bluish, outer side of the central fuscous patch being not deeply excavated as in the typical specimen, and white post-medial and submarginal bands not conspicuous; apical patch narrower and smaller.

Hab.–Corea (Shakuoji and Kwazan); 5 (2♂, 3♀) specimens were collected by T. Uchida and H. Takano.

2. Gluphisia crenata Esp. ab. infuscata n. ab.

Form and patern of the markings just like those of var. *japonica* Wilem.; primaries fuscous, on the outer half being somewhat paler, subbasal, antemedial, postmedial and submarginal bands being narrower, and of which the antemedial band being most conspicuous.

Hab.-Shinano (Shirahone); one male specimen sent me for indentification by Prof. I. Sugitani.

3. Notodonta sugitanii n. sp.

Differs from *N. tritophus* Esp. as follows:—

♀. Thorax black, mingled with some grayish hairs. Primaries with waved distinct ante-and postmedial bands, the former being inwardly and the latter outwardly lined with a pale grayish band; discocellular spot somewhat crescent shaped, ringed with gray; underside with a very faint fuscous postmedial band, which being only distinct at the costa. Secondaries with a very faint fuscous medial band; underside with a very conspicuous crescent spot, which touching outwardly the fuscous medial band.

Exp.–♀ 52 mm.

Hab.–Shinano (Hinokitoge, near Shirahone); one female specimen collected by Prof. I. Sugitani.

4. Takadonta takamukui Mats. ♂. Zool, Mag. Tokyo, Vol. XXXII, p. 147, (1919).

As I have described only the male of this species I wish to describe here the female. ♀. Makings of the primaries nearly as those of the male, but the color being paler and the form much larger; underside infuscated, on the outer 1/3 being paler. Secoadaries in the middle with a pale curved band. Underside as the primaries, on the outer 1/3 being paler. Antennae filiform, not ciliated, while in the male being strongly ciliated.

Exp.–♀ 56 mm.

Hab.–Hōki (Daisen); one male and and one female specimens collected by the author.

5. Hiradonta takaonis n. sp.

Near *Hyperaeschra tenebrosa* Moor.

♂. Thorax testaceous, head and collar dark brown, abdomen fulvous brown, the latter at the base with fuscous hairs; primaries dark brown, hind

margin and apex testaceous as in *tenebrosa;* ante-and postmedial bands black, wavy, especially the postmedial band being highly indentated, the space at the hind margin between the ante-and postmedial bands being infuscated; at the outer margin, the space between vein 4 and 5 being paler. Secondaries fuscous gray, near the middle with a paler band. Underside fuscous, medial band darker, 1/3 of both wings being paler.

Exp.–♂ 47 mm.

Hab.–Honshiu; one male specimen collected at Mt. Takao near Tokyo and another male at Chichibu by S. Hirayama.

6. Coreodonta coreana n. sp.

Primaries dark brown, on the outer 1/3 at the costa broadly paler; antemedial band highly wavy, below the medial vein near the base with a fuscous streak, so that with the wavy antemedial band forming a large W–shaped marking, its innerside being lined with testaceous; postmedial band black, obliquely curved and buiding a spot-series; interspaces between veins 4, 5, 6 and 7 being paler, and each with an infuscous streak, and the fuscous veins being often interrupted; marginal lobe of the hind margin somewhat infuscated.

Secondaries dark gray, lacking medial band. Underside of both wings gray, those of the primaries at the bases being somewhat darker. Body gray, thoracal tufts at the apices being fuscous, abdomen simillary colored as the hind wings.

Exp.–♂ 50 mm.

Hab.–Corea (Shakuoji); 10 male specimens collected by Uchida and Takano.

7. Hyperaeschra nigricosta n. sp.

♂. The form of wings just like that of *H. angustipennis* Mats.

Wings gray, primaries in tha middle with a broad, curved, interrupted fuscous band; secondaries somewhat paler than the primaries, with an indistict paler band. Underside pale gray, costa of primaries except the apical 1/4 narrowly fuscous, no trace of markings being visible. Body testaceous gray; palpi dark gray, the 3rd joint being darker.

Exp.–♂ 38 mm.

Hab.–Corea; 2 male specimens collected by Uchida, Takano and Hasegawa at Shakuoji and Suigen.

8. Lophopteryx robusta n. sp.

Near *L. kuwayamae* Mats., but much robuster.

♂. Yellowish brown. Primaries scattered with some dark bluish scales near the hind margin and at the base, near the middle with a quite broad fuscous postmedial band, which curves outwardly at vein 4, and ends at the innerside of tuft; hind marign broadly infuscated at the innerside of the tuft, with an indistinct, highly waved, fuscous antemedial band, which being more conspicuous at the hind margin; near the base with an indistinct, dark brownish basal markings; tuft darkbrown. Secondaries testaceous gray, in the middle with an indistinct fuscous band, anal angle being fuscous, with a short transverse testaceous bar and some bluish scales. Underside paler than on the uppersurface, in the middle of each wing with an indistinct broad fuscous band. Metanotum with a triangular pale testaceous space. Tarsi brown, ringed with testaceous. Abdomen testaceous, last abdominal segment on each side with a lateral tuft.

Exp.–♂ 43 mm.

Hab.–Hokkaido (Sapporo); 3 male spcimens collected by the author.

9. Lophopteryx nikkoensis n. sp.

♂ ♀. Male yellowish brown and female dark brownish. Primaries in the male near the middle with a broad fuscous band, which arising from the middle of the hind margin and ends at the costa before the apex; at the innerside of the band with some indistinct, narrow, longitudinal fuscous streaks. Secondaries pale testaceous, at the anal angle with a fuscous patch, its fringe being yellowish brown, with a testaceous curved bar. Underside grayish testaceous, in the middle somewhat infuscated; fringe at the anal angle being brownish.

Metanotum with a triangular testaceous space. Abdomen simillarly colored as on the secondaries. In the female primaries with some purplish shade, at

the innerside of the tuft with a zigzag fuscous, antemedial band, which being distinct only at the hind margin, thel atterb eing broadly fuscous. Metanotum of the female with a triangular whitish space.

Exp.–♂ 44 mm., ♀ 45 mm.

Hab.–Nikko; one male specimen collected by S. Hirayama and one female by T. Takamuku.

This species resembles somewhat *L. jezoensis* **Mats.**

10. Gangarides pueriariae Mell[1] var. coreanus n. var.

♂♀. Yellowish testaceous. Primaries scattered with brownish scales, subbasal, antemedial, medial, postmedial and submarginal bands being fuscous, subbasal band being incurved and interrupted at the subcostal vein; antemedial band somewhat incurved near the subcosta; medial band being distinctly incurved beyond the medial vein; postmedial band oblique and slightly excurved near the apex; submarginal band wavy, at both ends being indistinct; a small white spot in the cell; termen brownish, at the ends of veins checked narrowly with white scales. Secondaries yellow. Underside pale testaceous, with some greenish shade, both wings being provided with 2 central fuscous bands, inner one of which being somewhat diffused; near the costa with some brownish scales, which being grouped as a cloudy spot. Body beneath and legs, testaceous. Other characters as those of *G. pueriariae* Mell.

Exp.–♂ 72 mm. ♀ 80 mm.

Hab.–Corea (Shakuoji); 2 male and one female specimens collected by Uchida and Takano.

Gangarides puerariae Mell from south China differs somewhat in marking, and if it will be a distinct new species, I propose to give the name *coreanus*.

Ab. rubens n. ab.

♂. Differs from the type in its having pale reddish colored secondaries.

Hab.—Corea (Shokuoji); one male specimen collected by Uchida and Takano.

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1) Deutsche Entomologische Zeitschrift Heft I, P. 123, 1922.

1. Descriptions of New Genera.

1. Nericoides n. g.

Closely allied to *Nerice* Wk., but differs from the latter as follows:—

Compound eyes with some distinct hairs; thorax with a high conical projection, and not comb-shaped as that of *Nerice*; vein 6 from the besal 1/3 of areola, and not from the upper angle of the cell as in *Nerice*; vein 7 arises nearly from the middle part of 6, while in *Nerice* from 1/3 of 6; veins 3 and 4 arise nearly from a point.

Generic Type – *Nerice bipartita Butl.*

2. Chadisroides n. g.

Closely allied to *Chadisra* Wk., but differs from the latter as follows:—

♀. Antennae bipectinated, and at the apical one third being serrated; palpi short, not reaching the vertex of head; veins 7 and 10 to primaries arising from the upper part of the areola, vein 3 beyond the lower angle of cell; no tuft on the hind margin; vein 3 to secondaries arising beyond the lower angle of cell. In form and patern of the markings resembles much also *Wilemanus* Nag., but differs form it in its having pectinated antennae in the female.

Generic Type–*Ochrostigma ussuriensis* Püng. (= *Chadisra coreanus* Mats).

3. Coreodonta n. g.

Closely allied to *Epinotodonta* Mats., but differs from the latter as follows:—

♂. Antennae filiform, not serrated as in *Epinotadonta.*

Thorax in the middle with a long erect tuft, which gradually becoming lower towards the metanotum. Veins 6 and 7 to primaries branched far away from the end of cell; wings much narrower.

Generic type–*Coreodonta coreana* Mats.

It resembles also *Hyperaeschra* Btlr., but differs from the latter in having filiform antennae in the male.

4. Hiradonta n. g.

Near *Hyperaeschra* Butl.

Antennae in the male long serrated, at the apical 1/3 being filiform. Palpi upturned, reaching above the vertex, 3rd joint being short; compound eyes pubescent; thorax with no conical tuft; vein 6 to primaries arises from the upper angle of cell, origin of vein 3 being nearer to 2 than to 4; veins 6 and 7 to secondaries branched, being provided with a short stalk. Abdomen long, about 1/3 projecting beyond the hind wing.

Generic type–*Hiradonta takaonis* Mats.

5. Spataloides n. g.

Closely allied to *Spatalia* Hb., but differs from the latter as follows:—

Antennae in the male serrated, while in the type *argentina* Schiff. being strongly bipectinated, except at the extreme apex and which being serrated; antennae in the female filiform.

Vein 7 to primaries arises far way from the origin of 6.

Vein 3 to secondaries arises beyond the lower angle of cell, while in *Spataria* veins 3 and 4 being branched.

Generic type–*Spatalia dives* Oberth.

6. Stenospatalia n. g.

Also allied to *Spatalia* Hb., but differs from it as follows:—

Antennae bipectinated, the apical one third being serrated, while in *Spatalia* being serrated on their extreme apices (about 1/6); in the female antennae filiform.

Vein 3 to primaries arises far apart from the hind angle of cell, but being much nearer to 4 than to 2.

Veins 6 and 7 to secondaries branched, with a very short common stalk; vein 3 arising far apart from the hind angle of cell, as that of the primaries. Primaries narrower, costa near the apex being curved, in the female being more conspicuous.

Generic type–*Spatalia jezoensis* Wilm. et S.

7. Eguria n. g.

Closely allied to *Rosama* Wk., but differs from the latter as follows:— Palpi long, slenderer, obliquely ascending, second joint nearly 4 times as long as the first, 3rd joint slenderer and somewhat shorter than the first. Antennae in both sexes bipectinated.

Vein 3 to primaries arises widely apart from 4, but much nearer to 4 than to 2; at the hind margin on the outerside of tuft deeply excavated. It reesmbles also *Spatalia* Hb., but differs from it in having very long areola, vein 7 arising from the tip of areola, and bipectinated antennae in the female.

Legs long and slenderer, without long hairs.

Generie type–*Spatalia (Rosama) ornata* Oberth.

8. Mimopydna n. g.

Closely allied to *Pydna* Wk. but differs from the latter as follows:—

♂. Antennae serrated and long ciliated.

Thorax in the middle provided with a high erect tuft.

Areola very narrow, triangular, veins 7 and 8+9 from the apex of the areola. Abdomen very long, neary one half protruded from the hind margin of secondaries; at the apex with a brush-like tuft.

Generic type–*Pydna pallida* Wk.

A List of Notodontidae from Japan, Corea and Formosa.	Sagalien	Hokkaido	Honshiu	Shikoku	Kiushiu	Corea	Formosa
1. Tarsolepis japonica Wilem. et S.			×				
2. „ sommeri Hb.			×	×	×		×
3. „ taiwana Wilem.							×
4. Dudusa nobilis Wk. var. synopla Swinh.							×
5. „ sphingiformis Moor.			×			×	
6. Cerura bicuspis Bkh. var. japonica Grünb.			×				
7. „ furcula Clerck var. sangaica Moor.						×	
8. „ lanigera Btlr.		×	×	×		×	
9. „ liturata Wk.							×
10. Dicranura erminea Esp. var. menciana Moor.		×				×	
11. „ formosana Mats. (n. sp.)							×
12. „ vinula L. var. filina Btlr.		×	×				
13. Stauropus alternus Wk.							×
14. „ basalis Moor. var. niphonica Grünb.			×				
*15. „ confusus Wilem.							×
16. „ fagi L. var. persimilis Btlr.		×	×				
*17. „ nigrobasalis Wilem.							×
18. „ obliterata Wilem.			×				
*19. „ wilemani Mats. (=pulverulenta Wilem. (Nom. praeo.)							×
20. Shachia circumscripta Btlr. (Shachia subrosea Mats.)		×	×				
21. Damata longipennis Wk.							×
22. Quadricalcarifera coreana Mats.						×	
23. „ cyanea Leech.		×	×				
24. „ horishana Mats.							×
25. „ perdix Moor.		×	×				

*—Species not identified by the author.

	Sagalien	Hokkaido	Honshiu	Shikoku	Kiushiu	Corea	Formosa
26. Quadricalcarifera perdix Moor. var. nigroguttata Mats.		×					
*27. „ subgeneris Strand.							×
27. „ sugitanii Mats.			×				
28. „ viridimaculosa.							×
*29. „ viridipicta Wilem.							×
30. Chadisroides ussuriensis Püng. (Chadisra coreana Mats.)						×	
31 Wilemanus bidentatus Wilem.			×				
var. coreanus Mats. (n. var.)						×	
32. Liparopsis formosana Wilem.							×
33. Chethodonta grisescens Stgr.		×	×				
34. Somera viridifusca Wk.							×
35. Fentonia ocypete Brem.							
var. japonica Grünb.		×	×	×	×		
36. „ crenulata Mats.							×
*37. „ nigrofasciata Wilem.							×
38. Eufentonia niphonica Wilem. (=eximia Grünb).			×				
39. Disparia variegata Wilem. (=sordida Wilem.)			×				
var. formosana Wilem.)							×
40. Hoplitis milhauseri F. var. umbrosa Stgr.		×	×				
41. Uropyia meticulodina Oberth.		×	×			×	
*42. Urodonta arcuata Alph.		?	?				
43. „ branicki Oberth.		×	×				
44. „ hirayamae Mats.		×	×				
45. „ virimidixta Brem. (=Drymonia discoidalis Mats.)		×	×				
ab. infuscata Mats.		×					
46. Gangarides puerariae Mell var. coreanus Mats. (n. var.)						×	
ab. rubens Mats. (n. ab.)						×	

	Sagalien	Hokkaido	Honshiu	Shikoku	Kiushiu	Corea	Formosa
47. Gangaridopsis citrina Wilem.			×				
48. Lophocosma atriplaga Stgr.		×	×			×	
49. Epizaranga permâgna Btlr.		×	×				
(Zangra ziozankeana Mats.)							
50. Nerice davidi Oberth.		×	×				
51. Nericoides (n. g.) bipartita Btlr.		×	×				
52. Epodonta lineata Oberth.		×	×				
(=Drymonia octolineata Mats.)							
53. Ochrostigma japonicum Wilem.			×				
54. Drymonia basalis Wilem. et S.			×				
55. „ chaonia Hb. var. lunula Grünb.			×				
56. „ trimacula Esp. var. daisenensis Mats.			×				
57. Neodrymonia delia Leech.			×				
58. „ koreana Mats.						×	
59. Mesophalera sigmata Btlr.			×		×		
60. Naganoea manleyi Leech.		×	×				
61. Pheosia dictaenoide Esp,							
var. fusiformis Mats.	×	×	×				
62. „ tremulae Clerck.			×				
63. Mimodonta albicosta Mats.			×				
64. Neopheosia fasciata Moor.			×				
65. Hupodonta pulcherrima Moor.							
var. corticalis Btlr.		×	×			×	
66. „ lignea Mats.		×	×				
(=H. obsoleta Marum.)							
67. Shaka atrovittata Brem.		×	×				
68. Microphalera grisea Btlr.		×	×				

	Sagalien	Hokkaido	Honshiu	Shikoku	Kiushiu	Corea	Formosa
69. Notodonta rothschildi Wilem. et S.	×	×	×				
var. sachalinensis Mats.	×						
70. „ stigmatica Grünb	×	×	×				
71. „ sugitanii Mats. (n. sp.)			×				
72. „ tritophus Esp.							
var. uniformis Oberth.	×	×					
73. Mesodonta aliena Stgr.		×	×				
(=Notodonta nitobei Mats.)							
*74. „ basinotata Wilem.							×
*75. „ cinerea Btlr.			×				
76. „ gigantea Btlr.		×	×				
*77. „ graeseri Stgr.			?				
*78. „ griseotincta Wilem.							×
79. „ ishidae Mats.		×	×				
(=Notodonta arnoldi Oberth.)							
80. „ koreana Mats.						×	
81. „ lativittata Wilem.		×	×				
(=Notodonta moltrechti Oberth.)							
82. „ monetaria Oberth.		×	×			×	
83. „ moorei Hamp.							×
84. „ oberthüri Stgr.	×	×	×			×	
85. „ ovata Mats.			×				
86. „ rotundata Mats.			×				
*87. (?) trachistso Oberth.			?				
88. Fusadonta basilinea Wilem.			×				
*89. Cleapa latifascia Wk.							×
*90. Paleca rufescens Btlr.			×				

	Sagalien	Hokkaido	Honshiu	Shikoku	Kiushiu	Corea	Formosa
91. Epinotodonta fumosa Mats.			×				
(=Yazawaia japonica Marum.							
var. shibuyae Mats.	×						
92. Takadonta takamukui Mats.			×				
93. Coreodonta (n. g.) coreana Mats. (n. sp.)						×	
94. Hiradonta (n. g.) takaonis Mats.			×				
95. Hyperaeschra angustipennis Mats.			×				
96. „ biloba Oberth.		×	×				
*97. „ furva Wilem.							×
*98. „ kosemponica Strand.							×
99. „ nigricollaris Mats.			×				
100. „ nigricosta Mats. (n. sp.)						×	
101. „ suzukiana Mats.			×				
102. „ tenebrosa Moor.			×			×	
*103. „ tenebrosella Strand							×
*104. „ tusa Swinh.			×				
105. Allodontoides discoidalis Mats.							×
(=Hyperaeschra taiwana Marum.)							
106. Allodonta leucodera Stgr.		×	×				
(Hyperaesehra collaris Swinh.)							
var. sachalinensis Mats.	×						
107. Spataliodes (n. g.) dives Oberth.		×	×			×	
(=Spatalia okamotonis Mats.)							
108. „ doerriesi Graes.		×	×				
*109. ? Spatalia plusiotis Oberth.			?			?	
110. Eguria (n. g.) cinnamonea Oberth.			×		×		
111. „ ornata Oberth.			×	×	×	×	

	Sagalien	Hokkaido	Honshiu	Shikoku	Kiushiu	Corea	Formosa
(=Macrodonta Btlr.)							
112. Platychasma virgo Btlr.			×				
113. Leucodonta bicoloria Schiff.	×		×				
var. teineana Mats.		×					
114. Lophontosia cuculus Stgr.		×	×				
115. „ pryeri Btlr.		×	×				
116. „ camelina L.		×	×				
var. giraffina Hb.	×	×	×	×	×		
117. „ jezoensis Mats.		×					
118. „ kuwayamae Mats.	×	×	×			×	
119. „ nikkoensis Mats. (n. sp.)			×				
120. „ robusta Mats. (n. sp.)		×					
121. „ saturata Wk.	×	×	×	×		×	
var. hoegi Graes.		×	×				
122. Fusapteryx ladislai Oberth.			×				
123. Hagatapteryx admirabilis Stgr.		×	×				
124. Togepteryx vetulina Oberth.	×	×	×				
125. Odontosia sieversi Men.		×					
126. Himeropteryx miraculosa Stgr.	×	×	×		×		
127. Pterostoma griseum Brem.						×	
128. „ sinicum Moor.		×	×				
129. Euhampsonia cristata Btlr.		×	×			×	
130. „ splendida Oberth.		×	×				
131. Phalera assimilis Brem. et. Grey.			?		?	×	
132. „ angustipennis Mats.			×				
*133. „ flavomacula Wilem.							×
134. „ flavescens Btlr.		×	×	×	×	×	×

	Sagalien	Hokkaido	Honshiu	Shikoku	Kiushiu	Corea	Formosa
135. Phalera fuscescens Btlr.			×				
136. „ jezoensis Mats.		×	×				
137. „ minor Nag.			×				
*138. „ obscura Wilem.							×
139. „ takasagoensis Mats.			×				
140. „ sangana Moor.						×	
141. Anticyra combusta Wk.					×		×
142. Phalerodonta bombycina Oberth.						×	
143. Gonoclostera timonides Brem.	×	×	×	×	×	×	
144. Melalopha anachoreta F.	×	×	×	×	×	×	
var. orientalis Fixs.						×	
145. „ anastomosis L.	×	×	×				
146. „ curtuloides Ersch.		×	×				
147. „ pigra Hufn.							
var. obscurior Stgr.						×	
148. Micromelalopha sieversi Stgr.	×	×	×			×	
(troglodyta Graes.)							
*149. „ restitura Wk.			×				
150. Pygopteryx suava Stgr.		×	×				
*151. Norraca curvilinea Wilem.						×	
*152. Norracoides discollaris Strand						×	
*153. Turnaca delineivena Swinh.						×	
154. Pydna albifusa Wilem.						×	
155. „ albistriga Strand						×	
156. „ formosicola Strand						×	
157. „ inconspicua Wilem.						×	
158. „ insignis Leech			×				

	Sagalien	Hokkaido	Honshiu	Shikoku	Kiushiu	Corea	Formosa
*159. Pydna kanshireiensis Wilem.						×	
*160. „ metaphaea Wilem.						×	
*161. „ nebulosa Wilem.						×	
*162. „ plumosa Btlr.		×					
*163. „ sordita Wilem.						×	
164. „ southerlandi Holl.		?					
165. „ straminea Moor.	×	×	×	×	×	×	
*166. „ suisharyonis Strand						×	
167. „ testacea Wk.						×	
(=magna Mats.)							
*168. „ virgata Wilem.						×	
169. Mimopydna pallida Btlr.	×	×					×
170. Ramesa tosta Wk.		×				×	
171. Ptilophorides jezoensis Mats.	×						
172. , nohirae Mats.		×					
173. Ptilophora plumigera Esp.		?					

摘　要

日本産朝鮮及臺灣産新種の天社蛾並に既知の天社蛾目錄

理、農學博士　松村松年

今日まで余の研究せる所によりて見れば、日本、朝鮮及び臺灣産の天社蛾は實に百七十三種あり、其内余の所有せざるものにして未だ同定し得ざるものは＊印を有する三十四種なり。

昨年朝鮮にて内田登一及び高野秀三兩氏の採集せる標本中に新しき二種及び二變種並に未錄の二種ありたれば發表すべし。尙一昨年余が新日本千蟲圖解第四卷にて發表せし以來日本、朝鮮及び臺灣にて發見したる天社蛾の新種をも記載し尙序に八新屬をも發表すべし。

一、フタボシヤチホコ新變種。

Wilemanus bidentatus Wilem. var. coreanus Mats.

原種と異なる所は前翅は灰色にして少しく青色を帶び、中央の黑紋は原種の如く深く刻られず、白色の後横線及び亞外緣線は判然せず。翅端紋は小にして細し。

産地——朝鮮(釋王寺、花山)。内田及び高野の兩氏は二雄及び三雌を捕獲せり。

二、フタオビシヤチホコの新異常形。

Gluphisia crenata Esp. ab. infuscata Mats.

前翅は暗色、外半は少しく淡色、亞底線、前中横線、後横線及び亞外緣線は細く、前横線は最も判然す。

産地——信州(白骨)——杉谷岩彦氏は數頭を捕獲し余に其一頭を惠與せり。

三、スギタニシヤチホコ。

Notodonta sugitanii Mats.

之れはフタナミシヤチホコ N. tritophus Esp. に酷似すれども左の點により容易に區別し得べし。

胸部は黑色、灰色毛を混ず。前翅は判然せる波狀の前横線及び後横線を具へ、前者は内側に、後者は外側に灰白線を有す、横脈紋は弦月形を呈し、灰色輪を有す。裏面は甚だ判然せざる暗色の後横線を具へ、之れは唯だ前緣にて判然す。後翅は甚だ判然せざる暗色の中横線を有す。裏面は判然せる弦月紋を具へ、其外側に暗色帶あり。

開張(♀)五二ミ、メ、

産地——信州(槍峠)——杉谷岩彦氏は一頭の雌を余に送附せり。

四、タカムクシヤチホコ。

Takadonta takamukui Mats.

之れは昨年動物學雜誌三百七十九號一四七頁に記載せるものな

るが、其當時單に雄のみを記載し、雌を記載せざりしを以て序に其特徴を說明すべし。

雌前翅の斑紋は稍々雄の夫れと同一、然れども淡色にして、形大なり。裏面は暗色を帶び、外方の三分の一は淡色。後翅は中央に淡色の弓狀に曲れる一帶を具ふ。裏面は前翅の如く外方の三分の一は淡色。觸角は絲狀を呈し、刺毛を有せず。

開張五六ミ、メ。

昨年八月十七日二頭の雌を伯耆の大山にて捕獲せり。

產地——鳥取(大山)

五、 タカオシヤチホコ。

Hiradonta takaonis Mats.

胸背淡灰褐、頭及び頸は暗褐、腹部は黃褐にして基部に暗色毛を有す。前翅暗褐、後角及び翅端は淡灰褐、前橫線及び後橫線は黑色にして波狀を呈し、殊に後橫線は犬牙狀をなす、尙後緣に於ける前橫線と後橫線の中間は暗色、外緣と第四及第五脈との中間は淡色。後翅は暗灰色、中央に淡色帶あり。裏面は暗色、中帶は濃色、外方の三分の一は淡色。

開張四七ミ、メ。

產地——本州(高雄山、秩父)—余は平山修次郎氏の採集せる二頭の雄を所有す。之はオホウスグロシヤチホコ Hyperaeschra tenebrosa Moor. に酷似すれども翅形は狹く、犬牙狀の黑緣により容易に區別し得べし。

六、 テフセンシヤチホコ。

Coreodonta coreana Mats.

前翅は暗褐、前緣の三分の一は廣く淡色、前橫線は高き波狀を呈し、中脈の下方に當り翅底に近く暗色の一縱條ありて、波狀の前橫線と共にW字形の斑紋を表はし、其內側は淡灰褐、縱橫線は點紋より成り、黑色、外方に斜に曲る、第四、五及び第六脈の間室は淡色、其室內に暗色の一縱條を裝ふ、脈は暗色なれども時に遮斷せらる、後緣の突起毛は暗色。後翅は暗灰色、帶は判然せず。裏面灰色、前翅の基部は稍々暗色。體は灰色、胸背の突起は末端にて暗色。腹部は後翅と同色。

開張五〇ミ、メ、 高野及び內田の兩氏は十頭の雄を捕獲せるが、未だ雌を見ず。

產地——朝鮮(釋王寺)

七、 マユグロシヤチホコ。

Hyperaeschra nigricosta Mats.

形はホソバオグロシヤチホコ H. angustipennis Mats. に酷似す。翅は灰色、前翅の中央線は暗色にして廣く、稍々弓狀を呈し斷續す。後翅は前翅よりも少しく淡色、中央に判然せざる淡色の一帶あり。裏面は灰白色、前翅の前緣は細く暗色にして末端の四分の一は淡色、其他斑紋を有せず。體は灰色にして少く淡黃褐を帶び、下唇鬚は暗褐、第三節は暗色。

開張(♂)三八ミ、メ、

産地——朝鮮釋王寺、水原)二頭の雄を捕獲せるが何れも餘り完全ならず。

八、フトエグリシヤチホコ。

Lophopteryx robusta Mats.

之れはクワヤマエグリシヤチホコ L. kuwayamae Mats. に似たり。

雄は黃褐。前翅の後緣は暗褐、後緣と翅底に暗青色の鱗毛を疎に散在し、中央に近く太き暗色の後橫線を具へ、之れは第四脈の處にて少しく外方に曲り、後緣突起の內側に終はる、後緣突起の內側に判然せざる高き波狀の暗色前橫線ありて、之れは後緣にて判然す、翅底に近く判然せざる暗褐の半橫線あり、後緣の突起は暗褐。後翅は灰黃褐、中央に判然せざる暗色の一帶を具へ、內緣角は黑色にして青色鱗を混じ、上方に淡色の短かき棒狀線を橫置す。裏面は表翅よりも淡色、兩翅何れも中央に判然せざる暗色帶を裝ふ。中胸背の三角紋は灰黃白、跗節は褐色、淡色の輪紋あり。腹部は灰黃褐、尾節の兩側に毛塊を裝ふ。

開張(♂)四三ミ、メ、八月中旬三頭の雄を捕獲せり。

産地——北海道(札幌)

九、ニツカウエグリシヤチホコ、

Lophopteryex nikkoensis Mats.

雄黃褐、雌暗褐、雄前翅の中央に近く太き暗色の一帶を具へ、之れは後緣の中央より起り、前緣角の前方に終る、此帶の內側に判然せざる細き暗色線を縱走す。後翅は淡き灰黃、內緣角に暗色紋ありて、其緣毛は褐色、淡色の棒線は少しく弓狀に曲る。胸背の三角紋は灰黃、腹部は後翅と同色。雌にては雄と同樣なれども前翅少しく紫色を帶び、後緣の內側にて犬牙狀の暗色なる前橫線は判然す、後緣は廣く暗色。胸背の三角紋は白色。

開張(♂)四四、(♀)四五ミ、メ、一頭の雄は平山修次郎氏より、一頭の雌は高椋悌吉氏によりて捕獲せられたり、之れは稍々エゾエグリシヤチホコ L. jezoensis Mats. に似たり。

産地——本州(日光)

一〇、テフセンヒロバシヤチホコ、

Gangarides pueriariae Mell var. coreanus Mats.

