

Simple key to important thrips pests of Canadian greenhouses

Third edition

Created by:

Ashley Summerfield (Vineland Research and Innovation Centre) &
Dr. Sarah Jandricic (Ontario Ministry of Agriculture, Food and Rural
Affairs).

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For further information regarding the development of this document, or use of photos or graphics contact Dr. Sarah Jandricic at Sarah.jandricic@ontario.ca or by phone at (905) 687-1277.

Authors

Ashley Summerfield, Senior Research Technician, Vineland

Sarah Jandricic, Greenhouse Floriculture IPM Specialist, OMAFRA

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Who is this Key Designed For?

This key was designed for use by growers of, and IPM practitioners in, greenhouse floriculture and vegetable crops in Canada.

What is the purpose of this key?

For greenhouse growers/IPM practitioners to easily and properly identify species of thrips infesting their crops without necessitating the use of outside identification services.

Proper thrips identification is important because A) the presence of some thrips species can threaten exportation of plant material (*e.g.* Chili thrips), and B) effective control measures can vary considerably by species. For example, onion thrips and chrysanthemum thrips are both usually susceptible to Success (spinosad), while western flower thrips is not. On-site identification means that proper control or eradication measures can be implemented more quickly.

Collecting thrips for identification:

Collect thrips using plant taps from multiple areas (randomly selected) to get a picture of the entire thrips population in your greenhouse, or from specific areas of concern. Thrips can be tapped directly into a shallow container of soapy water to kill them. Or, thrips can be tapped into a container with a lid, which can be placed in the freezer for at least 30 min to kill the thrips.

Thrips are easiest to examine under the microscope when dead, but not dried out. Therefore, samples should be identified within the next 48h after collection so the samples do not desiccate.

Light coloured thrips can be identified to species on sticky cards, although some of the features may be more challenging to see. Dark coloured thrips are very difficult to identify on sticky cards so it is best to only try to identify them using specimens collected from plant taps.

How to use this key:

All features used in this key can typically be seen using a mid-quality dissection microscope. Your microscope will need to have a **maximum magnification level of at LEAST 45X**. To determine the maximum level of magnification on your microscope, take the highest number on the adjustable magnification dial (*e.g.* 4.5) and multiply it by the magnification of the eyepiece (usually 10X).

For each numbered step (1-15), pick one of the two possible choices that most resembles your specimen. This will indicate the species OR the next step you should jump to.

For proper identification, **ADULT (*i.e.* usually winged) thrips must be used**. If none of the thrips in the sample have wings, they may be a wingless species. In this case, choose the largest thrips in the sample which have large eyes, a distinct head, thorax and abdomen (see Fig. 1). Larval thrips will appear more “tube like” without distinctive body parts and have small eyes.

Position the thrips stomach side down so that the wings and eyes are facing up, with the head facing away from you. This is often easier to do with a small probe or fine paintbrush with the thrips floating in

water (or 70% alcohol) in a Petri dish or other small clear container. Look at multiple specimens (minimum of 20) to confirm your identification for an infestation on a specific crop. To get a wider picture of your greenhouse population, at least 100 thrips should be identified.

NOTE: This key is NOT comprehensive for all thrips species that may occur in Canada (or that may be found on imported on plant material), but includes those **most likely** to be encountered in floriculture and/or vegetable greenhouses. If proper species identification is in doubt, please contact an OMAFRA IPM extension specialist, or the [National Identification Service](#).

Who was this key designed by?

This key was a collaboration between Dr. S. Jandricic at the Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA) and A. Summerfield at the Vineland Research and Innovation Centre in consultation with Eric Maw of the Canadian National Collection of Insects, Arachnids and Nematodes.

Where to find more information:

To see photos of the most common pests found in greenhouses, along with descriptions of their damage and host crops check out our article in Greenhouse Canada:

<https://www.greenhousecanada.com/meet-the-new-thrips-on-the-block/>

If you are looking for more detailed keys or those that cover more species, there are several keys available online:

<http://journals.fcla.edu/flaent/article/view/87973>

<https://content.ces.ncsu.edu/insect-and-related-pests-of-flowers-and-foliage-plants/thrips-in-the-greenhouse>

<https://keyserver.lucidcentral.org/key-server/player.jsp?keyId=26&thumbnails=true>

