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<th>Title</th>
<th>Preliminary Notes on Thysanoptera in Sapporo and the Vicinity (With 17 Text-figures and 1 Table)</th>
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<td>Author(s)</td>
<td>KUDÔ, Iwao</td>
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<td>JOURNAL OF THE FACULTY OF SCIENCE HOKKAIDO UNIVERSITY Series VI. ZOOLOGY, 17(3): 446-461</td>
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北海道大学理学部紀要 に掲載の試単に於て は 北海道の一部及 びその周辺地方に於ける 羽翼目数種 の 生態に関する研究を行った。本研究所は 北海道大学理学部紀要 に掲載されたものである。
Preliminary Notes on Thysanoptera in Sapporo and the Vicinity1)

By

Iwao Kudō2)

Zoological Institute, Hokkaido University

(With 17 Text-figures and 1 Table)

In spite of their morphological peculiarities and economic importance, the studies on thrips or Thysanoptera have so far relatively been neglected in comparison with those on other insect groups. In Japan, too, no comprehensive work has so far been published except for the serial publications by Kurosawa (1929-1941), the final result of which was compiled in his recent synopsis (1968). Although this work gave the first framework to clarify the thysanopterous fauna of Japan, there are still numerous problems to be solved in taxonomic as well as in biologic and ecologic fields. This is especially true to the fauna of Hokkaido, because most previous studies have chiefly been made with the specimens from Honshu. For this reason, the present writer has carried out a preliminary survey of thrips inhabiting Sapporo and the vicinity, together with some biologic observations, especially on the flower preference as described bloom. The present paper deals with the taxonomic part of this survey, leaving the ecologic part in the next report.

Material and Methods

Most specimens were collected at Bannaguro near Ishikari and the campus of the Hokkaido University, partly also at other localities (Bankei, Maruyama, Tsukisappu, etc.). At collecting, each flower, or in case of composites and clovers, each head was separately packed in a polyethylene tube or bag, and the thrips were extracted in the laboratory. Sweeping on weeds and direct brushing from standing plants were also occasionally applied. Some specimens were discovered on soil. For identification of species and sex, the total slide preparations were made by using Neo-Shigaral medium. Concerning specially dark species, the specimens were left for several hours to one day in 10% caustic potash solution before preparation.

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The writer wishes to express his cordial thanks to Prof. M. Yamada and Dr. Sh. F. Sakagami of the Zoological Institute, Hokkaido University, for their valuable advices to the present study. Sincere thanks are also due to Mr. M. Saikawa of the Entomological Laboratory, Tokyo Agricultural College, for his kind suggestions concerning certain diagnostic characteristics.

Up to the present, sixteen species of thrips have been recorded from Hokkaido, thirteen of which were reported mainly by Kurosawa (1968). In the present paper, sixteen species are recorded from Sapporo and the vicinity. Among them three (Sericothrips gracilicornis, Aptinothrips rufus and A. stylifera) are new to Japan, and four (Taeniothrips distalis, T. flavidulus, Thrips hawaiiensis and Th. nigropilosus) are new to Hokkaido. Besides these species, three additional species were collected but they are not included in the present paper, because all are represented only by a single specimen and their accurate identification required further studies by using much more specimens. Most specimens recorded below were collected from various flowers. The plants marked with asterisk are those from which numerous specimens were collected and will be discussed in the next report. The specimens taken by sweeping or discovered on soil are shown by “Sweep”, and “Soil”, respectively. Unless particularly mentioned, the specimens were collected by the writer in 1969. Certain frequently cited localities are abbreviated as follows: Bannaguro (BN), the campus of the Hokkaido University (UC), the Botanical Garden of the Hokkaido University (BG).

Family Aeolothripidae

Aeolothrips Haliday

*Aeolothrips fasciatus* (Linné)

1761 *Thrips fasciata* Linné, Fauna Svecia: 266.

Host plants and Specimens examined: *Arabis japonica* (1♀, V-24, 2♂♂, VI-11, BN); *Viola grypoceras* (1♀ & 2♂♂, VI-2, BN); *Trifolium repens* (white clover, 1♀, VI-20, BN; 1♀, VII-21, UC); *Trifolium pratense* (red clover, 1♀ & 1♂, VI-20, 2♂♂, VII-4, 2♂♂ & 1♂, VII-18, 1 larva, VII-31, BN; 1♀ & 1♂, VI-27, UC); *Taraxacum officinale* (European dandelion, 2♂♂, V-24, BN; 3♂♂ & 1♂, V-30-67, 2♂♂ & 1♂, VI-5-67, Bankei): *Rosa rugosa*; *Vicia japonica* (3♂♂, VIII-27, 4 larvae, IX-10, BN); *Vicia cracca* var. *japonica* (1 larva, VII-31, BN); *Lathyrus maritimus*.

