Studies on the Japanese Harvesters. II. Harvesters from Hokkaido, with Special Reference to Variation.

By

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Studies on the Japanese Harvesters.

II. Harvesters from Hokkaido, with Special Reference to Variation.

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(With Plate I and one Text-figure)

On the arachnid fauna of Hokkaido we have a valuable paper of SAITO (1934), but his report dealt with only spiders and not with harvesters. So far as the Opiliones-fauna is concerned, from Hokkaido only a single species, *Oligocephalus aspersus* (KARSCH) has been reported hitherto by ROEVER (1911, 1923) as a distinct species. It is not too much to say that the Opiliones-fauna of Hokkaido have been almost overlooked and there have been hardly any studies on them. It is very regrettable that the investigation of harvesters in this island, where there is a particular interest from the zoogeo graphic point of view, has been left undone. The author has long been investigating the harvesters of Hokkaido with much interest. Fortunately last autumn I had an opportunity to travel in this island and have collected numerous specimens of harvesters. Further, in this journey as I felt myself equal to the Opiliones-fauna of Hokkaido, I wish to publish this paper.

The materials used for this work include specimens collected by Messrs. S. MAKINO, Professor of the Hokkaido University, T. IMAMURA, S. KOMAMURA, and E. MOMMA, to whom the author wishes to express his hearty thanks.

Before going further I am glad to take this opportunity of expressing my cordial thanks to Prof. Y. ABE for his valuable advice and unceasing encouragement during the progress of this study. I am also indebted to Messrs. T. TAIRA and S. MIZUOKA for the measurements, to whom I express my thanks.

In my collection from Hokkaido I have been able to identify the following species. These cover six genera including five species and one subspecies, of which one species and one subspecies are new to science.

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1) This study was done by the help of a grant from the Budget for Scientific Research of the Ministry of Education, to which the author wishes to express his hearty thanks.
Sub-order Palpatores
Tribe Dyspnii
Family Ischyropsalidae
1. Species Sabacon makiinoi n. sp.

Tribe Eupnoi
Family Phalangiidae
Sub-family Oligolophinae
2. Species Mitopus morio (FABRICIUS)
3. Species Oligolophus aspersus (KARSH)

Sub-family Liobuninae
4. Species Liobunum japonicum MÜLLER
5. Species Nelma gemfusca (KARSH)

Sub-family Gagrellinae
6. Subspecies Gagrella japonica yezoensis n. subsp.

Of these members Mitopus morio is a common species widely distributed through the Eurasiatic continent, north Africa, southern Sakhalien and Japan proper. Oligolophus aspersus and Liobunum japonicum are common in this island and Japan proper; the other forms of genus Liobunum inhabit both the old and new continents. Genus Oligolophus is also widely distributed in Europe and Asia, so these two species are considered to be the northern, holarctic forms, Nelma gemfusca is also a common species inhabiting in southern Sakhalien and Japan proper; another species of this genus is recorded from the Eurasiatic continent, so it may be thought that this species is a northern element too. Although Sabacon makiinoi is specific to Hokkaido, a closely related species occurs in Japan proper and another form of this genus is widely distributed in the old and the American continents. Accordingly this species also appears to be a northern form. On the other hand Gagrella japonica yezoensis is distinctly a southern, oriental element, and the ground form of this subspecies lives in Japan proper. Though in Hokkaido we met very often with harvesters, the numbers of species are very meagre. So far as the present study is concerned, only six genera including five species and one subspecies have been recorded from this island; among them five genera including five species belong to the northern, holarctic kinds, only a single genus including one subspecies is considered to be a southern, oriental element. From the above-mentioned facts it may probably be concluded that in the Opiliones-fauna of Hokkaido, as is shown in Japan proper, the northern, holarctic elements are more dominant than the southern, oriental ones; nevertheless, in the former island the southern elements are remarkably fewer in number than in main island.