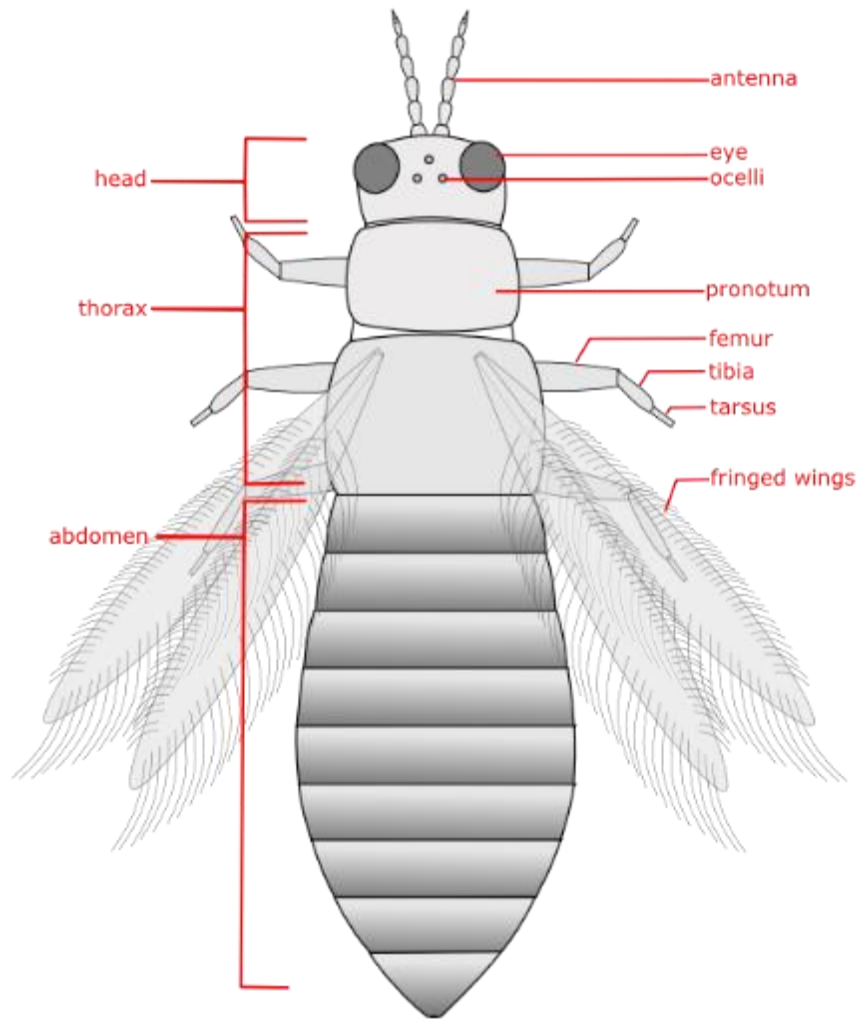


Figure 1. General anatomy of an adult thrips and important anatomical features used for identification in this key.

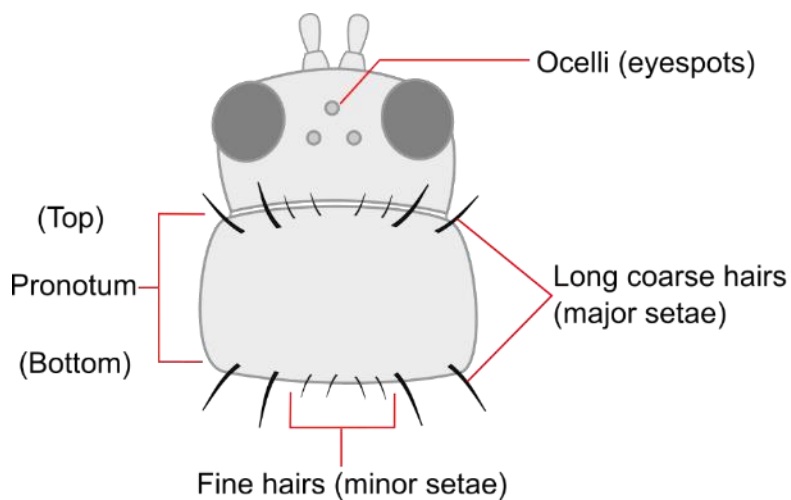


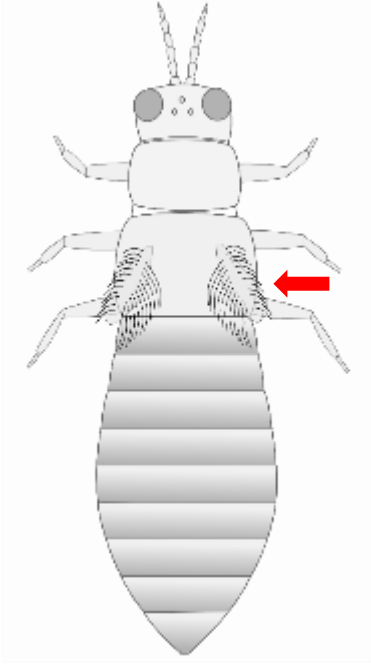
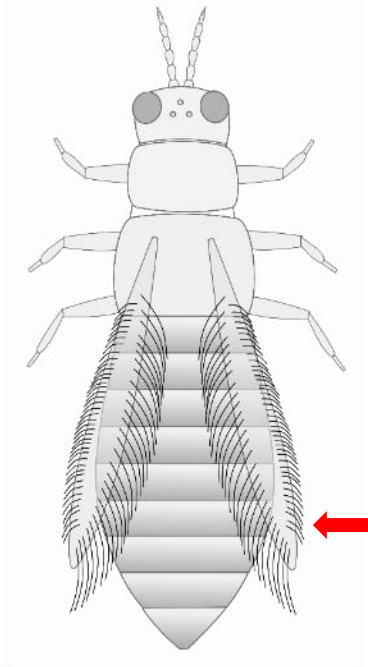


Figure 2. Close-up of features on the head and pronotum.

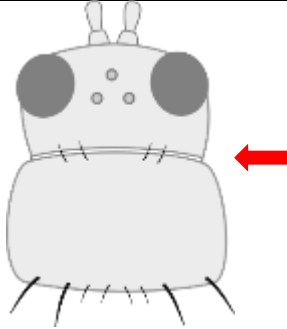
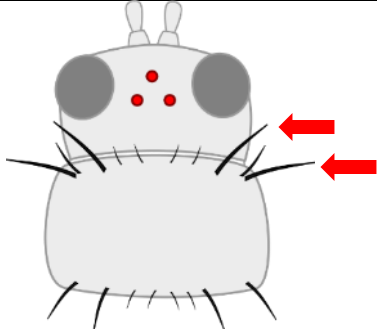
1.

