

NEW RECORDS OF THRIPS (THYSANOPTERA, TEREBRANTIA, THIRIPIDAE) FROM HIMACHAL PRADESH, INDIA

KAOMUD TYAGI AND VIKAS KUMAR*

Zoological Survey of India, M-Block, New Alipore, Kolkata-700 053

INTRODUCTION

Thrips are very small, fringed insect and belonging to the order Thysanoptera. The order Thysanoptera includes approximately 3500 species of Terebrantia reported across globally (ThripsWiki, 2014). The suborder Terebrantia represented by 290 species of 124 genera in Indian sub-region, of which 29 species are reported from Himachal Pradesh (Bhatti 1990). During the recent surveys in 2012-13 of Himachal Pradesh, 13 species of thrips have been identified and are being added to the fauna of state for the first time. All these new records are belong to subfamily Thripinae of family Thripidae of suborder Terebrantia. The species are *Anaphothrips sudanensis* (Trybom), *Bathrips melanicornis* (Shumsher), *Dendrothripoides innocuous* Karny, *Microcephalothrips abdominalis* D.L. Crawford, *Scirtothrips dorsalis* Hood, *Scirtothrips mangiferae* Priesner, *Stenchaetothrips bambusae* (Shumsher), *Thrips alatus* Bhatti, *Thrips apicatus* Priesner, *Thrips florum* Schmutz, *Thrips hawaiiensis* (Morgan), *Thrips palmi* Karny and *Thrips subnudula* (Karny). Diagnostic features, distribution details, material studied, and registration number as recorded on each slide mounted specimen housed at Zoological Survey of India in National Zoological Collections (NZC), Kolkata are also provided.

Specimens collected by beating method were preserved in collecting fluid (9 parts 10% alcohol + 1 part glacial acetic acid + 1 ml Triton X-100 in 1000ml

of the mixture) and mounted on to the glass slides in Canada balsam (Bhatti 1999). The photographs were taken through a Leica Trinocular Microscope (Leica DM-1000) and using Leica software application suite (LAS EZ 2.1.0). All the species are listed with their valid names, authority and the year of description. Species are listed systematically and alphabetically.

1. *Anaphothrips sudanensis* Trybom (Figs. 1-2)

1911. *Anaphothrips sudanensis* Trybom: 1.

Female (Macropterous and brachypterous). Body bicoloured, mainly brown except prothorax and abdominal segments III-V yellow. Legs yellow except femora and tibiae. Fore wing transparent except light brown band between basal $\frac{1}{4}$ to about middle. Antenna 8-segmented, III and IV with forked sense cones. Head wider than long; with 3 pair of ocellar setae; postocular setae uniserial. Pronotum about as long as head, without any prominent setae. Abdominal tergites III to VIII without sculpture at middle.

Male (Brachypterous). Body unicoloured or bicoloured. Ocelli absent. Tergite IX with 2 pairs of stout spindle shaped setae on tuberculated bases. Abdominal sternites III-VII each with a C-shaped pore area.

Material studied: 1 ♀, Himachal Pradesh: Govindsagar, Chilli leaves, 18.xi.2012, (Reg. No. 5957/H17), Vikas & Kaomud.

*Email: vikaszsi77@gmail.com

Distribution: India: Delhi, Himachal Pradesh (new record), Karnataka, Meghalaya, Punjab, Sikkim, West Bengal. *Elsewhere:* Bangladesh, Sri Lanka, Taiwan.

2. *Bathrips melanicornis* (Shumsher)
(Fig. 3-4)

1946. *Taeniothrips melanicornis* Shumsher: 179-181.

1962. *Bathrips melanicornis* (Shumsher); Bhatti: 34-35.

Both sexes macropterous. Body pale with dominant grey patches near to ocellar area, posterior margin of head, two longitudinal patches on pronotum, macrotergite, anterior half of pronotum, abdominal tergites II to VII with dwarf T-shaped patch covering the entire anterior half of tergite. Antennae and fore wing dark. Antennal segments III and IV with forked sense cones; fore wing lower vein with 4 setae, posterior fringes wavy. Abdominal tergites and sternites without craspedum. Male abdominal sternites VII with a single pore area.