雄灰黃、前翅に褐色鱗を散在す、亞底線、前橫線、中橫線、後橫線及び亞外緣線は暗色、亞底線は弓狀に曲り、副前緣脈の處にて遮斷せらる、前橫線は副前脈に近く、中橫線は中脈の上方にて何れも內方に曲る、後橫線は斜にして翅端に近く外方に曲り、亞外緣線は波狀を呈し、兩端にて餘り判然せず、尙後橫線に直角をなして判然せざる褐色の一線を前緣に送る、中室に白色の小紋を裝ふ。

後翅は黄色、裏面は淡き灰黄色、少しく綠色を帶び、褐色の二帶ありて其内後横線は細く、中横線は鱗毛より成り、太くして判然せず、褐色鱗を散在す。體下及び脚は灰黄、其他は原種と同一なり。

産地——朝鮮(釋王寺)。三頭(二雄及一雌)の標本を釋王寺にて捕獲す。

此原種は昨年南方支那にて發見せられたり。

尙雄に限り一種の新しき異常形あり、之れを ab. rubens Mats. と命名せり。

前翅は原種に異ならざれども、後翅は淡紅色を呈す。

尙從來の屬にして新屬と認むべきは左の六なり。

1. Nericoides Mats. (n. g.)——Nerice bipartita Btlr.
2. Chadisroides Mats. (n. g.)——Ochrostigma ussurienis Püng.
3. Spataliodes Mats. (n. g.)——Spatalia divea Oberth.
4. Stenospatalia Mats. (n. g.)——Spatalia jezoensis Wilem. et S.
5. Eguria Mats. (n. g.)——Spatalia ornata Oberth.
6. Mimopydna Mats. (n. g.)——Pydna pallida Wk.

尙又今回新に發見せる新屬は左の二なり。

1. Coreodonta Mats. (n. g.)——Coreodonta coreana Mats. (n. sp.)
2. Hiradonta Mats. (n. g.)——Hiradonta takaonis Mats. (n. sp.)

新屬の記◁

一、Nericoides (n. g.)——Nerice 屬に酷似すれども其異なる所は左の如し。

複眼には明瞭なる毛を生じ、胸背には圓錐形の突起を具へ、前翅の第六脈は小室基部三分の一より出で、Nerice 屬の如く中室の前角より出でず、第七脈は第六脈の稍々中央より分枝すれども Nerice 屬にては第六脈の三分の一より出づ、第三及び第四脈は稍々一點より出づ、斑紋は Nerice 屬に酷似す。此基準種はナカスヂシヤチホコ Nerice bipartita Btlr. なり。

二、Chadisroides (n. g.)——Chadisra 屬に酷似すれども其異なる所は左の如し。

雌觸角は兩櫛齒狀を呈し、末端の三分の一は鋸齒狀、下唇鬚は短く、頭頂に達せず。後翅の第七及び第八脈は小室の上方より起り、第三脈は中室の後角より遙に下方より出づ、後緣の中央に綠毛の突起を有せず。後翅の第三脈も亦同樣に中室の後角より遙か下方より出づ。之れは又 Wilemanus 屬に似れども後者の雌は糸狀の觸角を有するを以て容易に區別し得べし。此基準種はテフセンネジロシヤチホコ Ochrostigma ussuriensis Püng. なり。

三、Corecdonta (n. g.)——Epinotodonta 屬に似れども其異る所は左の如し。

觸角は糸狀を呈し、Epinotodonta 屬の如き鋸齒狀を呈せず。胸背に長き直立せる毛塊を具へ、之れは後胸背の方向に次第に低くし。前翅は細く、第六脈及び第七脈は中室の前角より遙か離れて分支す。之れは Hyperaeschra 屬にも似れども後者の雄は櫛齒の觸角を有するを以て容易に區

劃し得べし。此基準種はテアセンシヤチホコ Coreodonta coreana Mats. なり。

四、Hiradonta (n. g.)——之れはHyperaeschra屬に近きものなり。雌の觸角は長き鋸齒狀を呈し、末端の三分の一は糸狀を呈す。下唇鬚は上向して頭頂に達し、第三節は短かし。複眼は有毛。胸背に毛隆起を缺き、前翅の第六脈は中室の前角より出で、第三脈は第四脈よりも第二脈に近接す。後翅の第六脈と第七脈とは分支し、其柄は短かし。腹部は長く、後翅よりも略三分の一突出す。基準種はタカオシヤチホコHiradonta takaonis Mats. なり。

五、Spataliodes (n. g.)——Spatalia屬に酷似すれども其の異なる所は左の如し。

觸角は雄にては鋸齒狀を呈し、雌にては糸狀を呈す。前翅の第七脈は第六脈の基部より遙か離れて出で、後翅の第三脈は後角の下方より出づ。Spatalia屬にありては、雄の觸角は兩櫛齒狀を呈し、後翅の第三及び第四脈は分支して出づ。此基準種はギンボシシヤチホコ Spatalia dives Oberth. なり。

六、Stenospatalia (n. g.)——之れも亦Spatalia屬に酷似すれども其異なる所は左の如し。

觸角は兩櫛齒狀を呈し、末端の三分の一は鋸齒狀を呈す。然るにSpatalia屬にては唯末端の約六分の一のみ鋸齒狀を呈す。

雌にては觸角糸狀。前翅の第三脈は中室の後角より遙かに離れて下方より出づれども、第二脈よりも第四脈に近し。後翅の第六脈と第七脈とは分支し、其柄は短かし、第三脈は前翅の如く中室後角の下方より遙かに離れて出づ。前翅は細く、前緣は翅端に近く曲る、特に雌にて著し。此基準種はエゾギンシヤチホコ Spatalia jezoensis Wilem. et S. なり。

七、Eguria (n. g.)——Rosama屬に似れども其異る所は左の如し。

下唇鬚は長くして細く、斜に上向し、第二節は第一節よりも約四倍長し、第三節は細く第一節よりも稍々短し。觸觸は兩性とも兩櫛齒狀。前翅の第三脈は第四脈より遙かに離れて出づるも、第二脈よりも第四脈に近し。後緣は毛塊の外側にて深く刳らる。Spatalia屬にも似れども其異なる所は甚だ細長の小室を有し、第七脈は小室の末端より出で、雌は櫛齒狀の觸角を有す。

八、Mimopydna (n. g.)——Pydna屬に似れど其異る所は左の如し。

雄觸角は鋸齒狀を呈し、長刺毛を有し。胸背の中央に高き直立せる毛塊を具へ。前翅の小室は甚だ長く三角形を呈す、第七脈及び8+9脈は小室の末端より出づ。腹部は甚だ長く、其の半部は後翅より後方に突出す、尾端に掃狀の毛塊を裝ふ。

基準種はウスキシヤチホコ Pydna pallida Wk. なり。　(完)

ON PIKE FROM SAKHALIN AND *Lucius reichertii* (Dybowski)

BY

MADOKA SASAKI

(Hokkaido Imperial University)

樺太產パイクとヂボルスキーの *Lucius reichertii* とに就て

佐々木　望

Through kindness of Mr. T. Hikita, Mr. F. Handa, and Mr. J. Kajiura, five specimens of pike from Sakhalin have recently been brought into my hand. They were collected near Taraika where the fish is said to frequent the swamps. I have also in my possession another specimen of similar pike, from Siberia, wich Professor E. Eri of the Higher Normal School of Nara has kindly placed at my disposal; this, agreeing almost in every respect with the Sakhalin specimens in question, has been of great use in my present work. At a glance of these specimens, I recalled in mind the form from Dauria, which Pallas first described as a variety of the common pike *Lucius lucius*,[1] and which Dybowski afterwards named *Esox reichertii*.[2] But the description of both these writers being very brief, the form has hitherto been delt with but obscurely. The more closely I examined the specimens, the further my fancy went, and has at last developed itself into the belief that they might be certainly conspecific with this form. So I have been much interested in them, presuming that they might throw light on the discussion whether *Lucius reichertii* may or may not exist as a species distinct from *L. lucius;* toward this, chiefly the present work has been undertaken.

The five specimens from Sakhalin range from 368 mm. to 720 mm. in the length total, while that from Siberia has a total length of 800 mm.; this and the largest of the former specimens are mature male. All were well preserved, especially three from Sakhalin, which, when handed over to me, were still so fresh as almost to represent the living colour.

1) Zoographia Rosso-asiatica III, pp. 336–338.
2) Verh. Zool. Bot. Ver., Wien, 1869, p. 956.

The general structures are so very like those of *L. lucius* that the form, if roughly or carelessly examined, might be included within that species. The body is elongate, and shows in some measure a cylindrical appearance but is somewhat flattened laterally; the greatest depth is a little less than one-sixth the length total. When viewed laterally, the back is nearly straight from the occiput to the anterior origin of the dorsal fin. The belly is gently arched, the highest part being some distance anterior to the ventral fins where the body is of the greatest depth. The caudal peduncle is rather deep, measuring a little less than half the greatest depth of the body (Fig. 1.)

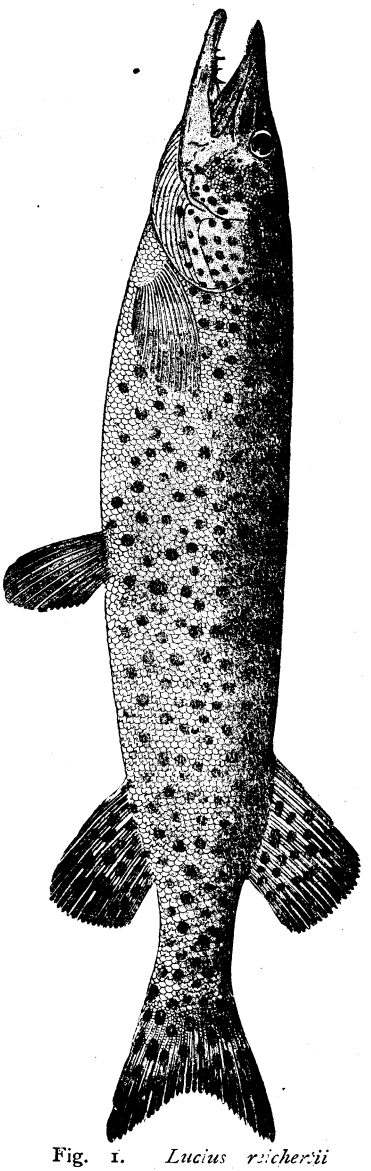


Fig. 1. *Lucius reichertii* (Dybowski), from Sakhalin, × 1/6.

The lenght of the head goes about three and a half in the length total, and well represents the characteristic feature of the Luciidae in having a flattened back and a spatulate snout, the length of which in turn is from 39 % to 41 % of that of the head. When viewed from above, the snout reveals itself as a semiellipse like other pikes; its width is two-thirds the length. The lower jaw projects a little beyond the upper. The eyes lie just in front of the middle of the head close to its upper margin, and their longest diameter is from 9/19 to 11/45 the length of the snout, and from 9/65 to 1/10 that of the head. The interorbital space is twice as wide as the eyes, well agreeing with the description of Dybowski.[1] The maxillary is a little shorter than half the length of the head, extending posteriorly just to the frontal margin of the eyes;

1) l. c., p. 956.

this also tallies with Dybowski's statement.

The teeth are slender, sharply pointed, usually more or less curved crescentwise, the larger ones are of almost canine appearance. There are about 50 teeth on each of the dentariesa, of which those on the anterior one-third of the bone are equally small and arrange themselves in a row, while on the remaining part they are very unequal in size, and form two or three irregular rows. Of the latter teeth several in the outside are prominent and become regularly smaller as they receed backwards, these teeth are visible before dissection. On each intermaxillary the teeth number about 15, forming a regular row, and are equally minute. Each palatine bone has roughly 170 teeth arranged in several rows, which become longer anteriorly and internally; of these ten or more near the antero-internal margin of the bone are especially large. The vomerine teeth are about 130 in number; they become longer anteriorly, and about ten on the anterior end of the bone are very long. The glossohyal has many teeth arranged in several rows on the posterior half.

The dorsal and anal fins are opposite each other in front of the caudal peduncle. The dorsal fin is a little longer than the anal, and originates a little more anteriorly. The rays of the dorsal fin, inclusive of the rudimentary ones in the anterior which are three or four in number, number 19 or 20, while the anal fin rays, also including the rudimentary ones, vary from 16 to 18. As regards these numbers again there can be found an agreement with the description by Dybowski, though they are both of greater number than given by Pallas, who mentions the rays to number 14 in each of the dorsal and anal. A similar difference from Pallas' description exists also in the number of the pectoral fin rays, which are 14 or 15 in the specimens before me as well as in the case of Dybowski and not 12 as Pallas gives. These differences are the only discernible dissimmilarities from Pallas' description; but this, perhaps, is due to the difference in counting and discounting of the rudimentary rays.

The scales of a longitudinal row along the mid-lateral line of the body range from 137 to 149 in number, counted from the scale next to the gill opening to that opposite to the last vertebra. Dybowski describes them to be-

146.[1] These numbers are decidedly greater than in *L. lucius*, in which they are given to be 135 by Cuvier and Valencinnes,[2] 116–130 by Günther,[3] 125–130 by Smitt,[4] and 123 by Jordan and Evermann.[5] The scales of an oblique row running from the anterior end of the dorsal fin anteriorly and ventrally number from 35 to 37. The cheek is covered entirely with scales, of which the number seems not to be quite constant, ranging from 150 to 250. The gill cover has scales only in the dorsal half, the remaining part being quite naked. Their number ranges from 70 to 120. The squamation of the head, thus, places the form very near *L. lusius*, and separates it from other pikes.

The branchiostegal rays are always 13 in number. Dybowski gives them as to be 14[6] which is near the number found in *L. lucius*, in which Cuvier and Günther both state to be 14, Jordan and Evermann, 14–16, and Smitt, 13–15. The vertebrae count 60 in the Siberian specimen and 63 in one of the Sakharin specimens, those of the precaudal region numbering 19 in the former and 21 in the latter.

The parietal bones entirely separate the frontals from the supraoccipital, a marked difference from the respects in the osteology of what we have hitherto known of the pikes which have the frontals joining the supraocipital (Fig. 2). Three specimens, which were all that were

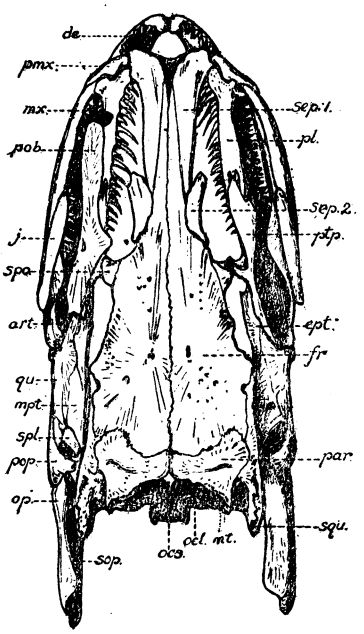


Fig. 2. *Lucius reichertii*. Upper view of the skull. × 2/3. art, articular; de, dentary; ept, mesopterygoid; fr, frontal; j. jugular (supprementary); mpt, metapterygoid; mt, epiotic; mx, maxillary; ocl, exoccipital; ocs, supraoccipital; op, opercle; par, parietal; pmx, intermaxillary; pob, preorbital; pop, preopercle; pt, palatine; ptp, pterygoid; qu, quadrate; sep. 1 & 2, supraethmoid; sop, subopercle: spl, symplectic; spo, sphenotic; squ, pterotic.

1) l. c., p. 957.
2) Histoire naturelle des Poisons, Tome XVIII, 1846, p. 286.
3) Catalogue of the Fishes in the British Museum, Vol. II, 1895, p. 998.
4) Skandinaviens Fiskar, Vol. II, 1895, p. 998.
5) Fishes of North and Middle America, pt. 1, 1896, p. 628.
6) l. c., p. 957.

available for my dissection, showed this same characteristic, though there might be discerned in some measure an individual variation as to the development of the parietals in respect to other bones of the vicinity. The parietals, developing extensively over the epiotics and supraoccipital, form contact with each other along the sagittal line of the head so that in the upper surface of the skull the frontals are quite separated from the supraoccipital. The epiotics, which appear in the upper surface of the skull in *L. lucius*, are in the specimens examined, almost hidden under the parietals and can only be seen in the posterior surface.

The coloration and patterns of the body are very characteristic, no less than the osteology referred to. The back of the body and head is deep gray or grayish blue. The sides shine with silvery lustre, shaded in light green or greenish blue. The belly is pearly white. Closely resembling the spotted muskellunge *L. masquinongy* (Mitchill) of North America, the head and body have many roundish or oval dark spots smaller than eyes, measuring from about 6 mm. to about 13 mm. in diameter in the largest of the Sakhalin specimens examined, a characteristic which makes the form decidedly distinct from *L. lucius* which may have whitish spots on the darker ground colour. As painted out by Dybowski the spots arrange themselves in more or less obliquely transvers lines, which all told for both the head and body, number roughly 30–35. The regularity is, however, present to individual variation; the one given in the text figure 1 is an example which has the extremely irregular arrangement of the spots. Except this respect the characteristic is quite constant, similarly occurring in all graduated sizes of specimens; this is also proved by the reports of the inhabitants in Taraika.

Anatomical characteristics of other internal organs were also examined but no marked point discriminative from other known pikes has been discovered. The dimensions of the specimens examined are as follows.

No. of specimen	Fish from Sakhalin i	ii	iii	iv	v	Fish from Siberia vi
Length total, measured from snout to base of caudal fin	368 mm.	460 mm.	530 mm.	625 mm.	720 mm.	800 mm.
Length of head	107 „	130 „	160 „	180 „	210 „	220 „
Distance from snout to base of ventral fin.	205 „	257 „	305 „	343 „	410 „	460 „
Distance from snout to anterior orgin of anal fin.	285 „	362 „	435 „	500 „	570 „	620 „
Length of snout	43 „	50 „	70 „	70 „	80 „	90 „
Length of maxillary	44 „	62 „	75 „	80 „	100 „	105 „
Length of eye	14 „	18 „	18 „	20 „	22 „	22 „
Interorbital distance	23 „	28 „	37 „	41 „	47 „	47 „
Depth of body	65 „	78 „	90 „	107 „	123 „	135 „
Depth of caudal peduncle	28 „	37 „	40 „	48 „	50 „	43 „
Length of dorsal fin	44 „	55 „	60 „	75 „	70 „	85 „
Length of anal fin	32 „	45 „	45 „	62 „	65 „	70 „
Length of dorsal-fin ray	53 „	65 „	65 „	80 „	72 „	80 „
Length of anal-fin ray	45 „	58 „	70 „	72 „	80 „	75 „
Length of pelvic-fin ray	43 „	60 „	65 „	76 „	63 „	75 „
Length of ventral-fin ray	40 „	57 „	62 „	70 „	78 „	75 „

As shown by the foregoing statement, the agreement of the Sakhalin form with Dybowski's *L. reichertii*, which is, as he declares, very probably identical with Pollas' variety from Dauria of *L. lucius*, is quite satisfactory so that I am greatly inclined to take them as conspecific. This opinion of mine is enforced by the fact that the Sakhalin specimen coincide in almost every

respect with that from Siberia, which locality is, indeed, in the vicinity of those given by Pallas and Dybowski. As to whether in any characteristic the Sakhalin form may exhibit the constant local variation with that of Siberia can not well be ascertained, due to the lack of sufficient specimens available. However, from the form of the river-system of Laka Baikal, which Dybowski describes under a name *L. reichertii* var. *baicalensis*,[1] the Sakahlin form seems to differ distinctly in several points: 1) In the Baikal form the maxillaries, being longer than in that of Sakhalin extends to beneath the centres of the eyes, 2) the scales in the longitudinal row along the mid-lateral line of the body are less numerous, being 130–134, 3) the branchiostegal rays are of a decidedly greater number, being 15 or 16, and 4) the spots of the body and head are described as golden yellow, not black as in the Sakhalin from.

In respect to the relationship of *L. reichertii* to *L. lucius*, the preceding paragraphs come into the conclusion, that there exists between them a marked difference at least as regards the number of the scales of the mid-lateral line of the body, in the osteology, and in the pattern of the head and body. No explanation is needed as to whether the differences are of sufficient value to retain *L. reichertii* distinct from *L. lucius*. Eventhough they may be separated, their intimate relationship is still easily recognised by their similarity as regards the general structure, in the squamation of the head, and in the pattern of the fins. And *L. reichertii* var. *baicalensis* alluded to stands between them as an intermediate form, the intermediation chiefly appearing in the number of the scales of the body, in the branchiostegal rays, and in the pattern of the head and body.

Pallas and Dybowski report them as inhabiting in the river-systems of the Onon and the Ingoda, the upper tributaries of the Amur widely distributed in Transbaikal of Siberia. According to Professor Eri the specimen from Siberia at my disposal is probably from the river-system belonging to the lower part of the Amur of Maritime Province. These habitats taken together with Sakhalin roughly demark the distribution of the species into a latitudinally extended area ranging from Lake Baikal on the west to Sakhalin

1) Verh. Zool. Bot. Ver., Wien, 1874, p. 392.

on the east.

The pike of Sakhalin has passed unnoticed from the earnest researches of Pallas, Middendorff, and Schrenck, but has come under the attention of Boulenger who gives it in his distribution map of pikes.[1] I much regret that I have unfortunately been unable to find the literature or other evidences, by which he has mapped it into Sakhalin. Bartholomew and others[2] overestimate the distribution of the Luciidae in delineating it into Hokkaido and the northern half of Honshu, where no species belonging to the family has yet been found.

1) Cambridge Nat. Hist., Fishes, p. 610.
2) Bartholomew's Physical Atlas, vol. V, 1911, pl. 25.

樺太産パイクとヂボルスキーの *Lucius reichertii* とに就て

佐々木望

摘要

著者は先頃疋田豊治、半田芳男、及梶浦愼行諸氏の勞によりて樺太産パイク五尾を視ることを得たり、右標本は曾てパラースが普通のパイク即ち *L. Lucius* の一變種として記載し、其後ヂボルスキーが *L. reichertii* と命名せる露領オノン地方のパイクと同一種ならんと考査す、著者は別に惠利惠氏の寄贈にかかる黑龍江産のパイク一尾を保存す其特徵は殆んど悉く樺太産パイクに一致す、之れ上の考査を確むる一事項と見做し得可し。抑々パラース及ヂボルスキーのなせる本種の記載は頗る簡單なるを以て從來本種は *L. lucius* と異名同種なるや或は全然別個の種として取扱ふ可きものなるや論說一定せざりき、茲を以て著者は外部の特徵は勿論、解剖上の諸點殊に其頭骨を悉細に檢査するに *L. lucius* より異る重要なる少くとも三つの特徵あることを確む、即ち(一)北米産の *L. masquinongy* に似て頭及胴に數多の明白なる黑き班紋あり、(二)頭骨に於て左右の顱頂骨は頭の中央線に沿ふて相接し前頭骨を上後頭骨より分離せしむ、又上耳骨は頭骨の唯後面に現れ居れり、(三)鱗は胴側中央線に沿ふて凡百三十七乃至百四十九を算す、但し外形の一般の構造、腮蓋の下半に鱗の無きこと、鰭の黑き班紋の數、形等は確に系統上他の既知のパイクよりも *L. lucicus* に近きことを證するに足る、而してかのヂボルスキーの *L. rechsrtii* var. *baicalensis* は上の兩種の中間に立つものと見做し得可し。本種は西はバイカル湖より東は樺太に至る緯度線に沿ふて東西に擴る分布區域を有す、樺太にパイクの產することはパラース、ミツデンドルフ、シユレンクの旅行記及研究誌にも見當らず、ブランジエは樺太をパイク科の分布區域中に包含せるも其論據は不明なり。北海道及其以南にはパイク科に屬するもの未だ知られず、パーソロミエの動物分布圖には北海道及本州の北半をもパイク科分布區域となすも之れ唯誤りたる同著者の憶測に過ぎるや殆んど明かなり。

MATERIALS FOR A FLORA OF HOKKAIDO. XI.

BY

KINGO MIYABE and YUSHUN KUDÔ.

北海道植物志料 XI.

宮部金吾
工藤祐舜

134. Trichomanes orientalis C. Chr. Ind. Fil. p. 646.

Trichomanes japonicum Fr. et Sav. Enum. Pl. Jap. II. pp. 207 et 618; Makino, Bot. Mag. Tokyo, XII. p. (193) et Phanerog. Pterid. Jap. Ic. pl. XXI. (non Thunb.).

var. **abbreviatum** (H. Chr.) Miyabe et Kudo, nom. nov.

Trichomanes japonicum Fr. et Sav. var. *abbreviatum* H. Chr. Bull. Herb. Boiss. VII. p. 817; Matsum. Ind. Pl. Jap. I. p. 349.

Hymenophyllum Wrightii Takeda, Bot. Mag. Tokyo, XXIV. p. 179, (quoad Pl. Kuril.).

NOM. JAP. *Kita-koganeshinobu.* (nov.).

HAB. *Hokkaido.* Prov. Shiribeshi: Shakotan (U. Faurie! n. 9893, June 10, 1893).

Kuriles. Isl. Etorofu: Toro (S. Fujimura![1] Aug. 27, 1890).

DISTRIB. (var.) Southern Kuriles, Hokkaido and Northern Honshu; (sp.) Kyushu, China and Himalaya.

A new genus to the Flora of Hokkaido.

135. Potamogeton praelongus Wulf. in Roem. Arch. III. 3. p. 311; Kunth, Enum. Pl. III. p. 133; Ledeb. Fl. Ross. IV. p. 27; A. Benn. in Journ. Bot. XXIV. p. 141 et XLII. p. 70; Rgl. et Til. Fl. Ajan. p. 120;

1) 藤村信吉。

[Trans. Sapporo Nat. Hist. Soc., Vol. IX. No. 1. Aug. 1924.]

Kawakami, Bot. Mag. Tokyo, XII. p. (225); Aschers. u. Graebn. Syn. Mitteleurop. Fl. I. p. 315 et Potamog. in Engl. Pfl.-reich. IV. 11. p. 96; Britt. et Br. Ill. Fl. I. p. 71; Matsum. Ind. Pl. Jap. II. 1. p. 27; Hegi, Ill. Fl. Mitteleurop. I. p. 127; Smiley, Univ. Calif. Publ. Bot. IX. p. 89.

Nom. Jap. *Obano-ebino.* (nov.).

Hab. *Hokkaido.* Prov. Oshima: Onuma (Y. Tokubuchi![1] Aug. 19, 1888).—Prov. Iburi: Kutchan (T. Baba![2]); Lake Hangetsu, at the foot of Mt. Makkarinupuri (I. Yamamoto![3] Aug. 30, 1912 et Aug. 2, 1913).—Prov. Kushiro: Lake Akan (T. Kawakami![4] Aug. 1897).—Prov. Nemuro: Nemuro (U. Faurie).

Kuriles. Isl. Etorofu: Shana (T. Kawakami! Aug. 1898).

Distrib. Kuriles, Hokkaido, Ajan, Europe and North America.

136. Potamogeton compressus L. Spec. Pl. ed. 1, p. 127; Ledeb. Fl. Ross. IV. p. 29; Aschers. u. Graebn. Syn. Mitteleurop. Fl. I. p. 339 et Potamog. in Engl. Pfl.-reich. IV. 11. p. 102; Kom. Fl. Mansh. I. p. 225; Hegi, Ill. Fl. Mitteleurop. I. p. 132.

Potamogeton zosteraefolium Schum. Enum. Pl. Saelland. I. p. 50; Kunth, Enum. Pl. III. p. 134; Kawakami, Bot. Mag. Tokyo, XII. p. (225); Benn. in Bull. Herb. Boiss. IV. p. 547; Matsum. Ind. Pl. Jap. II. 1. p. 28.

Potamogeton complanatum Willd. in Magaz. Ges. Naturforsch. Freunde Berlin, V. p. 297; A. Benn. Jour. Bot. XXIV, pp. 140 et 362.

Nom. Jap. *Akanko-mo, Yezo-yanagimo.*

Hab. *Honshu.* Prov. Mutsu: Aomori (N. Kinashi![5] Aug. 11, 1911); Yamada-gawa, Nishitsugaru-gun (———, Aug. 10, 1913).

Hokkaido. Prov. Oshima: Onuma (Y. Tokubuchi! Aug. 18, 1888).—Prov. Iburi: Azuma (U. Faurie).—Prov. Kushiro: Lake Akan (T. Kawakami! Aug. 1897; J. Hanzawa![6] Aug. 5, 1904; S. Tanakadate![7] July 1917); Lake Harutori (Miyabe! July 23, 1894); Lake Toro (J. Hanzawa! Aug. 8, 1904).

Distrib. Hokkaido, Honshu, Manchuria, Amur-region, Baical-region, Europe and North America.

137. Potamogeton Maackianus A. Benn. in Jour. Bot. XLII. p. 74;

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1) 徳淵永次郎。 2) 馬塲某 3) 山本岩雄。 4) 川上瀧彌。 5) 木梨延太郎。
6) 半澤洵。 7) 田中館秀三。

Matsum. Ind. Pl. Jap. II. 1. p. 26; Aschers. u. Graebn. Potamog. in Engl. Plf.-reich. IV. 11. p. 107; Nakai, Fl. Korea. II. p. 279.

Potamogeton serrulatus Rgl. et Maack, in Rgl. Tent. Fl. Ussuri. p. 153; Makino, Bot. Mag. Tokyo, IV. pp. 172, 421: V. p. 338; Kom. Fl. Mansh. I. p. 226 (nec Schrad. non Opiz.).

Potamogeton Robbinsii Oakes, var. *japonicus* A. Benn. in Bull. Herb Boiss. IV. p. 549; Kawakami, Bot. Mag. Tokyo, XII. p. (225).

