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Identification key and checklist to the Swedish Phlaeothripidae (Thysanoptera)

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Identification key and checklist to the Swedish Phlaeothripidae (Thysanoptera)

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Abstract

The Swedish fauna of thrips (Thysanoptera) in the family Phlaeothripidae consists of 49 species. A key to species found in Sweden is provided. One species is recorded as new for the country, and 10 new regional records are presented. A checklist of all Swedish species with regional distribution is also given.

Keywords

Thrips, identification, morphology, distribution, taxonomy, Tubulifera.

Introduction

The order Thysanoptera Haliday, 1836 are more commonly known as thrips, and are minute insects often not larger than 3 mm. The larger species may reach 5 mm in size. Some have caught the attention not only from researchers but also from the commercial and private sector, due to some species that are considered as pests in agriculture (Paine 1992) and even as invasive (Held et al. 2003; Boyd & Held 2006). The least studied group in Sweden is the family Phlaeothripidae Uzel, 1895. Some species are found in flowers, e.g. in the genus *Haplothrips* Amyot & Serville, 1843 (Fig. 1), but most of the known species in Sweden are found in soil, leaf litter and decaying wood. The small size and secluded lifestyle might be reasons for the relatively few taxonomic studies of the order in general and this family in specific.

The research regarding Palaearctic taxa is scarce. Only a few regional checklists have been published in recent years, and the most relevant identification keys are focused on Great Britain (Mound et al. 1976; Kirk 1996). In recent years the fauna of Poland has been studied more extensively, a region with a previously similarly understudied thrips fauna, which has led to a large gain in both taxonomic and ecological knowledge (Kucharczyk and Zawirska 1994; Kąkol and Kucharczyk 2003; Kucharczyk 2004; Kucharczyk and Kucharczyk 2008; Dubovský et al. 2010). Most of the knowledge of Swedish taxa is based on older identification literature, e.g. Ahlberg (1926), Mound et al. (1976) and Kirk (1996), often not specific for Scandinavian conditions. A few papers have been published reporting new species at irregular intervals, reporting sporadic observations (Qwick 1977; Vasiliu-Oromulu et al. 2000; Kobro 2011; Sörensson 2012; Gertsson 2015a; Gertsson & Fägerström 2017). Kobro & Rafoss (2006) produced a key to the genus *Hoplothrips* in Phlaeothripidae. Kobro (2013) produced an identification key to Norwegian thrips in general, but only covered the most common and for amateurs easily distinguished species. The complete overlap of Swedish and Norwegian species is currently not investigated. Gertsson (2015b) provided a checklist of Nordic thrips. However, this was based only on previously collected material in museum

collections. Recently new records to the fauna were made from freshly collected material, with a total of 5 new species for Sweden and several new regional records (Gertsson and Fägerström 2017; Gertsson 2021; Gertsson et al. 2022). In this paper we update the Swedish checklist of the family Phlaeothripidae and provide an identification key to the species with photographic illustrations.

Material and methods

For this study we have examined representative specimens from the collections of The Swedish Museum of Natural History, Sweden (NHRS), Lund Museum of Zoology (MZLU), Sweden, Forschungsinstitut und Naturmuseum Senckenberg (SMF), Germany and the private collections of Sverre Kobro and Manfred R. Ulitzka. In addition, freshly collected material have been used, prepared on slides with Euparal according to the method outlined in Kobro (2013). Exception for this method is preservation prior to maceration and the maceration step, where in this study fresh material has been stored in 80% ethanol prior to DNA extraction. Maceration has thereafter been carried out during DNA extraction before preparation on microscopic slides. This method has successfully been used for one step DNA extraction and maceration for small insect specimens (Wahlberg and Johanson 2018; Wahlberg 2019). DNA extract is stored at the NHRS for further studies. The material was examined and photographed using manual focus stacking on Nikon Eclipse 80i and Swift 380T microscopes, with Nikon DS-Fi1 and Swift SC1003 cameras. Photos were automatically aligned and stacked using Helicon Focus 8.0.4 and Swift Imaging 3.0, and edited and finalized in Adobe Photoshop CC 23.2.0. The distributional data are provided on county level. The material collected and preserved during this project is deposited at the NHRS.

Swedish faunistic provinces and abbreviations

Sweden is traditionally divided in to faunistic provinces, most based on historical cultural regions overlapping with administrative counties (Fig. 2). They are in the checklist and map abbreviated as below, from south to north.

