ARTICLE

Taxonomic review and key to species of genus *Thrips* Linnaeus (Thysanoptera: Thripidae) in the Philippines, with new record and description of a new species

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ABSTRACT

The description of one species new to science, *Thrips leytensis* **sp. nov.**, and redescription of *Thrips hanifahi* Mound and Azidah (**new record**), and 24 previously recorded *Thrips* species in the Philippines, namely: *Thrips alius* Palmer, *T. apicatus* Priesner, *T. brevistylus* (Priesner), *T. coloratus* Schmutz, *T. decens* Palmer, *T. extensicornis* Priesner, *T. flavus* Schrank, *T. florum* Schmutz, *T. hawaiiensis* (Morgan), *T. longicaudatus* (Bianchi), *T. malloti* (Priesner), *T. melastomae* Priesner, *T. morindae* Priesner, *T. nigropilosus* Uzel, *T. orientalis* (Bagnall), *T. palmerae* Reyes, *T. palmi* Karny, *T. parvispinus* (Karny), *T. simplex* (Morison), *T. subnudula* (Karny), *T. sumatrensis* Priesner, *T. tabaci* Lindeman, *T. vitticornis* (Karny), and *T. wedeliae* Priesner are provided. A key to species identification using morphology-based diagnostics of adult female thrips is also provided. Many of these species have little information beyond their original taxonomic description, however, 12 *Thrips* species are in the quarantine pests list of the European and Mediterranean Plant Protection Organization (EPPO), namely: *T. coloratus*, *T. flavus*, *T. florum*, *T. hawaiiensis*, *T. nigropilosus*, *T. orientalis*, *T. palmi*, *T. parvispinus*, *T. simplex*, *T. subnudula*, *T. sumatrensis*, and *T. tabaci*.

The flower thrips, *T. hawaiiensis*, is a pest of Cavendish banana, cashew, citrus, coffee, corn, *Gardenia*, guava, mango, mangosteen, pummelo and roses. *T. palmi* is a pest of cucumber, cotton, eggplant, legume, melon, pepper, potato, squash and tomato, and known vector of viral pathogens. *T. orientalis* is pest of *Gardenia* and *Jasminum*. *T. parvispinus* is a pest of melon, and known as serious pest of chili pepper. *T. simplex* is a pest of *Hibiscus* and *Gladiolus* while *T. sumatrensis* is a pest of *Dahlia*,

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KEYWORDS

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Jasminum and *Solanum*. *T. tabaci* is a pest of garlic and onion, and known vector of viral pathogens.

INTRODUCTION

The genus *Thrips* Linnaeus in the insect order Thysanoptera is one of the largest genera in family Thripidae with 303 species worldwide (Catalogue of Life 2024). There are 15 genera in subfamily Thripinae that are included in the *Thrips* genus-group whose members share the following morphological characters: ocellar setae pair 1 absent; antennae with 7 to 8 segments; abdominal tergites V-Vlll with paired ctenidia laterally; ctenidia on VIII situated posterior to the spiracles; and discal setae S2 on tergites Vl-Vll larger than S1 and S3 (Mound et al. 2017; Mound et al. 2022; Reyes et al. 2024). Of these genera, members of *Thrips* with 7-segmented antennae are morphologically similar to species of the genus *Stenchaetothrips* Bagnall (1926), but this structure is unreliable indicator of relationship because thrips antennal segmentation is subject to irregular homoplasy (Zhang et al. 2019). Species of *Thrips* could be distinguished from *Stenchaetothrips* by having postocular setae usually arranged in one row; a pronotum with 3 to 6 pairs of posteromarginal setae toward angulars, and 1 or 2 pairs of short or long posteroangular setae; mesosternal furca with spinula; metanotal median sculpture striate or reticulate; and abdominal tergites VI to VII with or without small, scallop-like projection on posterior margin (Palmer 1992; Reyes 1994; Mound and Azidah 2009; Masumoto and Okajima 2013; Sartiami and Mound 2013; Mound et al. 2017).

Within the genus *Thrips*, species vary in body color (i.e. yellow, brown, bicolored), body size, and chaetotaxy of body and forewings setae. The following morphological characters of female thrips are used in identifying species: head length, width and sculpture; length of mouthcone; length and location of ocellar setae pair lll; size of eyes; number and length of postocular setae pair l and ll; number, shape, length and color of antennal segments; length and width of pronotum, presence or absence of pronotal discal setae; number of posteromarginal setae toward angulars and length of posteroangular setae; color of legs and presence or absence of hairs or spines in inner margin of hindtibiae; color of forewings and number of anterior vein setae; metanotal median sculpture, location of median setae, and presence or absence of a pair of campaniform sensilla; presence or absence of spinula on mesosternal and metasternal furcae; presence or absence of comb of microtrichia on posterior margin of abdominal tergite Vlll; length of B1 and B2 setae on abdominal tergites lX and X; length of abdominal tergite lX and X; length of female ovipositor; and presence or absence of discal setae on abdominal sternites lll-Vl; and presence or absence of discal setae on pleurotergites (Palmer 1992; Reyes 1994; Mound and Masumoto 2005; Mound and Azidah 2009; Ng and Mound 2020).

Many researchers have studied and described species of *Thrips* in temperate and tropical regions of the world, including Ananthakrishnan and Jagadish (1966), Sakimura (1967), Bhatti (1980), Okajima et al. (1992), Nakahara (1994), Mound and Collins (2000), Mound and Azidah (2009), Zhang et al. (2011), Masumoto and Okajima (2013, 2019), Sartiami and Mound (2013), Tyagi and Kumar (2015), Mirab- balou (2016), Mound et al. (2016), and Ng and Mound (2020). In the Philippines, Moulton (1936), Palmer (1992), Reyes (1994, 2021), and Mound (2005) recognized and recorded a total of 24 species of *Thrips*, namely: *Thrips alius* Palmer, *T. apicatus* Priesner, *T. brevistylus* (Priesner), *T. coloratus* Schmutz, *T. decens* Palmer, *T. extensicornis* Priesner, *T. flavus* Schrank, *T. florum* Schmutz, *T. hawaiiensis* (Morgan), *T. longicaudatus* (Bianchi), *T. malloti* (Priesner), *T. melastomae* Priesner, *T. morindae* Priesner, *T. nigropilosus* Uzel, *T. orientalis* (Bagnall), *T. palmerae* Reyes, *T. palmi* Karny, *T. parvispinus* (Karny), *T. simplex* (Morison), *T. subnudula* (Karny), *T. sumatrensis* Priesner, *T. tabaci* Lindeman, *T. vitticornis* (Karny), and *T. wedeliae* Priesner. *Thrips morindae* Priesner, which was previously synonymized with *T. javanicus* Priesner (Palmer 1992; Reyes 2021) is included in this list because its status was restored as a valid name (Mound 2005; Mound and Azidah 2009) based mainly on body color of male thrips. *Thrips taiwanus* (Takahashi) was excluded because it is a junior synonym of *T. parvispinus* (Karny) (Palmer 1992; Reyes 1994; Mound and Collins 2000). Moreover, *T. tuscus* Moulton and *T. victoriensis* Moulton were also excluded for they were previously transferred to genus *Stenchaetothrips* (Palmer 1992; Reyes 1994; Reyes et al. 2024).