Family Thripidae

Chirothrips Haliday

*Chirothrips manicatus* Haliday

1836 *Thrips* (Chirothrips) manicata Haliday, Ent. Mag. 3: 444.

Most specimens were found on Graminae but a few were obtained on other plants as the following.
Host plants and Specimens examined: *Taraxacum officinale* (1♀, V-24, BN; 1♂, VI-9, Bankei); *Arabis japonica* (2♀♂, VI-11, BN); *Plantago lanceolata* (1♀, VI-20, BN); *Rosa rugosa* (1♀, VII-18, BN); *Trifolium pratense* (1♀, VI-20, BN; 2♀♀, VII-30, UC; 3♂♂, IX-13, Tsukisappu, S. Mawatari leg.); *Phleum pratense*; *Polypogon monspeliensis* (23♀♂, VII-27, BN); *Miscanthus sinensis* (50♀♂ & 13♂♂, IX-10, BN).

**Sericothrips** Haliday

*Sericothrips gracilicornis* Williams

(Figs. 1–5)

1916 *Sericothrips gracilicornis* Williams, The Entomologist 49: 222.

Female (Macropterous): Head and prothorax dark brown. Pterothorax a little lighter. Abdominal segments I to VI brown; segments VII to X dark brown. All coxae dark brown; femora dark brown, tip of fore femora a little lighter; fore tibiae brown, mid and hind tibiae a little darker, except tips; tarsi yellowish brown. Fore wings brown with cross band near base, hyaline about one-seventh of length at middle; hind wings nearly transparent with brown longitudinal vein. Antennae dark brown, first two segments, distinctly paler, and third, paler at base, becoming darker to apex.

Reticulation: Frons, area around ocelli and back of head with transverse striation. A thick, heavily chitinised dorsal band running near posterior lateral margin of head to level of hind margin of eyes. Prothorax covered with a number of transverse dark striations. Striations of abdominal tergites I to VIII, and legs lined with minute setae. Mid-dorsal posterior part of abdominal tergites free from striations and setae. Each abdominal tergite with stout transverse internal thickening near anterior margin.

Head (Fig. 3) about 1.6 times as wide as long, and about as long as prothorax. Frons depressed in front of anterior ocelli. Eyes large, projecting slightly on frontal margin; length 72 μ, width 58 μ; distance between eyes 75 μ, about 1.3 times as wide as eye; distance from eye to back of head 42 μ, only a little more than half length of eye. Two stout spines on each side of frons in front of ocelli, one near mid line, length 39 μ, the other near margin of eye, length 33 μ; a stout spine just on each side of anterior ocellus, length 33 μ; one long and two short spines near posterior dorsal angle of eye and three forwardly directed spines on cheeks. Mouth cone reaching end of prosternum. Maxillary palpi three-segmented, with length I, 19–22 μ; II, 10–11 μ; III, 18–21 μ; labial palpi two-segmented, short.

Antennae (Fig. 2) eight-segmented, about 2.9 times as long as head. Segment I short and barrel-shaped; II longer but not so wide, tapering at each end but more distinctly at base; III long and slender, 3.5 times as long as wide, with a pedicel at base; IV shorter than III, about 3.0 times as long as wide; V about 2.6 times as long as wide, widest at middle; VI about as long as IV; VII and VIII short, VIII longer than VII. Forked trichomes dorsally on III and ventrally on IV, and much
shorter simple cones near apices of V and VI externally.

Prothorax (Fig. 3) about 2.3 times as wide as long, about as long as head, two-fifths wider than head. Two stout spines each on anterior and posterior angle of; two pairs on anterior margin; three pairs on posterior margin, longest second spines about 42 μ. Pterothorax normal. Legs long and slender; especially fore tibiae short, hind tibiae long, and about 8 times as long as wide. Fore wings about 18 times as long as wide at middle, far wider at base. No trace of a hind vein on fore wings; fore vein represented by a row of spines, 3 at base, followed by 13–16 additional ones; 23 spines on costa.

Abdomen normal, hind margin of tergites II-VIII nearly laterally with fairly

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Figs. 1–5. Sericothrips gracilicornis. 1. female, dorsal; 2. right antenna; 3. head and prothorax (reticulation of prothorax not shown); 4. right fore leg (reticulation and micro setae not shown); 5. abdominal segments VIII-X.

Figs. 6–10. Aptinothrips rufus. 6. female, dorsal; 7. right antenna; 8. head and prothorax; 9. right fore leg; 10. abdominal segments VIII-X. Fig. 11. Aptinothrips stylifera, right antenna.
stout spine inset. Along the whole of hind margin of I-VIII tergites each provided with fine comb, not interrupted medially. Hind margin of sternites II-VI furnished with alternate length of fine comb and six long slender inset spines. IX tergite with 14 stout long spines and X with two pairs of spines, as shown in Fig. 5.