Sk = Skåne
Bl = Blekinge
Ha = Halland
Sm = Småland
Öl = Öland
Go = Gotland
GS = Gotska Sandön
Ög = Östergötland
Vg = Västergötland
Bo = Bohuslän
Ds = Dalsland
Nä = Närke
Sö = Södermanland
Up = Uppland
Vs = Västmanland
Vr = Värmland
Dr = Dalarna
Gä = Gästrikland
Hs = Hälsingland

Me = Medelpad
 Hr = Härjedalen
 Jä = Jämtland
 Ån = Ångermanland
 Vb = Västerbotten
 Nb = Norrbotten
 Ås = Åsele lappmark
 Ly = Lycksele lappmark
 Pi = Pite lappmark
 Lu = Lule lappmark
 To = Torne lappmark

Characters

The identification key is intended to be used for adult specimens, both females and males in various life stages and both winged and apterous forms. For this reason, some species that express great intraspecific variation it is possible to key out one species at several locations in the key. In Thysanoptera the most important morphological characters for species identification include antennal shape, presence, shape, and length of setae, feeding structures, and measurements of segments (Fig. 3). This always requires high magnification and specimen preparation. Large setae may be blunt, expanded (Fig. 10G), or acute at apex, and care need to be taken in preparation for avoiding collapse of expanded apices. The antennal segments often carry sensory organs in the shape of large trichomes. These are more robust and broader than bristles that they might be confused with (Fig. 6A–C). Maxillary stylets are parts of the feeding apparatus and can be seen in macerated specimens (Fig. 4A–B), and the width of the stylets and presence or absence of the median extension called maxillary bridge are used for separation of subfamilies and species groups. The last segment, segment X, of the abdomen may be either tapering and longitudinally divided or complete and tube shaped. The latter being one of the defining characters of the family Phlaeothripidae (Figs 3). Comprehensive and detailed descriptions of the anatomy and morphology of Thysanoptera are provided in Schliephake and Klimt (1979) and Moritz (2006).

Taxonomy

Phlaeothripidae Uzel, 1895

Diagnosis

The last abdominal segment, segment X, tubular in both males and females (Figs 3, 5C, 7A–B), without longitudinal division and without saw-like ovipositor. If wings present, then forewings without longitudinal veins and surface without microtrichia (Fig. 3).

Notes

There are about 3 700 known species of Phlaeothripidae in the world (Mound and Tree 2021). Most of these species are described from tropical and sub-tropical areas. In Sweden 49 species are known. The Phlaeothripidae are diverse in their biology; living of decaying matter, pollen, fungal spores and hyphae and prey, and sometimes expressing polymorphism and sociality (Kirk 1996; Mound 2004).

Key to the species of Phlaeothripidae from Sweden

1.	Maxillary stylets broad, at least 5 µm wide (twice as wide as base of postocular setae) (Fig. 4A).	Idolothripinae 1
	Maxillary stylets slender, less than 5 µm wide (Fig. 4B).	Phlaeothripinae 7
	Idolothripinae Bagnall, 1908	
2 (1).	Anterior margin of ocellar triangle with long setae (Fig. 4C); large and dark species with elongated head.	3
	Setae at anterior margin of ocellar triangle short or absent (Fig. 4D).	5
3 (2).	Lateral wings of pelta slender (Fig. 5E).	<i>Meglothrips bonanni</i>
	Lateral wings of pelta (abdominal tergite I) triangular (Fig. 5D).	4
4 (2).	Tarsi pale and tibia brown (Fig. 5C).	<i>Bacillothrips nobilis</i>
	Tarsi and tibia yellow (Fig. 5F).	<i>Megathrips lativentris</i>
5 (2).	Eyes ventrally elongated (Fig. 5A).	6
	Eyes not ventrally elongated.	7
6 (5).	Body (excluding antennae, legs and wings) brown with yellow pronotum and yellow transverse band on metanotum.	<i>Bolothrips bicolor</i>
	Body uniformly brown.	<i>Bolothrips dentipes</i>
7 (5).	Maxillary stylets close together, meeting or almost meeting medially (Fig. 4D).	<i>Cryptothrips nigripes</i>
	Maxillary stylets widely separated, at least half of the heads width apart (Fig. 4A).	<i>Bolothrips icarus</i>
	Phlaeothripinae Uzel, 1895	
8 (1).	Maxillary bridge present (Fig. 5B).	9
	Maxillary bridge absent (Fig. 4B).	28
9 (8).	Antennal segment IV with 2 sense cones (Fig. 6A).	<i>Xylaphlothrips fuliginosus</i>
	Antennal segment IV with 3-4 sense cones (Fig. 6B–C).	<i>Haplothrips 10</i>
10 (9).	Antennal segment III with no sense cones (cf. Fig. 9E).	<i>Haplothrips minutus</i>
	Antennal segment III with at least 1 sense cone.	11
11 (10).	Antennal segment III with 1 sense cone.	12
	Antennal segment III with 2 sense cones.	14
12 (11).	Postocular setae expanded or bluntly pointed (Fig. 6D).	<i>Haplothrips subtilissimus</i>
	Postocular setae acute (Fig. 6E).	13
13 (12).	Tube more than 2.3 times longer than wide (Fig. 7A).	<i>Haplothrips alpester</i>
	Tube less than 2.3 times longer than wide (Fig. 7B).	<i>Haplothrips aculeatus</i>