The genus *Thrips* is one of the genera under family Thripidae that includes several species that cause damage to crops, either alone or in combination of viral pathogens they transmit to plants (Riley et al. 2011; Mound et al. 2022). Thrips usually feed on leaves or flowers but many feed and reproduce on both leaves and flowers, and damage young fruits that affect their quality and marketability (Reyes et al. 2022). Due to the small size of thrips and their cryptic habit, often times adult thrips and larvae are often undetected on plants or plant parts for transport to other countries which affects thrips dispersal (Reyes 1990; Morse and Hoddle 2006). With the advent of global trade of fresh produce, foliage and cut flowers, the spread of thrips is being accelerated and pose biosecurity risks to many importing countries.

Many species of *Thrips* that were previously recorded in the Philippines have little information beyond their original taxonomic description, however, of the 24 species in the country, 12 species are in the quarantine pests list of the European and Mediterranean Plant Protection Organization (EPPO 2024), namely: *T. coloratus*, *T. flavus*, *T. florum*, *T. hawaiiensis*, *T. nigropilosus*, *T. orientalis*, *T. palmi*, *T. parvispinus*, *T. simplex*, *T. subnudula*, *T. sumatrensis*, and *T. tabaci*. An accurate species identification therefore is crucial for developing a reliable thrips detection method, and for designing an appropriate pest management program for quarantine pests. The study aimed to consolidate and review species of *Thrips* previously recorded in the Philippines, report new record, describe species new to science, and provide an illustrated key to species identification. The paper is intended for plant protection and quarantine researchers, teachers, farmers, students, and the global scientific community.

MATERIALS AND METHODS

Specimens used in the study consisted of 719 slide-mounted thrips (643 female and 76 male) in Canada balsam in the C.P. Reyes collection at National Museum of Natural History of the National Museum of the Philippines including specimens she received from M. Alba, M. Arcelo, A. Almeroda, H. Bergonia, B. Capunitan, J. Catindig, E. Decena, O. Estioko, V. Fernando, V. P. Gapud, I. Lit, Jr., M. Ma, E. C. Mituda, Oratai and Chantana, R. Joshi, M. D. Malabayabas, E. Oquias, I. Palacio, S.G. Reyes, and L. Ramos. The C.P. Reyes garlic thrips collection, and G. Belarmino and N. Romero Habib pepper thrips collection preserved in 70% ethanol at Department of Agriculture-Bureau of Plant and Industry, Manila, and type materials and other slide- mounted thrips specimens at Natural History Museum, United Kingdom were also examined. The specimens at the Philippine National Museum were collected sometime in 1978, 1980, 1982,1983,1984,1985,1987,1988, 2019, 2020, 2021 and 2022 from the Cordillera Administrative Region (Baguio City, Benguet, Mt. Province), Region 1 (Ilocos Norte, Ilocos Sur, Pangasinan), Region 2 (Batanes, Cagayan), Region 3 (Nueva Ecija), Region 4A (Batangas, Laguna), Region

4B (Oriental Mindoro, Palawan), Region 5 (Camarines Sur, Sorsogon), Region 6 (Guimaras, Negros Occidental), Region 7 (Bohol), Region 8 (Leyte); Region 9 (Pagadian, Zamboanga City), Region 10 (Bukidnon), Region 11 (Davao City, Davao del Sur, Davao del Norte, Davao de Oro, Davao Oriental), and Region 12 (North Cotabato, Sultan Kudarat, South Cotabato, Sarangani).

The classification of Thysanoptera was adopted from the Catalogue of Life (2024). The species in the genus *Thrips* were listed, and arranged alphabetically. The key to species was developed using morphology-based diagnostics of female thrips. Photomicrographs of female, and male thrips when available were taken using Keyence VHX digital microscope, Nikon Eclipse E200 and Olympus BX63 microscopes. The principal structures used in characterizing a female Thysanoptera (Thripidae) is shown in Fig. 1.