Measurements (mm.): Total body length 1.3; head length 0.112–0.117, width 0.188–0.195; prothorax length 0.145–0.155, width 0.258–0.265; pterothorax length 0.260–0.270, width 0.320–0.325; abdomen across at widest part 0.410–0.435; fore wings length about 0.750, width at base 0.107 and at middle 0.041. Antennae 0.330–0.335 in total length, and,

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<th>VI</th>
<th>VII</th>
<th>VIII</th>
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<tr>
<td>Length</td>
<td>25–27</td>
<td>40–42</td>
<td>70–72</td>
<td>55–60</td>
<td>47–49</td>
<td>54–60</td>
<td>11</td>
<td>16</td>
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</table>

Fore femora length 0.150, width 0.066; fore tibiae length including tarsi 0.203, width 0.050; middle femora length 0.164, width 0.052; middle tibiae length including tarsi 0.219, width 0.041; hind femora length 0.218, width 0.050; hind tibiae length including tarsi 0.303, width 0.037. Length of spines; longest on IX abdominal segment about 75 μ; on X segment 75 μ.

Host plants and Specimens examined: *Lathyrus maritimus* (1♀, VI-11, 1♀, VI-20, BN); *Vicia cracca* var. *japonica* (1♀, VII-11, 1♀, VII-31, BN); Sweep (1♀, VI-11, BN).

Remarks: These five specimens differ from the original description of *S. gracilicornis* in relative length of maxillary palpi 11:5:10 instead of 7:5:6, and number of spines on the outer half of vein 13–16 instead of 16–20, and arrangement of spines on prothorax is also slightly different. But, they are otherwise so similar to the description and figure by Williams, that are tentatively identified with *S. gracilicornis*.

This is the first record of the species from Japan.

This species is incorporated to the key by Kurosawa (1968, p. 20) as follows:

**Anaphothrips** Uzel

*Anaphothrips obscurus* (Müller)


This species has so far been recorded from Japan (Hokkaido, Honshu), Europe, North America, Africa, Hawaii, Australia on various Gramineae plants.
Host plants and Specimens examined: *Taraxacum officinale* (1♀, micropterous, VIII–14–'67, Uraboro in east Hokkaido); Soil (3♂♂, macropterous, II–18–'68, UC); Sweep (1♂, micropterous, & 5♀♀, macropterous, VI–11, BN); *Plantago lanceolata* (1♀, macropterous, VI–20, BN); *Medicago sativa* (1♀, micropterous, VII–30, UC).

*Aptinothrips* Haliday

1838 *Aptinothrips* Haliday, Ent. Mag.: 445.


This is the first record of the genus from Japan.

This genus is put into Thripinae by Morison and into Chirothripinae by Priesner. Although the present writer is not yet sufficiently qualified to discuss its real affinity, he regards *Aptinothrips* provisionally as a member of Thripinae and close to *Anaphothrips*. On the other hand, Kurosawa (1968) regarded *Anaphothrips* as a member of Sericothripinae, so that, *Aptinothrips* had also to be incorporated into the same subfamily, provided his system should be followed. However, the present writer would like to recognize both genera as belonging to Thripinae, as shown by the following key supplementary to that by Kurosawa (1968, p. 21):

1. (4) Ocelli present but may be represented merely by spots of pigment; wings present or reduced.
2. (3) Antennae apparently nine-segmented owing to false partition across VI segment; prothorax without any strong spines ........... *Anaphothrips*
3. (2) Antennae eight-segmented; postero-angle of prothorax with four long spines ........................................... *Chaetanaphothrips*
4. (1) Ocelli absent; wings absent; body usually very narrow .... *Aptinothrips*

*Aptinothrips rufus* (Gmelin)

(Figs. 6–10)


Female: Body yellow or pale yellow. Tip of abdomen and mouth cone brown. Eyes dark to blackish red. Antennae yellow, VI segment brown at end.

Head (Fig. 8) longer than wide; anterior margin of vertex projecting between eyes. Cheeks slightly swollen. Eyes small, with length about one-third of head;
distance between eyes 57μ, about 2.3 times as wide as eye. Ocelli absent. Antennae (Fig. 7) six-segmented without style; I short, wide and rounded, with distal margin sloping inwards; II longer, widest at middle and rounded at base above short pedicel; III slender with double pedicels; IV and V slightly rounded; VI coniform and longest.

Prothorax (Fig. 8) slender, a little wider than head, without any strong spines. Pterothorax a little wider, short. Wings completely absent. Legs very short and wide. Abdomen straight; tip of IX and X segment clearly hyaline spines.