Potamogeton Robbinsii Makino, Bot. Mag. Tokyo, I. pp. 4, 6 (non Oakes).

NOM. JAP. *Sennin-mo.*

HAB. *Hokkaido.* Prov. Oshima: Junsainuma (S. Nishida![1] Aug. 2, 1912); Onuma (S. Tanakadate! Sept. 1917).—Prov. Kushiro: Lake Akan (U. Faurie! n. 10172, Aug. 3, 1893; T. Kawakami! Aug. 1897; J. Hanzawa! Aug. 5, 1904); Lake Toro (Hanzawa! Aug. 8, 1904); Lake Kutcharo, at Oyakot, at the depth of 4–6 feet (K. Miyabe! Aug. 20, 1917; S. Tanakadate! Aug. 1917).

DISTRIB. Hokkaido, Honshu, Korea, Manchuria, and Ussuri-region.

138. Carex subspathacea Wormsk. Fl. Dan. IX. p. 4, t. 1530; Ledeb. Fl. Ross. IV. p. 304; Lange, Consp. Fl. Groenl. ed. 2, p. 140; Fr. Schm. Fl. Sachal. p. 196; Britt. and Br. Ill. Fl. I. p. 310, f. 726; Kük. Cyp.-Car. in Engl. Pfl.-reich IV. 20. p. 361; Miyabe and Miyake, Fl. Saghal. p. 538.

Carex Hoppneri Boott, in Hook. Fl. Bor. Am. II. p. 219, t. 220.

Carex salina Wahlb. var. *subspathacea* Tuckerm. Enum. Meth. (1843) p. 12; Blytt. Norg. Fl. I. p. 218.

Carex salina Wahlb. form. *nana* Trautv. in Consp. Fl. Nov.-Seml. p. 82.

NOM. JAP. *Hime-ushiosuge.*

HAB. *Hokkaido.* Prov. Kushiro: Akkeshi (K. Urakami![2] July 17, 1921).

Saghalien. Mereya (K. Miyabe, T. Miyake[3] and T. Miyagi![4] July 14, 1906); Dui (Glehn, June 1861); Truotoga (Glehn, Aug. 1861).

DISTRIB. Saghalien, Hokkaido, Northern Coast of Siberia, from Yalmal Peninsula and White Island eastward to the Chukchi Peninsula and the island of St. Lawrence.

1) 西田彰三。 2) 浦上啓太郎。 3) 三宅勉。 4) 宮城鐵夫。

This species is circumpolar in distribution, and its southernmost limit of distribution has so far been on the beach of the Aniwa Bay in the Southern Saghalien. It is therefore of great interest to know that it has recently been discovered in the main island of Hokkaido, in a salt marsh near Akkeshi in the province of Kushiro, on the Pacific coast.

139. Gymnadenia Iinumae Miyabe et Kudo, nom. nov.

Habenaria Iinumae Makino, Ill. Fl. Jap. I. n. 9, p. 1, t. 53.

Platanthera Iinumae Makino, Bot. Mag. Tokyo, XVI. p. 89; Matsum. Ind. Pl. Jap. II. 1. p. 259.

Nom. Jap. *Iinuma-mukago.*

Hab. *Hokkaido.* Prov. Oshima: in a wooded hillside, 3.5 miles north. west of Nanaë (F. C. Greatrex! Aug. 13, 1917).

Distrib. Hokkaido, Honshu, Shikoku and Kyushu.

New to the Flora of Hokkaido.

140. Tetragonia expansa Murr. in Comm. Goetting. VI. p. 13; Thunb. in Trans. Linn. Soc. II. p. 335; DC. Prodr. III. p. 452; Benth. Fl. Austr. III. p. 325; Miq. Prol. Fl. Jap. p. 89; Hance, Jour. Bot. (1870) p. 276 et (1878) p. 227; Bot. Mag. t. 2362; Fr. et Sav. Enum. Pl. Jap. I. p. 177; Forb. et Hemsl. Ind. Fl. Sin. I. p. 323; Pax, in Engl. Nat. Pfl.-fam. III. 1b. p. 44, f. 18; Palib. Consp. Fl. Korea. I. p. 95; Ito et Matsum. Tent. Fl. Lutch. p. 521; Matsum. et Hayata, Enum. Pl. Formosa. p. 167; Nakai, Fl. Korea. I. p. 250; Matsum. Ind. Pl. Jap. II. 2. p. 77; Aschers. u. Graebn. Syn. Mitteleurop. Fl. V. p. 391.

Tetragonia japonica Thunb. Fl. Jap. p. 208; Juel, Pl. Thunberg. p. 157.

Nom. Jap. *Tsuruna.*

Hab. *Hokkaido.* Prov. Oshima: the beach on the west side of Hakodate Head (F. C. Greatrex! Sept. 30, 1922).

Distrib. Hokkaido, Honshu, Kyushu, Tsushima, Liukiu, Korea, Formosa, Bonin, China, Australia, New Zealand, Polynesia, South America.

New to the Flora of Hokkaido.

141. Schizandra nigra Maxim. in Bull. Ac. Petersb. XVII. p. 144 et Mél. Biol. VIII. p. 370; Fr. et Sav. Enum. Pl. Jap. I. p. 18; Matsum. Ind. Pl. Jap. II. 2. p. 97: C. K. Schn. Ill. Handb. Laubh. I. p. 341, *in nota*

Schizandrae chinensis.

NOM. JAP. *Matsubusa*, *Ushibudo*.

HAB. *Hokkaido*. Prov. Oshima: Sannokawa in the vicinity of Hakodate (Yasoichi Oda![1] Oct. 4, 1915).—Without locality (Albrecht).

DISTRIB. Hokkaido, Honshu and Kyushu.

142. Rhamnus Ishidae Miyabe et Kudo, sp. nov.

Fruticulus nanus, prostratus, radices emittens, enermis, ramosus; rami crassi, repentes, multis cicatricibus foliosis praediti, cortice griseo-nigrescente; ramuli ascendentes, 16–24 cm. rarius ad 40 cm. alti, hornotini breves, glabri, bruneo-virides, vetustiores longitudinaliter sulcati, grisei vel nigro-brunescentes, glabri; gemmae fusiformi-ovatae, apice acutae, squamis suboppositis ciliatis vestitutae. Folia elliptica, obovato-elliptica vel late elliptica, apice subito breviterque cuspidato-acuta vel obtusa, basi etiam obtusa, rotundata vel leviter cordata, margine praeter partem basilarem inaequliter crenulata, supra glabra vel ad nervos pubescentia, subtus pubescentia vel ad nervos longe albo-pilosa, absque petiolo 3.5–5.5 cm. longa, 2–3.5 cm. lata, in ramulis novellis 8.5 cm. usque longa, 6.2 cm. usque lata, obscure lutescenti-viridia, subconcoloria, costis utrinque 7–8 in numero, leviter arcuatis; petioli breves, 5–8 mm. longi, puberulentes. Flores ♀ solitarii, ex axillis foliorum orti, virescentes, ca. 2.5 mm. longi; calycis tubus obconicus, glaber, lobis 5, ovato-conicis, apice acuminatisque calloso-obtusis, 3-nerviis; styli 3, ad basin fere soluti; pedicelli leviter arcuati, flores duplo longiores, ca. 4 mm. longi. Flores ♂ nobis ignoti. Fructus maturus globosus, non apiculatus, primo rubescens, deinde nigrescens, basi calycis persistenti planae insidens, ca. 7 mm. in diametro, 3 coccus; pyrena obovata, basi acuta, ca. 6 mm. longa, ca. 4 mm. lata, flavo-viridescens, dorso profunde excavata et culcata, dehiscens; semen obovatum, basi acutum, ca. 5 mm. longum, ca. 3.5 mm. latum, pallide castaneo-testaceum, dorso profunde excavatum, incrassato-marginatum, medio longitudinaliter striata.

NOM. JAP. *Miyamahan-modoki* (nov.)

HAB. *Hokkaido*. Prov. Ishikari: Mt. Yubari (B. Ishida[2] and M. Tatewaki![3] Aug. 5, 1921).—Prov. Hidaka: Mt. Apoi (B. Ishida! Aug. 1922).

DISTRIB. Endemic species!

1) 小田四十一。 2) 石田文三郎。 3) 館脇操。

This species is closely related to *Rhamnus alnifolia* L'Herit.[1] of North America, having 5-merous dioecious flowers and no petals. But it is easily distinguished from the latter by its broader leaves, which have abruptly cuspidate apices and more numerous closely set and prominent lateral nerves, and also by its larger fruits.

Last year, Mr. B. Ishida collected on Mt. Yubari the living specimens of this plant, which are now cultivated in our Botanical Garden. These plants produced a few female flowers this year, but failed to yield ripened fruits. This summer, he brought back again a large number of the living specimens to the Garden from Mt. Pinneshiri, in the province of Hidaka, where it grows abundantly near the top of that mountain.

143. Arctostaphylos Uva-ursi Spreng. Syst. Veg. II. p. 287; DC. Prodr. VII. p. 584; Cham. et Schl. in Linnaea I. p. 538; Ledeb. Fl. Ross. II. p. 909; A. Gray, Fl. N. Am. II. 1. p. 27; Fr. Schm. Fl. Sachal. p. 157; Herder, Pl. Radd. Monop. IV. 1. p. 43; Miyabe, Fl. Kuril. p. 247; Kurtz, Fl. Chilcat. in Engl. Bot. Jahrb. XIX. p. 393; Dippel, Handb. Laubholzk. I. p. 342; Britt. and Br. Ill. Fl. II. p. 572; Kom. Fl. Mansh. III. p. 212; C. K. Schn. Ill. Handb. Laubholzk. II. p. 543; Miyabe and Miyake, Fl. Saghal. p. 303.

Arbutus Uva-ursi L. Spec. Pl. ed. 1, p. 395; Pall. Fl. Ross. I. 2. p. 48.

Arctostaphylos officinalis Wim. et Grab. Fl. Silesiae I. p. 391.

Arctostaphylos procumbens E. Mey., in Patze, Mey. et Elk. Fl. Preuss. p. 188.

NOM. JAP. *Kumakokemomo.*

HAB. *Saghalien.* On the coast of Tschai-wo (Yoshio Kusano![2] 1921). *Kuriles.* Without locality (ex Pallas).

DISTRIB. Saghalien, Kuriles, Northern Manchuria, Eastern Siberia, Chukchi Peninsula, Baical-, Altai- and Ural-regions, Caucasus, Arctic and Northern Europe and North America.

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1) **Rhamnus alnifolius** L'Herit Sert. Angel. p. 5; Dippel, Handb. Laubholzk. II. p. 525; Britt. and Br. Ill. Fl. II. p. 406, f. 2393; C. K. Schn. Ill. Handb. Laubholzk. II. p. 277.

2) 草野芳雄。

In 1860, Glehn found berries and flowers of this plant at the house of Gilyak in Northern Saghalien. As to the Kurile Islands, Pallas already enumerated it without any locality. Last year, was added to our herbarium a small but interesting collection of plants from Northern Saghalien, which were collected in the vicinity of Tschai-wo by Captain Kusano. In this set, we found an excellent specimen of this long sought-after plant.

144. Apocynum venetum L. Spec. Pl. ed. 1, p 213; DC. Prodr. VIII. p. 440; Ledeb. Fl. Ross. III. p. 43; Maxim. Ind. Fl. Pekin. in Prim. Fl. Amur. p. 474; Miq. Prol. Fl. Jap. p. 62; Hance, Jour. Bot. (1883) p. 323; Fr. et Sav. Enum. Pl. Jap. I. p. 316; Franch. Pl. David. p. 206; Hook. f. Fl. Brit. Ind. III. p. 657; Palib. Act. Hort. Peterop. XXI. p. 224; K. Schumann, in Engl. u. Pr. Nat. Pfl.-fam. IV. 2. p. 179; Forb. et Hemsl. Ind. Fl. Sin. II. p. 98; Makino, Bot. Mag. Tokyo, XX. p. 90; Kom. Fl. Mansh. III. p. 297; Matsum. Ind. Pl. Jap. II. 2. p. 506.

Apocynum sibiricum Pall. ex Roem. et Schult. Syst. IV. p. 405; Ledeb. Icon. Fl. Ross. t. 240 et Fl. Alt. I. p. 235; Bunge, Enum. Pl. Chin. Bor. p. 43.

NOM. JAP. *Oshoroso.*

NOM. AINU. *Bashikurumun.*

HAB. *Hokkaido.* Prov. Shiribeshi: Kabuto-iwa, Oshoro (H. Kanzaki![1] July 21, 1885); on the coast, between Tsurikake and Garo in the island of Okushiri (Y. Kudo! Aug. 4, 1916).—Prov. Ishikari: Hamamashike (Y. Tanaka![2] July 14, 1905).

DISTRIB. Hokkaido, Honshu, Manchuria, Siberia, China, Western Tibet, Persia, Asia minor, Caucasus, Europe.

145. Anaphalis alpicola Makino, Bot. Mag. Tokyo, XVII. p. 151; Matsum. Ind. Pl. Jap. II. 2. p. 21.

NOM. Jap. Takane-yahazuhahako.

HAB. *Hokkaido.* Prov. Iburi: on serpentine rocks, between Pankerup-kepshnai and Mukawa (T. Ishikawa![3] June 1917).—Prov. Hidaka: Samani gun, Mt. Apoi (K. Kondo![4] Aug. 17, 1912); Mt. Orokunnenupuri (Y. Kudo! Aug. 29, 1914).

DISTRIB. Hokkaido and Honshu.

1) 神崎某。 2) 田中義麿。 3) 石川貞治。 4) 近藤金吾。

摘　要

134. Trichomanes orientalis C. Chr. var. **abbreviatum** Miyabe et Kudo. **きたこがねしのぶ。**（新稱）

本道に於て始めて發見せられたる屬にして、後志國積丹半島及千島國擇捉島に於て採集せられたり。

135. Potamogeton praelongus Wulf. **れほばえびも。**（新稱）

本道に於ては渡島國大沼、膽振國俱知安、半月湖、釧路國阿寒湖、根室國根室等に產す。

136. Potamogeton compressus L. **あかんこも。**（新稱）。**えぞやなぎも。**

本州にては陸奥青森、西津輕郡山田川等に生じ、本道に於ては渡島國大沼、膽振國厚眞、釧路國阿寒湖、春採湖、塘路湖等に生ず。

137. Potamogeton Maackianus A Benn. **せんにんも。**

本道に於ては渡島國蕪菜沼、大沼、釧路國阿寒湖、塘路湖、屈斜路湖等に生育す。

138. Carex subspathacea Wormsk. **ひめうしほすげ。**

本道に於ては釧路國厚岸及樺太に於てはメレヤ、ツィルウタカ等に於て採集せられ、本道に於ては新發見なり。本種は其分布區域極地的にして南樺太亞庭灣メレヤは其南端なりしに今回の調査に於て更に南下して厚岸海岸に生育するを知り得たり。

139. Gymnadenia Iinumae Miyabe et Kudo. **いひぬまむかご。**

本道に於ては七重の北西部に發見せられたり。

140. Tetragona expansa Murr. **つるな。**

本道に於て今回始めて函館灣頭に發見せられたり。かゝる熱帶性植物の本道に分布するは興味ある事實なりとす。

141. Schizandra nigra Maxim. **まつぶさ。うしぶたう。**

アルブレヒト氏は本道に於て採集せるも其產地を明記せざりしに函館中學校長小田四十一氏は本種を函館三の川にて採集せり。

142. Rhamnus Ishidae Miyabe et Kudo. **みやまはんもどき。**

本種は北米產 *Rhamnus alnifolia* L'Herit に酷似し五數の二家花を有し花瓣を有せず。然れども本種の葉の廣くして其先端急に微凸形をなし多數の近接せる顯著なる側脈及其大形なる果實により容易に區別することを得べし。前年石田文三郎氏は夕張岳より生植物を携へ來り、現今植物園内に培養せらる。是等の植物は本年雌花を生ぜるも成熟せる果實を附するに至らざりき。昨年夏同氏は日高國ピンネシリ山より多數の生植物を携へ還へり、該山の山頂附近に最も多量に生育す。

143. Arctostaphylos Uva-ursi Spreng. **くまこけもも。**

西歷1860年、グレーン氏は北樺太ギリヤークの家にて本種の花及果實を發見せり。パラス氏は千島に產するを記せども其產地を明記せ

ず。而して本學に寄贈せられたる草野大尉の北樺太東海岸チャイウォーに於ける採集品中に此の長く希望せる本種の完全なる腊葉を見出せり。

144. Apocynum venetum L. **ゐしよろさう。** パシクルモン(アイヌ名)。

北海道に於ては後志國忍路兜岩、奥尻島釣掛ガロ間、石狩國濱增毛等に分布す。

145. Anaphalis alpicola Makino. **たかねやはずははこ。**

北海道に於ては膽振國パンケルップケップシュナイ鵡川間の蛇紋岩上、日高國アポイ山及オロクンネヌプリ山等生ず。

TWO NEW SPECIES OF MOLLISIACEAE.

BY

KINGO MIYABE and KOGO TOGASHI.

滑菌科の二新種

宮部金吾
富樫浩吾

Belloniella Skimmiae sp. nov.
(Pl. III, fig. 1–6, and a Text-fig).

Foliicolous, spots irregularly roundish or elliptical, marginal or scattered, at length coalescent, sometimes covering a greater part of the surface, pale yellow, then pale brown, and at last the leaves fall off.

Apothecia hypophyllous, or rarely amphigenous, densely gregarious or scattered, first formed under the epidermis, early erumpent, saucer-shaped, subsessile, waxy in texture, dark brown and provided sparingly with filamentous hyphæ on the outside. Hypothecia and peridia well developed. Peridia psendoparenchymatous; peripheral cells thicker and deeper in color. Epithecia not developed. Apothecia solitary or two or three aggregated, measuring 340–520μ in diameter, 140–220μ in height and roll up under a dry condition.

Hymenium surface is light brown in color. Asci clavate or cylindrico-clavate, 3–8 spored, but typically 4-spored, generally biseriately arranged, 50–66×6–9μ. Pore of the ascus stains blue with iodine. Ascospores blavate-oblong, oblong-fusiform, hyaline, 2-celled, not constricted at the septum, 13.0–18.5×2.0–4.5μ, with many oil-drops. Paraphyses filiform, more or less broadened at apex, simple or often branched, 50–70×2.5–4.0μ.

Hab. On the living leaves of *Skimmia japonica* Thunb.

Hokkaido. Prov. Ishikari, Nopporo, (May 8, 1920, May 22, 1921, May

[Trans. Sapporo Nat. Hist. Soc. IX, 1. Aug. 1924.]

28, 1922, June 4 and 22, 1922, and June 19, 1923, K. Togashi). Prov. Kitami, Rebun Island, (Aug. 10, 1922, K. Togashi).

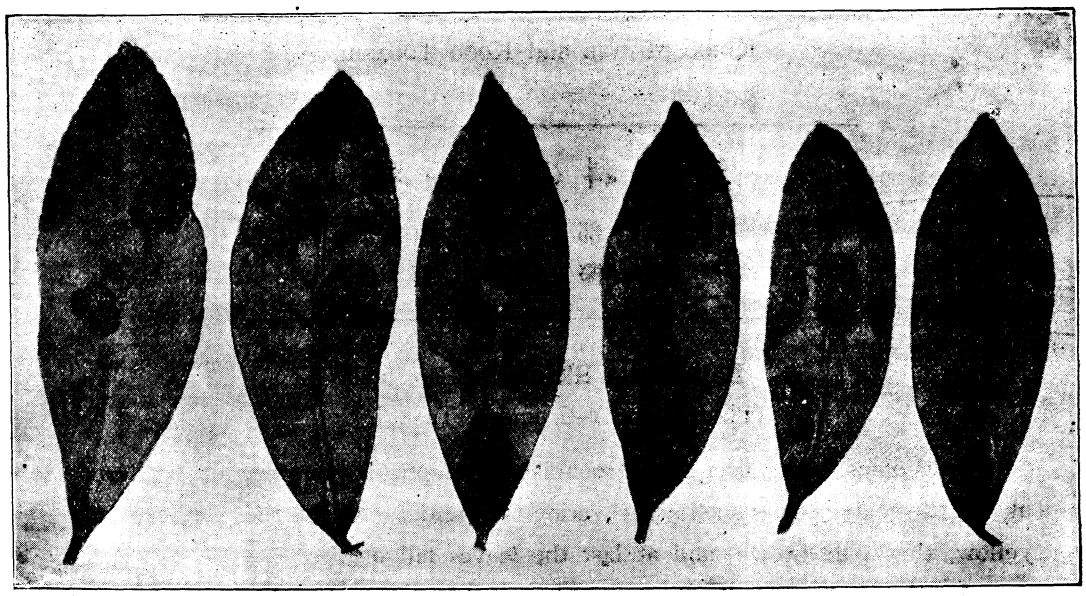


Fig. 1. Leaves of *Skimmia japonica* with diseased spots caused by *Beloniella Skimmiae*.

Infection takes place during the months of June and July, producing yellow discolored spots on the leaves. In autumn, mycelium is well developed in the intercellular spaces of the mesophyll, especially in the subepidermal tissues. In the next year, during a period extending from the end of May to the middle of June, the apothecia mature.

The texture and other characters of the apothecia and the numbers and characters of the ascospores lead us to consider the present fungus to be a species of *Beloniella*. Since Saccardo established the genus *Beloniella* in 1884, about ten species have been described up to the present, and they are mostly saprophytes with one or two exceptions. Our fungus differs in many respects from any of the species already described, inducing us to consider it to be a new species.

Pseudopeziza Peracapae. sp. nov.
(Pl. III, fig. 7–11)

Spots not formed. Apothecia epiphyllous, often amphigenous, rarely on the petioles and stems, scattered, solitary or often two or three aggregated, minute, black.

Apothecia first developed under the epidermis, then erumpent, disc-shaqed, sessile, brownish black on the outside, waxy in texture, 380–420μ in diameter and 100μ in height. Peridia well developed, pseudoparenchymatous, colored. Hypothecia little developed, hyaline. Asci club-shaped, 8-spored, with biseriate or irregular arrangement, hyaline, 53–67×7–10μ. Ascospores elliptical-fusiform or oblong-elliptical, unicellular, hyaline with two or three oil-drops, 9.5–14.0 ×3.0–4.5μ. Paraphyses filamentous with more or less thickened tips, often branched, 55–75×2–3μ.

Hab. On the living leaves and stems of *Peracarpa circæoides* Feer.

Hokkaido. Prov. Ishikari, Nopporo, (May 8, 1920, May 22, 1921, May 28, 1922, June 4 and 21, 1922, and June 19, 1923, K. Togashi). Mt. Teine, (June 19, 1921, July 4, 1922, K. Togashi). Prov. Kitami, Rebun Island, (Aug. 10, 1922, K. Togashi).

The host plant of the fungus in question belongs to an unique genus of *Campanulaceae*, peculiar to Japan and Himalayan region. It harbors many other interesting parasitic fungi apparently new to science. Our fungus differs from all the described species of *Pseudopeziza* on *Campanulaceae*.

The portion of the leaf on which the apothecia are formed, retains a green color for a long time, while the surrounding portion turns yellowish early in season.

The pore of the ascus does not stain with iodine, showing the fungus to have no relation to *Drepanopeziza* of Höhnel. We have not yet found the "hibernating form," *Pyrenopeziza* of our fungus, nor its conidial stage.

July 18, 1923.

Botanical Institute,
Hokkaido Imperial University,
Sapporo, Japan.

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Explanation of the Figures.

Plate III.

Fig. 1.—Fig. 6. *Beloniella Shinumiae* Miyabe et Togashi.

Fig. 1. Apothecium (×550). Fig. 2. Ascospores with oil-drops stained with alkannin. (×1300). Fig. 3. Ascus and ascospores with oil-drops stained with Sudan III (×1300). Fig. 4. Ascospores. (×750). Fig. 5. Asci (×660). Fig. 6. Paraphyses (×660).

Fig. 7.—Fig. 11. *Pseudopeziza Peracarpae* Miyabe et Togashi. Fig. 7. Apothecium (×500). Fig. 8. Apothecia on living leaf of *Peracarpa circaeoides*. (×20). Fig. 9. Ascospores with oil-drops stained with alkannin (×1300). Fig. 10. Asci (×660). Fig. 11. Paraphyses (×600).

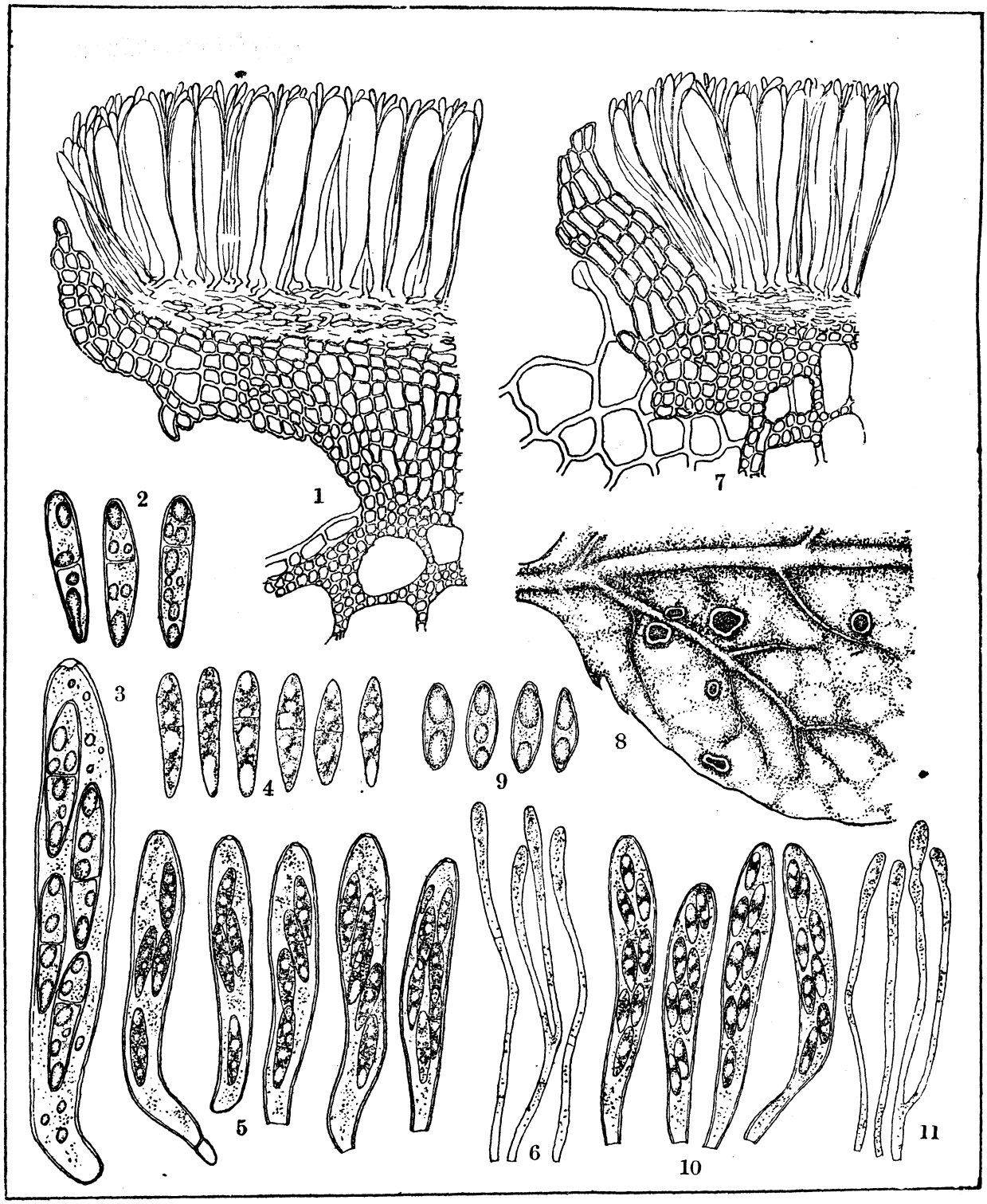
滑菌科の新種

摘要

滑菌科に屬する二新種につき記載せり。一はミヤマシキミに寄生するものにして *Beloniella Skimmiae* と命名し、他はタニギケフに寄生し *Pseudopeziza Peracarpae* と名附けたり。

Beloniella Skimmiae は野幌及び禮文島に於て採集せり。子嚢盤は五、六月の候に至りて成熟し間もなく他に傳染して淡黄色不規則なる圓形の病斑を生ず。菌糸は葉の組織内を縦横に迷走しそのまゝ越冬す。翌春病斑部の擴大すると共に多くは葉の裏面に暗褐色椀狀の子嚢盤を形成す。間もなく被害葉は脱落す。

Pseudopeziza Peracarpae は明かなる病斑を作らず。子嚢盤は葉の表面或は兩面、稀れには葉柄、莖等に多くは點在して生ず。病勢の進める被害葉にありては僅かに子嚢盤の周圍に綠色を殘すのみにして他は淡黄色となり遂に枯死す。本菌は野幌、手稻山、禮文島等にて採集せるを以て北海道にはひろく分布するものと思考す。



K. Togashi del.

STATISTICAL STUDIES ON THE VARIATION OF STAGBEETLES.

BY

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(With 8 figures and 4 tables)

鍬形蟲の變異の統計學的研究

犬飼哲男

Quetelet (1871) was the first who worked out the variability of human bodies by the statistical method, and established his law which later enabled Galton and others to recognize the coincidence of the variation curve with the binomial curve. Actual investigations, so far completed, support the law by which the general phases of variation in the organic world are explained.

In the year of 1894 Boteson worked on the variation of the stagbeetle *(Xylotrupes gideon)* and, later on that of the earwig *(Forficula auricularia)* and detected the dimorphic curve of frequency of variates. He was followed by a series of investigators on this question including de Vries (1895) on Chrysanthemum, Weldon (1895) on crabfish, Heincke (1897) on herring, Jennings (1911) on Paramaecium, Goldschmidt (1897) on moth and so forth.