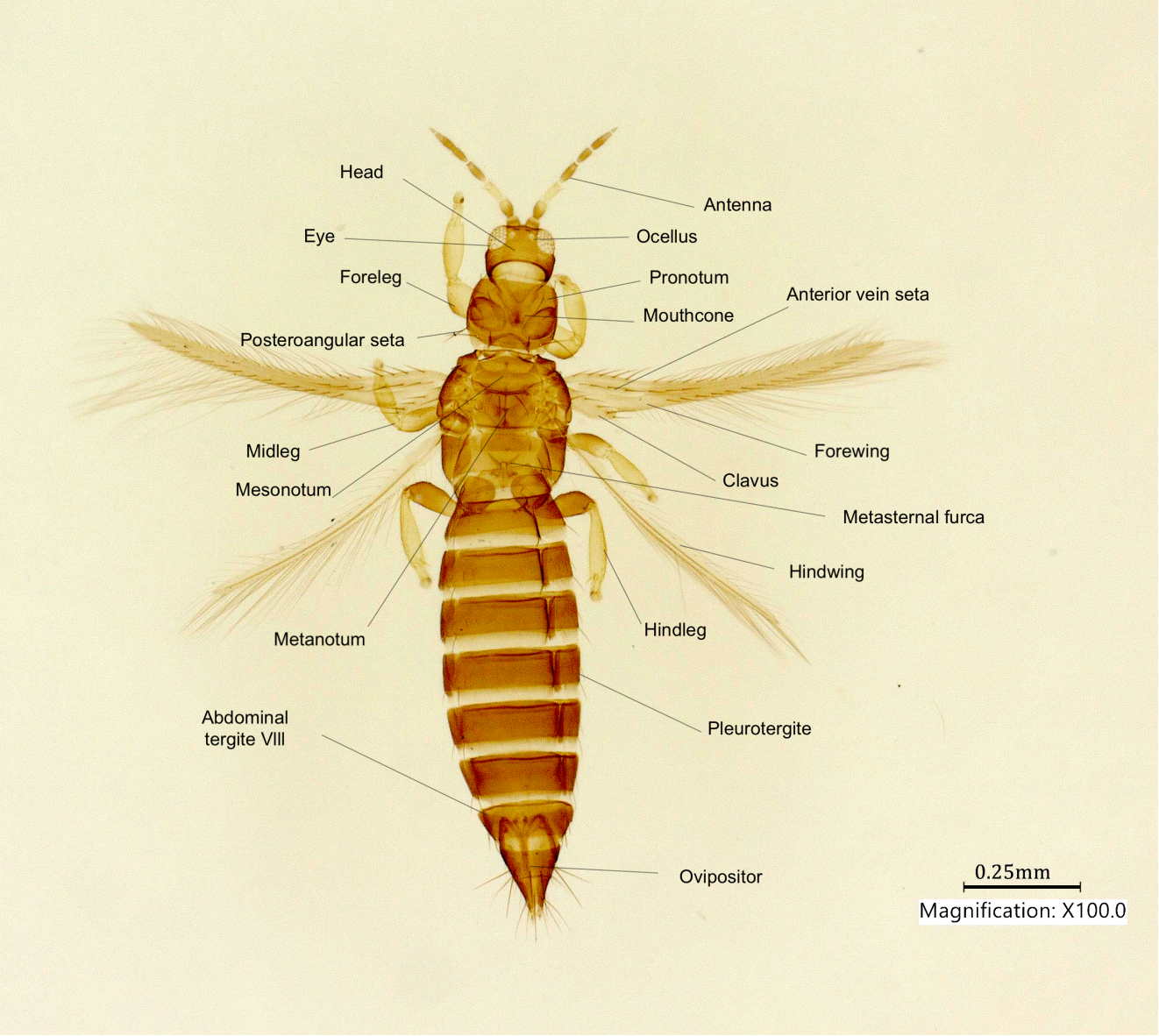


Figure 1: Principal structures of female Thysanoptera (Thripidae), dorsal aspect of *Thrips sumatrensis* Priesner [CP Reyes and RMC Catamora].

The distribution of the Philippine species of *Thrips* Linnaeus is shown in Fig. 2 while the list of host plants is presented in Table 1. The valid species name of host plants were checked using the database of the Plants of the World Online (POWO 2025). The following acronyms were used throughout the text to indicate specimen depository:

CASC	California Academy of Sciences, San Francisco, California, USA
DABPI	Department of Agriculture-Bureau of Plant Industry, Manila, Philippines
NHMUK	Natural History Museum, London, United Kingdom
PNM	National Museum of the Philippines, Manila, Philippines
SMFG	Forschungsinstitut Natur Museum Senckenberg, Frankfurt, Germany
USNM	National Museum of Natural History, Washington, D.C., USA

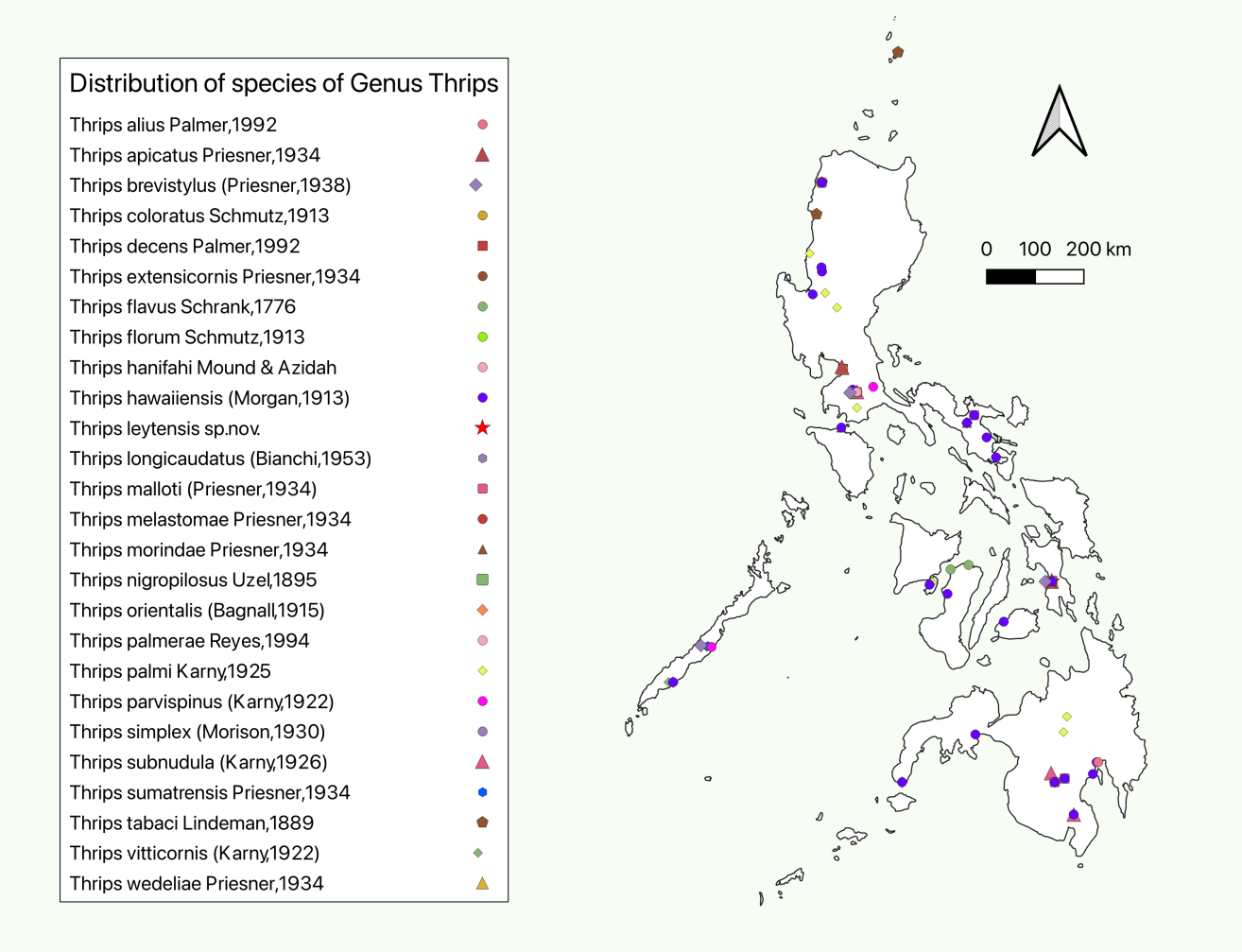


Figure 2: Distribution of the Philippine species of genus *Thrips* Linnaeus [PAC Buenavente].

Table 1: Host plants of the Philippine species of genus *Thrips* Linnaeus.

***Thrips* Species**	**Plant Family**	**Plant Species***
1. *Thrips alius* Palmer	Musaceae	*Musa sapientum* L.
2. *Thrips apicatus* Priesner	-	Unknown plant
3. *Thrips brevistylus* (Priesner)	Asparagaceae Poaceae -	*Cordyline* sp. *Zea mays* L. Unknown plant
4. *Thrips coloratus* Schmutz	-	Unknown plant
5. *Thrips decens* Palmer	-	Unknown plant
6. *Thrips extensicornis* Priesner	-	Unknown plant
7. *Thrips flavus* Schrank	- Verbenaceae	'Quigar' plant *Stachytarpheta jamaicensis* (L.) Vahl
8. *Thrips florum* Schmutz	-	Cut flower
9. *Thrips hanifahi* Mound and Azidah	Rubiaceae	*Coffea arabica* L.
10. *Thrips hawaiiensis* (Morgan)	Acanthaceae Amaranthaceae	*Pachystachys coccinea* (Aubl.) Nees *Amaranthus spinosus* L.