Material studied: 5 ♀, 2 ♂, Himachal Pradesh: Kangra, *Brassica campestris*, 20.xi.2012; 1 ♀, from Pinkish white flowers of unidentified tree, 22.xi.2012, (Reg. No. 5181/H17-5188/H17); 1 ♀, Chamba, *Cassia fistula* flowers, 6 ♀, 2 ♂, Kangra, from hedge; 1 ♀, 1 ♂, Mandi, general vegetation, 17.x.2013; 2 ♀, *Arundo donax*, 16.x.2013; 6 ♀, 3 ♂, Chamba, general vegetation, 10.x.2013 (Reg. No. 5719/H17-5742/H17), Vikas & Kaomud.

Distribution: India: Andhra Pradesh, Delhi, Himachal Pradesh (new record), Karnataka, Madhya Pradesh, Punjab, Tamil Nadu, West Bengal. *Elsewhere:* Burma, Indonesia, Taiwan.

3. *Dendrothripoides innoxius* Karny
(Figs. 5-6)

1914. *Euthrips innoxius* Karny: 359-360.

1978. *Dendrothripoides innoxius*(Karny); Bhatti: 10.

Both sexes macropterous. Body pale yellow, including legs. Antennal segment I-V yellow, VI yellow proximally and brown distally, VII-VIII light brown. Body setae pale. Fore wing with 2 brown cross bands. Pronotum with one pair of seta at its posterior angle. Abdominal tergites VI to VII with median pair of large,

sigmoidal setae. Male abdominal tergite IX with a posterolateral expanded setae on each side and abdominal sternites III to VII each with a small linear anteromedian glandular area.

Material studied: 2 ♀, 1 ♂, India, Himachal Pradesh: Mandi, general vegetation, 17.x.2013, (5756/H17 to 5758/ H17), Vikas & Kaomud.

Distribution: India: Delhi, Himachal Pradesh (new record), Karnataka. *Elsewhere:* Nepal, Bangladesh, Burma, Brazil, Malaya, Indonesia, Hong Kong, Taiwan, Philippines, Japan, Australia, Australia, Vanuatu, Fiji, Hawaii, Central and South America, West Indies.

4. *Microcephalothrips abdominalis*

D. L. Crawford

(Figs. 7-8)

1910. *Thrips abdominalis* D. L. Crawford: 157-159.

1926. *Microcephalothrips abdominalis* (Crawford); Bagnall: 113-114.

Both sexes macropterous. Body brown including legs. Antennae 7-segmented; segment II without microtrichia, III and IV with forked sense cones. Frontal surface smooth; basantra with two sclerotized plates and with 5-7 setae. Abdominal tergites I-VIII with large pointed triangular teeth at their posterior margin. Abdominal sternites III to VII of male with pore area.

Material Studied: 5 ♀, 1 ♂, India, Himachal Pradesh: Mandi, *Arundo donax*, 16-17.x.2013; 5 ♀, 5 ♂, Solan, *Solidago* sp. 19.x.2013, (5812/H17 to 5827/H17), Vikas & Kaomud

Distribution: India: Arunachal Pradesh, Delhi, Himachal Pradesh (new record), Karnataka, Meghalaya, Punjab, West Bengal. *Elsewhere:* Bangladesh, Indonesia, Philippines, China, Taiwan, Japan, Pacific Islands, Australia, North America, Central America, Argentina, Egypt.

5. *Scirtothrips dorsalis* Hood

(Fig. 9)

1919. *Scirtothrips dorsalis* Hood: 90-91.

Both sexes macropterous. Body pale yellow. Abdominal tergites with median dark patch. Tergites and sternites with dark antecostal ridges.