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| <p>a. Head and pronotum light tan or yellow; abdomen either pale yellow/tan or light to medium brown (GO TO STEP 2)</p> | <p>b. Head, pronotum, and abdomen all brown to black in colour; head and pronotum may be lighter brown than the abdomen, but not yellow (GO TO STEP 6)</p> |

2. Light-coloured thrips:

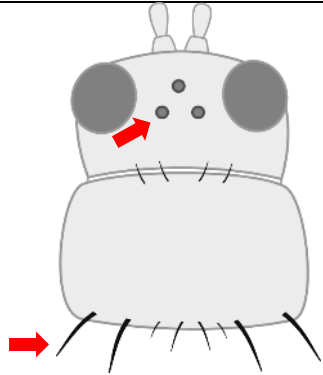
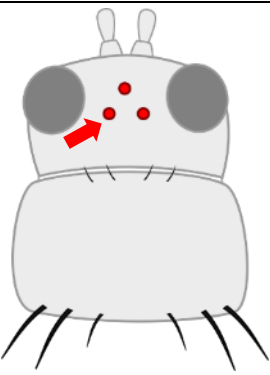
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| <p>a. Very short wings, shorter than the width of the body; usually only found on chrysanthemums and gloxinias; Chrysanthemum thrips (<i>Thrips nigropilosus</i>)</p> | <p>b. Long fringed wings extending nearly the full length of the body; (GO TO STEP 3)</p> |

3.

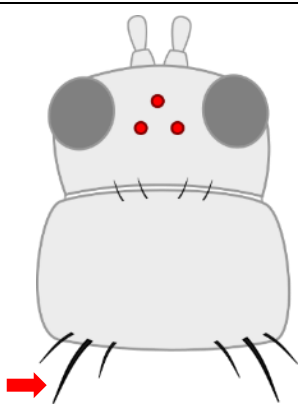
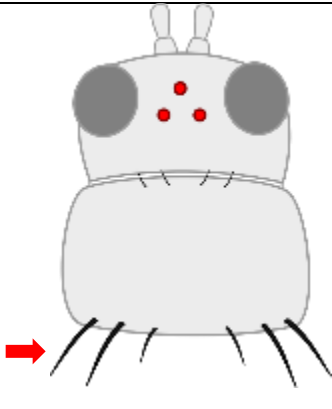
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|  |  |
| <p>a. No long coarse hairs on the top of pronotum; ocelli may or may not be red (GO TO STEP 4)</p> | <p>b. Top of pronotum has 2 pairs of long coarse hairs that are roughly equal in length; ocelli are red; most likely Western Flower Thrips (<i>Frankliniella occidentalis</i>) *</p> |

* In Ontario greenhouses, the majority of thrips you are likely to encounter will be Western Flower Thrips. However, they closely resemble other *Frankliniella* species. To differentiate them under a **compound microscope**, go to STEP 12.

4.

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| <p>a. Ocelli grey; 2 pairs of long coarse hairs on the bottom of the pronotum; foliar feeding damage: Onion thrips (<i>Thrips tabaci</i>)</p> | <p>b. Ocelli red; (GO TO STEP 5)</p> |

5.

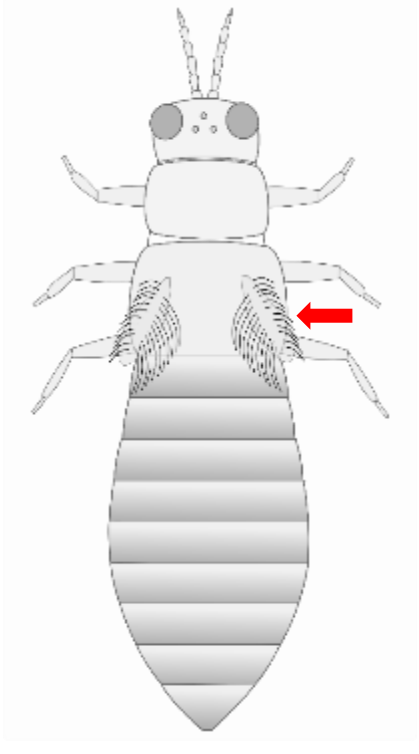
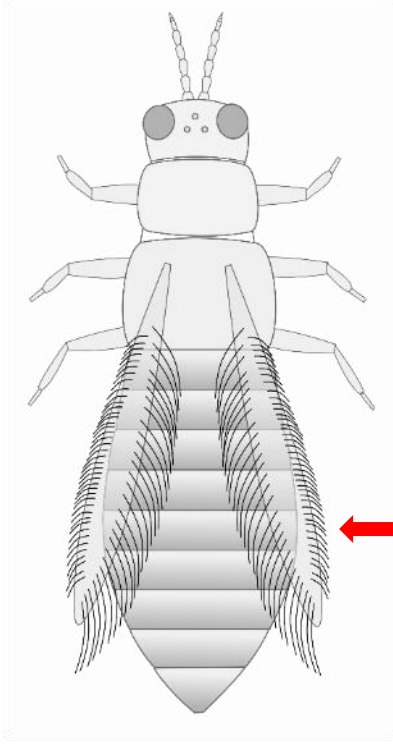
| | |
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| <p>a. 3 pairs of longer coarse dark hairs on the bottom of the pronotum, middle pair distinctly longer than the others. Small body size compared to other thrips species (including onion thrips). Usually found on tropicals; distinctive feeding damage that resembles broadmite damage:</p> <p>**Chilli thrips (<i>Scirtothrips dorsalis</i>). Not present in Canada but present in Florida, Texas, Mexico, and the Caribbean; possibly found on imported plant material. [if you have a compound microscope, see STEP 13]</p> | <p>b. 3 pairs of long coarse hairs on the bottom of the pronotum, outer two pairs distinctively longer than those in the middle; foliar feeding damage similar to Onion thrips:</p> <p>Most likely Chrysanthemum thrips, long winged morph (<i>Thrips nigropilosus</i>): not common, present throughout North America.</p> <p>If no wingless morphs also found, could be **Melon thrips (<i>Thrips palmi</i>): not present in Canada but present in Florida, Mexico, Central America, & Caribbean; possibly found on imported plant material. [See STEP 14]</p> |