14 (11).	Postocular setae short, no longer than the width of the eye (Fig. 6F).	15
	Postocular setae well developed and long (Fig. 7C).	18
15 (14).	Setae S1 on tergite IX blunt apically (Fig. 7D).	16
	Setae S1 on tergite IX acute.	17
16 (15).	Antennal segment IV yellow at base (Fig. 7E).	<i>Haplothrips leucanthemi</i>
	Antennal segment IV wholly brown (Fig. 7F).	<i>Haplothrips propinquus</i>
17 (15).	Both anteromarginal and anteroangular setae stout and at least twice as long as discal setae (Fig. 7G).	<i>Haplothrips alpicola</i>
	Anteromarginal setae minute, anteroangular setae sometimes longer both not as stout.	<i>Haplothrips angusticornis</i>
18 (14).	Setae S1 on tergite IX blunt apically (cf. Fig. 7E).	19
	Setae S1 on tergite IX acute.	21
19 (18).	Postocular setae acute (Fig. 7H).	<i>Haplothrips tritici</i>
	Postocular setae bluntly pointed (Fig. 5B).	20
20 (19).	Maxillary stylets about a third of head's width apart (Fig. 5B); tibia I brown	<i>Haplothrips senecionis</i>
	Maxillary stylets less than a third of the head's width apart (Fig. 7C); tibia I yellow apically	<i>Haplothrips statices</i>
21 (18).	Distal cilia of forewing with barbs (in high magnification), in lower magnification visible as a rough or frizzled surface (Fig. 8A).	<i>Haplothrips setiger</i>
	Distal cilia of forewing smooth	22
22 (21).	Postocular setae bluntly pointed (Fig. 8B).	23
	Postocular setae acute (Fig. 7H).	24
23 (22).	Maxillary stylets about a fourth of head's width apart (Fig. 8B); tibia I yellow but brown basally.	<i>Haplothrips verbasci</i>
	Maxillary stylets about half of head's width apart (Fig. 8C); tibia I wholly yellow.	<i>Haplothrips acanthoscelis</i>
24 (22).	Maxillary stylets close together, almost meeting medially (Fig. 8D).	<i>Haplothrips utae</i>
	Maxillary stylets at least a third of head's width apart (Fig. 4E).	25
25 (24).	Maxillary stylets half of head's with apart (cf. Fig. 8C)	<i>Haplothrips distinguendus</i>
	Maxillary stylets 0.3–0.4 of head's with apart (Fig. 7H).	26
26 (25).	Antennal segments III–IV, sometimes also V–VI, brown with yellow base, segments VII–VIII brown (Fig. 8E).	<i>Haplothrips hukkineni</i>