	Anacardiaceae	*Anacardium occidentale* L. *Mangifera indica* L.
	Apocynaceae	*Cascabela thevetia* (L.) Lippold (= *Thevetia peruviana* (Pers.) Schum.) *Nerium oleander* L. *Plumeria acuminata* Ait. *Plumiera rubra* L. (= *Plumiera acuminata* Aiton) *Tabernaemontana pandacaqui* Lam. (= *Ervatamia pandacaqui* Lam.)
	Araceae	*Calocasia esculenta* (L.) Schott Unknown plant
	Asteraceae	*Ageratum conyzoides* L. *Helianthus annuus* L. *Helichrysum stoechas* (L.) Moench *Leucanthemum* sp. *Tagetes erecta* L.
	Bignoniaceae	*Tecoma stans* (L.) Juss. ex Kunth
	Bixaceae	*Bixa orellana* L.
	Cannaceae	*Canna* sp.
	Caricaceae	*Carica papaya* L.
	Convolvulaceae	*Ipomoea batatas* (L.) Lam.
	Euphorbiaceae	*Codiaeum variegatum* L.
	Fabaceae	*Caesalpinia* sp. *Clitoria fairchildiana* Howard *Gliricidia* sp. *Haematoxylon* sp. *Leucaena leucocephala* (Lam.) de Wit. Unknown plant
	Heliconiaceae	*Heliconia* sp.
	Liliaceae	*Lilium sp.*
	Magnoliaceae	*Magnolia champaca* (L.) Baill. ex Pierre
	Malvaceae	*Gossypium* sp.
	Meliaceae	*Sandoricum koetjape* (Burm.) Merr.
	Musaceae	*Musa sapientum* L.
	Myrtaceae	*Psidium guajava* L. *Syzygium aqueum* (Burm.) Alston
	Oleaceae	*Jasminum sambac* (L.) Alton
	Poaceae	*Ageratum conyzoides* L. *Rottboellia cochinchinensis* (Lour.) Clayton (= *Rottboellia exaltata* L.)

		grass *Zea mays* L.
	Rosaceae	*Rosa* sp.
	Rubiaceae	*Coffea arabica* L. *Coffea robusta* L. *Gardenia* sp.
	Rutaceae	*Citrus* sp.
	Solanaceae	*Capsicum annum* L. *Physalis angulata* L. *Solanum* sp.
	Verbenaceae	*Lantana camara* L. *Stachytarpheta cayennensis* (Rich.) Vahl
	Zingiberaceae	Unknown plant
	-	'Maria-maria' plant 'Taratabaco' Unknown plant Unknown shrub Unknown tree Unknown weed
11. *Thrips leytensis* sp. nov.	Verbenaceae	*Stachytarpheta cayennensis* (Rich.) Vahl
12. *Thrips longicaudatus* (Bianchi)	Rutaceae	*Citrus* sp.
13. *Thrips malloti* (Priesner)	Apocynaceae	*Plumeria rubra* L. (= *Plumiera acuminata* Aiton) *Tabernaemontana pandacaqui* Lam. (= *Ervatamia pandacaqui* (Poir) Markgr.)
	Asteraceae	*Helianthus annuus* L.
	Fabaceae	*Cajanus cajan* (L.) Huth
	Nelumbonaceae	*Nelumbo nucifera* Gaertn. (= *Nelumbium speciosum* Willd.)
	Poaceae	*Zea mays* L.
	Rutaceae	*Citrus* sp.
	-	Unknown plant
14. *Thrips melastomae* Priesner	-	Unknown plant
15. *Thrips morindae* Priesner	Maranthaceae	*Maranta arundinacea* L.
	Musaceae	*Musa* sp.
	Rutaceae	*Citrus* sp.
	-	Unknown plant
16. *Thrips nigropilosus* Uzel	Asteraceae	*Osteospermum* sp.
	Fabaceae	*Cajanus cajan* (L.) Millsp.
17. *Thrips orientalis* (Bagnall)	Amaryllidaceae	Unknown plant
	Oleaceae	*Jasminum sambac* L.
	-	'Manban' Unknown plant

18. *Thrips palmerae* Reyes	-	Unknown plant
19. *Thrips palmi* Karny	Asteraceae	*Chrysanthemum* sp. *Cichorium intybus* L.
	Brassicaceae	*Raphanus raphanistrum sativus* (L.) (=*Raphanus sativus* L.)
	Cucurbitaceae	*Citrullus lanatus* (Thunb.) Matsum. and Nakai *Cucumis sativus* L. *Cucurbita maxima* Duchesne *Luffa acutangula* (L.) Roxb.
	Euphorbiaceae	*Jatropha curcas* L.
	Fabaceae	*Phaseolus vulgaris* L. *Vigna radiata* (L.) Wilczek *Vigna* sp.
	Malvaceae	*Abelmoschus esculentus* (L.) Moench *Gossypium* sp. *Hibiscus rosa-sinensis* L.
	Moraceae	*Morus alba* L.
	Rubiaceae	*Borreria* sp.
	Solanaceae	*Capsicum annum* L. *Nicotiana tabacum* L. *Solanum lycopersicum* L. (=*Lycopersicon lycopersicum* (Karst.) *Solanum melongena* L. *Solanum* sp. *Solanum tuberosum* L.
	Verbenaceae	*Lantana* sp.
	-	Cut flower Unknown plant Unknown tree Thai weed
20. *Thrips parvispinus* (Karny)	Cucurbitaceae	*Citrullus lanatus* (Thunb.) Matsum. & Nakai (=*Citrullus vulgaris* (L.) Schrader)
	Solanaceae	*Capsicum annum* L.
	-	Unknown plant
21. *Thrips simplex* (Morison)	Amaryllidaceae	*Crinum asiaticum* L.
	Apocynaceae	*Plumiera rubra* L. (=*Plumiera acuminata* Aiton)
	Asteraceae	*Dahlia* sp. *Helianthus annuus* L. *Osteospermum* sp.
	Cucurbitaceae	*Sicyos edulis* Jacq.
	Iridaceae	*Gladiolus* sp.
	Liliaceae	*Lilium* sp.
	Malvaceae	*Hibiscus rosa-sinensis* L.
	Moraceae	*Ficus* sp.
	-	Unknown plant
22. *Thrips subnudula* (Karny)	Amaranthaceae	*Amaranthus spinosus* L.

	Fabaceae Strelitziaceae	*Vigna radiata* (L.) R. Wilczek *Strelitzia reginae* Banks
23. *Thrips sumatrensis* Priesner	Arecaceae Fabaceae Moraceae Solanaceae Hydrangeaceae Zingerberaceae -	*Areca catechu* L. *Gliricidia* sp. *Artocarpus* sp. *Solanum melongena* L. *Hydrangea* sp. Unknown plant Unknown plant
24. *Thrips tabaci* Lindeman	Amaryllidaceae	*Allium* sp. *Allium sativum* L.
25. *Thrips vitticornis* (Karny)	Asteraceae Fabaceae	*Chromolaena odorata* (L.) R.M. King and H. Rob. *Gliricidia* sp. *Gliricidia sepium* (Jacq.) Kunth.
26. *Thrips wedeliae* Priesner	-	Unknown plant

* List of host plants based on collection labels of thrips specimens from the Philippines.