( 2 )
1. Spec. Sabacon makinoi n. sp. 2

The body is oval in shape and the abdominal end is slightly pointed (Pl. I, Fig. 1). The ocular tubercle is situated on the cephalothorax a little before its centre. The cephalothorax on the frontal margin and between the frontal margin and the ocular tubercle is provided with several numbers of fine, spine-like black hairs. The same hairs are also seen on the lateral sides of the cephalothorax. The cephalothorax except for those hairs is without armaments, and almost smooth. The first thoracic segment is fused with the posterior margin of the cephalothorax, and is furnished medially with a pair of minute spine-like hairs. The second thoracic segment is distinct and furnished with a pair of median spines, which are the stoutest of all the body-hairs of the dorsal surface, and are easily recognizable at a glance. The first to the fifth abdominal dorsal segments do not form a hard chitinous plate. The sixth to eighth segments are free. Each dorsal abdominal segment is provided with a transverse row of the black fine hairs.

The ocular tubercle is low, on the median line of the dorsal surface is a shallow groove; almost smooth, its anterior upper portion is decorated with a single small hair. Each ventral abdominal segment is furnished with a transverse row of the small hairs, such as is seen in the dorsal segment. The penis is very slender and the apical portion is slightly bent outwards. The end is provided with a long, sharp, slightly curved chitinous spine (Pl. I, Fig. 7).

The first joint of the male chelicerae is very characteristic in form (Pl. I, Figs. 2-3); the dorsal surface especially, over about 2/3 part of this joint is so enormously swollen that in the lateral view it seems to have a great protuberance on the dorsal side. In the dorsal view the protuberance is nearly round, its apical surface is covered with stout and conspicuous black spines, which are sufficiently dense to be brushlike. The second joint is normal and dorsally provided with spines. The inner surface of the cheliceral chelae are separated in three divisions (Pl. I, Fig. 4). The basal division is smooth, the middle division along with the inner surface is furnished with regular spines, which are dense and look like comb-teeth. In the apical division, the third joint is provided with one, the second with two conspicuous teeth.

All the joints of palpi are a little swollen and seem rather powerful, the patella and the tibia are particularly swollen (Pl. I, Fig. 5).

2) This species is offered to Prof. S. MAKINO in honor of his greatest kindness of collecting this specimen.
The femur ventrally and dorsally is provided with black spine-like hairs. The patella is slightly longer than the femur and is totally covered with black hairs, on its ventral side it has no teeth. This makes it a valuable feature distinguishing this species from its nearest relation. The basal half of the tibia is swollen and toward the apical end becomes slender; as a whole, this joint is somewhat bent inward. The smooth-iron-like tarsal joint is articulated through a small stalk to the end of tibial joint. Both tibial and tarsal joints are thoroughly furnished with black stout spines which are particularly thick on the superior and inferior surfaces and they stand out nearly at right angles to the joints.

The legs are relatively short. The coxae are furnished with black spines, and the other leg-joints with spines or spine-like small hairs. The second femur is provided with 4-5, and the fourth femur with 4 white rings which are considered to be false articulations, in their middle portions.

Coloration: The coloration of this species is not bright but seems to be relatively sober. The ground color of cephalothorax and the dorsal surface of the abdomen is dirty yellowish white. The lateral margin of the cephalothorax and its sides, behind the ocular tubercle, including the first thoracic segment are rusty blackish brown. The second thoracic segment laterally is the same color. The dorsal surface of abdomen is laterally rusty brown, and along the lateral margin presents several pale flecks of various shapes. The ocular tubercle is almost black, the median groove is pale rusty brown. The ventral surface including the genital plate and the coxae of legs is uniformly yellowish white. The spines which are present on these surfaces are black, in marked contrast to the whitish ventral surface. The chelicerae and palpi are yellowish. All leg-joints are brown, only the femora are basally white, but they never form two white rings (Pl. I, Fig. 6). The noduli-like rings of the second and fourth femora are equally white.