As is well known, Bateson distinguishes 'high' and 'low' individuals, applying the terms respectively to large and small sized individuals of the same sex of a species, that he had found by measurement of the horns of Lucanid stagbeetles. The terms refer, however, not only to the horns but also to the body itself, according to its strength. Bateson regrets "no suffi-

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cient number of male stagbeetles has yet been received to warrant any statement as to frequency of the various types of male." Now the Lucanid stagbeetles are, however, very common in forest localities in this country.

The stagbeetles occur very abundantly in our university grounds, being represented by two species called respectively *Cladognathus inclinatus*, Motsch; and *Lucanus maculifemoratus*, Motsch. During the last few years (1917–1919), a number of specimens was collected chiefly by Dr. Yoshimaro Tanaka. As is very well known, the male beetles are built very strongly and carry a pair of splendid antlers which are nothing else than vigorous mandibles. The females are furnished with a pair of solid but short jaws. Accordingly, these features of both sexes afford us already an excellent example of sexual dimorphism; but this is not the only difference. Upon further examination we find that there are in these forms other features which show the facts of variation.

Last spring, I had an opportunity to study the above mentioned collection which consists of 1362 males and 1333 females of *Cladognathus* and 320 males and 809 females of *Lucanus*. In specimens, taken at random, measurements and examinations of several facts have been carried out, and we find that the law of 'high' and 'low' individuals quite obviously applies to them. As the *body length* I have taken the extent from the top of the caput to the hind extremity of the sheathwings.

In this place, I wish to express my thanks to Dr. Hatta for his courtesy shown during my present study. I am also very much indebted to Dr. Tanaka who allowed me the free use of the collection.

I. **Cladognathus inclinatus,** Motsch.

Male.—The development of the mandibles in strength and otherwise, may be said to be proportional to the bodybuild: a large sized 'high' form is built solid and carries, together with strong legs, arched and vigorous antlers with several strong tines (Fig. I, *a–c*), while the small 'low' forms have straight short antlers looking like a pair of scissors with serrated edges, giving a

weak appearance (Fig. I, *g*. *h*.) As Fig. I shows, a complete gradation (Fig. I, *a–h*) occurs between the two extreme forms, and a continuous, fluctuating variation is quite obvious in this species (Fig. I, *a–h*).

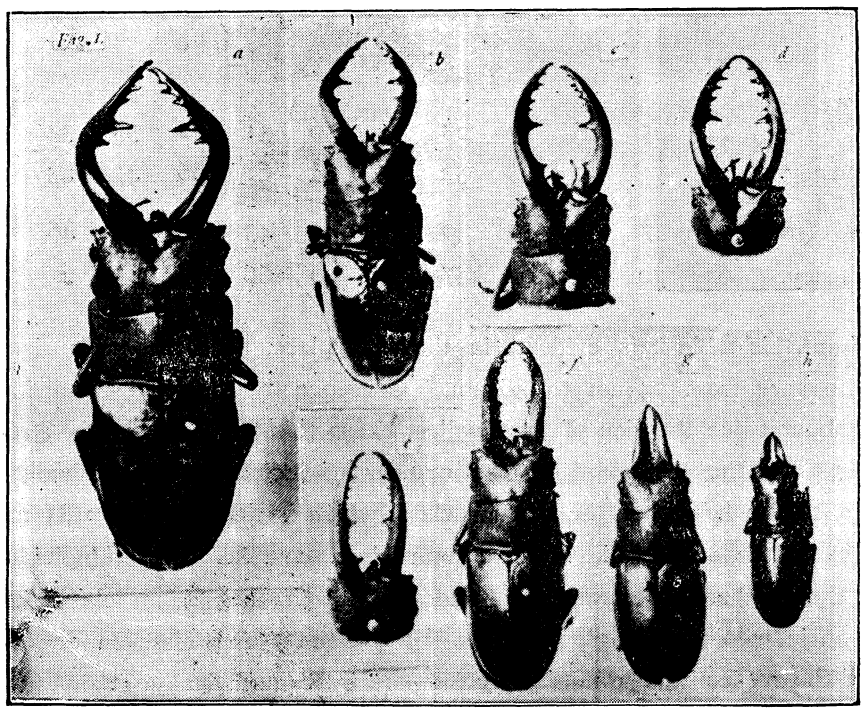


Fig. I. *Cladognathus inclinatus* Motsch. male. View of continuous variation between largest (46mm) *a* and smallest (25mm) *h* variates. *b* (36mm) small form of high tyge, *g* (30mm) large individual of low type, while *c*, *d* (37mm), *e* (35mm) and *f* (34mm) show intermediate forms from high to low. (Natural size).

Examined more precisely, the strength of the antlers together with their curvature is diminished from *a* to *f* (Fig. I) by grades until both mandibles are almost parallel to each other, as seen in *g* and *h*. The tines are also diminished in strength towards the small sized individuals, in which case they are represented merely by the serrated inner edge of the antlers; on the other hand, they get more numerous from the high forms to the low ones (see Fig. I, *a–h*). The variation is indeed, fluctuating; it is, however, not shown by a straight line, but describes a curve, as the following accounts show.

According to the length of the body, which was measured with an exactness of about 1/10 mm, the individuals have been grouped into 23 classes which comprise all those which stand between a given unit and the next one. As the result of these measurements the following table was obtained (Table I).

Table I.

Class. (mm)	24	25	26	27	28	29	30	31	32	33	34	35
Frequency.	2	7	12	35	52	75	**81**	61	66	47	43	52
Class. (mm)	36	37	38	39	40	41	42	43	44	45	46	
Frequency.	62	70	90	104	**137**	124	99	66	60	15	2	

From this table it is evident, in the first place, that the body size is found to vary from 24 mm to 46 mm. Consequently the largest individuals attain about twice the size of the smallest ones; this fact in itself is already striking. In the second place, the number of individuals is gradually increased to the height of the 30 mm class, which is represented by 81 members, while the smallest i. e. the 24 mm class, contains only 2 individuals. Then, the number is decreased by grades to 43 in the 34 mm class, losing about 40 in passing through 3 classes. From the 35 mm class on, the numbers of the respective classes rapidly increase again and finally attain, in the 40 mm class, the climax with 137 individuals. Then, the number falls again by grades as far as the 44 mm class with 62 individuals. In the next class, 45 mm, the number drops very suddenly and still more so in the class of 46 mm, which consists of only 2 of the biggest forms. Taken as a whole, the *prevalent distribution of variates of the 23 classes is met with twice, i. e. at the 30 mm class and at the 40 mm*, the two being separated by a wide gap near the 34 mm class.

I have endeavored to show the results graphically in Fig. 2. The figures on the ordinate show the number of individuals, those on the abscissa giving the body length in millimeters.

A glance at the curve makes it evident that the present species may be assumed to be dimorphic, so far as the majority of individuals is concerned.

In this respect the species is provided with two apices around which the population is crowded: the first apex corresponds to the 30 mm group, while the second falls in the 40 mm class.

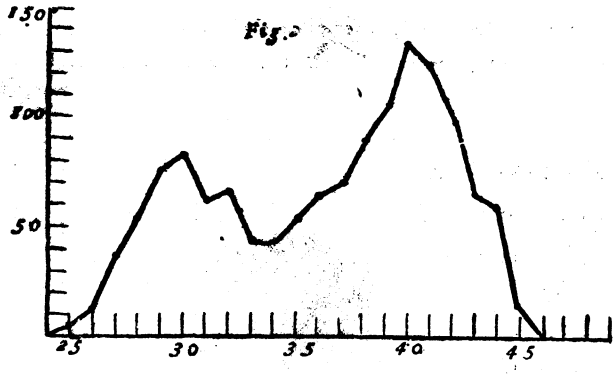


Fig. 2. Curve showing frequeucy of various body lengths of male in *Cladognathus*. Ordinates, numder of individuals; abscissa, body length in mm.

From the curve above given, it is evident that the two apices represent the majority of variates: firstly, it falls on the 30 mm class which exhibits the class of greatest frequency of moderately low individuals, and secondly on the 40 mm class which marks the maximum number of moderately high types, while all the intermediate forms (Fig. I. *b–f*) lie around the sinus, that is 34 mm, which indicates the rarer occurrence; the 37 mm class marks the higher limit beyond which none of the low types are met with, and the 33mm class the lower limit, which is never crossed by any of the high forms.

Female.— In contrast to the male which is armed with powerful antlers the female possesses only a pair of inconspicuous mandibles like forceps. The body size of the female is much inferior to that of the male. The largest female attains at most the body length of 34mm, or a point which reaches hardly the height of the male variates of middle length. It then fluctuates and runs straight to the minimum one of 23mm, so that there can not be drawn a distinct line of demarcation, as shown by a comparison of the two individuals (Fig. 3) standing at the extremities of a row in which 1333 females are serially arranged according to their body length, i. e. magnitude. It is evident that the biggest individual (*a*) is in every respect nothing more than the smallest one (*b*) magnified. More accurate data can be gathered with the same method which consists in the study of the males, in grouping the total population into certain classes according to the body length.

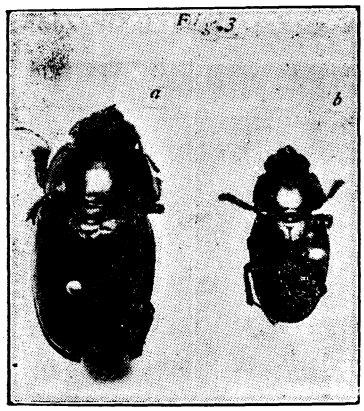


Fig. 3. *Cladognathus inclinatus*, Motsch. female. Surface view, giving 2 extreme variates of population. *a*, largest 34 mm; *b*, smallest 24 mm form. (Natural size).

All 1333 female beetles were grouped according to the units of the scale used in case of the males and we obtained 12 classes as follows (Table 2).

Table 2.

Class (mm)	23	24	25	26	27	28	29	30	31	32	33	34
Frequency	9	19	61	129	187	224	**226**	221	163	68	21	5

From this table (Table 2) we can gather 4 important facts, as the following descriptions show. First, the individuals standing at both the extremities are far inferior to the males in body length, as can be seen at once by comparing table 2 with table 1.[1] Second, the variation in this respect passes over from each unit to the adjacent ones not abruptly as in the males, but fluctuating continuously; accordingly, its range is shorter than in the case of males. Third, there are, in consequence, only 12 classes instead of 23 as in the males. Lastly, the number of individuals in each class increases suddenly towards the high types and then decreases likewise suddenly.

These data can be represented graphically by a curve which is shown in Fig. 4.

The curve starts at first rather slowly and ascends suddenly from 26mm to 28mm; then it slowly attains the mode and descends likewise slowly to 30mm which is at about the same height as 28mm on the opposite limb. From this point to 33mm it descends steeply just as the opposite limb ascends. Then it slides into the high type.

Both limbs of the curve, as is evident from Fig. 4, are nearly symmetrical and the curve is unimodal having an apex at 29 mm. It follows that the mean value of the variates, 28.6mm, nearly coincides with the empirical

mode, 29mm, the middle standing class; that is, it is very near to the normal variation curve. The value of the standard deviation $\sqrt{\frac{\Sigma(x^2.f)}{n}}$, where f represents the frequency, x the deviation of any class from the mean, and n the number of variates, is 2.06.

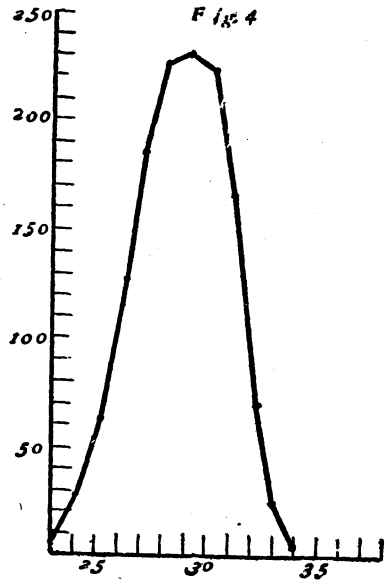


Fig. 4. Diagram showing frequency of body length of female in *Cladognathus*. Figures on axis as previous figure.

The female is, in this respect at least, much more condensed than the other sex and may be taken to be homogenetic, modifying itself in the normal way in which Galton's single variation curve is drawn.

In addition to these facts the mandibles of the females are formed always uniformly like a pair of claws with a fine serrated inner edge; they are neither arched antlers, nor severally tined, nor developed in several strengths according to the size of the body, as in the case of the males.

It follows that the variation in the females is very much narrower in its range than that of the male.

II. **Lucanus maculifemoratus,** Motsch.

Male.—This species was collected also from our university grounds; it is in the habit of living close together with the previous species, althogh it is more rare.

In the male, the big antlers may be said to be uniformly built throughout the whole collection; the most conspicuous feature of this pair of appendages consists in the bifurcation at their terminus. Fig. 5 shows that the antlers are by no means complicated or simplified, according to the body type, i.e. whether the body type is high or low; they are always arched and tined in several ways in the low type (*b*) as well as in the high type (*a*), except

that the tines of the former are inferior in development to those of the latter.



Fig. 5. *Lucanus maculifemoratus*, Motsch. Photo of representatives of two extreme variations. *a*, largest 50 mm; *b*, smallest 28mm individual. (Natural size).

The only externally noticeable distinction between the two types is found in the caput which in the low type, is truncated on both sides of its hind part, while in the high type this part is not truncated.

Taking the same unit of measurement as in *Cladognathus*, the total 320 male specimens whose body length I measured may be arranged in 23 calsses (Table 3).

Table 3.

Class (mm)	28	29	30	31	32	33	34	35	36	37	38	39
Frequency	1	2	2	10	8	10	10	9	10	18	15	14
Class (mm)	40	41	42	43	44	45	46	47	48	49	50	
Frequency	24	20	22	20	**42**	35	26	12	8	1	1	

From this table we notice, in the first place, that the present species is larger than the male of *Cladognathus* in both the high and low types; in the second place, the variation passes abruptly from one unit to the next one; consequently there are, thirdly, 23 classes as in *Cladognathus*, those at and near the extremities being represented by only a few individuals (see Table 1); and lastly, the numbers of each class are at first irregular in increasing and decreasing. The individuals shows a sudden increase in number from the 43mm class to the 44mm class; thereafter a steady decline takes

place down to the 49mm class from which no more are added. The results show that the species in question is more variable than *Cladognathus* and that the maximum frequency is attained at the 44mm class.

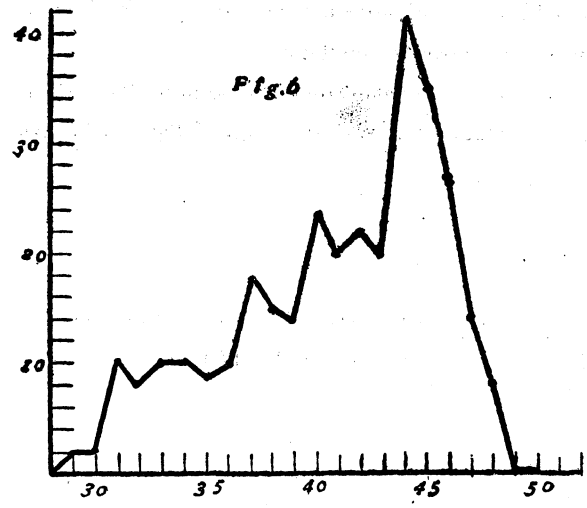


Fig. 6. Curve exhibiting frequency of variates in body length of *Lucanus* male; explanation as in previous figures.

The above data are expressed diagramatically in Fig. 6.

From its start to the 43mm class, the curve describes a zigzag line and then ascends steeply to the 44mm class, from which it descends nearly vertically, forming a very acute angle with its two limbs; then at the end it follows a horizontal course (Fig. 6). The curve is, however, unimodal. In this unimorphic curve the mode is at 44mm and the mean at 41mm; the median magnitude, 39mm, is, therefore, distant from the mean. I dare to assume, nevertheless, that the *Lucanus* male is on the way to dimorphism similar to that which is obvious in the male of *Cladognathus*.

Female.—The female variates of *Lucanus* are as simple as those of *Cladognathus*; the individuals of the low type can not be distinguished from those of the high type except by the much inferior body length in the former, which is a little more than half of the latter (Fig. 7). It is remarkable that the caput is truncated from both sides at its hind part, just



Fig. 7. *Lucanus maculifemoratus*, Motsch. female. View representing highest *a* (39mm), and lowest *b* (25mm) individuals. (Natural size).

as in the males of the low type (compare Fig. 7 with Fig. 5); the females look more gentle than the males, because the anterior side margin of the caput is round, instead of angular as in the case of the latter.

Concerning the body length, for the measurement of which 809 females were employed, the specimens are classified into 15 groups (Table 4), using the same units as in the foregoing cases.

Table 4.

Class (mm)	25	26	27	28	29	30	31	32	33	34	35	36
Frequency	2	3	7	20	36	60	86	121	**175**	124	94	56

Class (mm)	37	38	39
Frequency	18	16	1

Excepting the maximum and minimum length, in which the present species surpasses the last one, the variation resembles in every respect that in the females of *Cladognathus*. The highest and the lowest individuals are inferior in body length to the males. So far as the boby length is concerned, the variation passes not abruptly from one class to the next one, but fluctuates continuously. Accordingly its range is not so wide as in the males, and the classes are limited to 15, while the males are grouped into 23. The number of individuals in the respective classes increases at first slowly, then very suddenly towards the long types i.e. the 33mm class; finally it decreases likewise suddenly, until at the end it is gradual again.

The statements given on the females of *Cladognathus* are, therefore, also valid in this case. There are, however, two points by which the two species diverge from each other. First, the females of *Lucanus* comprise 15 classes, while those of *Cladognathus* are divided into only 12 classes. The second point of divergence, which is very important, consists in the fact that the individuals of *Lucanus* are added very abruptly to its maximum and decrease likewise abruptly, so that the multiplication attains directly the highest point; whereas in the case of *Cladognathus* both the increased and the decreased number in some classes near the maximum is only slightly diminished. These divergencies are shown more clearly in the curve which follows (Fig. 8).

The curve given from the data above illustrated (Fig. 8.), affords us an excellent example of the unimodal type which is nearly symmetrical on both sides of the mode, 33mm; the mean is 32.7mm and the median 33mm. Thus the theoretical mode coincides almost completely with that of the curve, so that it stands very near the normal curve.

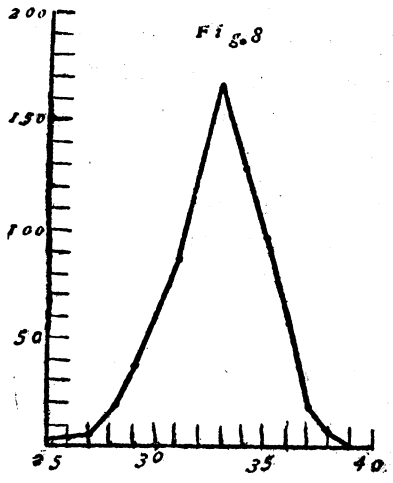


Fig. 8. Curve showing frequency of various grades of body length of females in *Lucanus*. Figures on axis represent units and numbers as before.

By the calculation of the value of $\sqrt{\frac{\Sigma(x^2.f)}{n}}$ the standard deviation was obtained as 2.14.

Comparing this curve with that of the females of *Cladognathus*, we see that here the apical angle is very acute instead of being an obtuse angle as in the case of *Cladognathus*. The conclusion is, therefore, justified that the variation in the females of *Lucanus* fluctuates normally between the two extremities, 25mm and 39mm.

Bateson (1894) was the first who made out in his study of stagbeetles of *Xylotrupes*, and earwigs, the existence of two apices in the frequency of variation. Bateson's case is based upon the length of the horns of 342 male beetles and the length of the forceps of 583 male earwigs. In the present investigation, we took the body length as the chief factor, because the specimens are abundant enough to ascertain the curve which Bateson made out otherwise. Our curve is, like his, *dimorphic* in *Cladognathus* at least.

In the dimorphic curve which de Vries (1895) gave for *Chrysanthemum segetum*, the author ascribes its two apices to the influence of the mixed factors of two different species, assuming the first maximum to be caused by the plants with 13 radial petals and the second by those of 21. In the course of his experiments with culture selections, from plants with dimorphic curve,

he produced two plants which have 13 and 21 petals as their single modes respectively. This assumption is confirmed by Heincke (1898) from a study of herring and by Jennings (1911) in the culture of Paramaecium.

The statistic demonstration of the dimorphic curve, which was carried out by Weldon (1894) on crabfish (*Carcinus maenas*), has been verified by Gigard (1894) employing the same material; he states that the curve derived from the small individuals is caused by parasites.

According to Goldschmidt (1913), who stated on the wings of a moth, *Lymantria mobacha*, the inferior apex of the dimorphic curve comes from the small type moulted always from small pupae which in their turn come from poorly nourished caterpillars.

Besides de Vries, the three last named authors assume the dimorphic curve to be caused by environmental factors. Bateson denies external circumstances which drive the animal into the dimorphic condition, inasmuch as the high and low forms are living close together under one and the same stone. The results of the present investigation are, therefore, in this respect in agreement with those of Bateson. It follows that the dimorphic condition of a species living under the same environmental circumstances is an inborn character.

From the results of the present investigation of *Cladognathus*, the following assertions are justified:- The female is less variable than the male. Concerning the *body length*, the latter is *dimorphic* while the female is, on the contrary, *unimodal*. The *mandibles*, or antlers of the male exhibit modifications which may be said to be almost endless, until they are reduced to those of the low types which are nothing more than a pair of forceps; accordingly the male in this respect, closely resembles the female which is provided with merely a pair of claw-like jaws. The resemblance goes not unfrequently so far that a male and a female, which are about equal in body size, may not at a glance be distinguished from each other when they are put into an insect box, containing many others. Thence, I dare to assume that the primary form of the species was represented by the female, from which the male form was derived by the variation acting on it in producing the complicated antlers from the claw-like mandibles. In fact the antlers are undergoing still further modifications.

For this assertion, the results obtained from *Lucanus* afford still stronger evidence. The variation is more striking also in the male than in the female; but it is less pronounced, compared with *Cladognathus*, inasmuch as here the *dimorphic condition* of the body length is not yet obvious enough, although a tendency thereto cannot be denied. What concerns the female, the variation is still simpler; it represents a *typical unimodal* type. The female shows, a striking characteristic which consists in the truncated posterior side margins of the caput. This morphological characteristic is visible again in the low-typed males (Fig. 5, *b*) and grows weaker towards the high-typed ones, until it is totally lost in the highest (Fig. 5, *a*). Notwithstanding the antlers which differ widely from the claw-like mandibles of the female, the female has this criterion referred to in common with the low-typed male. This characteristic, then, must once have been, I think, one of the conspicuous species characters. Here we are, therefore, also forced to assume that the female represents the primary type, whence the male type has been derived.

The present results from the study of the two species of stagbeetles interest us so far as they are concerned with variation, in the fact that they parallel each other, and as to the degree of variation, in the fact that both the forms are divergent from each other. It is obvious that *Lucanus* is in this respect inferior to *Cladognathus;* hence the course of variation in the latter can, to some extent, be deduced in that of the former. For instance, the obtuse-angled curve in the females of *Cladognathus* must have been an acute-angled one as in the case of the same sex of *Lucanus;* likewise the zigzag-lined curve in the males of the latter shows, without doubt, a tendency to pass over later into the dimorphic curve of the former. This multifarious variety of forms, which both the species of stagbeetles exhibit, forces us to assume that the beetles in question are in character quite variable. It is this variability, I think, that caused the beetles to exhibit sexual dimorphism.

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摘　　要

のこぎりくわがた及び**みやまくわがた**の雌雄に就き先づ前頭より翅蓋の先端に至る體長を測定し、これを基準としてその變異を統計學上より研究せり。

のこぎりくわがたの雄1362を檢するに、大腮の發達程度により所謂鋸齒型の小形種と鍬形型の大形種(附圖1. h及a)とを區別し得れど、兩形種の間には中間形種ありて、(附圖1. c, d, e及f)體長24mm——46mmの一連續的變異なる事を示す。但し中間形種を表はす34mmの個體數は比較的少數なり。從つて頻度曲線は双頂曲線なり。然るに雌に於ては1333の統計に依れば、變異幅員は著しく制限され23mm——34mmなり。而して最大頻度は中間形29mmにありてその兩極端に於ける個體の形質の差も著しからず(附圖3.)。即ち完全なる連續的彷徨變異にして、29mmに於て單頂を表はす規準曲線に近き頻度曲線を畫く。而してその標準偏差は2.06なり。

みやまくわがたの雄は前種の雄より大形にしてその變異は28mm——50mmの連續的變異なり。大腮は前種の如く大小形種に於てその差、顯著ならざるも、前頭部の横隆は形狀の發育程度著しく異る(附圖5)。320個體の示す頻度曲線は單頂にして44mmに最大數を有す。故にその頂點は著しく大形種の極點に偏側し前種の雄の如き双頂曲線に分化する傾向を示す。

雌は809にして前種と等しく雄に比し變異幅員は著しく極限せられ25mm——39mmの彷徨變異にして33mmに單頂を有する規準曲線に近き頻度を示す。その標準偏差は2.14なるを以つて前種の雌に比し頂點の急坂なる事を示す。

上記の双頂曲線の原因はBatesonの**かぶとむし**及び**はさみむし**の例と同樣に雄の內在性に由るものにして、異種屬の混在或は外界の影響等に原因するものに非ず。

くわがたむしに於ては雄は雌に比し變異性著しく大なり。而して**のこぎりくわがた**の最小形の雄は同形の雌に近似し大腮の發育程度も大差なし。**みやまくわがた**に於ても同樣にして最小形の雄の頭部の横隆は雌のものと形狀等し、而も雌は何れも標準變異を示す。故に雌形は此等種屬の原形にして雄形はこれより變化發達せしものと解し得。體長に據る變異に於ては兩種は共通點を有し、只**みやまくわがた**は前種に比し稍々變異の分化程度低きに留る。**のこぎりくわがた**の雌は他種の雌の如く嘗ては急坂頂點の曲線を示し、**みやまくわがた**の雄は遂には双頂曲線を示すに至る事想像するに難からず。何れの**くわがたむし**も著しく變異性に富む事明白にして斯る變異性に基きその雌雄二形は分化さるゝに至りしならん。

南樺太産脈翅系昆蟲類の研究

桑山覺

（挿圖五）

A CONTRIBUTION TO THE KNOWLEDGE OF THE NEUROPTEROUS INSECTS OF SOUTH SAGHALIEN.

BY

SATORU KUWAYAMA.

(With five text figures)

南樺太の昆蟲相に就ては未だ闡明せられざる處頗る多く、特に玆に報告せんとする脈翅系昆蟲類に關する吾人の知見の如きも亦極めて僅少なり。則ち、著者寡聞にして、唯僅かに松村教授(19)[1]がその著"樺太産昆蟲研究第一"に於て十三種を發表せられたると、西班牙なるL. NAVÁS教授(39)が一種を報告せると、並に三宅、岡本兩博士、中原ドクトル等がその著書中に分布の既に知られたる種に就き論議せられしとの外、他に何等の研究報告あるを知らず。されば著者は同地に於ける脈翅系昆蟲相を調査することの興味尠からざるべきを信じ、研究材料を得んとして、大正八年井澤英二氏が樺太視察を試みられたる際標本の採集を依頼せるに、氏は專門外にして而かも短時日の旅行なりしにも拘らず、特に貴重なる時間を割きて多數の採集品を齎らされたり。然れどもその多くは鞘翅類並に蝶類にして、脈翅類は極めて少く、而もそは何れも分布の既に知られたるもののみなりき。越へて大正十年八月下

1) 人名の後に記せる括弧内の數字は參考文献目錄の番號を示す。

[Trans. of Sapporo Natural History Soc. Vol. IX, Part 1. 1924.]