Measurements (mm.): Total body length 1.0–1.1; head length 0.130, width 0.120; head length including projecting vertex 0.145; prothorax length 0.135, width at widest part 0.185; pterothorax width 0.195; abdomen width at widest part 0.235; spines length on IX abdominal segment about 0.075–0.080; on X segment 0.050–0.055. Antennae about 0.210 in total length, and,

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<tr>
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<th>VI</th>
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<tr>
<td>Length</td>
<td>20-22</td>
<td>30-35</td>
<td>30</td>
<td>27-30</td>
<td>25</td>
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<tr>
<td>Width</td>
<td>30</td>
<td>25</td>
<td>20</td>
<td>20-22</td>
<td>20</td>
<td>19-20</td>
</tr>
</tbody>
</table>

Host plants and Specimens examined: Plantago lanceolata (1♀, VI–20, BN); Soil (1♀, IV–23, BN); Sweep (5♀♂, VI–9, BN.)

This is the first record of the species from Japan. This species is so far known in England, Europe, North America, India, and Hawaii on various grasses.

Aptinothrips stylifera Trybom

(Fig. 11)

1894 Aptinothrips stylifera Trybom, Ent. Tidskr. 15: 41.

Female: General form and structures as rufus. Body colour yellow. Antennae yellow; IV and V darker; VI brownish, becoming darker to apex; VII and VIII brown. Antennae (Fig. 11) eight-segmented; VI segment shorter than in rufus; style two-segmented; VIII slightly longer than VII.

Measurements (mm.): Total body length 1.1; Antennae 0.205 in total length, and,

<table>
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<tr>
<th>Segment</th>
<th>I</th>
<th>II</th>
<th>III</th>
<th>IV</th>
<th>V</th>
<th>VI</th>
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<tr>
<td>Length</td>
<td>20</td>
<td>30</td>
<td>30</td>
<td>25</td>
<td>25</td>
<td>42</td>
<td>10</td>
<td>12</td>
</tr>
<tr>
<td>Width</td>
<td>32</td>
<td>25</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>7</td>
<td>5</td>
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</table>

Spines length on IX abdominal segment 0.075; on X segment 0.060.

Host plants and Specimens examined: Soil (1♀, IV–23, BN); Sweep (1♀, VI–9, BN).

This is the first record of the species from Japan.

Key to species

Antennae six-segmented (without style) .......... rufus
Antennae eight-segmented (style two-segmented) .......... stylifera
**Taeniothrips** Serville

*Taeniothrips ref. distalis* Karny

(Figs. 12–17)

Female (Macropterous): Body dark to blackish brown. Femora dark brown; fore tibiae yellowish, shaded brown along outer and inner margins, mid and hind tibiae dark brown; tarsi yellow. Fore wings dark brown with a white cross band near base, hyaline about one-eighth of length at middle. Antennal segments I and II dark brown, III and extreme base of IV clear yellow, outer half of IV and V to VIII dark brown except for a pale ring near base of V. All spines on body and wings dark brown.

Head (Fig. 14) about 1.3 times as wide as long; slightly notched behind eyes. Eyes just half as long as head; distance between eyes same to width of eyes. Ocelli situated as shown in Fig. 14, interocellar spines very long, longer than eyes; a row of postocellular spines behind eye with length about 10–15µ. Maxillary palpi three-segmented with length, I, 25µ; II, 15µ; III, 22µ. Antennae eight-segmented, about 2.6 times as long as head, shape of segments as shown in Fig. 12 & 13; segment III longest, about 3.0 times as long as wide; IV slightly shorter than or equal to III, about 2.6 times as long as wide; V still shorter, about twice as long as wide; VI a little shorter than III, about 3.0 times as long as wide; VII and VIII short, VIII longer and narrower than VII; sense cone long and slender, III with a forked cone on dorsum, IV with a similar one ventrally, VI internally with a large one.

Prothorax (Fig. 14) about 1.2 times as long as head, two-fifths wider than head; four pairs spines along posterior margin, inner ones longest, 38µ in length. Pterothorax about twice as wide as prothorax, metanotal plate with 4 long spines along anterior margin, inner stout pair 80µ, outer pair 55µ long. Fore wings about 14 times as long as width at middle; hind wings with a median long vein; spines as follows, costa 24–26, fore vein 16–17 & 2 (or 3), hind vein 15–16.

Abdomen elongate, cylindrical but tapering after VIII segment; along posterior margin of IX and X segments with very long spines, as shown in Fig. 17. Comb along posterior margin of VIII segment weak on sides and absent at middle.