****If you think you have found a species not usually present in Canada, such as *Thrips palmi* or *Scirtothrips dorsalis*, you should consult an OMAFRA IPM specialist to verify the identification and discuss management options.**


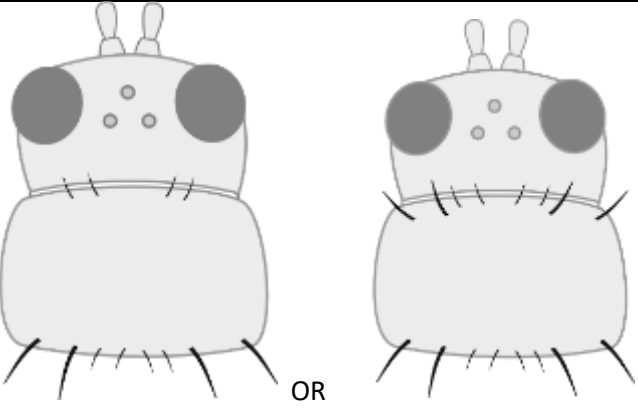
Dark-coloured thrips:

Dark-coloured thrips are very difficult to identify on sticky cards because the dark pigmentation makes the hairs on the pronotum nearly impossible to see. Dark morph onion thrips are lighter than all of the other thrips in this section, and their hairs are visible even on sticky cards. If you are finding thrips that are very dark brown to black on your sticky cards it is advisable to collect specimens from the crop before proceeding with this key (if you can't find any in your crop, you probably don't need to worry about them!)

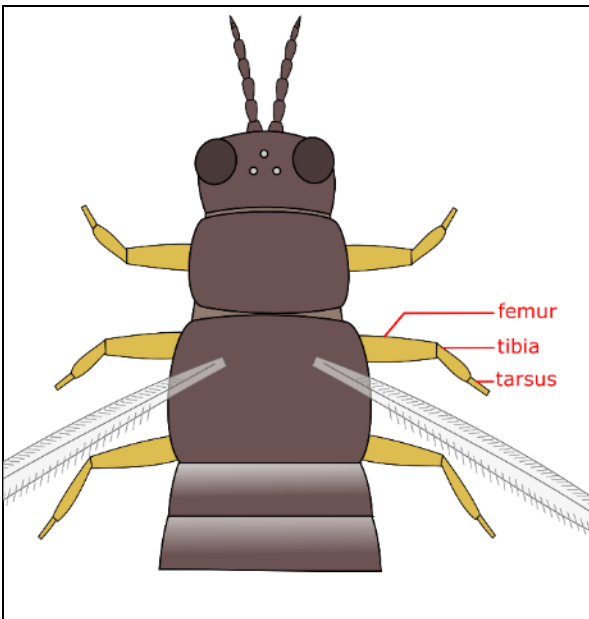
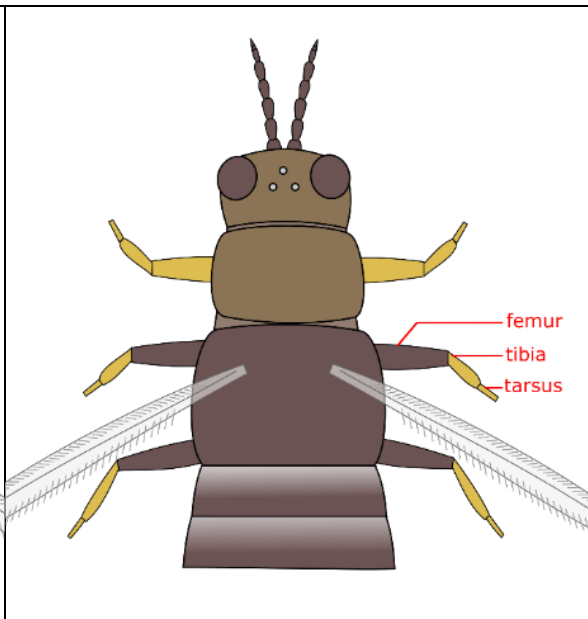
6.

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| <p>a. Very short wings, shorter than the width of the body; body dark brown to black; Tobacco thrips (<i>Frankliniella fusca</i>)</p> | <p>b. Long fringed wings extending nearly the full length of the body; (GO TO STEP 7)</p> |

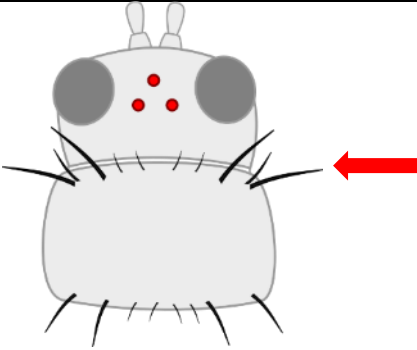
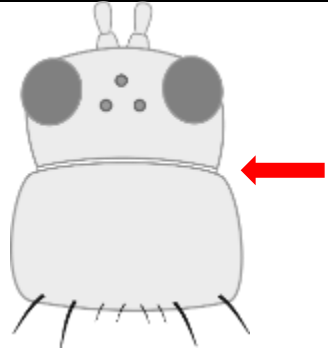
7.