旬より九月上旬に渉り、著者は官命を帶びて偶々同地に發生猖獗を極めたる松蛞蹶慘害調査のため渡樺するの機ありしを以て、大なる期待を畜きつつ同地に至りぬ。然るに時盛夏を過ぎ既に採集の適期にあらざりしと、用務の爲め匆々の旅行なりしとに由り、脈翅系昆蟲類は僅かに一二種を獲たるに過ぎざりき。而かも當時同地は既に天寒くして萬物秋色を帶び、一般昆蟲類は殆ど影を潜め、札幌附近の聯想を以て至れる著者の眼には、その想像に反する寂莫と昆蟲類の活動期間の甚だ短きとに、寧ろ異樣の感を懐かしめたりしなり。かくて著者は年來の希望を達成し得ざりしに、恰も大正十一年七八月江崎悌三氏は南樺太昆蟲相調査の爲渡樺、各地を跋渉して多數の研究材料を獲られ、その内脈翅系昆蟲類は總て著者に惠與して以てその研究を囑せらる。就て見るに新種と認むべきものなしと雖、未だ同地に分布の知られざりしもの若くは本邦に未記錄なるもの尠なからず。更に鹿野忠雄氏も同年渡樺し、その際得られたる一二の採品を寄送せられたり。乃ち、既知の事實と之れら數回に亘りて得たる標本の研究を基礎として、茲に一のsynopsisを編し、以て將來の研究に資せんとす。本文に載する處素より同地のものを網羅せりと稱すべからず。將來尚多數の發見せらるるものあるを信ずるを以て、科又は屬の檢索表の如きは未だ南樺太に知られざるものと雖、成る可く本邦産のものを網羅せんことに努めたり。尚二三本邦産脈翅系昆蟲類研究上注意すべき點も處々に附記することとせり。著者が茲に脈翅系昆蟲類の名の下に取扱ひしは、廣翅目(Megaloptera), 脈翅目 (Planipennia), 長翅目 (Mecoptera), 及毛翅目(Trichoptera) の四目にして、通計十一科十七屬二十五種を含む。これ等は何れも昆蟲地理學上興味深きものにして、南樺太の昆蟲相は、北海道の夫れよりも更に一層、西比利亞系統に接近せるを見る。この分布に關しては他日の機會に於て論究せんことを期す。

本文を草するに當り、貴重なる標本を寄與せられたる前記、江崎悌三、井澤英二並に鹿野忠雄の三氏に深厚なる謝意を表す。又著者が脈翅系昆蟲類研究上常に激勵と助言とを與へ

られ、且標本の檢索と圖書閲覽の自由を與へられたる、恩師理農學博士松村教授、並に岡本農學博士に對し、衷心の感謝を捧ぐ。尙一二圖書の借用を快諾せられたる矢野理學士に對しても、同樣謝意を表す。

目の檢索表

a1 普通、前後翅その形狀を異にし、後翅は廣くして、その內緣野は靜止の際縱疊し得べし。翅特に前翅は細毛若くは細鱗を以て多少密に覆はる。縱脈多くして、橫脈少なし。翅を屋斜狀に疊みて靜止す。口器不完全にして咀嚼に適せず。……毛翅目 Trichoptera

a2 普通、前後翅形狀の差異甚だしからず。後翅に內緣野を有するもの少なし。翅は裸翅、細毛を有することあるも、こは翅脈又は翅緣に限らる。口器完全して咀嚼に適す。

b1 頭部扁平にして、前口式 (prognather type) なり。翅は脈相密ならず。後翅に內緣野を有するものあり。翅を屋斜狀に疊みて靜止す。……廣翅目 Megaloptera

b2 頭部は稍楕圓球形に近く、下口式 (hypognather type) なれども、口部の突出著しからず。翅は縱脈橫脈共に多く、爲に網目狀をなすこと多し。翅を屋斜狀に疊みて靜止す。……脈翅目 Planipennia

b3 頭部は稍楕圓球形なるも、口部は著しく延長して口吻狀をなし、その先端に口器を具ふ。下口式。翅は縱脈多數にして橫脈少なし。靜止の際翅を半開して略水平に保つ。……長翅目 Mecoptera

廣翅目
MEGALOPTERA

本目は二科を含む。共に稚太產種を有す。

科の檢索表

a1 前胸は甚だ長く、他の胸環節を合したるものより遙に長し。雌は產卵管を有す。翅小にして翅脈多からず。緣紋の境界明瞭なり。小形乃至中形種。幼蟲は陸棲なり。……駱駝蟲科 Raphididae

a2 前胸は短くして他の胸環節と等長なるか、又は僅に長し。雌は產卵管を有することなし。翅は大にして脈相稍密。緣紋の境界明かならず。中形乃至大形の種類を含む。幼蟲は水棲なり。……蛇蜻蛉科 Sialidae

蛇蜻蛉科 Fam. Sialidae

K. C. DAVIS 氏 (5) は本科を二亞科に分類す。こは W. H. VAN DER WEELE 氏 (68) J. H. COMSTOCK 氏 (4) も既に承認せる處なり。何れも比較的原始的の形態を具ふ。

亞科の檢索表

a1 單眼三個を有す。第四跗節は簡單ににして分裂せず。大形乃至中形種を含む。……蛇蜻蛉亞科 Corydalinae

a2 單眼を缺く。第四跗節は明らかに二裂せり。稍小形種を含む。……センブリ亞科 Sialidinae

蛇蜻蛉亞科 Subfam. Corydalinae

未だ南樺太に本亞科の昆蟲の産するを知らず。本亞科は從來舊北洲に知られたりと雖、そは比較的溫暖なる地方に限られ、西比利亞にも分布せるの報告なし。されば假令本邦に普通なるヘビトンボ *Protohermes grandis* THUNBERG が北、北海道に迄分布せりと雖、恐らく同地には産することなかるべきかを想像せらる。然れども將來本亞科昆蟲の南樺太に於ける産否を確證せんことは昆蟲地理學上興味ある一命題たるべし。

センブリ亞科 Subfam. Sialidinae

舊北洲産の本亞科は唯次の一屬のあるのみ。

センブリ屬

Genus *Sialis* LATREILLE (1803)

1. センブリ

Sialis sibirica MACLACHLAN (Fig. I)

(第 一 圖)

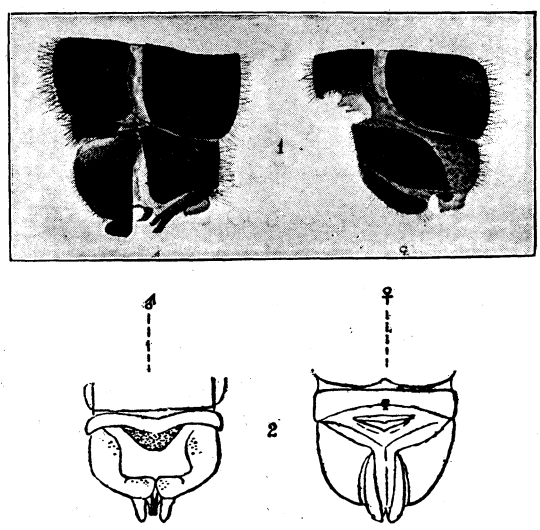
Sialis sibirica 'MACLACHLAN; Ann. Soc. Ent. Belg., XV, p. 55, pl. I fig. 10 (1872)': DAVIS; Bul. N. Y. State Mus., LXVIII, p. 452 (1903): VAN DER WEELE; Coll. Zool. Edm. Selys Longs., V, p. 82, fig. 65, 66 (1910): NAVÁS; Revue Russe d'Entom., XII, p. 421 (1912).

Sialis sibiricus? MATSUMURA; Thous. Ins. Jap. (日本千蟲圖解), I, p. 154, pl. X fig. 6 (1904)

Sialis frequens OKAMOTO; Trans. Sapporo N. H. Soc., I, p. 112 (1905/06): MATSUMURA; Syst. Ent. (昆蟲分類學), I, p. 167, fig. 202 (1907): OKAMOTO; Wien. ent. Zeit., XXIX, p. 256(1910): MATSUMURA; Jour. Coll. Agr., Tohoku Imp. Univ., IV, p. 13 (1911): NAKAHARA; Ins. World (昆蟲世界), XVIII, p. 315 (1914): NAKAHARA; Ent. News, XXVI, p. 158, fig. 6 (1915).

從來の記載の追補として、次に生殖器の形態を稍詳細に述ぶべし。

雄、腹部第九節の背板に一對の黑色なる上位生殖器附屬物(appendices superiores)あり。こは細長にして僅に上方に彎曲し、基部には一個の淡色なる膜質囊狀物あり。その下方に褐色のキチン質片ありて、前記附屬物の下側に接着す。更にその下位の部分は廣く淡色なる膜質にして、之れに一の彎曲せる褐色の鉤刺を有す。生殖瓣(genitalvalve)即ち第九節腹板は小にして幅狹く、キチン質帶をなし、黑色なり。之れに一對の下位生殖器附屬物を有す。こは黑色にして極めて大なる略三角形を呈せるものなり。これを腹面より見るときは、內方に彎曲して先端に至るに隨ひ細小し、これを側面より見るときは、基部太くして先方に向ひて細小し、更に先端部は急に上方に突出して略鎌形をなす。この附屬物は本種のもの本邦產種中最大にして、乾固標本にありても尙よくこれを認め得べし。



第一圖 Fig. I
センブリ *S. sibirica*
1. 腹端(側面廓大、左雄、右雌)
Terminal segments of abdomen, showing genitel parts. (lateral view, much enlarged) ♂ & ♀
2. 同上外形(腹面廓大)
Do, outline of ventral view. (much enlarged)
原圖 (original)

雌、腹部第八節腹板は狹くして黑褐色、厚く、側方稍幅廣し。その中央に顯著なる二個の硬化部ありて、更にその間一の濃色なる小突起を有す。上位生殖器附屬物は僅に突起を

なし、淡褐、軟質。第九節背板には更に二個の生殖肢(gonopoda)を有す。こは側面より見るときは棍棒狀をなし、體と同色なり。第七節腹板の後緣中央には一の窪部を有す。

産地

中野	1♀	14/VII	1919	井澤英二氏採 (液浸)[2]
豐原	2♀1♂	13/VII	1922	江崎悌三氏採 (液漬)
小沼	1♂	22/VII	1922	江崎悌三氏採 (液漬)

落合 (Galkinowroskoe) (據松村教授), Tshaivinskaja (據 NAVÁS 教授)

分布　樺太、北海道。西比利亞。

一般にセンブリ屬の種的區別は主として生殖器の形態學的差異に據るを安全とすべく、これが研究には酒精浸標本を用ゆるを宜しとす。色彩の如きは各種略同樣にして、同一種にありても個體により又羽化當時と時日を經過せるものとによりて濃淡可成りの相違を見ることあり。この點に關しては既に中原ドクトル(27)も注意せられたる處なりとす。抑も南樺太産のセンブリに就きては、一九一一年松村教授(19)は同地産の♀一頭に就き研究して北海道産のものと同一となし、*S. frequens* の名を與へられ、翌一九一二年 NAVÁS 教授(39)は DERBEK 氏の得たる樺太産のものに對し *S. sibirica* と同定せり。されば爾來同地には二種のセンブリを産すと知られたるも、こは果して別種なりや否や、知るに由なくして今日に至れり。然り而して、今回著者は新鮮なる南樺太産のものを得て、生殖器の構造を精檢し、これを VAN DER WEELE 氏(68)の記載と詳密なる圖とに對照せるに、假令 MACLACHLAN 氏の原記載を直接參照せずと雖、明らかに著者の檢せしものは諸て *S. sibirica* なることを知れり。更に著者が札幌に得て *S. frequens* と認めたる酒精浸標本を再檢せるに、これ亦全く生殖器の構造のみならず、その他の體軀の形態に於ても、VAN DER WEELE 氏の述べたる *S. sibirica* に一致せるを見たり。隨ひて從來慣用せられし *S. frequens* は遺憾乍ら *S. sibirica* の同物異名となさざるを得ず。從來の本種生殖器に關する記載は何れも簡なりと雖、尙且著者の

2) 「液浸」とは酒精浸標本の謂なり。「乾固」と記すときは乾固標本なることを指示す。本文中諸て準之。

この同定に對し裏書せるの感あり。則ち中原ドクトル(33)が *S. frequens* の ventral abdominal appendages of male として描きたるものは本種の下位生殖器附属物の形態に全く一致し、更に岡本博士(46)が "Die Abdominalspitze des Männchens mit zwei kleinen, kurzen Anhängen, welche, von der Seite gesehen, B-förmig sind." とし、松村教授(19)が "Abdomen dunkelbraun, an der Spitze beim ♂ mit 2 rundlichen blattartigen gegen an einander stossenden Anhängen" と記されたる記載も亦、本種の夫れを指示せられたるものなりと信ず。就中、岡本博士が附属物を小且短とせられたるは、一見上述の著者の記載と異るに似たれども、こは比較的の言葉にして、同博士が當時乾固標本によりて研究せられたるが爲、かくの如き結果となりたるなるべく、かの *S. mitsuhashii* が既に中原ドクトル(33)の圖示せるが如く短かき下位生殖器附属物を有せるにも拘らず、岡本博士はその原記載に "An der Abdominalspitze des Männchens ohne Anhänge" と示されたるに徴するも明らかなり。若し夫れ「側面より見るときはB形をなす」と記されたるに至りては明らかに本種のその特徴を示されたるものと云はざるべからず。

更に一言すべきは本種が西比利亞より樺太を通じ北海道に迄分布せるにも拘はらず、未だ本州に知られず、[3] 又本州産のヤマトセンブリ *S. japonica* V. D. WEELE 若くはネグロセンブリ *S. mitsuhashii* OKAMOTO が北海道若くはその以北の地に産することなきは昆蟲地理學上興味ある點なりとす。

駱駝蟲科 Fam. **Raphididae**

一八四三年、G. T. SCHNEIDER 氏(61)が本科を二属に別つの分類法を試みたる以來、E. PETERSEN 氏(55)岡本博士(22)等之れに從ふと雖、L. NAVÁS 氏(41)最近の研究にありては、嘗て著者(10)が紹介せしことありしが如く、本科を一の獨立せる目に取扱ひ、Rhaphidioptera となし、畧從來属とせる特徴を以て科の

3) 最近 NAVÁS 教授(42)が著者の送致せる東京及札幌産の兩標本を同一種と見做し、*S. japonica* となせるは、恐らく乾固標本特に雌なりしに因る誤なるべく、札幌産のものは *S. sibirica* となすを以て至當とせん。

夫れとなし、以て同目を二科四族十四屬七十三種の多數を含ましめたり。この細岐に渉る分類法は、果して從來のものに比し正鵠なりや否や、又より以上便宜なりや否やに就きては、尙將來研究の餘地ありと雖、單眼の有無、前胸の構造若しくは翅の狀態等は屬の特徴となすよりも、寧ろ亞科若くは族の價値あるべきを思はしむ。されば今本科を取扱ふに當りては、便宜上檢索表に示すが如く二亞科に別たんとす。

尙、本邦既知の本科は三種にして、キスヂラクダムシ *Raphidia ciarmandi* NAVÁS は本州に、タイワンラクダムシ *R. formosana* OKAMOTO は臺灣に、ラクダムシ *Inocellia crassicornis* SCHUMMEL は本州、四國九州及朝鮮に分布せりと雖、本州産の何れにありても著者の知る範圍に於て、その採集の北限界は關東地方(東京、日光)にして、未だ東北地方及北海道に於て之れを産するを知らず。然るに今回江崎悌三氏の採集に由りて *Raphidia*, *Inocellia* 兩屬が共に、西比利亞と同じく南樺太にも分布せることを知り得たるは、特に興味深き處とせざるべからず。隨ひて北海道並に東北地方にも本科の昆蟲の分布せることを想像するも、敢て無謀にはあらざるべく、今後特に此等の地方に於て、その確証を捉へんことを必要事となすべし。

亞科の檢索表

a1 單眼三個を有す。概ね前胸背板は兩側延長して前胸板を覆ふ。緣紋は一個又は夫れ以上の横脈を有す。……**眞正駱駝蟲亞科 Raphidinae**

a2 單眼を缺く。前胸板はよく顯はる。緣紋内に横脈を缺く。……**駱駝蟲亞科 Inocellinae**

眞正駱駝蟲亞科 Subfam. Raphidinae

本邦にて本亞科に隷するもの唯次の一屬ありて、南樺太にはその一種を産す。

ラァフ#ディア屬

Genus ***Raphidia***[4] LINNÉ (1735)

2. キモンラクダムシ 新稱

Raphidia xanthostigma SCHUMMEL (Fig. II)

(第 二 圖)

Raphidia xanthostigma 'SCHUMMEL; Versuch Beschr. Schles. Art. Gatt. Rhaphidia, p. 12, fig. 2 a, b. (1832)': BURMEISTER; Handb. Ent., II, p. 963 (1839): SCHNEIDER; Monogr. Rhaphid., p. 71, tab. III fig. a b (1843): WALLENGREN; Kongl. Sv. Vet. Akadem. Handl., IX-8, p. 64 (1870): ROSTOCK; Neur. germ., p. 114 (1888): VAN DER WEELE; Coll. Zool. Edm. Selys Longs., V, p. 88 (1910): PETERSEN, Gen. Ins., CLIV, p. 7 (1913)

Rhaphidilla xanthostigma NAVÁS; Monogr. Ord. Rafidiop, p. 54 (1918)

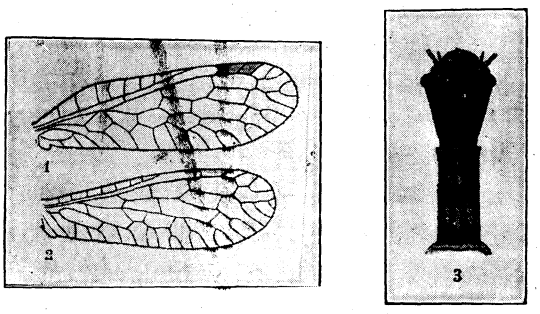
頭部、倒卵形にして後方に向ひて細まり、兩側僅かに圓弧をなす。黑色にして稍金屬性光澤を帶び、一面に細微の點刻を裝ふ。複眼は稍突出し、暗色。觸角約三十三節、基節は長大にして黃褐、その基部に灰白色環を廻らす。第二節稍太くして淡黃褐。第三節以後は略同大なるも末節に至るに隨ひ少しく細小す。一面に微毛を裝ふ。第三節乃至第十節前後の間は稍黃褐色なれども、それより末節に至る間は褐色を呈し、特に末節に至るに隨ひその濃度を增す。額片は黃褐色にして左右に各一個の暗褐色斑を有し、前緣少しく灰白を帶ぶ。上脣赤黃色なれどもその周圍淡色。大腮は赤色を呈するもその末端は廣く暗色を帶ぶ。兩鬚暗褐色、特にその末節は濃色を呈し、各節端は淡色なり。下脣淡色。頭頂に存する三個の單眼は距離互に接近し、且發育不完全にして明らかならず。特に後方の二個は陷窪部內にありて明瞭を缺く。後頭に存する一縱溝は細し。

前胸背板は地色汚穢褐色にして一面に黑褐色の微毛を疎生す。中央より稍前方に當り一の境界ありて、その前部は中央に細き地色の縱斑と周圍とを殘して廣く黑褐色、境界より

4) LINNÉ 氏は *Raphidia* と記せるも、BURMEISTER 氏は *Rhaphidia* と記す。爾後學者によりてその採る處同一ならず。例へばPETERSEN 氏は前者を採用するもNAVÁS 氏は後者に據れるが如きこれなり。茲には兩者を同一と見做して *Raphidia* を用ゆることとせり。

後部は一面に濃黑褐色を呈し、之れに約三條の地色の長斑を現はすも、中央のもの短かし。前胸板は黑色を呈し、中央に白色の大斑を殘す。中胸に於ける前封片、前楯板の全部及び楯柄の前半は黃白色を呈し其の他の部分は黑色なり。後胸は一樣なる黑色を呈す。

翅、透明にして少しく黃色を帶ぶ。脈は前翅に於て前緣脈の全部、前緣橫脈、亞前緣脈、徑脈の基方少許の部分並に內緣脈が黃色なると、後翅に於て翅の基方三分の一にある各脈の淡黃色なるを除きては全部暗褐色。兩翅に於ける周緣には褐色の微毛を稍密に生じ、翅脈上には同色の微毛を疎生す。前翅、前緣橫脈は七乃至八個にして、緣紋は細長、二室より成り、一色にして淡黃色、その分割脈は褐色を呈す。二徑室、一中室、三後中室、二前肘室あり。第二徑室は不正長六角形をなし、之れより二緣脈を放出す。第一緣脈は二分枝して叉狀をなし、第二緣脈は三若くは四分枝す。第三乃至第六緣脈迄皆叉狀をなす。第一、第二後中室と第一前肘室との交點(Navás 氏の tiridi)は無色をなす。後翅、前緣橫脈七個。緣紋は前翅に於けると同樣なれども更に細長、第二緣脈は三若くは四分枝し、第一及第三乃至第六緣脈は叉狀をなす。其の他の脈相は略前翅と同樣なり。



第二圖　Fig. II
キモンラクダムシ　*R. xanthostigma*
1. 前翅(擴大)
Fore wing (much enlarged)
2. 後翅(同)
Hind wing (do.)
3. 頭部及前胸背(擴大)
Head and prothorax (dorsal view, much enlarged)
原圖 (original)

脚、黃褐色なるも前基節の後半及中後基節の全部は黑色。轉節、前中腿節の外方及び後腿節の全部、各跗節の末節及び爪は暗褐色を帶ぶ。

腹部、地色は黑色。第一及第二節背板は黑褐色にして、

他節に比し稍淡く、第二節にありては中央に不明瞭なる淡色の大斑あり。第三乃至第八節は略同様にして、背板の後緣及兩側は顯著なる淡黃白色を呈す。尙、各節背中央に黃色の一縱條を裝ふも、こは多くの節に於て前緣に迄達せず。第八節背板は他に比し短小なり。第一節腹板は一樣なる黑色を呈するも、第二乃至第八節の夫れにありては、後緣並に兩側は明瞭なる淡黃白色を帶ぶ。こは後節に至るに隨ひ濃色となる。側膜は廣くして暗紫色を帶び、一面に多數の細き黃白條を有す。氣門黃白。氣門を通じて一の顯著なる黃白條あり。第九節(生殖節)は膨大にして、後緣淡黃白色を呈し、背面に暗黃色の細き一縱條を通ず。側片は大にして黃白色を呈し、その基方には廣く黑褐斑を裝ふ。黑色の短毛を疎生す。

體長	11.0 粍
觸角長	3.0 粍
前翅長	8.5 粍
前翅幅	2.5 粍
後翅長	7.5 粍
後翅幅	2.5 粍

産地

小沼 1♂ 17/VII 1922 江崎悌三氏採 (液浸)

分布 樺太。西比利亞、全歐洲。

本種は全歐洲より西比利亞に涉りて弘く分布せる種なるが從來南樺太否本邦に未記錄のものなりき。茲に南樺太に產することを報告すると共に、その緣紋の黃色なることを表はして、キモンラクダムシなる和名を新稱せり。SCHNEIDER 氏の記す處に據れば本種の幼蟲は體暗褐色にして腹背に淡黃紋を散在し、脚淡黃色、體長一二粍內外、梨樹 (*Pyrus communis*) の樹皮下に發見し得べしと云ふ。

駱駝蟲亞科 新稱 Subfam. **Inocellinae**

本亞科に隷するものにして南樺太に產するものは次の一屬一種なり。

イノセリア屬

Genus *Inocellia* SCHNEIDER (1843)

3. ラクダムシ

Inocellia crassicornis (SCHUMMEL)

Raphidia crassicornis SCHUMMEL; Versuch Beschr. Schles. Art. Gatt. Rhaphidia, p. 15, fig. 4 a, b, c (1832)': BURMEISTER; Handb. Ent., II, p. 964 (1839): RAMBUR; Hist. Nat. Ins., Névrop., p. 439 (1842)

Inocellia crassicornis SCHNEIDER; Monogr. Rhaphid., p. 89, tab. VII (1843): MACLACHLAN; Trans. Ent. Soc. Lond., 1875, p. 174 (1875): ROSTOCK; Neur. germ., p. 114 (1888): MATSUMURA: Thous. Ins. Jap., I, p. 156, pl. X fig. 5 (1904): MATSUMURA; Syst. Ent., I, p. 167, fig. 203 (1907): VAN DER WEELE; Coll. Zool. Edm. Selys Longs., V, p. 88 (1910): PETERSEN; Gen. Ins., CLIV, p. 11 (1913): OKAMOTO; Coll. Essays Nawa, p. 155, pl. V fig. 1 b, 2 b, 6 a–c (1917): NAVÁS; Monogr. Ord. Rafidiop., p. 77 (1918): KUWAYAMA; Ins. World, XXIV, p. 376 (1920).

産地

小沼 1♀ 17/VII 1922 江崎悌三氏採 (液浸)

分布 樺太、本州、四國、九州、朝鮮。西比利亞、中央及び北部歐洲。

著者が檢したる南樺太産のものはその標徴は殆ど全く岡本博士の記載せられたる處に一致せるも、唯少しく大形なり。又 SCHNEIDER, NAVÁS 兩氏の記事に對比するも彼我種を區別し得べき何等の標徴の差異を見ず。隨ひて岡本博士が疑問とせられたる本邦産のものと歐洲産のものとが同一種なりや否やに就きては遺憾乍ら未だ解決することを得ず。本種の幼蟲は歐洲にありてはドイツアカマツ (*Pinus sylvestris*) の樹皮下にありと云ふ。南樺太にありては恐らくトドマツ (*Abies* spp.) 或はエゾマツ (*Picea* spp) の類の樹皮下に棲息せるにあらざるなきか。

脈翅目

PLANIPENNIA (NEUROPTERA, s. s.)

本目に隷する昆蟲の分類は、廣狹種々の說ありて、未だ一般に承認せらるる處のものなし。一九〇七年、松村教授 (18) は廣義の脈翅目—— 本文に於ける廣翅目と脈翅目とを合したる

もの——に於て邦産種を九科に別たれたり。然るに、最近一九一八年、COMSTOCK 教授(4)は同意義なる脈翅目に於て世界に産するものを二十科に區別す。この後者の分科法に據れば、邦産種はその十四科に隷屬す。この內廣翅目に屬する二科を除くときは、本目は松村教授に從へば七科、COMSTOCK 教授に從へば十二科を數ふ。この相違は從來姬蜻蛉科 Hemerobiidae 並に草蜻蛉科 Chrysopidae の內に含まれたるものの獨立に由るものにして——科の創設は諸てが COMSTOCK 氏によりて行はれたるにはあらず——この後者の說は現今比較的多く採用せらるる處なり。著者も亦便宜上この分類法に從ふべし。唯、COMSTOCK 教授が姬蜻蛉科より分離せる Sympherobiidae —— 同氏のこの科に含ましめたる屬にして本邦に産するものに、*Sympherobius*, *Notiobiella* の二屬あり——は、兩者獨立せる科として取扱ふの要ありや否や、聊か了解に苦む處なきにあらず。ESBEN PETERSEN 氏の如きも、COMSTOCK 氏の前記研究と同年に發表せる濠洲産脈翅類研究[5]に於て、*Notiobiella* 屬は姬蜻蛉科中に含ましめたり。されば著者も亦姑くこの兩者をば一科となし置くべし。又 Sisylidae (水蜻蛉科) と Berothidae (毛蜻蛉科) とは近時 COMSTOCK, PETERSEN, 中原氏等が獨立せる二科として承認せる處なれども、著者は亦姑く兩者を合して Sisylidae となし、之れを Sisylinae と Berothinae の二亞科となさんとす。されば邦産の本目は次の十科に區別することを得べし。

科の檢索表

a1 前胸は中後胸を合したるものと等長若くは夫れより長し。前脚は極めて大となり所謂捕獲肢をなす。……螳螂蜱科 **Mantispidae**

a2 前胸は中後胸を合したる長さより長からず。又前肢は異常を呈せず。

b1 翅脈極めて少く、翅は白粉を以て覆はる……**粉蜻蛉科 Coniopterygidae**

b2 翅脈多く、翅は粉を以て覆はるることなし。

c1 雄にありては觸角櫛齒狀をなし、雌にありては腹端に長き針狀の產卵管を有す……**櫛齒蜻蛉科 Dilaridae**

c2 觸角櫛齒狀ならず、產卵管を有することなし。

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5) P. ESBEN-PETERSEN: Results of Dr. E. Mjoberg's Swedish Scientific Expeditions to Australia 1910–1913. 18. Neuroptera and Mecoptera: Arkiv. f. Zool., Bd. XI No. 26 pp. 1–37, pl. I–III.

d1 觸角は末端に至るに隨ひ漸次太まり所謂棍棒狀をなす。短くして概れ前翅長の三分一以下なり。……蟻蛉蛉科 Myrmeleonidae

d2 觸角は絲狀にして先端杓子狀を呈す。長くして前翅と等長、若しくは之れより僅かに長きか或は僅かに短かし。……長角蜻蛉科 Ascalaphidae

d3 觸角は絲狀若くは連鎖狀をなし、末端に至るに隨ひ細まる。

e1 單眼を有す。……扁翅蜻蛉科 Osmylidae

e2 單眼を缺く。

f1 翅透明にして概れ綠色を帶ぶ。翅の周緣に緣點を缺く。

g1 兩翅、多數の橫脈を有し、爲めに翅脈は網目狀を呈す。翅緣部と中央部とは明瞭に區別せらる。……網目蜻蛉科 Apochrysidae

g2 兩翅の翅脈は通例網目狀を呈せず。翅緣部と中央部との脈相の境界明らかならず。……草蜻蛉科 Chrysopidae

f2 翅半透明にして灰色、灰綠色、褐色等の色彩を帶ぶ。翅の周緣に於て翅脈間に一個宛の緣點を有す。

g1 前翅、徑分脈は一部徑脈と合せるが爲外見上多數の徑分脈を有す。その數二乃至それ以上なり。橫脈比較的多數なり。……姬蜻蛉科 Hemerobiidae

g2 前翅、徑分脈は普通一より成り、之れに數個の徑分脈支を有す。橫脈極めて少なし。……水蜻蛉科 Sisylidae

姬蜻蛉科 Fam. Hemerobiidae

本邦産の本科は次の檢索表に示す七屬なるが、南樺太に現在知られたるものは、僅に *Ninga*, *Micromus* の二屬にして、各一種を含む。然れ共 *Hemerobius*, *Eumicromus*, *Boriomyia*, *Drepanepteryx* 等の諸屬は歐洲、西比利亞、若くは北海道に弘く分布せるものなれば、[6] 今後の精査に伴ひ、或は同地に發見せられんことを豫期するも難きにあらざらんか。

屬の檢索表

a1 前翅の基部に再歸脈を有せず。

6) ミヤマヒメカゲロウ *Hemerobius humuli* LINNÉ は本邦に於ては北海道、本州に、海外にありては西比利亞、歐洲及北亞米利加に産し、エゾチャバネヒメカゲロウ *Eumicromus angulatus* STEPHENS は本邦に於ては北海道に、海外にありては前者と同樣西比利亞、歐洲及北亞米利加に産す。又 *Boriomyia lateralis* NAVÁS は西比利亞に、エグリヒメカゲロウ *Drepanepteryx phalaenoides* LINNÉ は歐洲及北海道に産す。

b1 兩翅甚だ細長なり。徑分脈は比較的少く、兩翅共中脈と肘脈と結合せり。……ホソバヒメカゲロウ屬 Micromus RAMBUR

b2 兩翅細長ならず。徑分脈は比較的多し。中脈と肘脈は少くも後翅に於ては結合することなし。……チヤバネヒメカゲロウ屬 Eumicromus NAKAHARA

a2 前翅の基部に一再歸脈を有し、こは亞前緣脈と共に一の獨立せる小室を形成す。

b1 前翅に二徑分脈を有し、後翅に段横脈を缺く。

c1 前翅に少くも三個の横脈列を有す。……クロヒメカゲロウ屬 Sympherobius BANKS

c2 前翅の横脈列は僅かに一なり。……ミドリヒメカゲロウ屬 Notiobiella BANKS

b2 前翅に三徑分脈以上を有し、後翅に二段横脈を有す。

c1 前翅徑分脈は五個以内なり。

d1 前翅に段横脈三連を有す。……マルバネヒメカゲロウ屬 Ninga NAVÁS

d2 前翅に段横脈二連を有す。…ヒメカゲロウ屬 Hemerobius LINNÉ

c2 前翅徑分脈は一〇個以上なり。……クビカクシヒメカゲロウ屬 Drepanepteryx LEACH

マルバネヒメカゲロウ屬

Genus *Ninga* NAVÁS[7]

1. マルバネヒメカゲロウ

Ninga deltoides (NAVÁS)

'*Megalomus deltoides* NAVÁS; Revue Russe d'Entom., IX, p. 397, fig. 1 (1910)'.