Measurements (mm.): Total body length 1.5–1.8; head length 0.150, width 0.190; prothorax length 0.175–0.185, width 0.250–0.265; pterothorax width 0.360–0.375; abdomen 0.425 across at widest part; fore wings length about 0.870–0.900, width about 0.065 at middle. Antennae about 0.380 in total length, and,

<table>
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<td>Length (µ)</td>
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<td>68–73</td>
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<td>68</td>
<td>10–13</td>
<td>20–23</td>
</tr>
<tr>
<td>Width (µ)</td>
<td>35</td>
<td>30</td>
<td>24</td>
<td>25</td>
<td>21</td>
<td>23</td>
<td>9</td>
<td>8</td>
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Length of spines; interocellars 0.080–0.085; antero-angulars of prothorax 0.034; outer postero-angulars of prothorax 0.080–0.085, inner 0.095–0.100; longest on IX abdominal segment 0.180–0.195; on X segment 0.150–0.170.

Host plants and Specimens examined: *Trifolium pratense* (*♀♀, VII–4, BN);
Variation in Vicia cracca var. japonica*.

Remarks: *Taeniothrips distalis* Karny is closely related to *T. formosae* Moulton. They are distinguished from one another by colouration of the antennal segments III, IV and V. According to Moulton (1928), "*T. formosae* is closely related to *T. distalis* Karny but may be distinguished by the longer antennae,

especially segments three and six, the nearly straight cheeks but converging towards posterior, the head being widest across at eyes, the basal portion of fourth antennal segment light yellowish, the darker and more noticeably enlarged fore femora, the darker wings, with only an indistinct light brown area near tip of fore wing, instead of clear whitish cross band." According to the description of these two species, there is little difference in proportion of antennal segment. Although the specimens collected by the writer agree with *formosae* in the colouration of antennae, there are some other differences in some characteristics. On the other hand, the present specimens are closely related to *distalis* in some characteristics,
especially concerning the distribution. \textit{T. distalis} is widely distributed from Southeast Asia to Honshu, while \textit{formosae} is known from Formosa but not recorded from Kyushu to Honshu. Both \textit{distalis} and \textit{formosae} are so far not recorded from Hokkaido. Although the present specimens nearly completely agree with the description of \textit{formosae}, the writer tentatively identified them with \textit{T. distalis} based upon the distribution. Further comparative studies are required, because both \textit{distalis} and the present specimens are variable in several characteristics. Some characters in \textit{distalis, formosae} and present specimens described above are synoptically shown as follows:

<table>
<thead>
<tr>
<th></th>
<th>\textit{formosae}</th>
<th>\textit{distalis}</th>
<th>the specimens recorded</th>
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<tbody>
<tr>
<td>Intercellular spine length</td>
<td>54</td>
<td>?</td>
<td>80</td>
</tr>
<tr>
<td>Antenna length</td>
<td>375</td>
<td>390</td>
<td>380</td>
</tr>
<tr>
<td>Length of antennal segments III to VI</td>
<td>72, 66, 45, 66</td>
<td>72, 74, 45, 62</td>
<td>70, 67, 43, 68</td>
</tr>
<tr>
<td>Colour of antennae</td>
<td>III and base of IV yellow</td>
<td>uniformly dark brown</td>
<td>III and base of IV yellow</td>
</tr>
<tr>
<td></td>
<td>costa 23</td>
<td>costa 31–32</td>
<td>costa 24–26</td>
</tr>
<tr>
<td>Spines of wings</td>
<td>fore vein 16 &amp; 2</td>
<td>fore vein 18 &amp; 2</td>
<td>fore vein 16 &amp; 2</td>
</tr>
<tr>
<td></td>
<td>hind vein 15</td>
<td>hind vein 17–18</td>
<td>hind vein 15</td>
</tr>
<tr>
<td>Longest spine on IX and X abdominal segments</td>
<td>165</td>
<td>192</td>
<td>195</td>
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\textit{Taeniothrips flavidulus} Bagnall


Female (Macropterus): Body yellow to orange yellow. Antennae yellow; III with brown at apex; two-thirds of IV at apex, half of V and VI-VIII brown. Rarely VII and VIII segments not separated clearly. Antennae 0.280–0.295 mm. in total length, and,

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<tr>
<td>Width ((\mu))</td>
<td>27</td>
<td>25–30</td>
<td>20–23</td>
<td>20–23</td>
<td>18–20</td>
<td>18–22</td>
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<td>7</td>
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</table>

Outer postero-angular spines of prothorax 0.075–0.077 (mm.), inner 0.080–0.082. Lateral spines on IX abdominal segment 0.098–0.105, mid-dorsal spines 0.075–0.080; on X segment 0.098–0.105.