The measurements are as follows: ♀: length of body 2.2 mm; breadth of abdomen 1.2 mm; breadth of cephalothorax 1.3 mm; length of palpus 3.2 mm; length of femora (in mm): I 1.6; II 2.5; III 1.6; IV 1.7; length of legs (in mm) I 6.9; II 12.6; III 7.0; IV 9.5.

Locality: 2♀, 3rd. X. 1948. Nopporo. S. SUZUKI.

Remarks: This new species has a close affinity to S. pygnaeum inhabiting in Japan proper, Shikoku and Kyushu, but the former can be distinguished from the latter in the following characteristics: the male palpal-patella of the latter has one conspicuous black tooth on its inferior surface, but the former has never such a tooth there;
further both species differ remarkably in the structure of the dorsal protuberance of the first joint of the male chelicerae, basal parts of the second and fourth femora of legs and in the armaments of the dorsal surface of the body.

The type specimen is preserved in the Zoological Laboratory of the Hiroshima University.

2. Spec. Mitopus morio (FABRICIUS)

*Phalangium morio* FABRICIUS, 1779, Reise Norw., p. 341.
OLIVIER, 1791. Enc. méthod., 6, p. 459.


KOLOSVARY, 1929. Magyarország Kaszisapkokjai, Budapest, p. 100.


For the voluminous literature except those which have been mentioned above, see SUZUKI's former papers.

Since this species was described for the first time by FABRICIUS (1779) as *Phalangium morio*, prodigious numbers of names have been given by different writers to this species. This resulted from its extremely wide range from Europe, Asia to North Africa. The populations of various localities are not identical in form, but exhibit remarkable differences. In Japan this species has been reported for the first time by the author (1939) from the Japanese Alps. Ever since (1941) he recorded the occurrence of this species in southern Sakhalien, but these two forms were fairly different in a certain characters. In Hokkaido only a single specimen was collected from Mt. Asahidake (2290 m above the sea level, one of the famous Mt. Daisetsu). In this island this species is considered to be a mountain-species and not a common form. The specimen from Hokkaido differs in the coloration and the measurements of body and legs from...
the mainland form; on the other hand it agrees fairly with that of
the southern Sakhalien.

**Locality:** 1♀, 24th, VIII, 1947, Mt. Asahidake (2290m above the
sea level), T. IMAMURA.

**Geographical distribution:** Europe, Asia, Iceland, Spitzbergen, North
Africa, Siberia, China, Manchuria, Japan proper, Hokkaido, southern
Sakhalien.

3. Spec. Oligolophus aspersus (KAR SCH)


**Locality:** 1♀, VIII, 1936, Sapporo, T. IMAMURA; 3♂, VIII, 1937,
Obihiro, S. KOMAMURA; 1♀, 22nd, VIII, 1948, Sapporo, T. IMAMURA;
1♀, 21st, IX, 1948, Asahigawa, T. IMAMURA.

**Geographical distribution:** Japan proper, Shikoku, Kyushu, Hokkaido,
southern Sakhalien.

4. Spec. Liobunum japonicum MÜLLER


**Locality:** 1♀, VIII, 1936, Sapporo, INOUE.

**Geographical distribution:** Japan proper, Kyushu, Shikoku, Hokkaido.

5. Spec. Nelima genufusca (KAR SCH)


Geographical distribution: Japan proper, Shikoku, Hokkaido, southern Saghalien, Korea.

Variation in species: Nelma grunfusca is one of the most common species in Japan; it is particularly numerous in summer and autumn in mountains and fields. It is such a widespread species occurring from Korea, Japan proper including Shikoku and Hokkaido to southern Saghalien, that the external characters in the various localities differ within wide limits. For example, the members inhabiting Mt. Hiko (Kyushu) have the most conspicuous differences from those of another localities. SATO and SUZUKI (1939) regarded them as a different species, Nelma nigriuxa. KISHIDA (1927, 1947) described two species of this genus, N. valida KISHIDA and N. montana KISHIDA. I have gathered numerous specimens of these species from various localities of Japan and adjacent islands and studied them comparatively. Lately I have confirmed that N. valida is a melanistic male individual of N. grunfusca and N. montana is a female individual of the same species; accordingly both species which were described by KISHIDA as different species, are identical with N. grunfusca.