Ninguta deltoides NAVÁS; Revue Russe d'Entom., XII, p. 420 (1912): NAKAHARA; Annot. Zool. Jap., IX, p. 46 (1915): NAKAHARA; Ent. Mag. (昆蟲學雜誌), I, p. 102 (1915).

Ninga deltoides NAKAHARA; Ins. World, XXIII, p. 137 (1919).

産地

豐原(追分)	1 ♀	16/VII 1922	江崎悌三氏採	(液浸)
小沼	1 ♂	17/VII 1922	江崎悌三氏採	(液浸)
大泊、富内間	2 ♂♂	9–12/VIII 1922	江崎悌三氏採	(液浸)

分布 樺太、北海道、本州。西比利亞。

本種は南樺太には稀ならざるものの如し。同地に於ける分布は、本研究に於て初めて報告する處のものなり。

7) 本屬名は中原ドクトル(37)の記する處に從ふ。著者不幸にして未だ NAVÁS 氏の本屬に改名したる原著を見ることを得ず。

ホソバヒメカゲロウ屬

Genus *Micromus* RAMBUR (1842)

2. ホソバヒメカゲロウ

Micromus novitius NAVÁS

'*Micromus novitius* NAVÁS; Revue Russe d'Entom., IX, p. 397 (1910)': NARAHARA; Annot Zool. Jap., IX, p. 35, pl. 1 fig. 4 (1915): NAKAHARA; Ent. Mag., I, p. 101 (1915): NAKAHARA; Ins. World, XXIII, p. 136 (1919).

産地

豊原、瀧ノ澤間 1♀ 26/VII 1922 江崎悌三氏採（液浸）

分布 樺太、北海道、本州、九州。

本種は南、九州より北、北海道に迄分布せる種なりしが、江崎氏の好意によりて、南樺太にもそのfaunaを有するを知れり。本研究に於て初めて之れを發表す。

櫛鬚蜻蛉科 Fam. **Dilaridae**

未だ南樺太に本科の昆蟲を發見せず。本科の本邦に於ける分布は著者(11)の既に報告せるが如く、本州、朝鮮及臺灣に各一種を代表的に有するに過ぎず。而かも未だ北海道にその分布を知らずと雖、朝鮮産のテフセンクシヒゲカゲロウ *Dilar septentrionalis* NAVÁSの如きは弘く東部西比利亞に分布せるものなれば、今後彼地に於ける分布を精査せんことは北海道に於ける分布の探求と共に興味多きことと信ず。

草蜻蛉科 Fam. **Chrysopidae**

邦産本科は六屬三十四種（內二變種）を數ふ。就中舊北洲系統のものは四屬にして、南樺太にはその二屬を産す。從來同地産のものは、一九一一年松村教授(19)によりて三種を紹介せられたるの外、何等追加さるることなかりしが、著者は今回の研究に於て既知の三種に更に一未記錄種を報告することを得たり。

屬の檢索表

a1 前翅、中脈分枝 (median fork) の基部に於て一の亞矩形室を有す。體軀及觸角肥大す。……**フトヒゲクサカゲロウ屬 Nothochrysa** MACLACHLAN

a2 前翅、中脈分枝の基部に於て一の稍三角形をなせる室を有す。體軀及觸角は多少纖細なり。

b1 雄の臀板は瓣狀を呈し一般に尾端と同長なるか又は之れより短かし。……**クサカゲロウ屬 Chrysopa** LEACH

b2 雄の臀板は長くして尾端より遙かに突出す。

c1 觸角は前翅より遙かに短く、緣紋内に横脈多し。臀板は其の尖端上方に屈曲す。……**ニネタ屬 Nineta** NAVÁS

c2 觸角は前翅と等長、緣紋内に横脈少し、臀板は其の尖端鈍にして上方に屈曲せず。……**クリソトロピア屬 Chrysotropia** NAVÁS

ニネタ屬

Genus *Nineta* NAVÁS (1912)

3. ホシクサカゲロウ

Nineta vittata (WESMAEL)

Chrysopa vittata 'WESMAEL; Bullet. Acad. Brux., VIII, p. 212 (1841)': MACLACHLAN; Jour. Linn. Soc. Zool., IX, p. 268 (1867): WALLENGREN; Kongl. Sv. Vet. Akadem. Handl. IX-8, p. 21 (1870): ROSTOCK; Neur. germ., p. 104 (1888): SÁNDOR; Állatt. Közlemén., XI, p. 190, tab. IV fig. 2 (1912)[8]: OKAMOTO; Jour. Coll. Agr., Tohoku Imp. Univ., VI, p. 64 (1914): NAKAHARA; Ins. World, XVIII, p. 400 (1914): NAKAHARA; l. c., XIX, p. 107 (1915): NAKAHARA; Ann. Ent. Soc. Am., VIII, p. 119 (1915).

Nineta vittata 'NAVÁS; Arx. l'Inst. Cienc., 1915, p. 87 (1915)': OKAMOTO; Rep. Hokkaido Agr. Exp. Sta., IX, p. 30, pl. III fig. 5-8, pl. V fig. 2 (1919): OKAMOTO; Ent. Mag., IV, p. 3 (1919).

Chrysopa alba BURMEISTER; Handb. Ent., II, p. 918 (1839).

Hemerobius proximus RAMBUR; Hist. Nat. Ins., Névrop., p. 425 (1842).

Nothochrysa olivacea 'GERSTAECKER; Mitt. Neu-Vorpom. Rügen, XXV, p. 74 (1893)': OKAMOTO; Jour. Coll. Agr., Tohoku Imp. Univ., VI, p. 54 (1914): NAKAHARA; Ins. World, XVIII, p. 398 (1914).

Parachrysa olivacea NAKAHARA; Ann. Ent. Soc. Am., VIII, p. 118, pl. VIII fig. 2-4 (1915).

Chrysopa innotata MATSUMURA; Jour. Coll. Agr., Tohoku Imp. Univ., IV, p. 14 (1911): OKAMOTO;

8) SÁNDOR 氏の研究に據れば SCHNEIDER (62) の *Ch. vittata* と稱するものは眞正のものにあらずしてこは *Ch. flava* SCOPOLI の異名と認むべきものなりと云ふ。

Trans. Sapporo N. H. Soc., V, p. 56 (1913): OKAMOTO; Jour. Coll. Agr., Tohoku Imp. Univ., VI, p. 63 (1914).

Chrysopa inornatella NAKAHARA; Ins. World, XVIII, p. 399 (1914).

産地

瀧ノ澤、清水間 2♀ 27/VII 1922 江崎悌三氏採（液浸）

喜美内 (Kimnai) (據松村敎授)

分布 樺太、北海道、本州。歐洲。

クサカゲロウ屬

Genus ***Chrysopa*** LEACH (1810)

南樺太産の三種は次の檢索表によりてこれを識別することを得。

種の檢索表

a1 觸角間にX字形の黑紋を有す。……**クサカゲロウ Ch. intima** M'L.

a2 觸角間にX字形の黑紋なし。

b1 觸角の下方に黑紋を缺く。前胸背に六乃至八個の黑點を有す。……**カラフトクサカゲロウ Ch. sachalinensis** MATS.

b2 觸角の下方に各一黑紋あり。前胸背にはその前緣兩側に一黑點を有するに止まる。……**ナナホシクサカゲロウ Ch. septempunctata** WESM.

4. クサカゲロウ

Chrysopa intima MACLACHLAN

Chrysopa intima MACLACHLAN; Trans. Ent. Soc. Lond., 1893, p. 230 (1893): OKAMOTO; Trans. Sapporo N. H. Soc., V, p. 50 (1913): OKAMOTO; Jour. Coll. Agr., Tohoku Imp. Univ., VI, p. 58 (1914): OKAMOTO; Rep. Hokkaido Agr. Exp. Sta., IX, p. 36, pl. I fig. 5, pl. III fig. 13–16, pl. VI fig. 1 (1919): OKAMOTO; Ent. Mag., IV, p. 3 (1919).

Chrysopa perla intima NAKAHARA; Ins. World, XVIII, p. 399 (1914): NAKAHARA; Ann. Ent. Soc. Am., VIII, p. 118 (1915).

Chrysopa perla (nec LINNÉ) MATSUMURA; Thous. Ins. Jap., I, p. 179, pl. XIII fig. 9 (1904): OKAMOTO; Trans. Sapporo N. H. Soc., I, p. 112 (1905/06): MATSUMURA; Syst. Ent., I, p. 169, fig. 205 (1907): MATSUMURA; Jour. Coll. Agr., Tohoku Imp. Univ., IV, p. 14 (1911).

Chrysopa perla fracta 'NAVÁS; Broteria, serie Zool., IX, p. 39 (1910)': NAVÁS; Revue Russe d'Entom., XII, p. 419 (1912).

産地

大澤	1 ♀	30/VIII 1921	著　者	採（液浸）
豐原	1 ♀	13/VII 1922	江崎悌三氏	採（液浸）
瀧ノ澤清水間	1 ♂ 1 ♀	27/VII 1922	江崎悌三氏	採（液浸）
轟峠、眞縫間	1 ♂	3/VIII 1922	江崎悌三氏	採（液浸）

大泊 (Korsakoff)（據松村敎授）

分布　樺太、北海道、本州。西比利亞。

5. カラフトクサカゲロウ

Chrysopa sachalinensis MATSUMURA

Chrysopa sachalinensis MATSUMURA; Jour. Coll. Agr., Tohoku Imp. Univ., IV, p. 14 (1911): OKAMOTO; Trans. Sapporo N. H. Soc., V. p. 57 (1913): OKAMOTO; Jour. Coll. Agr., Tohoku Imp. Univ., VI, p. 69 (1914): NAKAHARA; Ins. World, XVIII, p. 401 (1914): NAKAHARA; Ann. Ent. Soc. Am., VIII, p. 119 (1915): OKAMOTO; Rep. Hokkaido Agr. Exp. Sta., IX, p. 49, pl. 1 fig. 13, pl. IV fig. 5-6, pl. VII fig. 2 (1919): OKAMOTO; Ent. Mag. IV, p. 5 (1919).

Chrysopa nikkoensis OKAMOTO; Jour. Coll. Agr., Tohoku Imp. Univ., VI, p. 69 (1914).

産地

大澤	1 ♀	30/VIII 1921	著　者	採（液浸）
中里	1 ♂	2/IX 1921	著　者	採（液浸）
豐原	1 ♂ 1 ♀	21/VII 1922	江崎悌三氏	採（液浸）

貝塚 (Solowiyofka)（據松村敎授）

分布　樺太、北海道、本州。

前種並に本種は南樺太に比較的多産なるものの如し。

6. ナナホシクサカゲロウ 再稱

Chrysopa septempunctata WESMAEL (Fig. III)

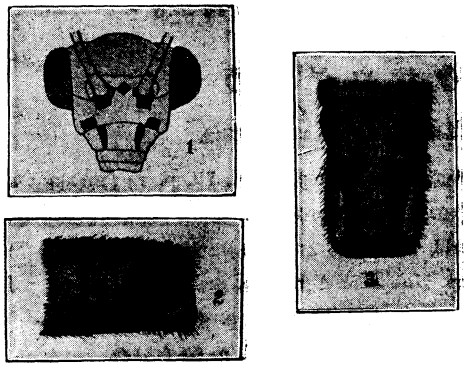
（第　三　圖）

Chrysopa septempunctata 'WESMAEL; Bullet. Acad. Brux., VIII, p. 210 (1841)': SCHNEIDER; Symb. Monogr. Chrysop, p. 101, tab. XXX (1851): MACLACHLAN; Jour Linn. Soc., Zool., IX, p. 269 (1867): WALLENGREN; Kongl. Sv. Vet. Akadem. Handl., IX-8, p. 19 (1870): ROSTOCK; Neur. germ., p. 103 (1888): SÁNDOR; Állatt. Közlemén., XI, p. 193, tab. V fig. 6 (1912).

Hemerobius mauricianus RAMBUR; Hist. Nat. Ins., Névrop., p. 425 (1842).

體黃綠色(生時は恐らく綠色なるべし)。頭部、頭頂僅に穹形をなす。複眼金綠色。觸角、前翅長より遙に短く、黃褐。

基部二節は黄色。基節甚しく膨大せり。末節に至るに隨ひ少しく濃色となる。兩鬚一樣に濃黄褐色。顔面に七個の黒紋あり。一は觸角間に位置し、略圓形。其の二は觸角の下方に存して稍弦形をなす。他の二は額片の兩側に位置して線狀をなす。更に頰部にありて額片上の黒線と直角に稍太なる楕圓形紋を有す。胸背稍淡色(恐らく生時黄色の一中條ありしなるべし)、前胸背は長さより稍幅廣く、中央に細き一縱溝と、之れに交叉して中央より少しく後方に太き一横溝あり。前緣角は斜に截斷狀をなす。一面に褐色の短毛を生ずるも、特に兩緣に多くして、横溝の後方には少なし。前緣部の兩側に各一個の淡黒色線紋を有す。中、後背板は無紋にして毛少なし。



第　三　圖　Fig. III
ナナホシクサ蠢ゲロウ
Ch. 7-punctata

1. 頭　部、前　面（廓　大）
Head, anterior view.
(much enlarged and modified)
2. 雄、腹　端（側　面、廓　大）
Terminal segments of male abdomen.
(lateral view, much enlarged)
3. 同　上　（腹　面、廓　大）
Do., ventral view (much enlarged)
原圖 (original).

翅、透明。あまり細長ならず。前翅端は略圓弧をなすも、後翅端は稍尖れり。緣紋は淡褐不透明にして長く、横脈多數なり。翅脈淡黄色(生時は鮮綠色なるべし)、翅脈上一面に淡黒毛を稍密生す。但し前翅に於ては前緣室(緣紋内を除く)、亞前緣室、徑室に於ける横脈全部、徑分脈支の基部、中脈の基方、肘脈支及臀横脈並に段横脈は略黒色を呈し、後翅に於ては前緣横脈、徑横脈並に徑分脈より放出する支脈の基方、段横脈は黒色を呈す。前翅段横脈は右翅8/12. 左翅9/11. 後翅の夫れは右翅8/9. 左翅7/9なり。

脚、淡黄綠色。前脚は後脚より多少濃色を呈せり。一面に黄褐毛を密生す。跗節は黄褐にして、爪褐色なり。

腹部、一面に黒褐色の微毛を密生す。雄の臀板は稍太に

して、その先端は腹端に達す。之れを腹面より見るときは稍長方形にして先端圓く多少膨大せり。

體長	15.0 粍
觸角長	13.0 粍
前翅長	18.0 粍
前翅幅	5.5 粍
後翅長	16.0 粍
後翅幅	5.0 粍

産地

豐原　1♂　21/VII 1922　江崎悌三氏採（液浸）

分布　樺太。　歐洲。

本種は歐洲に極めて普通なるものなるが、今回初めて南樺太にも分布せることを知りたり。而して、嘗て松村(18)岡本(43)兩博士によりて記されたるナナホシクサカゲロウ *Ch. septempunctata* と稱するものは、その記載より按ずるに眞正の *Ch. septempunctata* にあらずして、恐らくエゾクサカゲロウ *Ch. sapporensis* OKAMOTO 若くはクモンクサカゲロウ *Ch. japana* OKAMOTO なるべく、岡本博士の近來の報告(49, 51, 53, 54)に於ては何等本種に就きて言及せらるる處なかりき。さればこの名は當然本邦昆蟲相より抹消せられたるものなりしに、茲に再び本種を我が昆蟲相中に加ふることを得たるなり。隨ひて和名の如きも嘗て用ひられたるものを復活使用することとせり。更に今本種を本邦到る處に普通なるヨツボシクサカゲロウ *Ch. cognata* MACLACHLAN に對比するに、顏面の斑紋及翅脈の彩色に於て稍異る處ありと雖、其の他の特徵則ち體の大さ、前胸背の構造及その斑紋、並に雄生殖器(臀板)の構造等は全く兩者間に何等の差異なきを認めたり。抑も *Ch. cognata* は一八六七年 MACLACHLAN 氏(13)が本邦、支那及 Cambodia に産するものとして發表、命名せるものなるが、その記載の終に於て "It is closely allied to *C. septempunctata* and *C. bipunctata*, but differs in always wanting the spot between the antennae, &c." と附記せり。然るに一八七五年に至り同氏(15)は本邦産脈翅類の研究報告を發表したる際、この *Ch. cognata* に就きては "In one example from Japan there is a spot between the antennae

(absent in all the others), and it thus shows an approach to *C. bipunctata*; but is no individual is there any trace of black spots or streaks before the antennae. The species is closely allied to the European *C. 7-punctata*, and (with *bipunctata*) may be only a local condition thereof." と記せり。然るに岡本博士(53)は「予は此説に全然賛成せざるにあらざるも、顔面の斑紋及翅脈の彩色等により、本種を獨立せるものと認むべく、若し夫れ *Ch. septenpunctata* の完全なる雄標本を檢するを得ば此問題は直に解決し得べし。萬一兩者の臀板にして、同一構造を有するを知らば、本種を *Ch. septenpunctata* の變種となすに躊躇せざるべし」として姑く兩者を別種と見做され、以て今日に及べり。著者未だ歐洲産の標本を親しく檢せずと雖、SCHNEIDER 氏(62), SÁNDOR 氏(60)の精細なる記事と詳密なる圖版とによりて明らかに *Ch. septempunctata* と同定し得たる南樺太産の前記標本が、その雄生殖器の構造に於て、*Ch. cognata* の夫れと全く一致せるを見たるを以て、茲にマ氏の卓説に賛せんとす。而かも本種の頭部斑紋が可成りの變化性を有するものなることは既知の事實にして、SÁNDOR 氏(l. c.)に據れば、歐洲産のものにありても五變種を數へ得べきが、就中、var. *quinquepunctata* SCHNEIDER と稱するものは觸角下の二斑紋の消失せるものにして、var. *quadripunctata* SCHNEIDER なるものは更に觸角間の黑點を缺けるものなり。[9] されば *Ch. cognata* は斑紋の數に於て後者に類似せるも、その異る處は *quadripunctata* に於けるが如き觸角下の斑紋の消失にあらずして、頰部に於ける夫れの消失なりとす。然り而してマ氏の記したる觸角間に斑紋を有する *cognata* 形のものは原種に復歸せんとする一形態と見做すべきものなるが、その發現比較的稀なるものの如く、著者未だかゝる形態を具へたるものに相遇せず。されば *cognata* は *septempunctata* の變種と云はんよりも、寧ろ地方的に固定せる亞種と見做すを以て至當となさんか。叙上の理由によりて著者はヨツボシクサカゲロウの學名を下の如くに訂正せんとす。

Ch. septempunctata WESMAEL
subspecies *cognata* MACLACHLAN

9) 顔面の斑紋の消失は屢々他種に於ても認めらるる現象にして、例へば本種と同じく *punctata*-group の *Ch. aspersa* WESM. に於ても、亦 *x*-group の *Ch. formosa* BRAU. にありても、既に SÁNDOR 氏(60)が同様の事實を記したり。

分布　日本（北海道、本州、九州、臺灣）。西比利亞。支那。Cambodia.

廣翅蜻蛉科 Fam. **Osmylidae**

中原ドクトル(30)は、本邦産本科を、後翅に於ける肘脈と肘分脈とが平行せる *Osmylus* と、後翅肘分脈がその主脈に平行せざる *Spilosmylus* との二屬に別てるも、最近本科に關して詳細なる研究を行へる KRÜGER 教授(7)に據れば、邦産種を三亞科五屬に隷せしむ。[10] この後者の分類法は實に細微に渉るものなるが、今之れを茲に引用せんことは容易の業にあらざるを以て、こは他日の機會に讓り、唯南樺太に次の一種の產することを記すに止めんとす。

ニホンヒロバカゲロウ屬 新稱

Genus ***Eososmylus*** KRÜGER (1915)

7. ヒロバカゲロウ

Eososmylus??* (*Lysmus*) *harmandinus (NAVÁS)

Osmylus flavicornis (nec MACLACHLAN) MATSUMURA; Thous. Ins. Jap., I, p. 178, pl. XIII fig. 8 (1904): MATSUMURA; Syst. Ent., I, p. 172, fig. 206 (1907): MATSUMURA; Jour. Coll. Agr., Tohoku Imp. Univ., IV, p. 15 (1911).

'*Osmylus Harmandinus* NAVÁS; Ann. Soc. Scient. Brux., p. 190 (1910).'

'*Lysmus Harmandinus* NAVÁS; Revue Russe d'Entom., XI, p. 113 (1911).'

? Lysmus harmandinus KRÜGER; Stett. ent. Zeit., LXXIV, p. 26 &c. (1913): KRÜGER; l. c., p. 211 (1913).

(*Lysmus ?*) *harmandinus* KRÜGER; Stett. ent. Zeit., LXXV, p. 89 (1914).

Spilosmylus Harmandinus NAKAHARA; Annot. Zool. Jap., VIII, p. 508 (1914).

Eososmylus ?? Harmandinus KRÜGER; Stett. ent. Zeit., LXXVI, p. 74 (1915).

產地

豐原（追分）	1 ♀	16/VII	1922	江崎悌三氏採（液浸）
小沼	1 ♀ 1 ♂	17–22/VII	1922	江崎悌三氏採（液浸）
豐原、瀧ノ澤間	2 ♀	26/VII	1922	江崎悌三氏採（液浸）

10) I. Protosmylinae: — 屬 *Eosomylus* KRÜGER
II. Osmylinae: — 屬 *Osmylus* LATEREILLE
III. Spilosmylinae: 三 屬 *Spilosmylus* KOLBE; (*Lysmus*)? NAVÁS; *Heliosmylus* KRÜGER.

龍ノ澤、清水間 2♀ 1♂ 27/VII　1922 江崎悌三氏採（液浸）
清水、眞岡間 1♀　28/VII　1922 江崎悌三氏採（液浸）
轟峠、眞縫間 1♀　3/VIII　1922 江崎悌三氏採（液浸）
大泊、富内間 1♀ 9–12/VIII　1922 江崎悌三氏採（液浸）

貝塚 (Solowiyofka)（據松村教授）

分布　樺太、北海道、本州、九州(?)。

松村教授は*O. flavicornis* M'L. の南樺太に産することを記されたるも、こは既に中原ドクトル(30)の述べたるが如く、同じ名稱の下に日本千蟲圖解中に掲げられたるものは、その圖及記載によりて按ずるに、眞正の *flavicornis* とせんよりも、寧ろ NAVÁS 教授の *Lysmus harmandinus* と認むべく、隨ひて南樺太のものも同様なるべし。實際著者が檢せし十一頭の南樺太産標本中には一も *flavicornis* と認むべきものを存せざりき。尙 *harmandinus* の隷する屬に關しては NAVÁS 教授は最初 *Osmylus* 屬のものとして發表せるも、後之れを模式種として *Lysmus* なる屬を創設し、他に二三の種をも含ましめたり。然るに *Lysmus* なる屬はその範圍極めて不明瞭にして、既に多くの批評ありしが如く、之れを獨立せる屬と見做し難く、中原ドクトル(30)は *Spilosmylus* 中に合同し、岡本博士(Ent. Mitteil. Bd. III p. 23, 1914)は *Osmylus* 中に編入せり。KRÜGER 教授も亦之れを不確實のものとして取扱ひ居り、氏が中原ドクトルの研究に對し再研究を試みたる際、*Spilosmylus nigricornis* NAKAHARA は氏の Spilosmylinae に入るべきものにあらずして、寧ろ Protosmylinae に隷するを妥當となし、尙同種を模式として創設せる *Eososmylus* 屬には *Lysmus? harmandinus* 及 *Spilosmylus immaculatus* を疑問を以て編入せり。著者未だこれ等に對し詳細なる比較研究をなすの機なきを以て、假に最近の研究に從ひ置く。

蟻蜻蛉科 Fam. **Myrmeleonidae**

南樺太に於ける本科の昆蟲は未だ之れを知るを得ず。然れども、既に知られたるが如く、本科は比較的分布の廣き昆蟲にして、北海道にありては、歐洲並に本邦に極めて普通なるコウスバカゲロウ *Myrmeleon formicarius* LINNÉ を始めとして數

種を産す。又西比利亞には支那並に南露西亞、羅馬尼、土耳其斯坦等に弘く分布せるキガスリウスバカゲロウ *Formicaleo lineatus* FABRICIUS[11] の分布せるあり。されば南樺太に於ても今後の精査によりて本科の昆蟲を發見することなきを保し難し。

長角蜻蛉科 Fam. **Ascalaphidae**

未だ本科昆蟲にして南樺太産のものなし。著者(9)の曩に報告せるテフセンキバネツノトンボ *Ascalaphus sibiricus* EVERSMANN の如き、西比利亞、滿洲等に弘く分布せる種類ありと雖、北海道に於て未だ本科の昆蟲を一だに發見することなきを以て、或は同地に本科のものを得んことは望少きものとなさんか。

粉蜻蛉科 Fam. **Coniopterygidae**

本科も亦未だ南樺太産の種類を有せず。北海道に於てはキバラコナカゲロウ *Coniopteryx pulverulenta* ENDERLEIN の如きを産すと雖、樺太に於て本科のものを得んことは比較的至難ならん。

長翅目 (蠍蟲目)
MECOPTERA (PANORPATA)

邦産本目に關しては故三宅博士によりて最もよく研究せられたる處なるが、一九一五年 ESBEN-PETERSEN 氏(56)の發表せる世界の本目目錄に據れば、邦産種として Panorpidae に隷するもの三十三種、Bittacidae に屬するもの六種を數ふ。本邦に於てかくの如く多數の本目昆蟲を産すと雖、その多くは本州以南の地に限られ、一度津輕海峽を越へて北海道に至らばその種類極めて少く僅かに二種を知らるるのみ。就中、フタスヂシリアゲムシ *Panorpa leucoptera* UHLER は到る處に普通なりと雖、他の一種たるオホシリアゲムシ *P. japonica macrogaster* MACLACHLAN は

11) 著者は土屋寛暢氏の好意によりて本種の朝鮮にも分布せることを知り得たれば、上記の和名を附せんと欲す。本種は或は *Distoreon* 屬に移さるべきものなるやも知れず。今後精査の上改めて報告するの機あるべし。

函館産の模式標本以外に未だ知られざるの稀種なり。更に宗谷海峽を越ゆれば僅に南樺太に個有なるカラフトシリアゲムシ *Panorpa sachalinensis* MATSUMURA 一種を産するのみ。かくの如く北海道及南樺太が各特別なる一種によりて代表せらるることは興味深きことと云はざるべからず。然れ共西比利亞にありては、余の知る範圍に於て、*Panorpa amurensis* MACLACHLAN, *P. orientalis* MACLACHLAN (*Aulops melania* NAVÁS は PETERSEN 氏に據れば本種の synonym なりと云ふ) 並に本邦に於て本州及九州に産するホソヲビシリアゲムシ *P. cornigera* MACLACHLAN の三種を産す。隨ひて或は今後の精査に伴ひて南樺太乃至北海道に於て尙一二の未記錄種乃至新種の追加せらるべきを想像し得ざるにあらず。かくして西比利亞に於けるものとの關係の明かにせられんことは昆蟲地理學上特に望ましき點なりとす。

本邦産のものは次の二科に含まる。

科の檢索表

a1 觸角長し。前翅に於て Cu_1 脈は中脈と合することなし。脚は中等大にして爪は一對なり。腹部、雄は圓柱狀にして尾端は鉄子狀附屬物を有し常に之れを上方に擧ぐ。雌にありては圓錐狀なり。……**擧尾蟲科 Panorpidae**

a2 觸角短し。前翅に於て Cu_1 脈は中脈の一部と合せり。脚甚だ長くして爪は對をなさず。腹部は雌雄共に略圓柱狀をなし、雄の尾端に鉄子狀附屬物を缺く。……**擬蚊擧尾蟲科**[12] **Bittacidae**

擧尾蟲科 Fam. Panorpidae

本邦産の本科は四屬に別たる。就中、本邦に於ける分布が臺灣のみに限られたるタイワンシリアゲムシ屬 *Neopanorpa* V. D. WEELE 及同じく九州のみに限局せる、體軀各部の細長なるホソシリアゲムシ屬 *Leptopanorpa* MACLACHLAN の二屬を除き他の舊北洲系統の二屬の檢索表を次に示さん。

12) Bittacidae の和名に就ては既に一色周知氏(昆蟲學雜誌, Vol. IV, no. 1, p. 29, 1919)がその隷屬種の一般にガガンボモドキの名あるの故を以てガガンボモドキ科と稱せられたるも、こは科の名稱として往々双翅目中の僞大蚊科 (Limnobiidae) に類似混同せらるるの虞あるを以て松村教授(18)が *Bittacus sinensis* WALKER に對し用ひられたるカモドキシリアゲムシの名を以て本科の代表名に宛たり。

屬の檢索表

a1 爪はその下面に銳齒を有す。……**シリアゲムシ屬 Panorpa** LINNÉ
a2 爪はその下面に銳齒を缺く。……
……**シリアゲムシモドキ屬 Panorpodes** MACLACHLAN

シリアゲムシ屬

Genus *Panorpa* LINNÉ (1758)

1. カラフトシリアゲムシ

Panorpa sachalinensis MATSUMURA

Panorpa sachalinensis MATSUMURA; Jour. Coll. Agr., Tohoku Imp. Univ., IV, p. 12, pl. I fig. 9, 10 (1911): MIYAKE; Jour. Coll. Agr., Imp. Univ., Tokyo, IV, p. 352 (1913): PETERSEN; Ent. Meddel., X, p. 223 (1915).