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| <p>a. Pronotum has no long coarse hairs, front legs entirely yellow(GO TO STEP 8)</p> | <p>b. Pronotum has long coarse hairs; note that these are more challenging to see on black thrips (GO TO STEP 9)</p> |

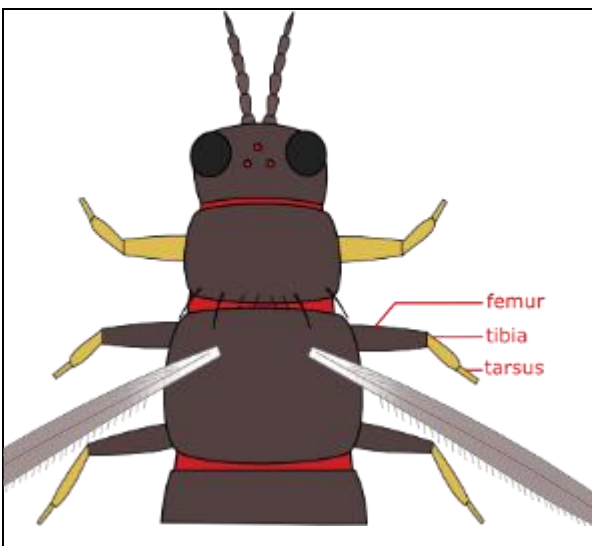
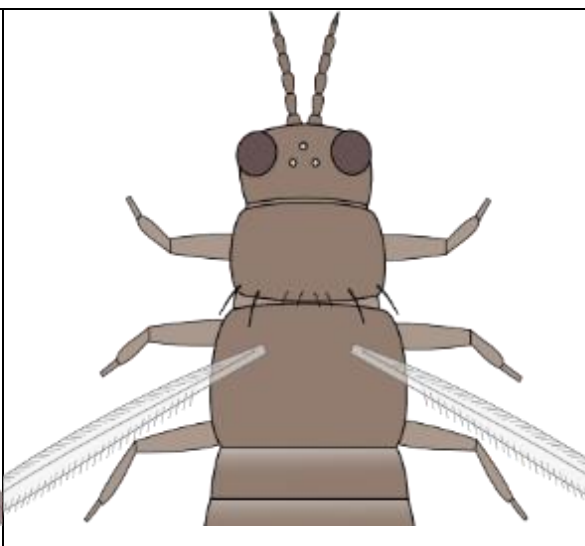
8.

| | |
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| <p>a. All legs entirely yellow; head and pronotum as dark as or darker than the rest of the body; wings uniform in colour and paler than the body (visible on dry specimens): Greenhouse thrips (<i>Heliothrips haemorrhoidalis</i>); uncommon in Ontario</p> | <p>b. Front legs yellow, back legs yellow with brown femurs; head and pronotum often lighter in colour than the rest of the body; light patches at the top and tips of the wings (visible on dry specimens): Banded greenhouse thrips (<i>Hercinothrips femoralis</i>) uncommon in Ontario</p> |

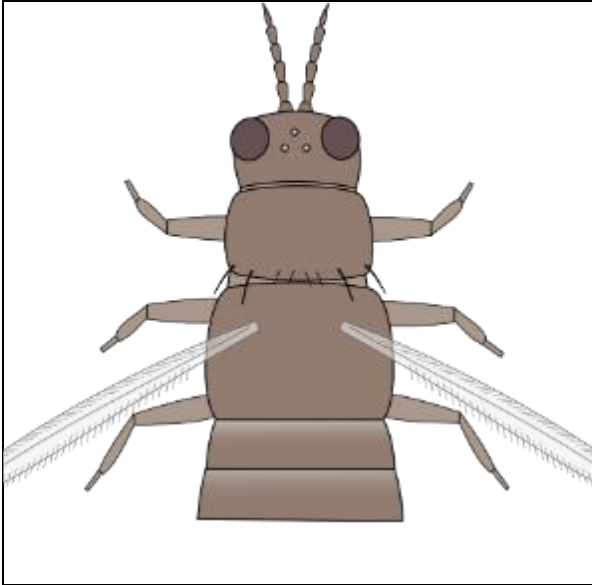
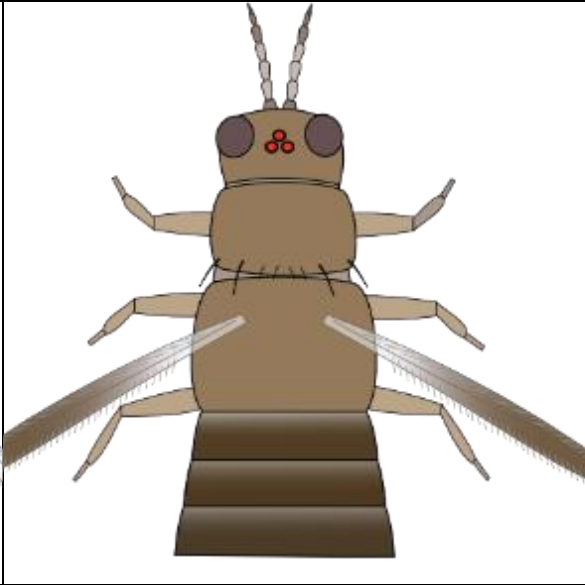
9.

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| <p>a. Pronotum has long coarse hairs on BOTH top and bottom of pronotum; no red pigment visible between the segments: most likely winged morph of <i>Franklinella fusca</i>; could also be dark morph Western Flower Thrips (<i>F. occidentalis</i>), or <i>F. intonsa</i> (not known from Ontario but present in British Columbia)</p> | <p>b. NO long coarse hairs or fine hairs on the top of pronotum; bottom has 2 pairs of long coarse hairs; red pigment may or may not be visible between segments (GO TO STEP 10)</p> |

10.