Numerous specimens have been collected from various localities of Hokkaido and measurements were made of the length of legs and body of over a hundred individuals of this species. On this subject the author will publish more complete studies in the another paper. In this paper he limits his statements to the extent of legs alone. In Fig. 1, the variation of the length of 4th leg in different populations of this species is shown. For comparison the results of several populations in Japan proper are also cited in the figure. In Text-fig.
1. the localities are arranged according to their latitudes, namely, the dwelling-places situated in the lowest latitudes have been arranged in the uppermost positions respectively. The legs of this species are notably characterized by their great length and delicacy. If we compare the length of legs of different populations, we find, in general, that the means of legs are not always of the same value, and the means of 4th legs in no two localities are identical. Sometimes such differences are quite conspicuous. I have been able to ascertain in the present study that the legs are never definite in length, but vary within the wide limits not only in the different individuals of the same locality but also in the populations of different localities. In general, the legs of the populations of Hokkaido are shorter than those of Japan proper. For example, in comparison of the extreme cases of Asahigawa (in the north of Hokkaido) and Sandankyo (near Hiroshima, in the south of Japan proper), the longest leg of the shortest-sized population (Asahigawa) was considerably shorter than the shortest leg of the longest-sized population (Sandankyo). Thus the length of the legs of various populations varies in different localities, it tends to vary in an orderly way, and the size variants are generally arranged in so-called “clinal” character (HUXLEY, 1939). Namely, the means for southern localities are greater than those for the northern ones, they decrease approximately in proportion to the increase of latitude. If we take the greatest mean of 4th leg of Sandankyo as 100, the ratio of the populations of Hokkaido to Sandankyo is respec-
The legs of the populations of Hokkaido are thus only about 60 to 70 percent as great in length as the legs of the longest-sized population of Japan proper. In a comparison of the shortest-sized and the longest-sized population, they would show remarkably different appearances, so that to some amateur collectors they would seem fairly distinct species. It seems accordingly to be quite well established that the legs of this species decrease in length in proportion to the increase of latitude. Thus in such geographic variation of this species we can recognize a certain distinct regularity; nevertheless, it is often locally reversed. In Text-fig 1, Nopporo is situated slightly more northerly than Sapporo, but the mean of the former population is greater than that of the latter; the same is found in the case of Hiroshima and Sandankyo. Although two localities exist in comparatively close proximity, the ecological environments, for example, temperature, humidity, wind, light, and so forth, of their habitats may be considerably different. These environmental differences are considered to have some effects on the regularity of the variation of legs. There exist similar exceptions in the high mountain-species; for example, Mt. Tateyama (3015 m above the sea level), one of the Japanese Alps, is situated in far more southerly than Asahigawa, yet the mean length of the legs of the former population is smaller than that of the latter population (SUZUKI, unpublished). It might be thought accordingly, that the legs are variable in length not only according to latitude, but also according to the complicated ecological factors.

To know the physiological mechanism of these phenomena is very difficult and references on this subject are few. Whatever it may be, the length of legs of this species differs in different localities. The explanation would be of very interesting from the viewpoint of the problem of species-formation.