産地

大泊	1♂1♀	29/VI	1919	井澤英二氏採 (乾固)
眞岡	1♀	3/VII	1919	井澤英二氏採 (乾固)

池邊讃 (Chipsani), 富內 (Tonnaitcha), 落合 (Galkinowraskoe), 轟峠 (Todoroki) (據松村教授)

分布 樺太。

本種は六七月の交南樺太に於て極めて普通の種類なるが如し。

毛翅目
TRICHOPTERA

本邦產毛翅目は ULMER 氏 (65) に據れば十三科を數ふ。今主として同氏の分類に從ひ、これ等の檢索表を記せば次の如し。

科の檢索表

a1 小形種。翅特に前翅は密生せる長毛によりて厚く覆はれたり。緣毛長し。こは特に後翅に於て然りとす。後翅中室 (Discoidal cell) は常に開く、則ち之れを缺く。翅は通例細長にして翅端は多少强く尖れり。觸角は前翅と等長なることあるも、多くは短大にして短環節を密に連接せり。

小腮鬚は雌雄共に五節。その末節は屈曲せず、又環節をなすことなし。普通單眼を有す。……姫石蠶科 Hydroptilidae

a2 中形乃至大形種。小形なるもの罕なり。前翅は決して長毛を密生することなく、稀に之れを有することあるも僅に疎生するに過ぎず。緣毛長からず。觸角は前翅と等長なるか又は之れより長く、稀に僅に短きものあり。

b1 小腮鬚は殆ど諸ての場合五節より成る。

c1 小腮鬚の末節は更に若干の環節をなし彎曲す。多くは他節を合したるものよりも遙に長し。

d1 單眼を有す。……河石蠶科 Philopotamidae

d2 單眼を缺く。

e1 前脛節距は三なり。……Polycentropidae

e2 前脛節距は三より少なし。

f1 前翅に第一脈叉を有す。……筒石蠶科 Hydropsychidae（繩石蠶科）

f2 前翅（後翅に於ても）に第一脈叉を缺く。……Psychomyidae

c2 小腮鬚の末節は環節をなさず。亦彎曲することなし。こは他節を合したるものより短かし。

d1 單眼を有す。

e1 前脛節距は二又は三、中脛節距は多くの場合四なり。

f1 小腮鬚の基部二節は短大、第三節は細長なり。……流石蠶科 Rhyacophilidae

f2 小腮鬚第二節は第一節より遙かに長し。……♀石蠶科 Phryganeidae

e2 前脛節距は一又は之れを缺く、中脛節距は二又は三なり。……♀刳石蠶科 Limnophilidae

d2 單眼を缺く。

e1 前翅に副中室（Median cell）を有す。……Calamoceratidae

e2 前翅に副中室を缺く。

f1 前翅及後翅共に中室を缺く。……細翅石蠶科 Molannidae

f2 前翅に中室を有す。

g1 前翅徑分脈枝は皆分岐し、多くは第一及第二脈叉を有す

h1 徑脈と第一脈叉との間（少くとも前翅に於て）に一橫脈を有す、則ち徑脈は第一脈叉と結合せり。Odontoceridae

h2 徑脈と第一脈叉とは何れの翅にありても結合することなし。……♀毛石蠶科 Sericostomatidae

g2 前翅に於て上位徑分脈枝のみ分岐し、多くは第一脈叉を有するに止まる。兩鬚長毛を密生す。……長角石蠶科 Leptoceridae

b2 小腮鬚は五節より少なし。

c1 小脚鬚四節、單眼を有す。……石蠶科 Phryganeidae
c2 小脚鬚は二節又は三節。
d1 小脚鬚は常に絲狀をなし圓柱狀の環節より成る。之れに生ぜる毛は密生せずして短く又鱗毛を以て覆はるることなし。隨ひて顏面の狹められるることなし。前脛節距は一又は之れを缺く。單眼を有す。……含刺石蠶科 Limnophilidae
d2 小脚鬚は各節密接し、屢々長毛又は鱗毛を密生す。爲に假面狀に變形することありて、顏面を狹小ならしむ。前脛節距は多くの場合二なり。單眼を缺く。……含毛石蠶科 Sericostomatidae

石蠶科 Fam. Phryganeidae

既知本邦産本科は三屬なり。而して南樺太産のものは松村教授(19)によりて一屬三種を知られたるも、著者今回の研究に據れば、更に三種を加へて二屬六種となすべく、尙その二種は本邦に未記錄なりとす。

屬の檢索表

a1 前後翅共に第一脈叉を缺く。亞前緣脈と徑脈との間に基橫脈を缺く第三脈叉は兩翅共に有柄なり。……Limnocentropus Ulmer
a2 兩翅に第一脈叉を有す。亞前緣脈、徑脈間に基橫脈を有す。兩翅の第三脈叉は有柄ならず。
b1 前翅比較的多毛ならず。種類によりては殆ど裸翅に近きものあり。通例前翅は短廣なり。雌の前翅に第四脈叉を缺く。……ゴマフトビケラ屬 Neuronia Leach
b2 前翅は密に毛を生ず。通例前翅は細長なり。雌の前翅に第四脈叉を有す。……トビケラ屬 Phryganea Linné

ゴマフトビケラ屬

Genus *Neuronia* Leach (1815)

南樺太産の本屬は從來三種なりしも、本研究に於て一種を加ふ。これ等は次の檢索表によりて識別することを得べし。

種の檢索表

a1 翅は黃褐、前翅には黑褐色紋を密布し網目狀を呈す。
b1 前翅の網目狀紋は細密なり。翅開張二七乃至三二粍。……

……カラフトアミメトビケラ N. clathrata KOLEN.

b_2 前翅の網目狀紋は稍濃且粗大なり。翅開張二五粍以下。……

……ヒメアミメトビケラ N. apicalis MATS.

a_2 翅は乳白色又は微に黃色を帶ぶ。前翅に黑色乃至黑褐色の點紋を密布す。網目狀を呈することなし。

b_1 翅は帶白色、前翅の點紋は稍粗にして、後翅の外緣には廣く一樣なる黑帶を廻らす。……カラフトゴマフトビケラ N. phalaenoides L.

b_2 翅は微に黃色を帶び前翅の點紋は稍密、後翅外緣の黑褐帶は濃色の部と淡色の部と相交互す。……

……ウスイロゴマフトビケラ N. atrata GMEL.

1. カラフトゴマフトビケラ

Neuronia phalaenoides (LINNÉ)

'*Phryganea phalaenoides* LINNÉ; Fauna Suec., ed. II, p. 378 (1761).'

Phryganea phalaenodes BURMEISTER; Handb. Ent., II, p. 935 (1839).

Oligotricha phalaenoides RAMBUR; Hist. Nat. Ins., Névrop., p. 472 (1842).

Holostomis phalaenoides MACLACHLAN; Jour. Linn. Soc., Zool., XI, p. 104 (1871): WALLENGREN; Kongl. Sv. Vet. Akadem. Handl., XXIV-10, p. 16 (1891).

Neuronia phalaenoides MACLACHLAN; Trichop. Eur. Fauna, p. 19, pl. II (1874): ULMER: Coll. Zool. Edm. Selys Longs., VI, (1), p. 6 (1907): ULMER; Gen. Ins., LX, p. 23, pl. XXIX fig 1 (1907): ULMER; Süsswass. Deutschl., V/VI, p. 72 (1909): MATSUMURA; Jour. Coll. Agr., Tohoku Imp. Univ., IV, p. 15 (1911): NAKAHARA; Canad. Ent., XLV, p. 325 (1913): NAVÁS; Rev. R. Acad. Cienc. Ex., Fis. y Nat., Mad., XVIII, p. 161 (1919): KUWAYAMA; Zool. Mag., (動物學雜誌) XXXIV, p. 957 (1922).

Holostomomis melaleuca (nec MACLACHLAN) MATSUMURA; Thous. Ins. Jap., I, p. 166, pl. XII fig. 2 (1904): MATSUMURA; Syst. Ent., I, p. 187, fig. 222 (1907).

産地

久春内、轟峠間　1♀　2/VIII　1922　江崎悌三氏採（乾固）

貝塚 (Solowiyofka), 池邊讃 (Chipsani)（據松村教授）

分布　樺太、北海道、朝鮮。西比利亞。北部歐洲。高加索。

2. ウスイロゴマフトビケラ

Neuronia atrata (GMELIN) (Fig IV)

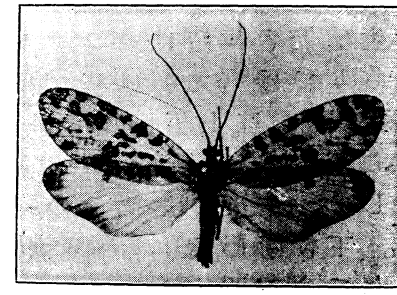
（第　四　圖）

'*Phryganea atrata* GMELIN; Syst. Nat., ed. XIII, p. 2634 (1788).'

Holostomis atrata MACLACHLAN; Jour. Linn. Soc., Zool., XI, p. 104 (1871): WALLENGREN; Kongl. Sv. Vet. Akadem. Handl., XXIV-10, p. 17 (1891).

Neuronia atrata MACLACHLAN; Trichop. Eur. Fanna., p. 20, pl. II (1874): ULMER; Coll. Zool. Edm. Selys Longs., VI (1), p. 7 (1907): ULMER; Gen. Ins., LX, p. 23 (1907): KUWAYAMA; Zool Mag., XXXIV, p. 957 (1922).

頭部、光澤ある黒色にして、一般に毛少きも、觸角間及顔面に赤褐の毛叢を有す。頭頂は扁平にして、その中央に細小なる一縦溝と深き横窪あり。單眼は暗赤にして稍突出し、複眼は乾固標本にありては灰褐色を呈す。觸角、前翅長の約四分の三、黒色なれども末端の二三節は微に灰黒色を帶ぶ。基節は大にして稍圓味を帶び、第二節は次節より太きも稍短し。この兩節にありては前方に暗褐縁を有し、一面に褐色の短毛を疎生す。第三節以後は畧同形をなすも漸次細小し、全面に同色の微毛を疎生す。顔面の兩側及口部には金色の細毛を有す。口吻部黄褐、兩鬚亦黄褐にして同色毛を疎生す。小腮鬚は雄にありては第一節最も短く、第二節より第四節に至るに隨ひ相順じて細長となる。雌にありては第一節の短小なるを除き、各節略等長なるも、基節より末節に向ひ漸次細まる。



第四圖 Fig. IV
ウスイロゴマフトビケラ
N. atrata ♂
自然大
(natural size)
原圖 (original)

前胸は漆黒色にして小さく、背面に二個の同色瘤起ありて、之れより黄褐色の長毛を射生す。中、後胸は背腹共に光澤ある黒色。黄褐色の短毛を疎生せり。

前翅、寧ろ細長にして、翅端はあまり突出せず。外縁は緩かに圓弧をなす。光澤ある乳白色にして、半透明、一面稍淡黄色を帶ぶ。之れに全面黒褐色なる大小種々の斑紋あり。その狀、翅基黒褐にして、前縁に沿ひ横長なる大斑約六個を排列し、後縁の中央に亦一個の大斑あり。外縁にありては各翅脈上に於て縦斑を存せり。その他の部分にありては一面不定なる小斑を横列し、こは互に

癒合せることあり。翅脈は翅の地色と同一なれども、斑紋の存する部分は斑紋と同色をなす。脈相は他の類似種と略同様にして、徑脈は翅端に近く外方に向ひて一屈曲をなせり。中室は稍細長。第一脈叉は基部より約三分の二の個處に於て分岐す。後翅は前翅と同色なれども稍淡く、透明度大なり。前緣に數個の小黑褐斑あり。就中、亞前緣脈の翅端に接する部分にあるもの最大なり。その後方、中室端に於て同じく一の黑褐斑を有す。翅頂より外緣に渉り淡褐色帶あり、こは各脈叉の中間及翅脈上に於て黑褐色斑をなし、濃淡相交互す。

前肢、基節より腿節に至る間は黑褐、脛節褐色、蹠節暗褐にして、一面褐色の微毛を生ず。距及爪は赤褐。中、後肢は基節より腿節暗褐にして、特に後肢には腿節の內側後半に一黃條あり。脛節汚黃色なるもその基部暗褐、距、刺及爪は赤褐。蹠節は暗褐色なれ共末節に至るに隨ひ濃度を增す。

腹部は天鵞絨狀黑色にして、各節後緣は微に暗褐色を呈す。

生殖器の構造はカラフトゴマフトビケラに類する處あり。雄にありては第九節は甚だ狹けれども、その中央部は稍三角形に突出す。肛上板(suranal plate, penis-cover)は極めて大にして、且長く、稍下方に彎曲して恰も短艇形をなす。光澤ある暗黃褐色にして、中央に黑褐色の一龍骨を有す。先端は輕く圓弧をなす。下位附屬物(inferior appendages)はあまり太からず。暗黃褐色にして、下方より見るときは內方に彎曲しその先端尖り、且之れに淡色毛を生せり。こはその上方に指形をなせる淡黃色の細長なる分枝ありて、上內方に向ひ、側面より見るときは一の半圓形を描く。この部分亦淡色毛を生ず。これ等附屬物は何れも末節端に附着せるが、末節腹板は稍圓弧をなして中央部突出し、左右兩緣に三角形をなせる銳齒あり、この銳齒は下位附屬物の下緣附着點に接せり。末節腹板の後緣及銳齒は光澤ある赤褐にして、淡色毛を生せり。雌にありては第八節狹小。第九節は第八節に比し稍廣しと雖尙幅狹し。こは色黃褐にして背方に二三の暗色斑あり、中央に一縱溝を有す。又これに灰黃色毛を密生せり。側片黃褐にして廣く、左

右より内部生殖器を包む、末節腹板は廣くして舌狀、後緣は圓弧をなして、その部分暗褐色なり。

	♂	♀
體長	15.0粍	17.0粍
觸角長	18.0粍	18.0粍
前翅長	22.0粍	25.0粍
前翅幅	8.5粍	9.0粍
後翅長	20.0粍	22.0粍

産地

小沼　1♀ 21/VII 1922 江崎悌三氏採（乾固）
東白浦、小田寒間 1♂ 5/VIII 1922 江崎悌三氏採（乾固）

分布　樺太。　西比利亞。　北部歐洲。

本種は西比利亞、北部歐洲に分布せる種類なれども、未だ本邦に未記錄のものなりしに、本研究に於て初めて南樺太に迄分布せることを確證せり。

本種は、その形態最もよくゴマフトビケラ *Neuronia melaleuca* MACLACHLAN に類似す。然れども本種の翅の地色が帶黃色にして斑紋亦黑褐色なること、後翅外緣帶は淡色にして、而かも濃淡兩部分を交互すること、兩鬚及脚の黃褐色なること等によりて、直に兩者を識別し得べく、雌雄生殖器の構造亦彼我全く相異る。カラフトゴマフトビケラにも幾分近似する處あるも、こは既に檢索表に記したるが如き差違あり。又本種は之れに比し形更に小なりとす。

3. カラフトアミメトビケラ

Neuronia clathrata (KOLENATI)

Oligostomis clathrata 'KORENATI; Gen. et Spec. Trichop., I, p. 82 (1848)': WALLENGREN; Kongl. Sv. Vet. Akadem. Handl., XXIV–10, p. 19 (1891).

Neuronia clathrata MACLACHLAN; Jour. Linn. Soc., Zool., XI, p. 105 (1871): MACLACHLAN; Trichop. Eur. Fauna, p. 18, pl. II (1874): ROSTOCK; Neur. germ., p. 24 (1888): ULMER; Coll. Zool. Edm. Selys Longs., VI (1), p. 5 (1907): ULMER; Gen. Ins., LX, p. 123 (1907): ULMER; Süsswass. Deutschl., V/VI, p. 71, fig. 114b (1909): MATSUMURA; Jour Coll. Agr., Tohoku Imp. Univ., IV, p. 16 (1911): NAKAHARA; Canad. Ent., XLV, p. 324 (1913): KUWAYAMA; Zool. Mag., XXXIV, p. 958 (1922).

産地　落合 (Galkinowrsakoe)（據松村教授）

分布　樺太。　歐洲。

著者未だ南樺太産の本種を檢するを得ず。

4. ヒメアミメトビケラ

Neuronia apicalis MATSUMURA

Neuronia apicalis MATSUMURA; Thous. Ins. Jap., I, p. 172, pl. XII fig. 11 (1904): MATSUMURA; Syst. Ent., I, p. 188, fig. 224 (1907): MATSUMURA; Jour. Coll. Agr., Tohoku Imp. Univ., IV, p. 15 (1911): NAKAHARA; Canad. Ent., XLV, p. 325 (1913): KUWAYAMA; Zool. Mag., XXXIV, p. 958 (1922).

産地

轟峠、眞縫間 1♂ 2♀ 3/VIII 1922 江崎悌三氏採（乾固、液浸）

落合 (Galkinowraskoe)（據松村教授）

分布　樺太、　北海道。

トビケラ屬

Genus *Phryganea* LINNÉ (1740)

本屬は從來南樺太に知られたるものなかりしに、本研究に於て次の二種を數ふ。

種の檢索表

a1 大形種。後翅黑藍色にして外緣に近く太き一黃帶を有す。……ムラサキトビケラ **Ph. regina** M'L.

a2 小形種。後翅淡灰色、半透明、外緣微に淡黑色を帶ぶ。……ハイマダラトビケラ **Ph. varia** F.

5. ムラサキトビケラ

Phryganea regina (MACLACHLAN)

Holostomis Machlachlani var. *regina* MACLACHLAN; Jour. Linn. Soc., Zool., XI, p. 103 & 104 (1871).

Holostomis regina MATSUMURA; Thous. Ins. Jap., I, p, 165, pl. XII fig. 1 (1904): MATSUMURA; Syst. Ent., I, p. 186, fig. 219, 221 (1907).

Neuronia regina ULMER; Coll. Zool. Edm. Selys Longs., VI (1), p. 6, fig. 1–3. taf. I, fig. 1 (1907): ULMER; Gen. Ins., LX, p. 24, tuf. XXIX fig. 3 (1907): ULMER; Deutsch. ent. Zeitschr., 1908,

p. 339 (1908): ULMER; l. c., 1911, p. 400 (1911): NAKAHARA; Zool. Mag., XXV, p. 265, pl. VII fig. 1 (1913); NAKAHARA; Canad. Ent., XLV, p. 323 (1913): NAVÁS; Rev. R. Aced. Cienc. Ex., Fis. y Nat. Mad., XVIII, p. 161 (1919).

Phryganea regina KUWAYAMA; Zool. Mag., XXXIV, p. 958 (1922).

産地

豐原　1♀　23/VII 1922　江崎悌三氏採（乾固）

分布　樺太、北海道、本州、臺灣。支那。印度。

本種は北海道及本州に普通種なるに拘らず、從來南樺太に知られざりしも、今や同地にも分布せることの確證を得るに至れり。

6. ハイマダラトビケラ

Phryganea varia FABRICIUS (Fig. V)

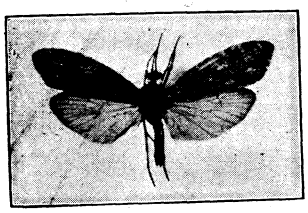
（第　五　圖）

'*Phryganea variegata* FOURCROY; Ent. Par., II, p. 357 (1785).'

Phryganea varia 'FABRICIUS; Ent. Syst., II, p. 77 (1793)': BURMEISTER; Handb. Ent., II, p. 934 (1839): RAMBUR; Hist. Nat. Ins., Névrop., p. 471 (1842): MACLACHLAN; Jour. Linn. Soc. Zool., XI, p. 103 (1871): MACLACHLAN; Trichop. Eur. Fauna, p. 24 pl. III (1874): ROSTOCK; Neur. germ., p. 23 (1888): ULMER; Coll. Zool. Edm. Selys Longs., VI (1), p. 7 (1907): ULMER; Gen. Ins., LX, p. 25, taf. XXIX fig. 6 (1907): ULMER; Süsswass. Deutschl. V/VI, p. 74, fig. 118 c. d. (1909): KUWAYAMA; Zool. Mag., XXXIV, p. 959 (1922).

Dasystegia variegata WALLENGREN; Kongl. Sv. Vet. Akadem. Handl., XXIV-10, p. 24 (1891).

頭部、黒褐色。頭頂に一の赤褐縦條を有す。縦條の兩側、後頭及顔面一面に灰色の長毛を密生す。單眼赤色。複眼は黒色にして突出す。觸角、前翅長より長からず（標本にありては先半折損して長さ明かならず）。その基節は長大にして黒色なれども、基部赤褐にして、又外方に一赤褐條を有す。其の他の環節は略同形、全長の基半にある各節は暗黄褐色にして、各一の暗黒色環を有し、先半の各節にありては、この暗黒色環は擴がりて全節寧ろ黒色を呈す。一面暗



第五圖　Fig. V.
ハイマダラトビケラ
Ph. varia. ♂
自然大
(Natural size)
原圖 (original)

黒色毛を密生せり。口吻部は末端汚穢黄色。兩鬚暗黒褐。小腮鬚第一節は極めて短かけれども、第二乃至第四節は略等長、第二節は他節に比し稍太し。

前胸、黄褐にして之れに灰色の長毛を密生す。尚二三の黒色の長毛を交ゆ。中胸及後胸背は黒色を呈するも、兩胸の小楯板は暗赤色を呈し、又中胸の楯板に各一の暗赤縦條あり。この縦條、中胸に於ける小楯板及肩部には灰色の長毛を密生し、又少許の黒褐毛を交ゆ。

前翅、比較的短く、翅端稍尖る。地色灰黄色にして、之れに一面不定なる淡黒褐色の網目狀紋を密布す。隨ひて寧ろ全體黒味勝に見ゆ。稍不透明。一面に黒色、灰色又は黄色の短毛を密生せるが、第三第四翅端室の基方及後緣に近き二三脈上には特に黒毛を叢生せる一小部分あり。第三及第六翅端室に存する白紋は明瞭なり。脈は褐色。徑脈は翅端に近づきて強く屈曲せり。中室稍長し。後翅、淡灰色にして微に灰黒色を帶び、稍透明に近し。翅端より外緣に渉り淡黒色を以て緣取らるゝも、その內方の境界は明らかならず。但し緣紋部及第一翅端室に於ける緣部の一小點は淡色にして地色を現はせり。脈暗褐色。

前肢、基節より腿節に至る間濃黒褐、脛節は灰褐にして末端近く黒色環を裝ひ、尚外側に二小白斑あり。蹠節淡黄赤、各節端は廣く黒色環を裝ふ。距及刺は赤褐。中肢にありては一樣なる淡褐色なれども、脛節及蹠節にありてはその各節末端に一黒色環を裝ふ。尚脛節にありては不定の黒斑を有す。距及刺は赤褐。刺は比較的長く且多數なり。後肢は一樣なる汚黄色にして、蹠節の各節に黒色環を裝ふも淡くして明瞭ならず。距及刺亦前中肢と同樣。爪は各肢赤褐なり。

腹部、背板黒褐色なるも、各節後緣は灰褐色を呈す。腹板は黄褐色にして各節の後緣は廣く灰黄色をなす。一面褐色毛を疎生するも第八節にありては他節よりも稍多毛なり。第九節背板は大にして、扁平に突出し中央緣は僅かに窪む。又その邊緣の中央は深く刳れたり。こは光澤ある黄褐色なれども邊緣部は赤褐色、之れに暗黄色の甚だ長き緣毛を密生し、尚

緣毛の附着點は一の顆粒をなせり。肛上板は緣毛下に蔽はれ、圓筒形の鞘となりて突出す。色淡黃なれ共先端部稍濃く、斜に截斷狀に終る。腹部末節の側方稍上方に赤褐色の上位附屬物を有するも、こは極めて小なり。下位附屬物は甚だ長くして上方に向ひこは二分岐し、基方より汚黃色の長毛を密生せり。分岐は側面より見るときは略平行す。その下位なるは稍短く、濃赤褐にして、稍內方に向ひ、特に先端部は內方は屈曲して末端尖れり。その上位なるは前者に比して遙かに細長、略肛上突起と等長にして內方に彎曲せり。その色光澤ある赤褐にして、先半黑色、灰黃色の細毛を密生せり。腹部末節の腹板は稍延長して、下位附屬物の中間に於て一の三角部を形成す。

體長	12.0粍
前翅長	15.0粍
前翅幅	5.5粍
後翅長	12.0粍

產地

豐原　1♂　25/VII 1922　江崎悌三氏採（乾固）

分布　樺太。　全歐洲。

本種は從來本邦に未記錄にして、本研究に於て之れが南樺太に產することを紹介するものなり。而して本種は既にMACLACHLAN (16), ULMER (64)兩氏の述べたるが如く、歐洲に弘く分布して而かも西比利亞に未だ發見せられざる種なるが、かの歐洲より西比利亞に渉りて分布せる *Ph. obsoleta* HAGEN を發見せずして、却て本種を南樺太に得たるは昆蟲地理學上注目に價す。

本種は *Ph. obsoleta* HAGEN に酷似するも、本種の後翅外緣に濃色帶を有すること、前翅に存する白斑の顯著なること、雄腹部第九節背板の長く延長せること（*Ph. obsoleta* にありては之れを殆と全く缺如す）等を以てその區別すべき主なる特徵とす。尙本邦產種たるウンモントビケラ *Ph. sordida* MACLACHLAN 又はセジロウンモントビケラ *Ph. ulmerina* NAVÁS に類似する處あるも、前翅斑紋は本種にありてはこれ等二種の如く濃色ならず、又翅形も細長ならざれば、容易に區別することを得べし。

刳石蠶科 Fam. Limnophilidæ

本邦産本科の既知種は七屬に含まるるが、從來南樺太のものは僅かに松村教授(19)が一種を報告せられたるに止る。然るに著者はこの他に更に四種を追加し得たるが、こは何れも本邦に既知のものなり。

屬の檢索表

a1 後翅の中室は開く。……**クロバネトビケラ屬**新稱 **Moropsyche** BANKS
a2 後翅の中室は閉づ。
b1 距は 1—2—2. ……**ホタルトビケラ屬 Nothopsyche** BANKS
b2 距は 1—3—4
c1 前翅外緣は强く刳れて波狀を呈す。……
……**エグリトビケラ屬 Glyphotælius** STEPHENS
c2 前翅外緣は强く刳らるることなし。外緣は眞直なるか、弓形に彎曲せるか、又は翅端脈の部分のみ僅かに窪みたり。
d1 後翅外緣は先端に近く一回僅かにうねる。
e1 後翅第一翅端脈は翅の先端に近く徑脈と合同するか或は之れと結び付けらる。……
……**スヂトビケラ屬 Nemotaulius** BANKS
e2 後翅第一翅端脈は徑脈に接することなし。……
……**アヤトビケラ屬 Grammotaulius** KOLENATI
d2 後翅外緣は直線的にしてうねることなし。
e1 前翅は稍細長にして翅端は斜に截斷狀を呈し圓からず。
……**キリバネトビケラ屬 Limnophilus** LEACH
e2 前翅は廣く、翅端は多少强く圓弧をなす。……
……**Stenophylax** KOLENATI

エグリトビケラ屬

Genus *Glyphotaelius* STEPHENS (1837)

7. エグリトビケラ

Glyphotaelius admorsus MACLACHLAN

Glyphotaelius admorsus 'MACLACHLAN; Trans. Ent. Soc. Lond., (3) V, p. 250 (1866)': MATSUMURA; Thous. Ins. Jap., I, p. 167, pl. XII fig. 4 (1904): MATSUMURA; Syst. Ent., I, p. 189, fig. 225 (1907): ULMER; Coll. Zool. Edm. Selys Longs., VI (1), p. 16, fig. 24, 25. taf. 1 fig. 4 (1907):

ULMER; Gen. Ins. LX, p. 40 (1907): ULMER; Deutsch. ent. Zeitschr., 1908, p. 340 (1908); NAKAHARA; Zool. Mag., XXVI, p. 344. fig. 1, 2 (1914): NAKAHARA; Canad. Ent., XLVII, p. 90 (1915); NAVÁS; Rev. R. Acad. Cienc. Ex., Fis. y Nat., Mad. XVIII, p. 162 (1919).

産地

豐原　1♀　24/VII 1922　江崎悌三氏採（乾固）

分布　樺太、北海道、本州、九州。

本種は本邦に比較的稀ならざる種類なるも、南樺太には從來知られざりしに、今回江崎氏の好意によりて同地にも産することを知れり。

キリバネトビケラ屬

Genus *Limnophilus* LEACH (1815)

南樺太産のものは松村博士が一種を報告せられたるも、著者は却てこの種を見ずして他の二種を檢することを得たり。これ等三種は次の如くにして區別し得べし。

種の檢索表

a1 前翅は黃色にして透明紋を有す。……
……**ウスバキトビケラ L. correptus** M'L.

a2 前翅は褐色乃至暗褐色を呈す。

b1 前翅灰色にして一面に微小の褐色紋を散在す。一二の透明紋を有す。……**ヒメモントビケラ L.affinis** CURTIS

b2 前翅暗褐、翅の中央に前緣より後緣に渉る三角形の大なる透明紋あり。前緣亦透明なり。……**アムールトビケラ L. amurensis** ULM.

8. ヒメモントビケラ

Limnophilus affinis CURTIS

Limnophilus affinis 'CURTIS; Phil. Mag., IV, p. 123 (1834)': MACLACHLAN; Trichop. Eur. Fauna, p. 82, pl. IX (1876): ROSTOCK. Neur. germ., p. 30 (1888): WALLENGREN; Kongl. Sv. Vet. Akadem. Handl., XXIV–10, p. 54 (1891): MATSUMURA; Thous. Ins. Jap., I, p. 170, pl. XII fig. 9 (1904): MATSUMURA; Syst. Ent., I, p. 190, (1907): ULMER; Coll. Zool. Edm. Selys Longs., VI (1), p. 19 (1907): ULMER; Gen. Ins., LX p. 43 (1907): ULMER; Süsswass. Deutschl., V/VI, p. 134, fig. 212 (1909): MATSUMURA; Jour. Coll. Agr., Tohoku Imp. Univ., IV, p. 16 (1911): NAKAHARA; Zool Mag., XXVI, p. 351 (1914): NAKAHARA; Canad. Ent., XLVII, p. 94 (1915): NAVÁS; Rev. R. Acad. Cienc. Ex., Fis. y Nat., Mad., XVIII, p. 162 (1919).