Head with two pairs of major median postocular setae; ocellar setae III situated between hind ocelli. Antenna 8-segmented. Metanotum medially with elongate reticles or striations, arcuate in anterior third, median setae not at anterior margin. Tergites with dark transverse antecostal ridge, also dark area occupying median third of tergites. Sternites IV to VI with numerous microtrichia. Tergite IX of male without drepanae.

Material Studied: 6 ♀, India: Himachal Pradesh, Kangra, *Euphorbia*, 14.xi.2012 (5324/H17-5327/H17, 5661/H17, 5279/H17); 2 ♀, Mandi, general vegetation, 17.x.2013 (5744/H17-5745/H17); 1 ♀, Chamba, unidentified plant, 12.x.2013 (5743/H17); 17 ♀, 1 ♂, Govindsagar, *Ricinus Communis*, 18.xi.2012; 1 ♀, chilli leaves, 18.xi.2012, (5217/H17-5235/H17); 5 ♀, 3 ♂, Kangra, *Mimosa pudica*, 14.x.2013 (5747/H17-5753/H17); 1 ♀, Bilaspur, unidentified tree, 18.xi.2012 (5244/H17), Vikas & Kaomud.

Distribution: India: Andhra Pradesh, Assam, Delhi, Gujarat, Himachal Pradesh (new record), Karnataka, Kerala, Madhya Pradesh, Maharashtra, Meghalaya, Odisha, Punjab, Rajasthan, Tamil Nadu, Uttar Pradesh, West Bengal. *Elsewhere:* Pakistan, Bangladesh, Thailand, Sri Lanka, Sulawesi, Malaya, Indonesia, Taiwan, Japan, Korea, Philippines, Solomon Islands, New Guinea, Australia, South Africa.

6. *Scirtothrips mangiferae* Priesner
(Fig. 10)

1932. *Scirtothrips mangiferae* Priesner: 143-145.

Both sexes macropterous. Body pale. Head with two pairs of major median postocular setae; ocellar setae III situated in line with anterior margin of hind ocelli. Antenna 8-segmented. Metanotum with reticulate sculpture; median pair of setae short, inserted along the anterior margin. Fore wing posterior fringe hairs wavy. Tergites VIII and IX with microtrichia medially. Sternites without microtrichia mesad of seta S2. Tergite IX of male with drepanae.

Material Studied: 4 ♀, India: Himachal Pradesh, Mandi, Unidentified plant, 15.x.2013 (5754/

H17-5755/H17, 5709/H17, 5718/H17), Vikas & Kaomud.

Distribution: India: Delhi, Himachal Pradesh (new record), Karnataka, Madhya Pradesh. *Elsewhere:* Egypt, Middle East, Eastern Africa.

7. *Stenchaetothrips bambusae* (Shumsher)
(Figs. 11-12)

1946. *Thrips bambusae* Shumsher: 182-183.

1981. *Stenchaetothrips bambusae* (Shumsher); Bhatti & Mound: 14.

Both sexes macropterous. Body brown; proximal ¼ of fore wing unshaded; Tibiae yellow. Postocular setae III longer than I.

Material Studied: 15 ♀, 2 ♂, Himachal Pradesh, Govindsagar, bamboo leaves, 18.xi.2012; 1 ♀, 1 ♂, Bilaspur, from *Ajeratum* sp., 17.xi.2012; 5 ♀, 3 ♂, Hamirpur, from Bamboo, 25.xi.2012; (5193/H17-5216/H17, 5276/H17, 5236/H17-5237/H17).

Distribution: India: Himachal Pradesh (new record), Maharashtra, Rajasthan, Tamil Nadu. *Elsewhere:* Myanmar, Japan.

8. *Thrips alatus* Bhatti

1980. *Thrips alatus* Bhatti: 118-120.

Both sexes macropterous. Body yellow including legs and wings. Ocellar III outside the ocellar triangle. Antenna 7-segmented. Abdominal tergite II with 4 lateral marginal setae. Abdominal sternites and laterotergites without accessory setae. Comb on tergite VIII complete. Abdominal tergite III-VI of male with pore area.