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| <p>a. Head and body black with light patches at the top of the wings (visible when alive or specimens are dry); red ocelli (may not be visible); red/pink pigmentation between the segments often visible; front legs pale, back with black femurs: Echinothrips, aka Poinsettia thrips (<i>Echinothrips americanus</i>)</p> | <p>b. Head and pronotum tan or brown; no red pigmentation visible between segments; legs mostly uniform in colour. (GO TO STEP 11)</p> |

11.

| | |
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| <p>a. Grey ocelli/ocelli not visible; abdomen similar in colour to head and pronotum; wings uniform in colour and paler than the body: dark morph Onion Thrips (<i>Thrips tabaci</i>)</p> | <p>b. Bright red ocelli; abdomen often darker in colour compared to head and pronotum; wings brown at the ends with light patches at the top visible when alive or specimens are dry: ** <i>Thrips parvispinus</i> or <i>Thrips setosus</i>; neither present in Canada but present in some US states; possibly found on imported plant material. Note that the males of these species are pale yellow. It is not possible to accurately differentiate between the two species without a compound microscope [see STEP 15].</p> |

****If you think you have found a species not usually present in Canada, such as *Thrips parvispinus* or *Thrips setosus*, you should consult an OMAFRA IPM specialist to verify the identification and discuss management options.**

Advanced Identification Features

These features are not visible using a dissection microscope, and **a compound microscope is required** to complete these steps.

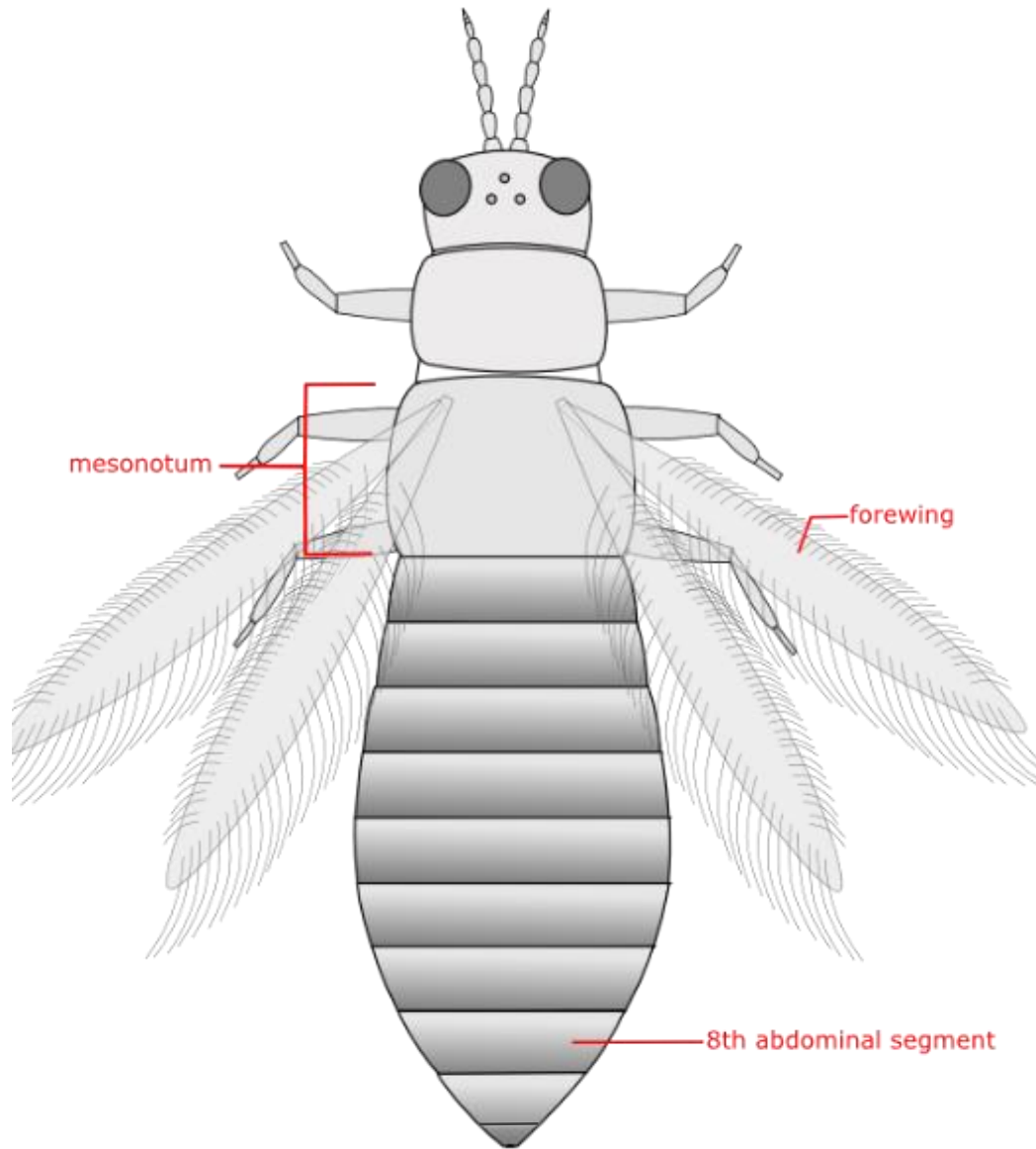
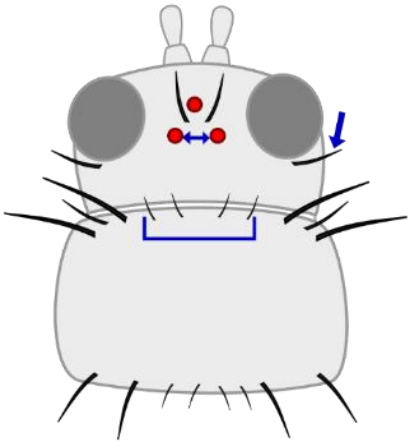
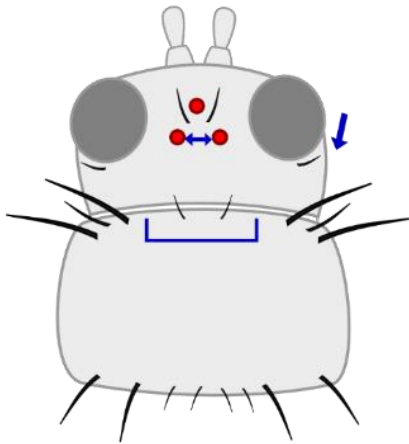
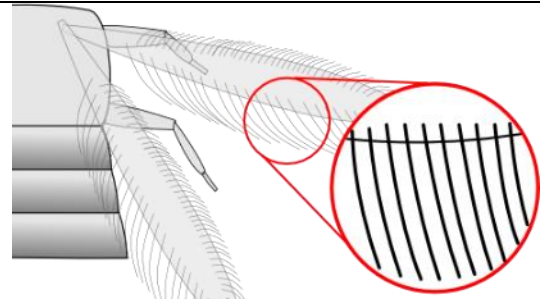
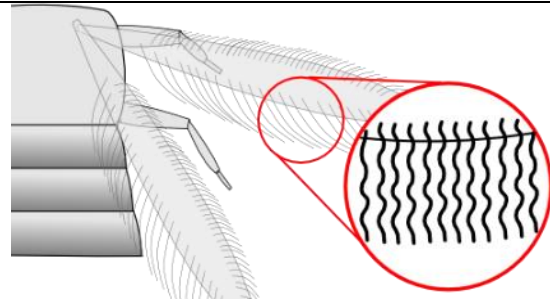