In addition to this geographic variation, I wish to describe another interesting fact. In Text-fig. 1, we can see some particular exceptions in which the length of legs is enormously different from the normal ones and falls outside of the amplitude of variation. These populations were found in Nopporo and Asahigawa, they mixed with normal populations in the same dwelling-place. The author ascertained the
existence of such abnormal populations in various habitats of Japan proper also. These abnormal populations have extremely short length of legs, i. e. the length of 4th legs of the short-sized populations is as follows (in mm):

<table>
<thead>
<tr>
<th>Locality</th>
<th>Nopporo</th>
<th>Asahigawa</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean of normal 4th leg</td>
<td>♂ 72</td>
<td>♀ 70</td>
</tr>
<tr>
<td>Length of abnormal 4th leg</td>
<td>♂ 49-50</td>
<td>♀ 45</td>
</tr>
</tbody>
</table>

Thus the differences of the length of legs between the normal and short-sized populations are very distinct, furthermore, the body-size of both populations is so remarkable, that at first I thought that the dwarf type might be not yet fully developed individuals. According to my careful study, they show good secondary sexual characters and are considered to be completely matured or at least almost matured individuals. Although it is unpublished, I have ascertained that there exists a particular ecological type of this species, which is enormously smaller in the size of the body and leg, in Mt. Ishizuchi (Shikoku) and in the neighboring of Nikko. The existence of such an ecological type would suggest that the dwarf type is not merely a teratological form, but both normal and dwarf types may coexist in nature.


The body of the male is nearly ellipsoidal in shape and dorso-ventrally is a little flattened; that of the female is remarkably convex, in fully matured individuals typically oval. The surface of the cephalothorax is almost smooth, but along with frontal margin there are to be seen four or more minute teeth (Pl. I, Fig. 13). The cephalothorax and the first two thoracic segments are quite normal. The second thoracic segment is divided by a distinct groove from the abdomen. The 1-5 dorsal abdominal segments vary in degree of the development of the chitinization, in the different individuals. In some cases every segment is bordered by a stippled shallow groove, in other instances the border line of the segments becomes indistinct; in extreme cases the chitinization of segments is so much developed that the boundary of segments almost disappears, with only the trace of the border line left on its sides. The second segment is always provided with a median short spine, which is blunt and in the lateral
habitats of Japan and especially the body-size of the males. According to the difference of coloration the male individuals may be roughly arranged in the following three groups, i.e., patterned type, stripe type and melanistic type.

1. Patterned type (Pl. I, Fig. 8): As the name shows, the members of this type have a distinct color-pattern on the dorsal surface of the body. The ground color of the cephalothorax is yellowish white. Its lateral margin is rusty brown. Laterally and in front of the ocular tubercle, ground surface is whitish with many rusty brownish flecks in various sizes and shapes. From the median point of the frontal margin run two fine pale brownish lines, which do not reach the ocular tubercle. The dorsal scutum is reddish.
brown with pale flecks. In the dorsal median line of the body is a broad dark brown or black stripe, which starts from the anterior margin of the first thoracic segment and once becomes narrow on the posterior margin of the first dorsal scutum segment; on the second segment it becomes broad again and on the following segments runs with nearly the same breadth, ending on the posterior margin of the fifth segment. The median stripe is sectioned segmentally by the pale yellowish band on each border line, and each segment within its median fleck is marked with a pair of yellowish spots. Along the lateral margins of the stripe are pale brownish yellow flecks of various shapes. The free dorsal segments are brown, medially a little darker and with a several pale yellowish spots. The ventral surface of body is uniformly whitish yellow, in some instances its middle parts are dirty colored. The color of the genital plate and coxa is similar to that of the ventral segment. The small humps and the small granules of coxae and the genital plate are resin-like brown. The chelicerae are pale yellow. The palpi are similar to the former, only the femur apically, the patella, and the tibia dorsally are brownish. All the leg-joints other than coxae are dark brown or blackish brown, but the trochanter dorsally, the femur basally are pale yellowish brown. The false articulations are white.

2. Stripe type (Pl. I, Figs. 9 and 12): The members of this type bear a close resemblance in coloration to the former type, but in this type it is darker and the patterns are not so conspicuous as in the former group. The fundamental type of pattern is generally like the former but the median stripe is not separated in each segment and it marks the middle of the upper surface. The dorsal scutum within the stripe, segmentally exhibits a pair of small pale spots, and on its sides exhibits numerous pale flecks of various shapes. The ventral surface is more dirty than that of the first type.