	Antennal segment III shaded yellow to light brown, IV–VII brown (Fig. 8F).	27
27 (26).	Anteromarginal setae short, about as long as discal seta (Fig. 8G).	<i>Haplothrips alpester</i>
	Anteromarginal setae long, at least twice as long as discal seta (cf. Fig. 7G).	<i>Haplothrips tritici</i>
28 (8).	Fore femur with apical tubercle (Fig. 9A); 3 sense cones on antennal segment III–IV (Fig. 9B).	<i>Acanthothrips nodicornis</i>
	Fore femur without apical tubercle; if teeth on femur present then antennal segment IV with 4 sense cones.	29
29 (28).	Eyes ventrally elongated (Fig. 9C).	<i>Cephalothrips monilicornis</i>
	Eyes not ventrally elongated.	30
30 (29).	Mouth cone long and narrow, extending beyond posterior margin of pronotum (Fig. 9D).	<i>Poecilotriops albopictus</i>
	Mouth cone shorter.	31
31 (30).	Antennal segment III without sense cones (Fig. 9E).	<i>Lispothrips crassipes</i>
	Antennal segment III with at least 1 sense cone (Fig. 9F).	32
32 (31).	Antennal segment III with 1 sense cone.	<i>Liothrips</i> 33
	Antennal segment III with 2–3 sense cones (Fig. 9F).	34
33 (32).	Setae S1 on tergite IX as long as, or close to as long as, segment X (tube) (Fig. 9G).	<i>Liothrips austriacus</i>
	Setae S1 on tergite IX closer to or half as long as segment X (Fig. 10A)	<i>Liothrips setinodis</i>
34 (32).	Abdomen clearly bicolored, with at least segment VIII–IX mostly yellow (Fig. 10B); segment X (tube) yellow and often with dark transverse terminal band or shadings, sometimes also yellow head and pronotum in micropterous individuals.	35
	Abdomen uniformly brown or yellow, sometimes with pale or red markings.	36
35 (34).	Segment VIII–X yellow (Fig. 10B).	<i>Hoplothrips pedicularius</i>
	Segment VI–X yellow.	<i>Hoplothrips caespitis</i>
36 (34).	Pronotom with 5 pairs of well-developed bristles, may be short but stout (Fig. 10C).	37
	Pronotum with 4 pairs of well-developed bristles, anteromarginals not distinctly stouter than discal seta.	43
37 (36).	Postocular setae present but short, shorter or as long as the width of eye (Fig. 10E); setae S1 on tergite IX distinctly shorter than half of the length of segment X (tube) (Fig. 10F).	<i>Phlaeothrips</i> 38

	Postocular setae well developed and as long as or longer than the length of eye (Fig. 10F); setae S1 on tergite IX close to or more than half as long as segment X (Fig. 10G).	41
38 (37).	Head with lateral tubercles (Fig. 10H).	39
	Head without lateral tubercles (Fig. 10D).	40
39 (38).	Antennal segment III about 3 times as long as wide. Tibia I often wholly yellow (Fig. 10I).	<i>Phlaeothrips coriaceus</i>
	Antennal segment III less than 2.6 times as long as wide. Tibia I often only yellow apically (Fig. 10J).	<i>Phlaeothrips denticauda</i>
40 (38).	Tibia I largely yellow, tibia II and III distinctly bicolored with yellow apex and base (Fig. 10K).	<i>Phlaeothrips annulipes</i>
	All tibia brown.	<i>Phlaeothrips bispinosus</i>
41 (37).	Postocular setae (Fig. 10E) and setae S1 on tergite IX expanded apically (Fig. 10G). Forewing constricted medially.	<i>Hoplandrothrips bidens</i>
	Postocular setae and setae S1 on tergite IX acute. Forewing parallel sided.	42
42 (41).	Large pronotal bristles expanded apically (Fig. 11A).	<i>Holothrips schaubergeri</i>
	Large pronotal bristles acute.	<i>Hoplothrips polysticti</i>
43 (36).	Antennal segment IV with 2 sense cones (Fig. 9F).	44
	Antennal segment IV with 3-4 sense cones.	48
44 (43).	Maxillary stylets about a third of head width apart (Fig. 11B).	45
	Maxillary stylets close together, meeting or almost meeting medially (Fig. 4B).	46
45 (44).	Large pronotal bristles expanded apically (cf. Fig. 11A).	<i>Hoplothrips longisetis</i>
	Pronotal bristles acute.	<i>Hoplothrips caespitis</i>
46 (44).	Setae S1 as long as or longer than segment X (tube) (Fig. 11C).	<i>Hoplothrips unicolor</i>
	Setae S1 shorter than segment X.	47
47 (46).	Antennal segment I slightly tapering apically, II and III yellow or light brown at least partly, and segments IV-VII distinctly darker (Fig. 11D). Macropterous females with cluster of sensory hairs on antennal segments IV-VI (Fig. 11D).	<i>Hoplothrips semicaecus</i>
	Antennal segment I more evenly tubular, II-VII more uniformly yellow or light brown (Fig. 11E).	<i>Hoplothrips carpathicus</i>
48 (44).	Antennal segment IV with 3 sense cones	49
	Antennal segment IV with 4 sense cones	52