RESULTS AND DISCUSSION

RESULTS

Genus *Thrips* Linnaeus

Thrips Linnaeus, 1758: 457. Type species *Thrips physapus* Linnaeus, 1758, by subsequent designation of Latreille (1810).

There are 303 extant species in the genus *Thrips* (Catalogue of Life 2024) of which 24 species were previously recorded from the Philippines (Nakahara 1985; Palmer 1992; Reyes 1994, 2021; Mound 2005).

Diagnostic characters.

Head about as long as wide or wider, with transverse striae posteriorly; mouthcone elongate, rounded. Ocellar setae pair l absent, ll and lll present, lll inserted inside or outside ocellar triangle. Eyes medium or relatively large. Postocular setae usually in one row, well developed or very small. **Antennae** 7- or 8-segmented, segments III and IV each with forked sense cone. **Pronotum** with transverse striae with discal setae, and 3 to 5 pairs of posteromarginal setae toward angulars, 2 pairs of posteroangular setae long or short, subequal in length. Tarsi-2 segmented. **Forewings** with series of setae on anterior vein broadly interrupted or complete. **Legs** yellow, brown or bicolored. Mesonotum with transverse striae, median pair of setae inserted far ahead of posterior margin. **Metanotal median sculpture** striate, weakly reticulate or distinctly reticulate; median setae inserted near or behind anterior margin; pair of campaniform sensilla present or absent. Mesosternal furca with spinula. Metasternal furca without spinula. **Abdominal tergites** V to Vlll with paired ctenidia laterally, on Vlll situated posterior of spiracles; posterior margin of Vlll with complete, incomplete or without comb of microtrichia on posterior margin; tergites lX and X with long B1 and B2 setae, subequal in length. **Abdominal sternites** lll to Vl with or without discal setae. **Pleurotergites** with or without discal setae. Female ovipositor well developed. Male similar to female in structure; abdominal sternites lll to Vll each with transverse pore plate.

Species of *Thrips* Linnaeus in the Philippines and references when first recorded

1. *Thrips alius* Palmer – Palmer (1992)
2. *Thrips apicatus* Priesner – Palmer (1992)
3. *Thrips brevistylus* (Priesner) – Palmer (1992)
4. *Thrips coloratus* Schmutz – Palmer (1992)
5. *Thrips decens* Palmer – Mound (2005)
6. *Thrips extensicornis* Priesner – Palmer (1992)
7. *Thrips flavus* Schrank – Palmer (1992)
8. *Thrips florum* Schmutz – Nakahara (1985)
9. *Thrips hanifahi* Mound and Azidah, 2009, **new record**
10. *Thrips hawaiiensis* (Morgan) – Moulton (1936)
11. *Thrips leytensis* **sp. nov**.
12. *Thrips longicaudatus* (Bianchi) – Palmer (1992)
13. *Thrips malloti* (Priesner) – Moulton (1936)
14. *Thrips melastomae* Priesner – Palmer (1992)
15. *Thrips morindae* Priesner – Palmer (1992)
16. *Thrips nigropilosus* Uzel – Palmer (1992)
17. *Thrips orientalis* (Bagnall) – Palmer (1992)
18. *Thrips palmerae* Reyes – Reyes (1994)
19. *Thrips palmi* Karny – Calilung (1977)
20. *Thrips parvispinus* (Karny) – Moulton (1928)
21. *Thrips simplex* (Morison) – Palmer (1992)
22. *Thrips subnudula* (Karny) – Palmer (1992)
23. *Thrips sumatrensis* Priesner – Palmer (1992)
24. *Thrips tabaci* Lindeman – Capco (1957)
25. *Thrips vitticornis* (Karny) – Palmer (1992)
26. *Thrips wedeliae* Priesner – Palmer (1992)

Differential diagnosis of the Philippine species of *Thrips* Linnaeus

Thrips apicatus is similar to *T. subnudula* in having 7-segmented antennae, yellow forewings and legs, metanotal median sculpture reticulate with median setae inserted behind the anterior margin and a pair of campaniform sensilla, and abdominal sternites lll to Vl and pleurotergites with discal setae. *T. subnudula*, however, is uniformly yellow in body color, ocellar setae pair lll inserted inside the ocellar triangle, pronotum

with 5 pairs of posteromarginal setae toward angulars and 2 pairs of posteroangular setae, abdominal sternites lll to Vl with 24 to 30 discal setae, and pleurotergites with 3 to 5 discal setae while *T. apicatus* is yellow with abdominal tergite X brownish in some individuals, ocellar setae pair lll inserted outside the margin of ocellar triangle, pronotum with 3 to 4 pairs of posteromarginal setae toward angulars and 2 pairs of long posteroangular setae, abdominal sternites lll to Vl with 20 or more discal setae, and pleurotergites with 2 to 6 discal setae.

Thrips tabaci is similar to *T. nigropilosus* in having a head wider than long, 7-segmented antennae, pronotum with 3 pairs of posteromarginal setae toward angulars and 2 pairs of posteroangular setae, metanotal median sculpture striate or weakly reticulate with median setae inserted behind the anterior margin and campaniform sensilla absent, and abdominal sternites lll to Vl without discal setae. *T. nigropilosus*, however, is yellow with brown markings on thorax and abdomen, ocellar setae pair lll inserted outside the margin of ocellar triangle, forewings anterior vein with 7 basal and 3 distal setae, and lateral side of abdominal tergites and pleurotergites without rows of microtrichia while *T. tabaci* is yellow, brown or bicolored, ocellar setae pair lll inserted inside the ocellar triangle, forewings anterior vein setae with 4 to 6 distal setae, and lateral side of abdominal tergites and pleurotergites with rows of fine microtrichia.

Thrips palmi is similar to *T. flavus* in having a mouthcone almost reaching the posterior margin of the prosternum, ocellar setae pair lll inserted outside the margin of ocellar triangle, pronotum with 3 pairs of posteromarginal setae toward angulars and 2 pairs of long posteroangular setae, forewings and legs yellow, metanotal median sculpture striate with and a pair of campaniform sensilla, and abdominal sternites lll to Vl and pleurotergites without discal setae. *T. flavus*, however, has brown body color with antennae usually 8-segmented or 7-segmented in some individuals, and metanotal median sculpture transversely striate anteriorly, longitudinally striate on posterior three quarters with median setae inserted behind the anterior margin while *T. palmi* has yellow body color with 7-segmented antennae, and metanotal median sculpture striate converging posteriorly with median setae inserted behind anterior margin.