Host plants and Specimens examined: \textit{Anemone Raddeana} (3♀♀, IV–26, UC; 3♀♀, IV–29, BG); \textit{Rhododendron brachycarpum} (1♀, VI–25, BG); \textit{Philadelphus satsumi} (3♀♀, VI–30, BG); \textit{Heracleum dulce} (3♀♀, VI–19–‘67, Maruyama; 2♀♀, VI–27, UC); \textit{Rosa rugosa} (1♂, VII–18, BN); \textit{Rosa} spp. (21♀♀ & 9♂♂, VII–25, BG); \textit{Cardiocrinum Glehni} (12♀♀ & 11♂♂, VII–25, BG); \textit{Vicia cracca} var. \textit{japonica} (2♀♀, VII–18, BN);
Lathyrus maritimus*; Medicago sativa (3♀♂, VII–30, UC); Trifolium pratense (4♀& 1♂, VII–16, Bankei); Trifolium repens (1♀ & 1♂, VII–21, UC); Cirisium spp. (3♀& 2♂, VII–21, UC; 63♀♂ & 18♂♂, VIII–22, Bankei; 13♀♂ & 4♂♂, VII–22–‘67, Akkeshi in east Hokkaido); Erigeron annuus (3♀♂ & 4♂♂, VII–25, BG); Rudbeckia laciniata (3♀♀, VIII–3–‘67, UC); Taraxacum officinale*; Robinia pseudo-acacia (1♀, VI–29, UC).

Remarks: The postero-angular spines of the prothorax of the secimens examined are clearly longer than in the description by Kurosawa, with the length nearly comparable to that in Thrips nigropilosus and Th. flavus. But the specimens are different from Th. nigropilosus in length of antennal segments, and from Th. flavus in relative proportion of head and prothorax. Probably they may represent an extreme of the variation range of Taeniothrips flavidulus.

Although Kurosawa and Bagnall recorded this species only from Eribotrya japonica, Citrus Aurantium subsp. nobilis var. Unshiu and Clematis sp., many host plants were recorded in the present survey as shown above. This is the first record of the species from Hokkaido.

**Frankliniella Karny**

**Frankliniella tenuicornis** (Uzel)

1939 Frankliniella tenuicornis Kurosawa, Volumen Jubilare Prof. S. Yoshida: 591–593.

Host plants and Specimens examined: Sweep (1♀, IX–10, BN). This species is known from Japan (Hokkaido, Honshu), Siberia, Manchuria, New Britain, Europe and North America.

**Frankliniella intonsa** (Trybom)

1895 Thrips intonsa Trybom, Entom. Tidskr. 14: 188.

Host plants and Specimens examined: Anemone Raddeana*; Anemone flaccida (2♀♀, V–16, UC; 3♀♂, V–12, 5♀♂, V–17, BG); Ranunculus repens (15♀♀, VI–25, 8♀♂, VI–28, UC); Gagea lueta*; Corydalis ambigua (2♀♂, V–3, UC); Tulipa Gesneriana (2♀♀, V–12, BG; 2♀♂, V–13, 3♀♂, V–18, UC); Forthia suspensa (1♀, V–10, UC); Narcissus Tazetta var. chinensis (6♀♀, V–12, 3♀♂, V–13, BG); Arabis japonica (3♀♀, V–24, 2♀♂, VI–2, 10♀♀, VI–11, BN); Brassica campestris subsp. Napus (53♀♀ & 2♂♂, VII–30, UC); Potentilla fruticosa (3♀♀, VI–30, BG); Iris ensata var. hortensis (12♀♀ & 3♂♂, VI–30, BG); Cardiocrinum Glehnii (2♀♂, VII–25, BG); Calystegia japonica (8♀♂ & 5♂♂, VIII–5, Sakaemachi); Rudbeckia laciniata (3♀♀, VII–21, 8♀♂ & 1♂, VIII–3, UC); Cirisium spp. (3♀♀, VII–21, UC; 8♀♂ & 3♂♂, VIII–22, Bankei); Erigeron annuus (2♀♀ & 1♂, VII–30, 4♀♂ & 1♂, VIII–3, UC); Hieracium umbellatum (3♀♀, VII–4, 2♀♂, VII–18, BN); Liliun lancifolium (24♀♀
& 9♀♂, VII-25-'67, in Sapporo city); *Medicago sativa* (17♀♂ & 41♂♂, VII-30, UC); *Trifolium pratense*; *Trifolium repens*; *Rosa rugosa*; *Taraxacum officinale*; *Vicia cracca* var. *japonica*; *Lathyrus maritimus*.

*Frankliniella intonsa* is widely distributed from Europe to Pacific coast of Eastern Asia, recorded from numerous host plants. This species is also a dominant species in the area surveyed.