Material Studied: 1 ♀, 1 ♂, Himachal Pradesh: Bilaspur, from *Ajeratum* sp., 17.xi.2012 (5274/H17-5275/H17), Vikas.

Distribution: India: Himachal Pradesh (new record), Uttar Pradesh. *Elsewhere:* Nepal.

9. *Thrips apicatus* Priesner
(Fig. 16)

1934. *Thrips apicatus* Priesner: 264, 286.

Both sexes macropterous. Body pale yellow except distal half of abdominal tergite X dark brown, and with median light brown spot on tergites IV-VII. Head broader than long; ocellar

setae III outside the ocellar triangle. Antenna 7-segmented. Metanotum median pair of setae inserted behind anterior margin. Abdominal sternites and laterotergites with accessory setae. Comb of posterior margin of tergite VIII absent in middle, a rudimentary comb present on sides in female and absent in male. Median pair of setae (S1) on sternite VII inserted far ahead of posterior margin. Abdominal sternites III–VII of male each with a narrow distinct pore area.

Material Studied: 1 ♀, Himachal Pradesh, Kangra, Hedge with violet flowers, 14.x.2013 (5489/H17), Vikas & Kaomud.

Distribution: India: Andhra Pradesh, Delhi, Himachal Pradesh (new record), Karnataka, Kerala, Madhya Pradesh, Tamil Nadu. *Elsewhere:* Thailand.

10. *Thrips florum* Schmutz (Figs. 13-14)

1913. *Thrips florum* Schmutz: 1003.

Both sexes macropterous. Female brown and male pale yellow. Head broader than long; ocellar setae III inserted outside the ocellar triangle, or just on tangent joining the outer margin of fore and hind ocelli. Antenna 7-segmented. Mesonotum with a pair of anterior median campaniform sensilla; area around these sensilla unsculptured. Fore wing clavus with 5 setae; apical veinal seta shorter than subapical veinal seta and basal discal seta longer than apical veinal seta or subequal to it. Abdominal sternites with accessory setae. Posterior margin of abdominal tergite VIII with comb of microtrichia in female and absent in male. Abdominal sternites with accessory setae and laterotergites without accessory setae. Abdominal sternites III–VII of male each with transversely elongated pore area.

Material Studied: 9 ♀, India, Himachal Pradesh: Kangra, from *Euphorbia*, 14.xi.2012, (Reg. 5297/H17-5305/h17); 12 ♀, 2 ♂, white rose; 2 ♀, hedge; 12 ♀, Pumpkin, 14.x.2013; 3 ♀, General Vegetation, 10.x.2013; 3 ♀, 6 ♂, *Cassia fistula* flowers, 12.x.2013; 23 ♀, cactus flowers, 10.x.2013; 1 ♀, Mandi, Tea flowers, 13.x.2013;

1 ♀, white flowers, 16.x.2013; 4 ♀, *Arundo donax*, 16.x.2013; 6 ♀, Solan (Reg. 5542/H17-5615/H17); Kangra, 5 ♀, 1 ♂, from Creeping herb, 20.xi.2012, (Reg. 5206/H17-5311/H17); 4 ♀, Chamba, 10.x.2013, general vegetation, (Reg. 5277/H17-5379/H17, 5479/H17), Vikas & Kaomud.

Distribution: India: Delhi, Himachal Pradesh (new record), Karnataka, Odisha, Tamil Nadu. *Elsewhere:* Florida, Caribbean, Australia.

11. *Thrips hawaiiensis* (Morgan) (Fig. 15)

1913. *Thrips hawaiiensis* Morgan: 3.