Thrips alius is similar to *T. malloti*, *T. leytensis* **sp. nov**. and *T. morindae* in having brown body color, 7-segmented antennae, pronotum with 3 pairs of posteromarginal setae toward angulars and 2 pairs of posteroangular setae, abdominal tergite Vlll usually without comb of microtrichia on posterior margin and sternites lll-Vl without discal setae. *T. alius*, however, has a head longer than wide, ocellar setae pair lll inserted outside the margin of ocellar triangle, forewings brown with pale subbasal quarter and anterior vein with 7 basal, and 3 to 6 distal setae, and metanotal median sculpture with weakly formed reticles anteriorly and defined reticles posteriorly with internal markings. Moreover, *T. malloti*, *T. leytensis* **sp. nov**. and *T. morindae* are similar in having a head wider than long, and ocellar pair lll setae inserted inside the ocellar triangle immediately behind foreocellus. *T. malloti*, however, has almost complete series of setae on anterior vein of forewings, and metanotal median sculpture with reticles equiangular to elongate posteriorly without internal marking while *T. leytensis* **sp. nov.** has large eyes, anterior vein of forewings with 7 basal and 3 distal setae, metanotal median sculpture elongate anteriorly, hexagonal medially and posteriorly and reticles without internal marking, and abdominal pleurotergites with 1 discal seta, and *T. morindae* has protruded eyes, anterior vein of forewings with 7 basal and 4 to 5 distal setae, metanotal median sculpture with reticles transversely elongate anteriorly and longitudinally elongate posteriorly with internal markings.

Thrips hanifahi is similar to *T. decens*, *T. extensicornis*, *T. orientalis*, *T. palmerae*, *T. parvispinus* and *T. simplex* in having reticulate metanotal median sculpture, abdominal sternites lll to Vll with discal setae, and abdominal pleurotergites without discal setae. *T. decens*, *T. extensicornis*, *T. orientalis*, *T. palmerae* and *T. parvispinus*, however, are brown in body color while *T. hanifahi* is yellow in color with abdominal tergites III–VIII with brownish area medially and X brownish at apex, and ovipositor long, extending beyond abdominal apex. Moreover, *T.* decens and *T. extensicornis* are similar in having 7-segmented antennae and predominantly brown forewings. *T. decens*, however, has forewings with small pale area basally and subbasally and anterior vein of forewing with almost complete row of setae and 2 distal setae, reticles on metanotal median sculpture with internal markings, and abdominal tergite Vlll with few small teeth-like microtrichia laterally on posterior margin while *T. extensicornis* has forewings with pale basal quarter and anterior vein with 7 basal and 2 or 3 distal setae, metanotal median sculpture with equiangular reticles posteromedially with few internal markings, and abdominal tergite Vlll without comb of microtrichia on posterior margin. Moreover, *T. orientalis, T. palmerae* and *T. parvispinus* are similar in having 7-segmented antennae, and brown forewings with small pale subbasal area. *T. orientalis*, however, has almost complete row of setae on anterior vein of forewings, metanotal median sculpture with elongate reticles anteriorly and hexagonal reticles posteriorly and reticles with numerous internal markings, and abdominal tergite Vlll with comb of microtrichia interrupted medially on posterior margin while *T. palmerae* has anterior vein of forewings with 7 basal and 4 distal setae, metanotal median sculpture striate anteriorly, reticulate medially with elongate reticles posteriorly and few reticles with internal markings, and abdominal tergite VIII with irregular microtrichia laterally on posterior margin, and *T. parvispinus* has antennal segments lll and lV constricted at apex, forewings anterior vein with almost complete row of setae, metanotal median sculpture reticulate and reticles elongate with faint internal markings, and abdominal tergite Vlll without comb of microtrichia or with few microtrichia laterally on posterior margin.

Thrips simplex is similar to *T. brevistylus* and *T. vitticornis* in having 8-segmented antennae. *T. brevistylus*, however, has metascutal median sculpture striate in form of subcircular pattern on anterior median half and longitudinally striate posteriorly and laterally with median setae inserted closed together at anterior margin while *T. simplex* has metanotal median sculpture reticulate medially, elongate posteriorly and reticles with faint internal markings, and *T. vitticornis* has metanotal median sculpture closely striate medially and posteriorly, median setae inserted at anterior margin but not closed together.

Thrips melastomae and *T. sumatrensis* are similar in having uniformly brown body, ocellar setae pair lll inserted outside margin of ocellar triangle, 7-segmented antennae, and brown to dark forewings, abdominal tergite Vlll with complete comb of microtrichia on posterior, and sternites lll to Vl with discal setae. *T. melastomae*, however, has a head about as long as wide, pale legs, metanotal median sculpture transversely striate anteriorly and longitudinally striate posteriorly and median setae inserted near anterior margin while *T. sumatrensis* has a head wider than long, legs bicolored, forewings brown with small subbasal pale area or pale base, and metanotal median sculpture with transverse striae anteriorly and longitudinal striae posteriorly and median setae inserted at anterior margin.

Thrips coloratus is similar to *T. longicaudatus*, *T. hawaiiensis* and *T. florum* in having 7segmented antennae, metanotal median sculpture striate, discal setae on abdominal sternites lll to Vl

present, and pleurotergites without discal setae. *T. longicaudatus*, however, has dark brown head, thorax, and abdominal tergites Vlll to X and yellowish brown tergites l to Vll, forewings anterior vein with almost complete row of setae, metanotal median sculpture transversely striate on anterior quarter and longitudinally reticulate on posterior three quarters, and abdominal tergites lX and X unusually long while *T. coloratus* is yellow with brown median patches on abdomen and brown tergite X, forewings anterior vein setae with 7 basal and 3 distal setae, and metanotal median sculpture transversely striate on anterior half and longitudinally striate on posterior half, and *T. hawaiiensis* is bicolored or brown with 7- or 8-segmented antennae in some individuals, venal seta on the forewing clavus is longer than the subterminal seta, mesonotum with striae around campaniform sensilla near anterior margin, and metanotal median sculpture with transverse striae on anterior half and longitudinal and widely spaced striae on posterior half. *T. hawaiiensis* is very similar to *T. florum* but *T. florum* is uniformly brown in color, antennae usually 7-segmented, venal seta on the forewing clavus shorter than the subterminal seta, mesonotum with no striae around campaniform sensilla near anterior margin, and metanotal median sculpture with transverse closely spaced striae on anterior half, longitudinal widely spaced striae medially and longitudinal and closely spaced striae posteriorly.

Thrips wedeliae is similar to *T. hawaiiensis* in having some individuals with 7- or 8-segmented antennae, ocellar setae pair lll inserted outside margin of ocellar triangle, and abdominal sternites lll to Vl with discal setae. *T. wedeliae*, however, is uniformly brown with bicolored legs, forewings anterior vein setae with 8 basal and 4 or more distal setae, metanotal median sculpture with transverse striae anteriorly and longitudinal striae posteriorly and median setae inserted at the anterior margin while *T. hawaiiensis* is bicolored or brown with yellow legs, forewings anterior vein setae with 7 basal and 3 distal setae, metanotal median sculpture with transverse striae on anterior half and longitudinal and widely spaced striae on posterior half and median setae inserted near the anterior margin.