**Thrips** Linné

**Thrips hawaiiensis** (Morgan)


Host plants and Specimens examined: *Taraxacum officinale* (1♀, VI-9, Bankei; 1♀, VI-28, UC); *Rosa rugosa* (1♀, VII-4, BN); *Trifolium pratense* (2♀♂, VII-16, BN); *Cirsium* spp. (14♀♂, VII-16, 2♀♂, VIII-22, Bankei; 54♀♂, VII-21, UC).

Although this species are so far known from various host plants, the writer could obtain it only from *Cirsium* spp. The intermarginal setae of the abdominal sternites are 8 to 11.

This species is new to Hokkaido.

**Thrips tabaci** Lindeman


Host plants and Specimens examined: *Arabis japonica* (3♀♂, VI-2, 6♂♂, VI-11, BN); *Vicia cracca* var. *japonica* (1♀, VII-15, UC); *Rosa rugosa* (1♀, VI-20, BN); *Brassica campestris* subsp. *Napus* (3♀♂, VII-30, UC); *Lathyrus maritimus* (1♀, VI-11, 2♀♂, VII-4, 2♀♂, VIII-27, BN); *Trifolium pratense* (10♀♂, VI-27, 8♀♂, VII-30, UC; 1♀, VI-20, 3♀♂, VII-4, 1♀, VII-18, 1♀, VII-31, 1♀, VIII-10, BN); *Taraxacum officinale* (1♀, VI-11, Sakaeemachi, 2♀♂, X-12, 1♀, X-24, UC); *Erigeron annuus* (2♀♂, VII-25, BG; 2♀♂, VII-30, UC).

*Thrips tabaci* is widely known in the world from various host plants, but in the present survey it was obtained only from the plants mentioned above. *Vicia cracca* var. *japonica* and *Rosa rugosa* are seemingly not the proper host plants, because only one specimen of them was obtained from each of them, nevertheless very many flowers were examined.

**Thrips nigropilosus** Uzel


Female (Macropterous): Body yellow. Antennae brown; segment I pale yellow; II paler; base of III, IV and V yellowish brown. Head 1.6 times as wide as long. Mouth cone long and slender. Maxillary palpi long, length I, 20μ; II, 11μ, III, 25μ. Antennae 0.260 in total length, and,
Segment | I  | II | III | IV | V  | VI | VII
---|---|---|---|---|---|---|---
Length (μ) | 25 | 35 | 48 | 42 | 36 | 50 | 20

Outer postero-angular spines of prothorax 0.065, inner 0.070. Lateral spines on IX abdominal segment 0.115, mid-dorsal spines 0.105; on X 0.100.

Female (Micropterous): Head, prothorax and antennae darker than macropterous, and anterior margin of abdominal tergites with brownish.

Male (Micropterous): General form and structures as in female. Spines shorter than female. Postero-angular spines of prothorax 0.047. Antennae 0.235 in total length, and,

Segment | I  | II | III | IV | V  | VI | VII
---|---|---|---|---|---|---|---
Length (μ) | 23 | 30 | 40 | 35 | 32 | 45 | 19

Host plants and Specimens examined: *Trifolium pratense* (1♀, macropterous, VI–27, UC); *Taraxacum officinale* (2♀♀, micropterous, X–12, 4♀♀ & 1♂, all micropterous, X–24, UC).

This species is new to Hokkaido.

Family Phloeothripidae

*Haplothrips* Serville

*Haplothrips chinensis* Priesner


Host plants and Specimens examined: *Viola grypoceras* (3♀♀, V–24, BN); *Arabis japonica* (1♀, V–24, BN); *Arabis* sp. (7♀♂ & 5♂♂, VI–9, Bankei); *Forsythia suspensa* (1♂, V–10, UC); *Narcissus Tazetta* var. *chinensis* (5♀♀, V–12, 1♂, V–13, BG); *Rhododendron brachycarpum* (2♀♀ & 1♂, VI–25, BG); *Brassica campestris* subsp. *Napus* (1♀, VI–17, Soranuma, H. Fukuda leg.); *Rosa rugosa*; *Trifolium pratense*; *Trifolium repens*; *Vicia japonica*; *Vicia cracca* var. *japonica*; *Lathyrus maritimus*; *Taraxacum officinale*.

This species is known from Japan (Hokkaido, Honshu, Shikoku, Kyushu), Formosa, China and Korea.

*Haplothrips aculeatus* (Fabricius)

1803 *Thrips aculeatus* Fabricius, Systema Rhyngotorum: 312.

Host plants and Specimens examined: *Taraxacum officinale* (1♀, VI–9, Bankei); *Trifolium repens* (1♀, VII–18, BN); *Trifolium pratense* (2♀♀, VII–4, 1♂, VIII–10, BN); *Plantago lanceolata* (4♀♀ & 1♂, VI–20, BN); *Phleum pratense* (1♀, VI–19, UC); Sweep (1♀, VIII–5, UC, 1♂, IX–10, BN).