Figure 3. Additional anatomical regions where identification features are found using a compound microscope.

12. Western flower thrips (*Frankliniella occidentalis*) vs. other similar *Frankliniella* species:

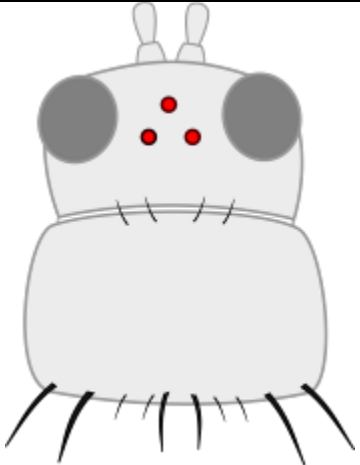
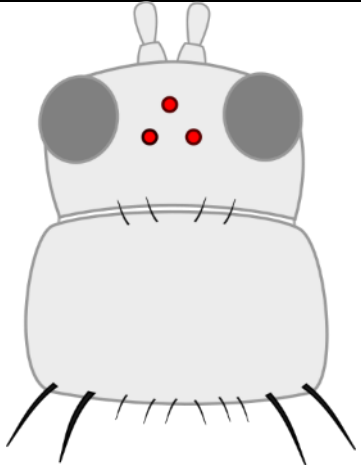
| | |
|---|--|
|  |  |
| <p>a. Four fine hairs on the top of the pronotum between two major setae; coarse hairs behind eyes long and prominent (longer than the distance between the ocelli): Western Flower Thrips (<i>Frankliniella occidentalis</i>)</p> | <p>b. Only two fine hairs on top of pronotum between two major setae; hairs behind eyes short and less noticeable (shorter than the distance between the ocelli): either Eastern Flower Thrips (<i>F. tritici</i>), Common blossom thrips (<i>F. schultzei</i>), or Florida Flower thrips (<i>F. bispinosa</i>)**</p> |

13. Chilli thrips (*Scirtothrips dorsalis*) vs. other thrips species:

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|--|--|
|  |  |
| <p>a. fringe of hairs on forewings straight: Chilli thrips (<i>Scirtothrips dorsalis</i>)**</p> | <p>b. fringe of hairs on forewings wavy: NOT chilli thrips</p> |

****If you think you have found a species not usually present in Canada, you should consult an OMAFRA IPM specialist to verify the identification and discuss management options.**

14. Chrysanthemum thrips (*Thrips nigropilosus*) vs. Melon thrips (*Thrips palmi*):

| | |
|---|---|
|  |  |
| <p>a. pores on mesonotum absent; three pairs of long coarse hairs on pronotum, center pair shorter than the outer two: Chrysanthemum thrips (<i>Thrips nigropilosus</i>)</p> | <p>b. pores on mesonotum present (see Fig. 4); only two pairs of long coarse hairs on pronotum: Melon thrips (<i>Thrips palmi</i>)**</p> |