Key to the Philippine species of *Thrips* Linnaeus, 1758

1. Abdominal sternites lll to Vl and pleurotergites with discal setae ……..……..……..……..……..……..……..……..2

   Abdominal sternites lll to Vl without discal setae; pleurotergites with or without discal setae ……...……..……...…. 3

2. Body yellow, with brownish abdominal tergite X in some individuals; ocellar setae pair lll inserted outside margin of ocellar triangle; pronotum with numerous discal setae, 3 to 4 pairs of posteromarginal setae toward angulars, and 2 pairs of long posteroangular setae; abdominal sternites lll to Vll usually with more than 20 discal setae; and pleurotergites with 2 to 6 discal setae ……..…...… *T. apicatus* Priesner

   Body yellow; ocellar setae pair lll inserted inside ocellar triangle; pronotum with numerous discal setae, 5 pairs of posteromarginal setae toward angulars, and 2 pairs of relatively short posteroangular setae; abdominal sternites lll to Vll with 24 to 30 discal setae; pleurotergites with 3 to 5 discal setae (Fig.21a,b,c)…….... *T. subnudula* (Karny)

3. Discal setae on abdominal sternites lll to Vl absent; discal setae on pleurotergites present or absent ……...…. 4

   Discal setae on abdominal sternites lll to Vl present; discal setae on pleurotergites absent……..…..….. 11

4. Metanotal median sculpture striate or with few reticulations medially; abdominal tergite Vlll with complete comb of microtrichia ……..……...5

   Metanotal median sculpture distinctly reticulate; abdominal tergite Vlll without comb of microtrichia or with few microtrichia laterally ……...…. 8

5. Pleurotergites and lateral side of tergites with rows of fine microtrichia; body yellow or brown; metanotum striate with few reticulations medially and lines converging toward posterior margin (Fig. 23a,b,c) ……..…*T. tabaci* Lindeman

   Pleurotergites and tergites without rows of fine microtrichia……..……..……..……..……..…… 6

6. Body yellow with brown markings on thorax and abdomen; ocellar setae pair lll inserted outside margin of ocellar triangle; antennae 7-segmented; legs yellowish (Fig.15a,b,c)…….. *T. nigropilosus* Uzel

   Body pale yellow or brownish; antennae 7- or 8-segmented ……..……..……..……..7

7. Body pale yellow; antennae 7-segmented, segments l and ll whitish, lll yellow with brownish apex; lV and V brown with pale base, Vl and Vll brown; mouthcone elongate, almost reaching posterior margin of prosternum (Fig.18a1,a2,b,c,d) …...……..…*T. palmi* Karny

   Body brownish; antennae 8-segmented (7- segmented in some individuals), l whitish, ll yellow, lll bicolored, lV and V brown with yellow base, Vl to Vlll brown (Fig.7a,b,c,d) ……..……...…….. *T. flavus* Schrank

8. Head longer than wide; ocellar setae pair lll inserted outside margin of ocellar triangle; antennae 7-segmented; metascutal median sculpture with weakly formed reticles anteriorly and defined reticles posteriorly with internal markings (Fig.3) ……..…... *T. alius* Palmer

   Head wider than long; ocellar pair lll setae inserted on margin or inside ocellar triangle, immediately behind foreocellus; antennae 7-segmented ……..... 9

9. Forewings series of setae on anterior vein almost complete with 1 distal seta; metanotal median sculpture reticulate, reticles equiangular to elongate posteriorly without internal marking (Fig.13a,b,c,d) …….. *T. malloti* Priesner

   Forewings series of setae on anterior vein with 7 basal and 3 to 5 distal setae …..…..…..…..…..…..……..10

10. Postocular setae prominent; forewings anterior vein with 7 basal and 3 distal setae; reticles on metanotal median sculpture elongate anteriorly, hexagonal medially and posteriorly, reticles without internal marking; pleurotergites with 1 discal seta (Fig.11a,b,c,d,e,f) ….……*T. leytensis* **sp. nov**.

    Postocular setae not prominent; eyes protruded; forewings anterior vein with 7 basal and 4 to 5 distal setae; reticles on metanotal median sculpture transversely elongate anteriorly and longitudinally elongate posteriorly, reticles with internal markings (Fig.14a,b,c,d)…… ……..*T. morindae* Priesner

11. Metanotal median sculpture reticulate or striate anteriorly and reticulate medially, reticles with faint or pronounced internal markings ……..……..…….... 12

    Metanotal median sculpture striate ……..…..… 18

12. Antennal segment lll and lV constricted at apex; head and thorax light brown, abdomen brown; forewings brown with pale subbasal quarter, anterior vein with almost complete row of setae (Fig. 19a,b,c) ……...… *T. parvispinus* (Karny)

    Antennal segment lll and lV usually not constricted or slightly constricted at apex; body uniformly brown or yellow with brownish area in abdomen ……. 13

13. Body yellow with abdominal tergites III–VIII with brownish area medially, X brownish at apex; antennae 7-segmented; pronotum with small discal and posteroangular setae; metanotum reticulate, reticles without internal marking; ovipositor long, extending beyond abdominal apex (Fig. 9) …….. *T. hanifahi* Mound and Azidah

    Body uniformly brown; antennae 7- or 8- segmented; pronotum usually with long posteroangular setae…...…14

14. Antennae 8-segmented, 1 and ll brown, lll yellowish brown, lV to Vlll brown; forewings brown with pale basal quarter, anterior vein with 7 or 8 or basal and 5 or 6 distal setae (Fig. 20a,b,c) ..……..… *T. simplex* (Morison)

    Antennae 7-segmented; forewings with small pale area subbasally or with pale basal quarter ……..... 15

15. Metanotal median sculpture striate anteriorly, reticulate medially with elongate reticles posteriorly, reticles with internal markings; abdominal tergite VIII posterior margin with irregular microtrichia laterally (Fig.17a,b,c) ….……...…. *T. palmerae* Reyes

    Metanotal median sculpture reticulate; abdominal tergite Vlll with or without comb of microtrichia on posterior margin ……..……...…….. 16

16. Forewings brown with pale basal quarter, anterior vein with 7 basal and 2 or 3 distal setae; metanotal median sculpture with equiangular reticles posteromedially with few internal markings ……. *T. extensicornis* Priesner

    Forewings brown with small pale area basally or subbasally, anterior vein with almost complete row of setae ……..……...…….. 17

17. Legs brown with yellowish foretibiae and tarsi; metanotal median sculpture reticulate, reticules with internal markings; abdominal tergite Vlll with few small teeth-like microtrichia laterally on posterior margin (Fig.6) …….…….... *T. decens* Palmer

    Femora brown, foretibiae brown with pale apex, mid and hind tibiae brown, tarsi yellow; metanotal median sculpture reticulate, reticles elongate anteriorly and hexagonal posteriorly, reticles with numerous internal markings; abdominal tergite Vlll with comb of microtrichia interrupted medially on posterior margin (Fig.16a,b,c,d)…….*T. orientalis* (Bagnall)

18. Forewings dark or with small subbasal pale area; metanotal median setae inserted closed together at anterior margin …..……...……..…….... 19