Both sexes macropterous. Female brown or bicoloured and male pale yellow. Head broader than long; ocellar setae III inserted outside the ocellar triangle, much stouter and longer than any other dorsal head setae. Antenna 7- or 8-segmented. Mesonotum with a pair of anterior median campaniform sensilla; area around these sensilla transversely sculptured. Fore wing clavus with 5 setae on anal vein; apical veinal seta longer than subapical veinal seta and basal discal seta shorter than apical veinal seta. Abdominal sternites with accessory setae. Laterotergites without accessory setae. Posterior margin of abdominal tergite VIII with complete comb of microtrichia in female and absent in male. Abdominal sternites III–VII of male each with transversely oblong or medially narrowed pore area.

Material Studied: 2 ♀, Chamba, 10.x.2013, general vegetation, (Reg. 5961/H17-5962/H17), Vikas & Kaomud.

Distribution: India: Delhi, Maharashtra, Himachal Pradesh (new record), Karnataka. *Elsewhere:* Jamaica, Australia.

12. *Thrips palmi* Karny (Fig. 17)

1925. *Thrips palmi* Karny: 10-15.

Both sexes macropterous. Body bright golden yellow including wings and legs. Head broader than long; ocellar setae III inserted outside the ocellar triangle. Antenna 7-segmented. Mesonotum with campaniform sensilla anteriorly at middle.

Metanotum with longitudinal lines of sculpture at middle; median pair of setae inserted far back of anterior margin; companiform sensilla present. Abdominal sternites and laterotergites without accessory setae. Posterior margin of abdominal tergite VIII with complete comb of microtrichia in female and absent in male. Abdominal sternites III-VII of male each with transversely elongate pore area.

Material Studied: 1 ♀, 1 ♂, India: Himachal Pradesh, Govindsagar, From Brinjal Flowers, 18.xi.2012, (5140/H17-5141/H17); 4 ♀, 1 ♂, Bilaspur, mixed herb, 17.xi.2012; 1 ♀, from *Parthenium hysterophorus*, 17.xi.2012, (5143/H17-5148/H17); 1 ♀, *Eucalyptus* leaves, 17.xi.2012 (5333/H17); 6 ♀, 1 ♂, from *Ajeratum* sp., 17.xi.2012 (5269/H17-5270/H17); 1 ♀, Nangil, *Brassica campestris*, 19.xi.2012 (5330/H17); 1 ♀, Solan, general vegetation, 19.x.2013, (5342/H17); 2 ♀, Bilaspur, flowers and leaves of *Ficus racemosa*, 18.xi.2012, (5329/H17,5331/H17); 1 ♀, Kangra, creeping herb with bluish violet flowers, 20.xi.2012 (5332/H17), Vikas & Kaomud.

Distribution: India: Andhra Pradesh, Delhi, Himachal Pradesh (new record), Karnataka, Madhya Pradesh, Maharashtra. *Elsewhere:* Pakistan, Bangladesh, Thailand, Singapore, Malaya, Southern China, HongKong, Taiwan, Southern Japan, Indonesia, Philippines, Samoa, Wallis Island, Guam, New Caledonia, Puerto Rico, Martinique, Guadeloupe, Reunion, Sudan.

13. *Thrips subnudula* (Karny)

(Fig. 18)

1926. *Ramaswamiahiella subnudula* Karny: 208-210.

2010. *Thrips subnudula* (Karny): Mound: 16.

Both sexes macropterous. Body pale yellow. Antennae 7-segmented. Ferna undivided. Basantra membranous. Abdominal sternites and laterotergites with accessory setae and numerous setae at their posterior margin.

Material Studied: 1 ♀, India: Himachal Pradesh, Mandi, *Acacia* sp., 17.x.2013, (5390/H17); 1 ♀, Solan, *Solidago* sp. 19.x.2013 (5536/H17).

Distribution: India: Delhi, Haryana, Himachal Pradesh (new record), Karnataka, Madhya Pradesh, Maharashtra, Odisha, Punjab, Rajasthan, Tamil Nadu, West Bengal. *Elsewhere:* Bangladesh, Nigeria, Pakistan, Uganda, Sri Lanka.

SUMMARY

Thirteen new record of Thrips belonging to the subfamily Thripinae of family Thripidae are recorded first time from the Himachal Pradesh state of India.