3. Melanistic type (Pl. I, Figs. 10 and 11): The individuals of this type are those in which the phenomenon of melanism is strongly developed, the degree of melanism varies in different specimens. In the extreme instances the abdomen has seldom any patterns, is almost deep black, with only a trace of dorsal stripe on the lateral side of the first segment. In some cases in which the melanism is not so extremely developed there exist several pale flecks in the two longitudinal rows on the lateral sides of the dorsal scutum. The coloration of cephalothorax is like that of the first type, but the color is deeper and as a whole it looks darker. The ventral surface of the abdomen medially is dirty brownish.

The coloration of the female is almost the same as in the first type, but is relatively pale and the patterns are more distinct than in
The body of the male.

**Measurements** (in mm): Length of body, ♂ 3.5-4.9; ♀ 4.8-7.9; breadth of abdomen, ♂ 2.5-3.4; ♀ 2.6-5.4; breadth of cephalothorax, ♂ 2.5-3.4; ♀ 2.5-3.5; length of palpus, ♂ 3.5-4.2; ♀ 3.2-4.2; length of femur, ♂: I 3.9-5.8 II 6.8-10.5 III 4.0-6.5 IV 5.5-9.0; ♀: I 3.1-6.2 II 5.8-11.5 III 3.2-7.1 IV 5.0-9.5; length of leg, ♂: I 18.1-29.1 II 31.0-51.9 III 20.5-31.1 IV 27.1-42.1; ♀: I 16.8-28.0 II 29.9-55.0 III 17.6-33.4 IV 24.5-41.5.

As above described, the results of measurements show a remarkable variation in different individuals and localities. In this species I was able to find similarity to the instance of *Nehma genjusca*, but it will be fully reported in another paper.

**Locality:** The numerous specimens were collected from the following localities. VIII, 1937, Obihiro, S. KOMAMURA; VIII, 1946, Sapporo, T. IMAMURA; 20th, VIII, 1948, Asahigawa, T. IMAMURA; IX, 1948, Asahigawa, T. IMAMURA; 27th to 29th, IX, 1948, Asahigawa, S. SUZUKI; 3rd, X, 1948, Nopporo, S. SUZUKI; 4th to 5th, X, 1948, Sapporo, S. SUZUKI.

**Remarks:** The new subspecies is fairly distinguishable from the ground form inhabiting in Japan proper, Kyushu and Shikoku, in the following characteristics. In the new subspecies the melanism is notably developed and in extreme instances the abdomen is almost black, but in the ground form it is never seen. The ground form has no armaments on the frontal margin of the cephalothorax, but the new subspecies are provided with several teeth here. On the other hand the armaments of the ocular tubercle are much stronger in the former than in the latter. Furthermore, the spine of the dorsal scutum is conspicuously different in both forms.

The type-specimen is preserved in the Zoological Laboratory of the Hiroshima University.

**On the variation of the false articulations:**

The members of Sub-family Gagrellinae have always at least one false articulation on the second femur of leg. RÖWER (1923, 1929) has put particular emphasis on the false articulations of the femora of legs and he separated the genus *Gagrella*, one genus of its Sub-family, including numerous species, into many genera by the number and distribution of noduli. He said (1929) "...with very rare exceptions, the number and distribution of the noduli are almost always constant in each genus and species." BANKS (1930) studied the Opiliones-fauna of Borneo, but in that study he did not support RÖWER’s view. In the author’s experience in some instances the number and distribution of the false articulations are rather constant, but we met often with cases in which they are not always constant,
accordingly I think that the number and distribution of the false articulations may be important characters in classification in some degree, but that they could have never absolute value of distinguishing the many genera and species as ROEWER believed. I have carefully observed the number and distribution of the false articulations in this species, the results are shown in the following table.