49 (48).	Antennal segment I slightly tapering apically, II and III yellow or light brown at least partly, and segment IV-VII distinctly darker (Fig. 11D). Macropterous females with cluster of sensory hairs on antennal segments IV-VI (Fig. 11D).	<i>Hoplothrips semicaucus</i>
	Antennal segments different.	50
50 (49).	Setae S1 on tergite IX blunt apically (Fig. 11F).	<i>Thorybothrips unicolor</i>
	Setae S1 on tergite IX acute (Fig. 11G).	51
51 (50).	Setae S1 on tergite IX as long as or longer than tube (Fig. 11C).	<i>Hoplothrips unicolor</i>
	Setae S1 on tergite IX shorter than tube (Fig. 11G).	<i>Hoplothrips polysticti</i>
52 (48).	Major pronotal bristles expanded (cf. Fig 11A).	<i>Hoplandrothrips williamsianus</i>
	Major pronotal bristles acute or blunt, not expanded.	53
53 (52).	Antennal segment III with long and strongly inwards curving sense cone at inner margin (Fig. 11H).	<i>Hoplothrips fungi</i>
	Sense cones on segment III forward pointing and stout.	54
54 (53).	Antennal segments IV-VI brown, IV at most slightly shaded (Fig. 11D).	55
	Antennal segments IV-VI bicolored with basal half yellow (Fig. 11I).	56
55 (54).	Antennal segment VIII not distinctly constricted at base, VII and VIII confluent (Fig. 11D).	<i>Hoplothrips semicaucus</i>
	Antennal segment VIII constricted at base, separating VII and VIII (Fig. 11J).	<i>Hoplothrips polysticti</i>
56 (54).	All tibia wholly yellow (Fig. 11K).	<i>Hoplothrips corticis</i>
	Only tibia I yellow, tibia II and III at most yellow basally and apically (Fig. 11L).	<i>Hoplothrips ulmi</i>

Checklist of the Swedish Phlaeothripidae

Idolothripinae Bagnall, 1908

Diagnosis

The Idolothripinae are distinguished by the broad maxillary stylets. The maxillary stylets are at least 5 µm broad.

Notes

There are 7 known species in Sweden in this subfamily. The broad maxillary stylets are hypothesized to be an adaptation to feeding on fungal spores (Mound and Palmer 1983).

Bacillothrips Buffa, 1908

Bacillothrips nobilis (Bagnall, 1909)

Distribution: Go.

Remark: First record for Sweden. In Fennoscandia this species has previously been recorded from Denmark, Norway and Finland (Kobro 2011, Gertsson 2015b). Feeding on fungal spores (Mound 1974), and found in dry grass, sedges, and dead branches mainly from *Salix* L. (Schliephake and Klimt 1979; Mound et al. 1976).

Material examined: SWEDEN • 1♀ Gotland, Gotlands kommun, Vitärtskällan; 57.8512°N, 18.8123°E; 10 Jul. 2011; B. Eklund, leg.; Malaise trap; Loc. 029-06.

Bolothrips Priesner, 1926

Bolothrips bicolor Heeger, 1852

Distribution: Up.

Bolothrips dentipes (O. M. Reuter, 1880)

Distribution: Sk, Sm, Öl, Ög, Bo, Sö, Up, Lu.

Bolothrips icarus (Uzel, 1895)

Distribution: Sk, Öl, Go, GS, Sö, Up.

Remark: First record for Sö.

Material examined: SWEDEN • 1♀ Södermanland, Nyköping kommun, Skeppsvik; dry meadow at roadside with *Crepis*, *Vicia* and *Plantago*; 58.639919°N, 16.822483°E; 3 Jun 2021; E. Wahlberg, leg.

Cryptothrips Uzel, 1895

Cryptothrips nigripes (O. M. Reuter, 1880)

Distribution: Sk, Sm, Öl, Bo, Sö, Up, Vs, Vr, Dr, Lu.

Megathrips Targioni-Tozzetti, 1881

Megathrips lativentris (Heeger, 1852)

Distribution: Sk, Bl, Sm, Öl, Go, GS, Ög, Vg, Bo, Ds, Nä, Sö, Up, Vr, Dr, Gä, Hs, Me, Hr, Jä, Ån, Vb, Nb, Ly, Pi, Lu, To.

Megalothrips Uzel, 1895

Megalothrips bonanni Uzel, 1895

Distribution: Sk.

Phlaeothripinae Uzel, 1895

Diagnosis

Differentiated from Idolothripinae by the slender maxillary stylets, at most 3 µm wide.

Notes

The majority of the species in the family belongs to this subfamily, for Sweden 42 species are known. The life histories are very varying, ranging from species feeding on fungal hyphae to predatory species (Mound and Tree 2020).