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PLATE-I



Fig. 1. *Anaphothrips sudanensis*, female



Fig. 2. *Anaphothrips sudanensis*, male

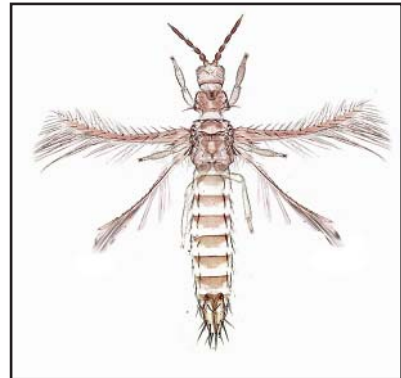


Fig. 3. *Bathrips melanicornis*, female

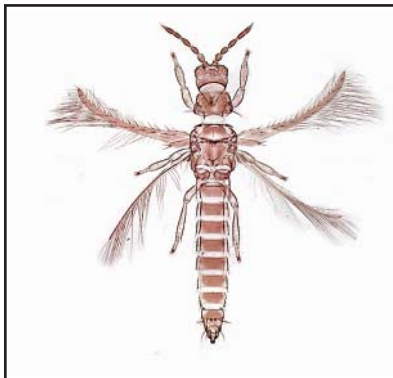


Fig. 4. *Bathrips melanicornis*, male

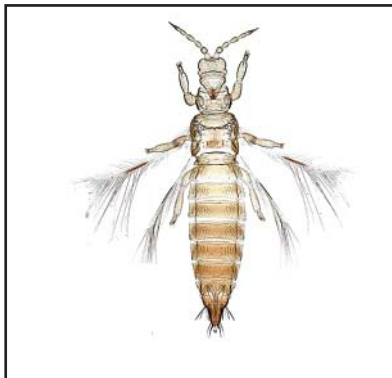


Fig. 5. *Dendrothripoides innoxius*, female

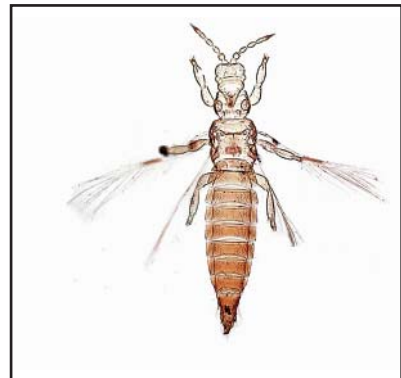


Fig. 6. *Dendrothripoides innoxius*, male



Fig. 7. *Microcephalothrips abdominalis*, female



Fig. 8. *Microcephalothrips abdominalis*, male

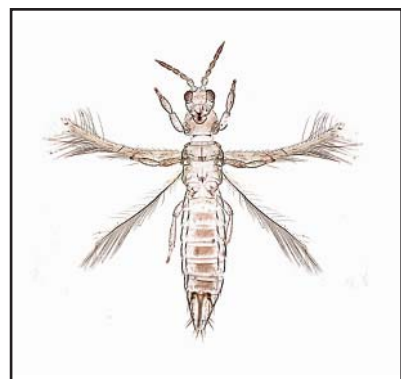


Fig. 9. *Scirtothrips dorsalis*, female

PLATE-II