<table>
<thead>
<tr>
<th>Locality</th>
<th>Asahigawa</th>
<th>Obihoro</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No. of specimen</td>
<td>1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26</td>
<td></td>
</tr>
<tr>
<td>Number of noduli</td>
<td>Right femur</td>
<td>1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 2 3 4 1 2 2 2 3 4 1 2 2 2</td>
</tr>
<tr>
<td>Left femur</td>
<td>1 2 2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 3 1 1 1 1 1 1 2 1 1 2 2 2 2 1 2</td>
<td></td>
</tr>
</tbody>
</table>

As is shown in the table the numbers of the false articulations are not so constant, there exists a notable variation of numbers. Especially, they are often different on the two sides. The ratio of each femur to the total numbers of femora is shown in the following table:

<table>
<thead>
<tr>
<th>Number of noduli</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>1?</th>
<th>2?</th>
<th>1+1?</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of femur</td>
<td>5</td>
<td>50</td>
<td>28</td>
<td>3</td>
<td>5</td>
<td>1</td>
<td>1</td>
<td>93</td>
</tr>
<tr>
<td>Ratio of femur to total no. of femora</td>
<td>5.4%</td>
<td>53.8%</td>
<td>30.6%</td>
<td>3.2%</td>
<td>5.4%</td>
<td>1.1%</td>
<td>1.1%</td>
<td>100%</td>
</tr>
</tbody>
</table>

As is shown in the table, the femur having one nodule is 53.8 percent, that having two is 30.0 percent and that having no nodule is 5.4 percent, all the rest (10.8 percent) have various numbers of noduli. The false articulations are thus not always constant in the same species, we can not therefore, accept totally the ROEWER’s argument. I think that the problem on the importance of the false articulations should be more carefully studied.
Summary.

1. Six genera including five species and one subspecies of harvesters were known from Hokkaido.
2. Saraccon maki nobi and Gagella japonica yezoensis are new to science.
3. So far as the Opiliones fauna is concerned, in Hokkaido the northern, holarctic elements are remarkably dominant than the southern, oriental ones.
4. The legs of Nellina geminata vary in length in different populations; they show a "clinal" variation in general, namely, they vary inversely with the latitude.
5. In Nellina geminata there exist two types, normal and dwarf types in the same locality.
6. The variation of Gagella japonica yezoensis was discussed.

Literature.

Explanation of Plate I.

Figs. 1-7. *Sabacon makinoi* n. sp.

- Fig. 1. Dorsal view of the body. $\times 15$.
- Fig. 2. Left chelicera, lateral view. $\times 30$.
- Fig. 3. First joint of right chelicera, dorsal view. $\times 30$.
- Fig. 4. Right cheliceral chelae, dorsal view. $\times 60$.
- Fig. 5. Left palpus, outer-side view. $\times 30$.
- Fig. 6. Right, second femur of leg, outer-side view. $\times 15$.
- Fig. 7. Penis, ventral view. $\times 60$.

Figs. 8-17. *Gagrella japonica yezoensis* n. subsp.

- Figs. 8-10. Dorsal view and Figs. 11-12. lateral view of the body. $\times 10$.
- Fig. 8. Patterned type. Loc. Asahigawa. Dat. 21 Sept. '48.
- Fig. 9. Stripe type. Loc. Asahigawa. Dat. 20 Aug. '48.
- Fig. 10. Melanistic type. Loc. Asahigawa. Dat. 21 Sept. '48.
- Fig. 11. Melanistic type. Loc. Asahigawa. Dat. 21 Sept. '48.
- Fig. 12. Stripe type. Loc. Asahigawa. Dat. 21 Sept. '48.
- Fig. 13. Anterior half of cephalothorax with chelicerae, dorsal view. $\times 15$.
- Fig. 14. Lateral view of ocular tubercle. $\times 30$.
- Fig. 15. Left chelicera, inner-side view. $\times 15$.
- Fig. 16. Left palpus, inner-side view. $\times 15$.
- Fig. 17. Penis. $\times 20$. 

(16)
SUZUKI, S. Studies on the Japanese Harvesters. II. Pl. I.