Acanthothrips Uzel, 1895

Acanthothrips nodicornis (O. M. Reuter, 1880)

Distribution: Sm, Bo, Sö, Up, Vs, Vr, Dr.

Cephalothrips Uzel, 1895

Cephalothrips monilicornis (O. M. Reuter, 1880)

Distribution: Sk, Vg, Öl, Sm, Sö, Up, Vr.

Remark: First record for Vg.

Material examined: SWEDEN • 2♀♀ Västergötland, Laxå kommun, Finnerödja; sandy slope with *Carex* and *Calluna*; 58.929699°N, 14.340039°E; 5 Jun 2021; E. Wahlberg, leg.

Haplothrips Amyot & Serville, 1843

Haplothrips acanthoscelis (Karny, 1910)

Distribution: Sk, Öl.

Haplothrips aculeatus (Fabricius, 1803)

Distribution: Sk, Bl, Ha, Sm, Öl, Go, Ög, Vg, Bo, Sö, Up.

Remarks: First record for Ha.

Material examined: SWEDEN • 1♀ Halland, Varberg kommun, Tvååker; meadow on old cultivated land with *Quercus*, *Fagus* and *Fraxinus*; 57.02078°N, 12.47949°E; 19 May 2021; E. Wahlberg, leg.

Haplothrips alpester Priesner, 1914

Distribution: Sk, Öl, Vg, Sö, Vr, Ly.

Remark: First record for Sö.

Material examined: SWEDEN • 1♂ Södermanland, Nyköping kommun, Skeppsvik; marsh with *Hierochloë*, *Juncus*, *Carex*, *Luzula* and *Schoenoplectus*; 58.645574°N, 16.843128°E; 3 Jun 2021; E. Wahlberg, leg.

Haplothrips alpicola Priesner, 1950

Distribution: Ly.

Haplothrips angusticornis Priesner, 1921

Distribution: Sk, Ög, Up, Vr.

Haplothrips distinguendus (Uzel, 1895)

Distribution: Sk, Sm, Vg, Up.

Haplothrips hukkineni Priesner, 1939

Distribution: Sk, Sm, Öl, Go Sö, Up, Vr.

Haplothrips leucanthemi (Schrank, 1781)

Distribution: Sk, Ha, Sm, Öl, Bo, Ds, Nä, Ög, Sö, Up, Vr, Jä, Vb, Lu, To.

Remark: First record for Ha.

Material examined: SWEDEN • 1♂ Halland, Halmstad kommun, Särdal; on *Armeria maritima*; 56.73674°N, 12.64723°E; 19 May 2021; E. Wahlberg, leg.

Haplothrips minutus (Uzel, 1895)

Distribution: Sk, Sö.

Haplothrips propinquus Bagnall, 1933

Distribution: Sk, Sö, Up, Vr, Gä, Hs, Jä, Lu.

Haplothrips senecionis Bagnall, 1932

Distribution: Öl.

Haplothrips setiger Priesner, 1921

Distribution: Sk.

Haplothrips statices (Haliday, 1836)

Distribution: Sk, Bl, Ha, Sm, Öl, Ög, Bo, Sö, Up, Hs, Hr, Jä, Ån, Nb, Lu.

Haplothrips subtilissimus (Haliday, 1852)

Distribution: Sk, Sm, Sö, Up.

Remark: First record for Sm.

Material examined: SWEDEN • 1♀ Småland, Kalmar kommun, Bottorp; alley with *Quercus* and *Prunus*; 56.591923°N, 16.212710°E; 11 May 2021; E. Wahlberg, leg.

Haplothrips tritici (Kurdjumov, 1912)

Distribution: Sö.

Haplothrips utae Klimt, 1970

Distribution: Sk, Sm.

Haplothrips verbasci Osborn, 1896

Distribution: Sk.

Holothrips Karny, 1911

Holothrips schaubergeri (Priesner, 1920)

Distribution: Sö.

Hoplandrothrips Hood, 1912

Hoplandrothrips bidens (Bagnall, 1910)

Distribution: Sk, Öl, Up.

Hoplandrothrips williamsianus Priesner, 1923

Distribution: Vr.

Haplothrips Amyot & Serville, 1843

Haplothrips caespitis (Uzel, 1895)

Distribution: Sk.

Haplothrips carpathicus Pelikan, 1961

Distribution: Sk, Ds, Sö, Up, Vr.

Haplothrips corticis (De Geer, 1773)

Distribution: Sk, Bl, Öl, Go, GS, Sm, Ög, Bo, Sö, Up, Vb, Nb.