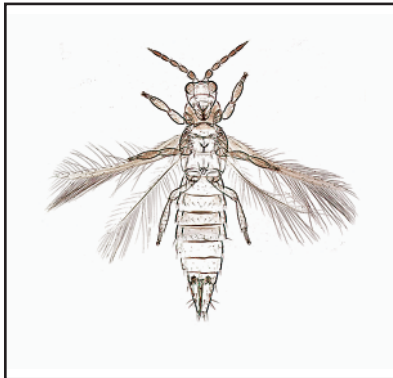


Fig. 10. *Scirtothrips mangiferae*, female

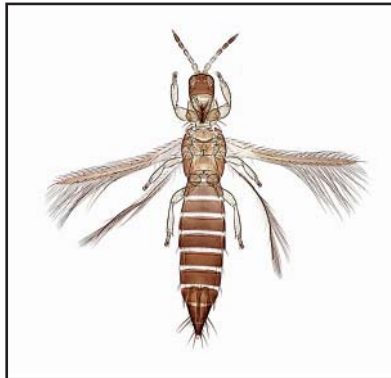


Fig. 11. *Stenchaetothrips bambusae*, female

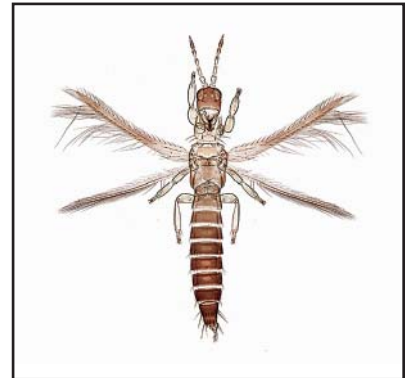


Fig. 12. *Stenchaetothrips bambusae*, male



Fig. 13. *Thrips florum*, female

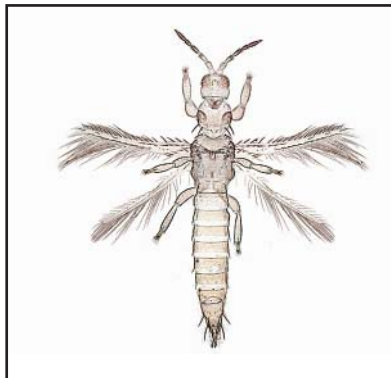


Fig. 14. *Thrips florum*, male

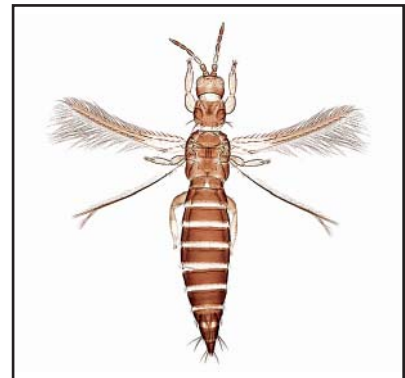


Fig. 15. *Thrips hawaiiensis*, female

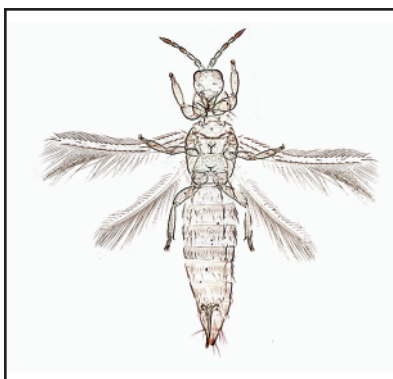


Fig. 16. *Thrips apicatus*, female

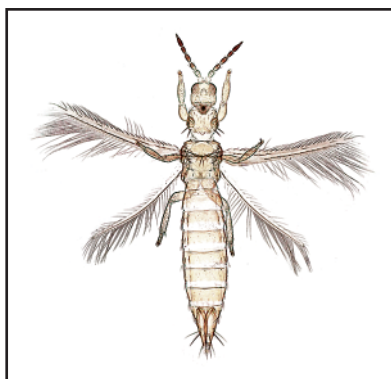


Fig. 17. *Thrips palmi*, female

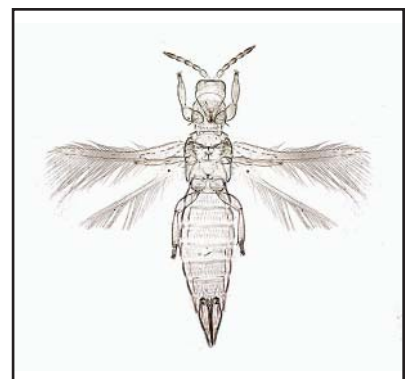


Fig. 18. *Thrips subnudula*, female