This species is widely distributed in the northern hemisphere and mainly known from Graminae and many other plants. In the present survey, however, only a few specimens were obtained, because no intensive collecting was made with Graminae.
Thysanoptera in Sapporo

Haplothrips niger (Osborn)


Host plants and Specimens examined: Taraxacum officinale (2♀, VI-28, UC); Rhododendron brachycarpum (1♀, VI-25, BG); Brassica campestris subsp. Napus (1♀, VI-17. Soranumadake, H. Fukuda leg.); Lathyrus maritimus (1♀, VII-4, BN) Rosa rugosa (1 pupa, VII-4, 1♀, VII-31, BN); Vicia cracca var. japonica and Vicia japonica (2♀♀, VII-18, 3 pupae, VIII-27, 1 prepupa & 2 pupae, IX-10, BN); Plantago lanceolata (5♀♀, VI-17, BN); Trifolium pratense*; Trifolium repens.*

Kurosawa recorded this species only from clover at Koton in Sapporo in 1950. In the present survey, too, it was abundant on clover but not on other plants.

Adding to seven species newly discovered by the present survey, 23 species of Thysanoptera have so far been recorded from Hokkaido. As the present survey

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<th>Species</th>
<th>Region 1)</th>
<th>Hokkaido</th>
<th>Japan</th>
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<td>1. Aeolothrips conjunctus</td>
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<td>2. Liothrips glycinicola</td>
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<td>3. Ecaecanthothrips piceae</td>
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<td>4. Taeniothrips glycines</td>
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<td>5. Docessissophothrips frontalis</td>
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<td>7. Haplothrips subterraneus</td>
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<td>10. Taeniothrips distalis</td>
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<td>11. Taeniothrips flavidulus</td>
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<td>12. Frankliniella intonsa</td>
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<td>15. Frankliniella tenuscinis</td>
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<td>16. Liothrips vaneeckei</td>
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<td>17. Haplothrips aculeatus</td>
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<td>18. Thrips hawaiiensis</td>
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<td>19. Aeolothrips fasciatus</td>
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<td>20. Anaphothrips obscursus</td>
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<td>21. Thrips nigropilosus</td>
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<td>22. Aptinothrips rufus</td>
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<td>23. Thrips tabaci</td>
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| Total | 23 | 16 | 16 | 11 | 11 | 6 | 1 | 1 |

1) Pa (Palaearctic), Ne (Nearctic), Or (Oriental), Au (Australian including Hawaiian), Nt (Neotropical), Et (Ethiopean).

*:* Ubiquitous.  *:* Rare or localized.  ?: Dubious records.
was confined to Sapporo and the adjoining areas, it is assumed that much more species would be discovered through systematic collecting in other districts. Leaving further clarification for the future, a provisional sketch of the faunal make-up in Hokkaido was given in Table 1 based upon the previous records.

The species tabulated exhibit the following distribution patterns: Holarctic-Oriental 4 spp., Holarctic-Australian, Endemic to Hokkaido, each 3, Holarctic, Palaearctic, Palaearctic-Oriental, Oriental, Endemic to Japan, each 2, Palaearctic-Oriental-Australian, Holarctic-Oriental-Australian, cosmopolitan each 1. Among these species, some species included in the patterns Holarctic-Australian-Oriental, Holarctic-Oriental, Holarctic-Australian, Endemic to Japan-Australian-Oriental-Australian, might be proved by further studies, cosmopolitan or nearly, so either caused by the extension of the range through human influence or not. Among three species endemic to Hokkaido, Liothrips glycinicola and Ecacanthothrips piceae were not collected since their original descriptions, and the type specimen of L. glycinicola was lost.

Within the limit of the present knowledge, therefore, the thysanopterous fauna of Hokkaido is, as in many other insect groups, mostly composed of widespread species, chiefly of Holarctic elements, with an admixture of certain Oriental elements.

References


--- 1937a. A new species of Sericothrips from Japan. Ibid. 11: 115-117.

--- 1937b. Descriptions of four new thrips in Japan. Ibid. 11: 266-275, 1 pl.


--- 1949. Genera Thysanopterorum, Keys for the identification of the genera of the
   Desert Egypte, 13: 1–549.
Sakimura, K. 1937. A survey of host range of thrips in and around Hawaiian pineapple
Uzel, H. 1895. Monographie der Ordnung Thysanoptera. 472 pp. 10 pls. (Czech, with
   German descriptions). Königgrätz.
Williams, C.B. 1916. Biological and systematic notes on British Thysanoptera. Entomologist