Remark: First record for Nb.

Material examined: SWEDEN • 1♀ Norrbotten, Åsele, Björnlandet nationalpark; 63.9702°N, 18.0533°E; 12–26 Jul 2011; K. Norberg, B.O. Johansson, leg.; Malaise trap; Loc. 034-04.

Hoplothrips fungi (Zetterstedt, 1828)

Distribution: Bl, Öl, Go, Up, Hs.

Hoplothrips longisetis (Bagnall, 1910)

Distribution: Sk, Ds, Vr.

Hoplothrips pedicularius (Haliday, 1836)

Distribution: Sk, Sm, Sö, Up, Vr, Dr, Hs.

Hoplothrips polysticti (Morison, 1949)

Distribution: Sk, Ög, Vr, Dr, Vb.

Hoplothrips semicaecus (Uzel, 1895)

Distribution: Sk, Ha, Up.

Remark: First record for Ha.

Material examined: SWEDEN • 3♂♂ Halland, Falkenberg kommun, Vessigebro; deciduous forest (*Fagus*), in *Fomes fomentarius*; 57.05748°N, 12.78881°E; 18 May 2021; E. Wahlberg, leg.

Hoplothrips ulmi (Fabricius, 1781)

Distribution: Sk, Bl, Ha, Sm, Öl, Go, GS, Ög, Bo, Ds, Sö, Up, Vs, Vr, Dr, Ån, Vb, Lu.

Hoplothrips unicolor (Vuillet, 1914)

Distribution: Sö.

Liothrips Uzel, 1895

Liothrips austriacus (Karny, 1910)

Distribution: Vr.

Liothrips setinodis (O. M. Reuter, 1880)

Distribution: Ha, Up.

Lispothrips O. M. Reuter, 1899

Lispothrips crassipes (Jablonowski, 1894)

Distribution: Sm.

Phlaeothrips annulipes O. M. Reuter, 1880

Distribution: Sk, Sm, Ög, Bo, Sö, Up, Vs, Vr, Dr, Vb.

Phlaeothrips bispinosus Priesner, 1919

Distribution: Vr.

Phlaeothrips coriaceus Haliday, 1836

Distribution: Sk, Bl, Ha, Sm, Öl, Go, Bo, Sö, Up, Vs, Hs, Vb.

Phlaeothrips denticauda Priesner, 1914

Distribution: Sk, Vr.

Poecilotriphs Uzel, 1895

Poecilotriphs albopictus Uzel, 1895

Distribution: Sk, Vr.

Thorybothrips Priesner, 1924

Thorybothrips unicolor (Schille, 1911)

Distribution: Öl, Go.

Xylaplothrips fuliginosus (Schille, 1911)

Distribution: Sm, Ha, Sö, Ds, Vr, Dr, Lu, To.

Remark: First record for Ha and Sö.

Material examined: SWEDEN • 1♂ Halland, Falkenberg kommun, Vessigebro; on *Larix decidua*, 56.97484°N, 12.72877°E, 19 May 2021; E. Wahlberg, leg. • 2♀♀ Södermanland, Nyköping kommun, Skeppsvik; mixed forest; 58.645574°N, 16.843128°E; 03 Jun 2021; E. Wahlberg, leg. • 1♀ Södermanland, Gnesta kommun, Fridsta; private garden with mixed vegetation; 59.067287°N, 17.155016°E; 14–21 Jun 2021; E. Wahlberg, leg., window trap. • 1♂ Södermanland, Gnesta kommun, Önnersta; on dead *Betula*; 59.047010°N, 17.145951°E; 16 Jul 2021; E. Wahlberg, leg.

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Figure legends

Figure 1. *Haplothrips leucanthemi* in flower of *Leucanthemum vulgare* Lam.

Figure 2. Map of Swedish faunistic provinces.

Figure 3. Habitus of *Haplothrips utae*, dorsal view. Roman numbers indicate abdominal segment number. Scale bar: 100 µm.

Figure 4. A–D. Head, dorsal view. **A.** *Bolothrips icarus*. **B.** *Haplothrips carpathicus*. **C.** *Bacillothrips nobilis* (ocellar triangle). **D.** *Cryptothrips nigripes*. Scale bars: 100 µm, bps: base of postocular seta, ms: maxillary stylet.