産地　富内 (Tonnaitcha) (據松村教授)

分布　樺太、北海道、本州、四國。西比利亞。全歐洲。

著者未だ樺太産のものを檢するを得ず。

9. アムールトビケラ

Limnophilus amurensis ULMER

Limnophilus amurensis 'ULMER; Stett. ent. Zeit. LXVI, p. 8, taf. I fig. 4, 5 (1905)': ULMER; Coll. Zool. Edm. Selys Longs., VI (1) p. 19, fig. 28, 29, taf. I fig. 5 (1907): ULMER; Gen. Ins. LX, p. 43, taf. XXXI fig. 9 (1907): ULMER; Deutsch. ent. Zeitschr., 1908, p. 341 (1908): NAKAHARA; Zool. Mag., XXVI, p. 350, fig. 12 (1914): NAKAHARA; Canad. Ent., XLVII, p. 94 (1915): NAVÁS; Rev. R. Acad. Cienc. Ex., Fis. y. Nat., Mad., XVIII, p. 163 (1919).

産地

豐原　1♂ 1♀ 23–26/VII 1922　江崎悌三氏採 (液浸、乾固)

〃　1♀　10/IX　1922　鹿野忠雄氏採 (乾固)

分布　樺太、北海道、本州。西比利亞。

本種は從來本邦に於ては北海道にのみ知られたるものなるが、南樺太にも分布せることを知る。尙著者は竹內吉藏氏の好意により同氏採集に係る本州産 (湯本、一九一八年六月六日) の一標本を有す。

10. ウスバキトビケラ

Limnophilus correptus MACLACHLAN

Limnophilus correptus MACLACHLAN; Trichop. Eur. Fauna., Suppl. II, p. 18, pl. LIII (1880): MATSUMURA; Thous. Ins. Jap., I, p. 171, pl. XII fig. 10 (1904): MATSUMURA; Syst. Ent., I, p. 190, fig. 227 (1907): ULMER; Coll. Zool. Edm. Selys. Longs., VI (1), p. 18 (1907): ULMER; Gen. Ins., LX, p. 42, 45 (1907): ULMER; Deutsch. ent. Zeitschr., 1908 p. 341 (1908): NAKAHARA; Zool. Mag., XXVI, p. 350 (1914): NAKAHARA; Canad. Ent., XLVII, p. 93 (1915): NAVÁS; Rev. R. Acad. Cienc. Ex., Fis. y. Nat., Mad. XVIII, p. 162 (1919).

産地

豐原　1♂　10/IX　1922　鹿野忠雄氏採 (乾固)

分布　樺太、北海道、四國。西比利亞。支那。

本種の南樺太に産することは本研究の報告を以て嚆矢となす。

ホダルトビケラ屬

Genus ***Nothopsyche*** BANKS (1906)

11. トビイロトビケラ

Nothopsyche pallipes BANKS

Nothopsyche pallipes BANKS; Proc. Ent. Soc. Wash., VII, p. 107, pl. III fig. 1 (1906): MATSUMURA; Syst. Ent., I, p. 190 (1907): ULMER; Coll. Zool. Edm, Selys Longs., VI (1), p. 29, fig. 49, 50 (1907): ULMER; Gen. Ins, LX, p. 70 (1907): ULMER; Deutsch. Zeitschr., 1908, p. 341 (1908): NAKAHARA; Zool. Mag, XXVI, p. 355 (1914): NAKAHARA; Canad. Ent., XLVII, p. 95 (1915).

産地

喜美内　1♀　11/VIII 1922　江崎悌三氏採（乾固）

分布　樺太、北海道、本州。

南樺太に得たる前記標本は内地産のものに比し遙かに大形（體長一六粍、前翅長二四粍）なれども、其の他の特徴に於ては別種とすべき差異を認めず。本種も亦從來同地に記錄せられたることなきものなり。

次に記す三科三種は共に松村教授（19）によりて南樺太に產することを報告せられたるものなれ共、不幸にして著者未だこれ等を檢することを得ざるものなり。

毛石蠶科 Fam. Sericostomatidæ

リタツクス屬

Genus ***Lithax*** MACLACHLAN (1876)

12. ヒゲブトキトビケラ

Lithax karafutonis MATSUMURA

Lithax karafutonis MATSUMURA; Jour. Coll. Agr., Tohoku Imp. Univ., IV, p. 16 (1911).

産地　池邊讃 (Chipsani)（據松村教授）

分布　樺太。

原記載により考察すればヒゲブトトビケラ新稱 *Goera japonica* BANKS（本州產）に甚だよく類似せる種なり。

長角石蠶科 Fam. Leptoceridæ

クロヒゲナガトビケラ屬

Genus *Mystacides* LATREILLE (1825)

13. クロヒゲナガトビケラ

Mystacides nigra (LINNÉ)

'*Phryganea nigra* LINNÉ; Fauna Suec., ed. I, p. 225 (1746)

Mystacida nigra RAMBUR; Hist, Nat. Ins., Névrop. p. 511 (1842)

Mystacides nigra MACLACHLAN; Trichop. Eur. Fauna, p. 314, pl. XXXIV (1877): ROSTOCK; Neur. germ., p. 67 (1888): WALLENGREN; Kongl. Sv. Vet. Akadem. Handl., XXIV-10, p. 128 (1891): ULMER; Coll. Zool. Edm. Selys. Longs., VI (1), p. 46 (1907): ULMER; Gen. Ins., LX, p. 139 (1907): ULMER: Süsswass. Deutschl., V/VI, p. 95, fig. 156 (1909); MATSUMURA; Jour. Coll. Agr., Tohoku Imp. Univ., IV, p. 17 (1911).

Mystacides ater BURMEISTER; Handb. Ent. II, p. 917 (1839).

産地 池邊讃 (Chipsani) (據松村教授)

分布 樺太。 西比利亞。 歐洲。 北亞米利加。

細翅石蠶科 Fam. Molannidæ

ホソバネトビケラ屬

Genus *Molanna* CURTIS (1834)

14. ホソバネトビケラ

Molanna moesta BANKS

Molanna moesta BANKS; Proc. Ent. Soc. Wash., VII, p. 110, pl. III fig. 5, 6 (1906): ULMER; Gen. Ins., LX, p. 150 (1907): ULMER; Deutsch. ent. Zeitschr., 1908, p. 350 (1908): MATSUMURA; Jour. Coll. Agr., Tohoku Imp. Univ, IV, p. 17 (1911).

産地 池邊讃 (Chipsani) (據松村教授)

分布 樺太、 本州。

RESUMÉ

Prior to the publication of the "Erster Beitrag zur Insekten-Fauna von Sachalin" by Prof. MATSUMURA (*19*)[a] in 1911, as far as I am aware, anyone

a) Reference is made by number (italic) to "Literature cited."

of the species of neuropterous insects, viz., Megaloptera, Planipennia, Mecoptera and Trichoptera, was not recorded from South Saghalien. In the work above mentioned, thirteen species, belonging to nine genera under nine families, were enumerated, and five of them were new to science. In the next year, Prof. NAVÁS (*39*) recorded the distribution of the Siberian alder-fly, *Sialis sibirica* M'L., to the region just referred to. And then Drs. MIYAKE (*20*), OKAMOTO (*49, 51, 53, 54*), and NAKAHARA (*25, 27, 28, 30, 35*) have referred some of them in their contributions, but no more added. In the last few years I have endeavoured to obtain some neuropterous specimens from South Saghalien with great interest, and now can recognize twenty-five species as occurring in the same region. These specimens were collected in 1919 by Mr. E. IZAWA, in 1921 by the author, and in 1922 by Messrs. T. ESAKI and T. KANO. Although I recognize that it does not cover two-thirds of the species to be found in South Saghalien, I presented a synopsis for the benefits of future studies. As this, in the synoptic tables I have included some families and genera not yet recorded from there, but in some other regions of the Japanese Empire.

Here, let me follow the list of species treated in this paper, showing their geographic distribution.

Species. \ Regions.	Europe.	Siberia.	Japan.								Other regions.
			Saghalien.	Hokkaido.	Hondo.	Shikoku.	Kiushu.	Loo-choo.	Formosa.	Corea.	
MEGALOPTERA											
Sialidæ											
1. *Sialis sibirica* M'L.		×	×	×							
Raphididæ											
†2. *Raphidia xanthostigma* SCHUM.	×	×	×								
*3. *Inocellia crassicornis* (SCHUM.)	×	×	×		×	×	×			×	
PLANIPENNIA											
Hemerobiidæ											
*4. *Nineta deltoides* (NAV.)		×	×	×	×						

Species. \ Regions.	Europe.	Siberia.	Japan. Saghalien.	Hokkaido.	Hondo.	Shikoku.	Kiushu.	Loo-choo.	Formosa.	Corea.	Other regions.
*5 *Micromus novitius* NAV.			×	×	×		×				
Chrysopidæ											
6. *Nineta vittata* (WESM).	×		×	×	×						
7. *Chrysopa intima* M'L.		×	×	×	×						
8. *Ch. sachalinensis* MATS.			×	×	×						
†9. *Ch. septempuntata* WESM.	×		×								
subsp. *cognata* M'L.		×		×	×		×		×		China. Cambodia.
Osmylidæ											
10. *Eososmylus ?? harmandius* (NAV).			×	×	×		?×				
MECOPTERA											
Panorpidæ											
11. *Panorpa sachalinensis* MATS.			×								
TRICHOPTERA											
Phryganeidæ											
12. *Neuronia phalaenoides* (L.)	×	×	×	×						×	Caucasus.
†13. *N. atrata* (GMEL.)	×	×	×								
°14. *N. chathrata* (KOL.)	×		×								
15. *N. apicalis* MATS.			×	×							
*16. *Phryganea regina* (M'L.)			×	×	×				×		China. India.
†17. *Ph. varia* FAB.	×		×								
Limnophilidæ											
*18. *Glyphotaelius admorsus* M'L.			×	×	×		×				
°19. *Limnophilus affinis* CURTIS	×	×	×	×	×	×					
*20. *L. amurensis* ULM.		×	×	×	×						
*21. *L. correptus* M'L.		×	×	×		×					China.
*22. *Nothopsyche pallipes* BANKS			×	×	×						
Sericostomatidæ											
°23. *Lithax karafutonis* MATS.			×								
Leptoceridæ											
°24. *Mystacides nigra* (L.)	×	×	×								N. America
Molannidæ											
°25. *Molanna moesta* BANKS			×		×						
Total.	10	12	25	16	14	3	?5	0	2	2	

* Hitherto unknown from South Saghalien, but recorded from the other regions of Japan.

† Hitherto unknown from South Saghalien, as well as all other regions of Japan (unrecorded species to the Japanese fauna).

° According to Prof. MATSUMURA.

From my studies, as showing in the above table, twelve species have been added to the neuropterous fauna of South Saghalien. Among the newly added species, the four could be identified with species hitherto known outside of Japan, but from Europe or Siberia.

Furter more, all the species listed above are interesting and worthy to mention, at least for their distribution. It is an interesting fact that the proper species of Saghalien are very few, namely only two, at present. However, all the species in the region just referred to can make into the following bundles by means of the range of geographic distribution.

(1)	Species distributed in Saghalien only	2	
(2)	Species distributed from Europe or Siberia to Saghalien	5	15
(3)	Species distributed from Europe or Siberia to Japan proper through Saghalien	10	
(4)	Species distributed from Japan proper to Saghalien	8	18
	Total	25	

These data will give some valuable hints to the geographic distribution of insects in Japan, but further discussions on the subject will be postponed for the future study.

December 1922.

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瓢蟲の腹節數並に雌雄の區別

栗崎眞澄

ON THE NUMBER OF THE ABDOMINAL SEGMENTS AND THE EXTERNAL DIFFERENCES BETWEEN FEMALE AND MALE OF COCCINELLIDS.

BY

MASUMI KURISAKI.

(With Plate IV)

一、腹節數

日本産瓢蟲二十五屬に就きて其腹節數を見るに雌雄共に殆と皆八個の背板と六個の腹板を有す。稀れに *Synonycha* 屬に於けるが如く雌雄其數を異にし雄は腹板六個を有するも雌は一個を減じて五個となり（第四圖版XIV—XVII）又 *Ptychanatis* 屬に於て見るが如く雌の第六腹板は殆と退化して五個の觀を呈するものあるも（第四圖版VII—X）此等は單に兩性間の差異に過ぎずして基本節數に於ては等しく六個と見做すべきものなるを以て本邦産瓢蟲の腹板は全部六個にして $\frac{D_1D_2D_3D_4D_5D_6D_7D_8}{V_1V_2V_3V_4V_5V_6}$ なる腹節式を有するものと云ふを得べし。

飜て歐米産に關する諸學者の説を見るに西暦1810年 Latreille 氏が本科を創設せし以來今日迄可成り著しき意見の相違あり。即ち Jacquedural 氏(1818)は腹板五個となし Fowler 氏(1889)は五乃至六個なるも稀れに七個とせり。然るに Ganglbauer (1889) Calwer (1916) 及 Della Beffa (1914) の諸氏は之を五乃至六個となし $\frac{D_1D_2D_3D_4D_5D_6D_7D_8}{V_1V_2V_3V_4V_5(V_6)}$ なる腹節式を充當せるを見る。されば現今世界に於ける定説は五乃至六個と見做を得べく從て本邦種を

[Trans. of Sapporo Natural History Soc. Vol. IX, Part 1. 1924.]

基礎として調査せる予の結果とは可成りの相違あり。

蓋し從來分類學者によりて取扱はれたる又取扱はれつゝある昆蟲類は或特別なる種屬を除きて他は殆ど乾燥標品なり。然るに一般昆蟲類の體軀は生活時と死後とは著しき差異ありて彼の比較的變化に乏しき甲蟲類にありても瓢蟲の腹部の如きは可成り著しき變形を呈するを常とす。例へば *Ptychanatis* 屬の退化しつゝある微小なる第六腹板は生存せる間は明瞭なるも斃死後は腹部の收縮に伴ひて第五節下に隱れ生活標品に關する知識を有するものにあらざれは其正確なる節數を査定すること困難なり。以上は僅に一例に過ぎざるも學者の所謂五乃至六個說なるものは或は此不自然なる研究材料の缺陷より斯く誤認せられたるものにあらざるや將又 *Synonycha* 屬に於けるが如く兩性間に節數の差異あるを識らず其一方のみを見て即斷せるものにあらざるなきや多少の疑問を抱かざるを得ず。殊に本邦產屬の殆ど全部が彼我共通なる點より推考するときは益々疑を深ふす。

二、雌雄の區別

瓢蟲類の性に關しては雄は雌より概して小形なりと云ふ外現今にては外部形態による兩性の區別は絕對に不可能なりとせり。然れども此雄雌間に存する大さの差異は獨り瓢蟲に限らず一般昆蟲類は勿論全動物界に共通の事柄なり。然るに予が本邦產九屬十一種に就きて行ひたる研究の結果によるときは今日迄不明なりとせる兩性間には極めて明瞭なる或は稍判然せる外部形態上の特徵を具備す。而して其區別を表現する位置は殆ど雌雄何れかの腹板に限らるゝが如し。

但し本邦產及歐洲產中には斑紋色彩によりて兩性を識別し得らるゝものあるも此種の特性に關しては玆に論せず。卽ち次の如し。

I. Epilachna 屬

1. *E. 28-maculata* Motsch. ニジュウヤホシ（第四圖版I—IV）

雌雄共に六個の腹板を有す。

雌の第六腹板は鈍三角形を呈し中央より完全に分裂す。
雄の第六腹板は完全なり。

2. *E. niponica* Lew. オホニジユウヤホシ

前種に同じ。

II. Coccinella 屬

C. 7-punctata L. ナヽホシテントウ（第四圖版XIII）

雌雄共に六個の腹板を有す。

雌の第六腹板は完全なり。

雄の第六腹板には大なる一凹陷を横置す。

III. Ptychanatis 屬

P axyridis Pall. テントウムシ（第四圖版VII—X）

雌雄共に六個の腹板を有す。

雌の第六腹板は微小にして中央突出する第五腹板下に隱れ判然せず。故に乾燥標品にありては恰も五個の觀を呈す。

雄の第六腹板は尾背板より稍長く且つ後端少しく突出するを以て之を背面より見るときは其全緣を認むることを得。

IV. Anisosticta 屬

A. kobensis Lew. ジユウクホシテントウ（第四圖版XXII）

雌雄共に六個の腹板を有す。

雌の第六腹板は完全なり。

雄の第六腹板は之を兩分する極て狹き深き陷入部を有するを以て一見 *Epilachna* 屬に類似するも後者に於けるが如く單に分裂したるものにあらず。

V. Hippodamia 屬

H. 13-punctata L. ジユウサンホシテントウ

（第四圖版XXI—XXII）

雌雄共に六個の腹板を有す。

雌の第一腹板は最大にして第二板之に亞ぎ以下殆ど同長なり。

雄に於ては第四第五の兩板は殆ど同長なるも第六板はIV+V にして後緣の中央少しく凹陷す

VI. Synonycha 屬

S. grandis Thunb. オホテントウ(第四圖版XIV−XVII)

雌雄腹板の數を異にす。

雌の一板は退化して五節となり末節の後緣の中央は突出して雄より廣大なる尾背板外に現はる。

雄の腹板は六個なるも尾節は短小なり。且尾背板は雌より小形なり。

VII. Chilocorus 屬

C. similis Ross. ヒメアカボシテントウ(第四圖版XVIII−XX)

雄雌共に六個の腹板を有す。

雌の第五腹板の後緣は殆ど弧狀を呈し雄より大なり。

雄の第六腹板は尾背板外に突出するを以て之を背面より見るときは微小なる尾背板の如き觀を呈す。第五腹板の後緣は殆ど一直線をなし雌より稍小なり。

VIII. Amida 屬

A. tricolor Har. アミダテントウ(第四圖版XXIII)

雌雄共に六個の腹板を有す。

雌の第六腹板は雄より遙に大にして後緣は弧狀に彎入す。

雄の第六腹板は完全なるも雌より著しく小形なり。

IX. Novius 屬

1. *N. (Vedalia) cardinalis* Muls. ベダリヤテントウ(第四圖版XII)

雌雄共に六個の腹板を有す。

雌の第六腹板は完全なり。

雄の第六腹板は後緣廣く深く彎入す。

2. *N. limbatus* Motsch. ベニヘリテントウ (第四圖版XI)

雌雄共に六個の腹板を有す。

雌の腹板は完全なり。

雄の第六腹板の後緣は少しく陷入す。

以上は僅に九屬十一種の研究の結果に過ぎざるも學者によりて今日迄全く不可能なりとせられたる瓢蟲の雌雄の區別は外部形態によりて可能なることを立證せるものと云ふを得べし。蓋し斯る顯著なる特性が今日迄發見し得られざりしは專ら研究材料の不自然に基因するものと信ず。即ち腹節の項に於て述べたるが如く此種の研究に供用する材料は生活標品乃至「アルコホル」標品ならざるべからず。然らざれば生活時若しくは「アルコホル」漬の標品に於て判然せる以上の特徴も乾燥標品に於ては概して不明瞭となるを免れず。彼の *Epilachna* に於ける分裂せる雌の尾板も斃死後は互に密着して檢鏡するも判然せざるに至る。されば乾燥標品を唯一の研究材料とせる分類學者が之等の特徴を發見し能はざりしは寧ろ當然の事と信ず。

三、概　　括

1. 現今學界に承認せられたる瓢蟲の腹節式は $\frac{D_1D_2D_3D_4D_5D_6D_7D_8}{V_1V_2V_3V_4V_5(V_6)}$ なるも予の研究によれば $\frac{D_1D_2D_3D_4D_5D_6D_7D_8}{V_1V_2V_3V_4V_5V_6}$ にして稀れに腹板五個を有するもの (*Synonycha grandis* Thunb♀) あるも此は單に兩性間の或一方に現はれたる雌雄の區別に過ぎず。

2. 外部形態によりて瓢蟲の雌雄を區別することは全然不可能なりとせられたるも日本産九屬十一種に就きて調査せる結果兩性中或一方の腹部に顯著なる特徴を具備する場合多きを以て容易に兩性を區別し得。

備考——本研究には出來得る限り生活「アルコホル」乾燥三種の材料を併用したるも *Anisosticta, Hippodamia* の二屬は九州地方に發見し得ざるを以て止むなく他の二種の標品を供用せり。又雌雄は交尾或は解剖によりて豫め決定したり。尙圖版解說中 [*D*] は腹部背板 [*V*] は腹部腹板の略字なり。

RÉSUMÉ.

It has hitherto been generally recognized that in the Coccinellids the number of the ventral abdominal segments is usually five but rarely six, and that the sexes are indistinguishable externally, except in some cases where the male is smaller in size than the female.

The only sexual difference as regards the number of segments was known in *Synonycha* (*S. grandis* Thumb.) where the ventral abdominal segments of the female are five in number.

Besides the difference in number of the ventral abdominal segments in *Synonycha* as stated above, there are found some more characters in structure of the abdominal segments, by which the two sexes can be distinguished externally, for example, the sixth ventral segment is complete in the male *Epilachna* (excepting *E. adomirabilis* Motsch.), but entirely bifid in the female of the same species, while slightly or deeply notched on the posterior margin in the male *Novius*.

As the result of his careful studies the author cannot agree with the previous workers on the external morphology of Coccinellids.

Those such conspicuous characters were overlooked by them seem to be due to the used materials unfitted for observation, being in dried condition for examination.

In dry specimens, the abdominal segments contract together so as to make distinguishment of the last segment very difficult.

The present work is based on the living specimens as far as possible, but in a few cases where such specimens were not at hand alcoholic and dried specimens were emproyed.

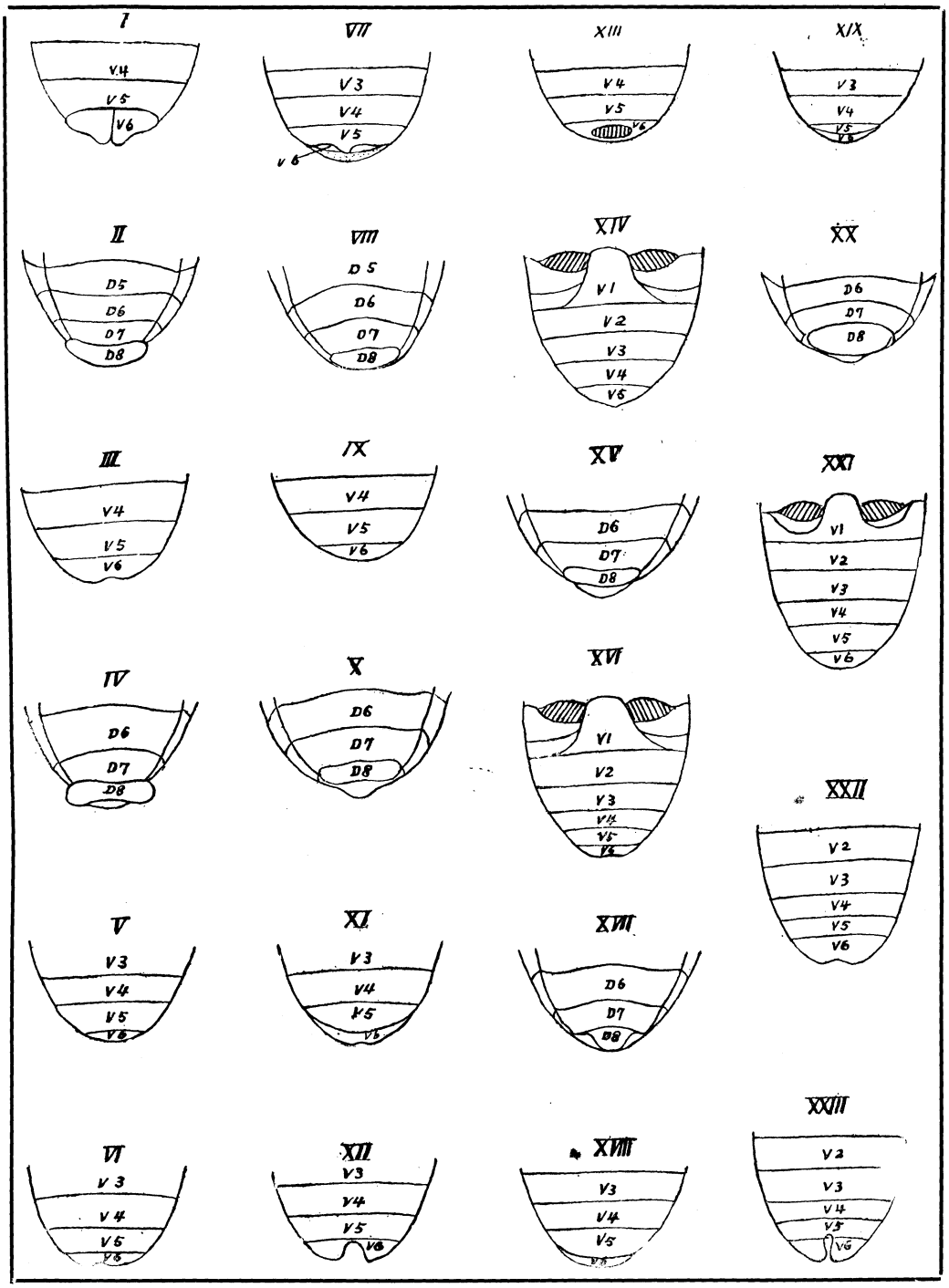
In the Zoological Institute,
Kyushiu Imperial University.

Explanation of Plate IV.

D = Dorsal abdominal segment.

V = Ventral abdominal segment.

I.	ニジユウヤホシ *Epilachna 28-maculata* Motsch.	♀ V4–6 (magnified)
II.	〃 〃 〃 〃	〃 D5–8 (〃)
III.	〃 〃 〃 〃	♂ V4–6 (〃)
IV.	〃 〃 〃 〃	〃 D6–8 (〃)
V.	アミダテントウ *Amida tricolor* Har.	〃 V3–6 (〃)
VI.	〃 〃 〃 〃	♀ V3–6 (〃)
VII.	テントウムシ *Ptychanatis axyridis* Pall.	〃 V2–6 (〃)
VIII.	〃 〃 〃 〃	〃 D5–8 (〃)
IX.	〃 〃 〃 〃	♂ V4–6 (〃)
X.	〃 〃 〃 〃	〃 D6–8 (〃)
XI.	ベニヘリテントウ *Novius limbatus* Motsch.	〃 V3–6 (〃)
XII.	ベダリヤテントウ *N.* (*Vedalia*) *cardinalis* Muls.	〃 V3–6 (〃)
XIII.	ナナホシテントウ *Coccinella 7-punctata* L.	〃 V4–6 (〃)
XIV.	オホテントウ *Synonycha grandis* Thunb.	♀ V1–5 (〃)
XV.	〃 〃 〃 〃	〃 D6–8 (〃)
XVI.	〃 〃 〃 〃	♂ V1–6 (〃)
XVII.	〃 〃 〃 〃	〃 D6–8 (〃)
XVIII.	ヒメアカホシテントウ *Chilocorus similis* Ross.	♀ V3–6 (〃)
XIX.	〃 〃 〃 〃	♂ V3–6 (〃)
XX.	〃 〃 〃 〃	〃 D6–8 (〃)
XXI.	ジュウサンホシテントウ *Hippodamia 13-punctata* L.	♀ V1–6 (〃)
XXII.	〃 〃 〃 〃	♂ V2–6 (〃)
XXIII.	ジュウクホシテントウ *Anisosticta kobensis* Lew.	〃 V2–6 (〃)



M. Kurisaki del.

本會記事

本會の例會の公開は諸種の事情に依りしばらく中絶したるが、再び之を復興する事となり、大正十一年十一月十日午後一時半より、北海道帝國大學農學部農業經濟學講堂に於て左記の講演を行ふ。

バクテリアの形態に就て	半澤　洵君
毒を以て毒を制す	松村松年君

同十二月二十七日、ルイ・パストール誕生の百年に相當するを以て、本會主催により之が紀念講演會を北海道帝國大學中央講堂に於て開催し宮部會長司會の下に下記講演會を行ふ。聽衆約五百人。

開會の辭	宮部會長
讃辭	佐藤昌介君
パストール研究所の由來及現在	今　裕君
化學上の業績	田所哲太郎君
應用菌學上の業績	半澤　洵君
蠶業上の業績	須田金之助君
獸醫學上の業績	葛西勝彌君
醫學上の業績	中村　豐君

終りて、有志豐平館に於て祝宴を催す。

大正十二年一月二十七日農業經濟學講堂に於て例會及び總會を開く、例會に於ては下記の講演あり。

天南星に於ける性の轉移現象と性のコントロールに就て	前川德次郎君

終りて總會に移り、各幹事の事務報告に次いで、規則改正の事を議し、第三章第五條に準會員に關する規定を設け準會員は學生に限る事とし、第五章の役員の數を變更し、會計幹事を二名增員し、第七章第一條會費の項を正會員は金四圓準會員は金二圓と改め、第二條終身會員の即納を金八拾圓と訂正し、第三條に會費滯納の場合に會報の發送を停止す可き規定を設け、第八章第一條の會報發行回數を一回と訂正せり

最後に役員の改選を行ひ次の諸君の當選を見たり。

會長 宮部金吾君

庶務幹事 栃内吉彦君 龜井專次君

會計幹事 前川德次郎君 五藤威夫君

編輯幹事 新島善直君 坂村徹君

(栃内誌す)

謝告

大正十二年九月本誌印刷校了ニ近キ際大震火災ノ厄ニ遭遇シ爲メニ中止ノ已ムナキニ至リ今般改メテ印刷致シ從ツテ發刊遲延ノ段茲ニ奉深謝候

(編輯幹事)

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