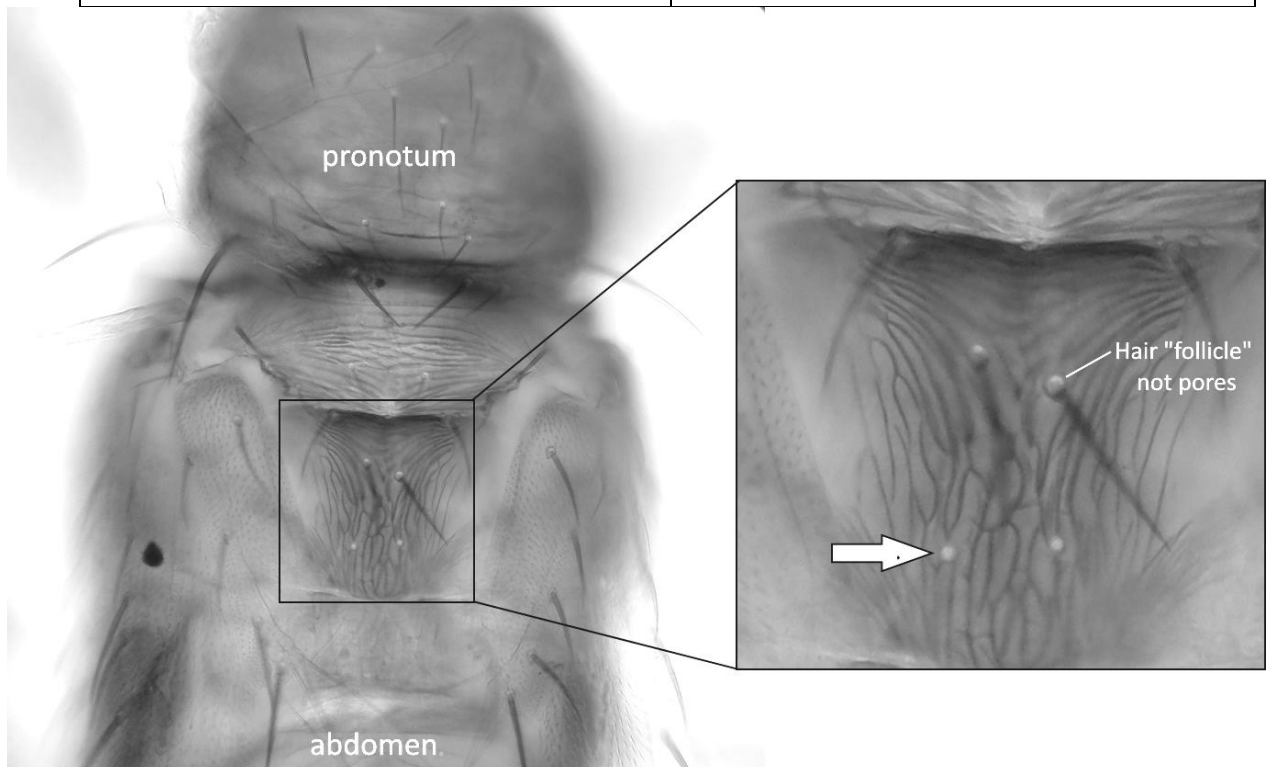
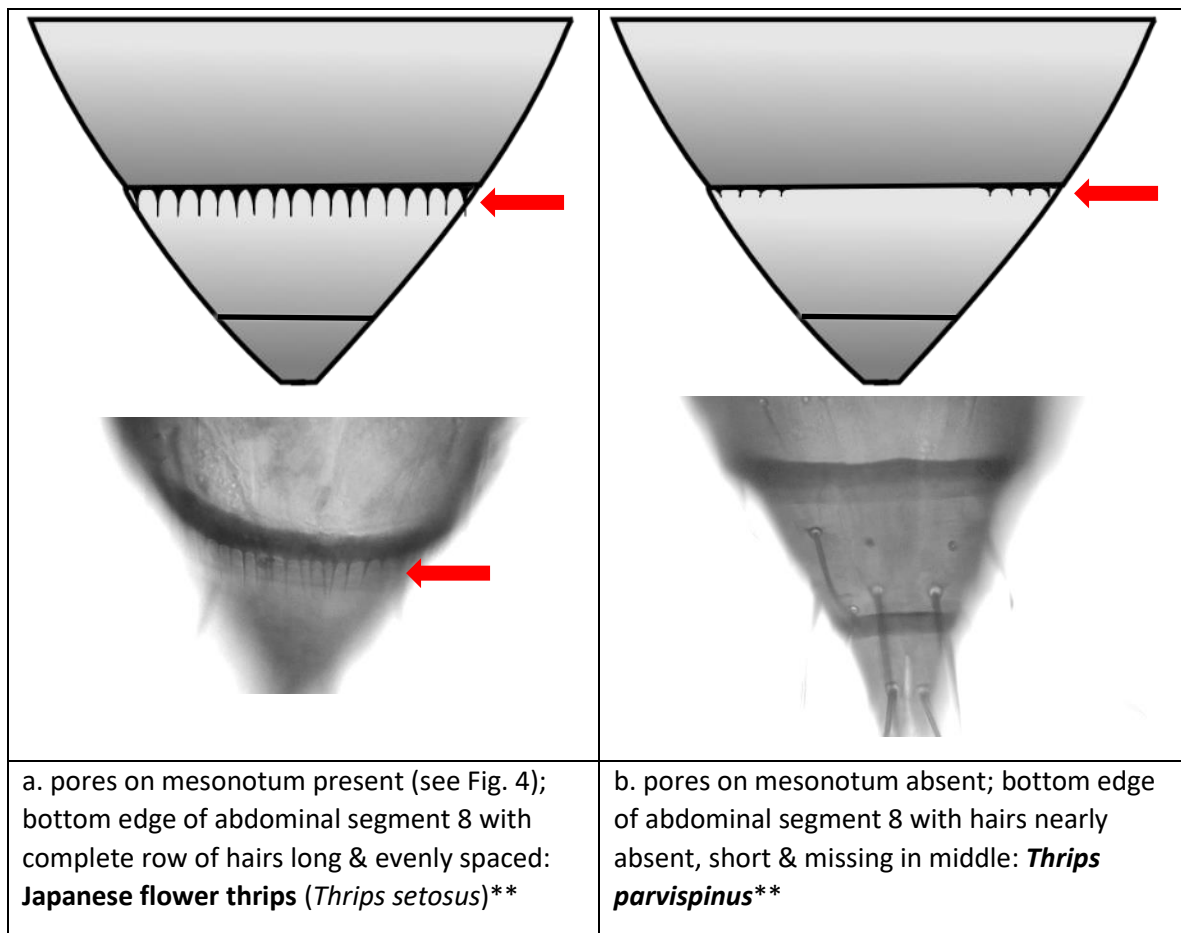


Figure 4. Pair of pores on mesonotum (formally called “campaniform sensillae”) located below pair of long coarse hairs. Note that the “follicle” (attachment point) for the hairs may look like pores.

15. Japanese flower thrips (*Thrips setosus*) vs. *T. parvispinus*:



****If you think you have found a species not usually present in Canada, you should consult an OMAFRA IPM specialist to verify the identification and discuss management options.**