Figure 5. A–B. Head, dorsal view. **A.** *Bolothrips dentipes* (ventral margins of eyes also visible). **B.** *Haplothrips senecionis*. **C.** Habitus, dorsal view, *Bacillothrips nobilis*. **D–E.** Pelta *B. nobilis*. **E.** *Megalothrips bonanni*. **F.** Foreleg, *Megathrips lativentris*. Scale bars: 100 µm (A–B, D–E), 1 mm (C), mb: maxillary bridge, ps: postocular seta, lwp: lateral wing of pelta.

Figure 6. A–C. Part of antenna, dorsal view, roman numbers indicate segment number. **A.** *Xylaplothrips fuliginosus* (Schille, 1911). **B.** *Haplothrips subtilissimus* (Haliday, 1852). **C.** Segment IV, ventral view, *H. subtilissimus*. **D–F.** Dorsal view of right side of head. **D.** *Haplothrips subtilissimus*. **E.** *H. alpester*. **F.** *H. leucanthemi*. Scale bars: 100 µm, sc: sense cone, br: bristle, ps: postocular seta.

Figure 7. A–B. Dorsal view of segment X (tube). **A.** *H. alpester*. **B.** *H. aculeatus*. **C.** Head, dorsal view, *H. statices*. **D.** Tergite IX, dorsal view, *Haplothrips leucanthemi*. **E–F.** Antenna, dorsal view, antennal segment IV marked. **E.** *H. leucanthemi*. **F.** *H. propinquus*. **G.** Pronotum, dorsal view, *H. alpicola*. **H.** Head dorsal view, *H. tritici*. Scale bars: 100 µm, ms: maxillary stylet, S1: seta 1, am: anteromarginal seta, ds: discal seta, ps: postocular seta.

Figure 8. A. Distal portion of forewing, *H. setiger*. **B–D.** Dorsal view of head. **B.** *Haplothrips verbasci*. **C.** *H. acanthoscelis* **D.** *H. utae*. **E–F.** Antenna, roman numbers indicate segment number. **E.** *H. hukkineni*. **F.** *H. tritici*. **G.** Pronotum, dorsal view, *H. alpester*. Scale bars: 100 µm, ps: postocular seta, ms: maxillary stylet, am: anteromarginal seta, ds: discal seta.

Figure 9. **A.** Foreleg, *Acanthothrips nodicornis*. **B.** Antennal segment IV, *A. nodicornis*. **C.** Head, ventral view, *Cephalothrips monilicornis*. **D.** Head and pronotum with mouth cone (mesonotum detached), *Poecilotriops albopictus*. **E–F.** Antenna, roman numbers indicate segment number. **E.** *Lispothrips crassipes*. **F.** *Hoplothrips longisetis*. **G.** Abdominal segments IX–X, yellow structure underneath is male genitalia, *Liothrips austriacus*. Scale bars: 100 µm, sc: sense cone, mc: mouth cone, S1: seta 1.

Figure 10. **A.** Abdominal segments IX–X, *Liothrips setinodis*. **B.** Abdomen, dorsal view, roman numbers indicate segment number, *Hoplothrips pedicularius*. **C.** Pronotom, dorsal view, *Phlaeothrips annulipes*. **D–E.** Left half of head, dorsal view. **D.** *P. annulipes*. **E.** *Hoplandothrips bidens*. **F–G.** Abdominal segments IX–X. **F.** *P. annulipes*. **G.** *H. bidens*. **H.** Head, dorsal view, *Phlaeothrips coriaceus*. **I–K.** Foreleg, dorsal view. **I.** *P. coriaceus*. **J.** *P. denticauda*. **K.** Middle leg, *P. annulipes*. Scale bars: 100 µm, S1: seta 1, am: anteromarginal seta, ds: discal seta, ps: postocular seta.

Figure 11. **A.** Anterolateral portion of pronotum, dorsal view, *Holothrips schaubergeri*. **B.** Head, dorsal view, *Hoplothrips longisetis*. **C.** Segments IX–X, *H. unicolor*. **D–E.** Antenna, roman numbers indicate segment number. **D.** *H. semicaecus*. **E.** *H. carpathicus*. **F–G.** Segments IX–X. **F.** *Thorybothriops unicolor*. **G.** *Hoplothrips polysticti*. **H.** Antenna, segment III, *H. fungi*. **I.** Antenna, *H. ulmi*. **J.** Antenna, segments V–VIII, *H. polysticti*. **K–L.** Middle leg. **K.** *H. corticis*. **L.** *H. ulmi*. Scale bars: 100 µm, aa: anteroangular seta, ms: maxillary stylet, sc: sense cone.





