    Forewings brown with pale basal quarter; metanotal median setae inserted at or near anterior margin……..…….. 23

19. Metanotal median sculpture striate, in form of subcircular pattern on anterior median half, longitudinally striate posteriorly and laterally; antennae 8-segmented (Fig. 4a,b,c,d) ..... *T. brevistylus* (Priesner)

    Metanotal median setae inserted at or near anterior margin not closed together; antennae 7- or 8-segmented ……..… 20

20. Metanotal median sculpture closely striate medially and posteriorly; antennae 8-segmented, 1 and ll brown, lll yellow, lV brown with pale base, V to Vlll brown (Fig. 24a,b,c) ……..……..…… *T. vitticornis* (Karny)

    Metanotal median sculpture with transverse striae anteriorly and longitudinal striae posteriorly; antennae 7- or 8- segmented ……. 21

21. Legs pale; antennae 7-segmented, ll and ll brown, lll pale brown, lV to V pale brown, Vl brown to pale brown, Vll brown; abdominal tergite Vlll with comb of microtrichia on posterior margin ……. *T. melastomae* Priesner

    Legs bicolored yellow and brown; abdominal tergite Vlll with irregular or complete comb of microtrichia……...…….……..... 22

22. Antennae 7-segmented, 1 brown, ll brown with pale apex, lll yellow and pedicellate, lV and V brown with pale base, Vl and Vll brown; abdominal tergite Vlll with complete comb of microtrichia on posterior margin (Fig. 22a,b,c) …….…….…….…….…….……. *T. sumatrensis* Priesner

    Antennae 7-segmented or 8-segmented; segment 1 and ll brown, lll yellow, lV and V yellow with brown apex, Vl to Vll or to Vlll brown; abdominal tergite Vlll with irregular comb of microtrichia on posterior margin (Fig. 25) ……..……. *T. wedeliae* Priesner

23. Body yellow usually with brown median patches on abdomen, tergite X brown; metanotal median sculpture transversely striate on anterior half and longitudinally striate on posterior half, median setae inserted near anterior margin (Fig. 5) ……..…. *T. coloratus* Schmutz

    Body and legs yellow, brown or bicolored; abdominal tergites lX and X normal or unusually long ……. 24

24. Head, thorax, and abdominal tergites Vlll, lX and X dark brown, tergites 1 to Vll yellowish brown; metanotal median sculpture transversely striate on anterior quarter and longitudinally reticulate on posterior three quarters; abdominal tergites lX and X unusually long (Fig.12) ….……...…… *T. longicaudatus* (Bianchi)

    Body bicolored or uniformly brown; abdominal tergites lX and X normal ……... 25

25. Head and thorax yellowish orange and abdomen dark brown or body yellowish brown with light brown abdomen; antennae 7- or 8-segmented; mesonotum with striae around campaniform sensilla near anterior margin; metanotal median sculpture with transverse striae on anterior half and longitudinal and widely spaced striae on posterior half (Fig. 10a,b,c,d)…..*T. hawaiiensis* (Morgan)

Body uniformly brown; antennae 7-segmented; mesonotum with no striae around campaniform sensilla near anterior margin; metanotal median sculpture with transverse closely spaced striae on anterior half, longitudinal and widely spaced striae medially, and longitudinal and closely spaced striae posteriorly (Fig. 8a,b) ...……. *T. florum* Schmutz

1. *Thrips alius* Palmer, 1992
Thrips alius Palmer,1992: 19.

Diagnostic characters.
Body brown (Fig. 3). **Head** longer than wide with transverse striae posteriorly, mouthcone elongate with rounded tip; ocellar setae pair lll inserted outside margin of ocellar triangle; eyes rounded; postocular setae pair l and lll well developed, pair ll very small; antennae 7-segmented, l and ll brown, lll pale, lV to Vll with pale base and brownish apices; **pronotum** transversely striate with discal setae and 3 pairs of posteromarginal setae toward angulars, 2 pairs of posteroangular setae long, subequal in length; **forewings** brown with pale subbasal quarter, anterior vein with 7 basal, and 3 to 6 distal setae; mesonotum with weak transverse striae; **legs** bicolored with forelegs pale, mid and hindfemora brownish; mesonotum transversely striate; **metanotal median sculpture** with weakly formed reticles anteriorly and defined reticles posteriorly with internal markings, median setae inserted behind anterior margin, pair of campaniform sensilla absent; **abdominal tergite** Vlll without comb of microtrichia or few microtrichia laterally on posterior margin, tergites lX and X with B1 and B2 setae long, subequal in length; **abdominal sternites** lll-Vl without discal setae; **pleurotergites** without discal setae. Male similar to female in structure; abdominal sternites lll to Vll each with transverse pore plate.



Figure 3: *Thrips alius* Palmer: female [D Hall].

Material examined.
Holotype ♀ (NHMUK): **Philippines**: TADECO [Panabo], Davao del Norte, on banana, *Musa sapientum* L. (Musaceae), E. S. Raros, 9-lX-1977 (NHMUK).

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

Diagnostic characters.
Body yellow with abdominal tergite X brown in some individuals. **Head** about as long as wide, mouthcone elongate with rounded tip; ocellar setae pair lll inserted outside margin of ocellar triangle; eyes rounded; postocular setae pair l and lll well developed, ll very small; **antennae** 7-segmented, l to lll pale, lV to V bicolored yellow and brown, Vl to Vll brown; **pronotum** transversely striate with numerous discal setae and 3 to 4 pairs of posteromarginal setae toward angulars, 2 pairs of posteroangular setae long, subequal in length; **forewings** yellow, anterior vein setae with 7 basal and 3 distal setae; **legs** yellow; mesonotum transversely striate; **metanotal median sculpture** with transverse striae anteriorly and longitudinal striae posteriorly, median setae inserted behind anterior margin, pair of campaniform sensilla present; mesosternal furca with spinula; metasternal furca without spinula; **abdominal tergite** Vlll with irregular comb of microtrichia on posterior margin; tergites lX and X with B1 and B2 setae long, subequal in length; **abdominal sternites** lll to Vl with 20 or more discal setae; **pleurotergites** with 2 to 6 discal setae. Male similar to female in color and structure; abdominal sternites lll-Vll each with transverse pore plate (Bhatti 1980; Palmer 1992; Alavi 2021).

Remarks. The diagnostic characters of the species was based on Palmer (1992) who recorded *T. apicatus* in the Philippines (?Manila). The holotype of the species is in SMFG.

3. *Thrips brevistylus* (Priesner, 1938)
Taeniothrips brevistylus Priesner,1938: 496.
Thrips brevistylus (Priesner): Bhatti, 1978: 191.

Diagnostic characters.
Body uniformly brown (Fig. 4a,b,c,d). **Head** wider than long, transversely striate on posterior half, mouthcone elongate with rounded tip; ocellar setae pair lll inserted outside margin of ocellar triangle; eyes slightly prolonged posteriorly; postocular setae pair l well developed, ll small; **antennae** 8-segmented, l and ll brown, lll pale yellow, lV to V brown with pale base, Vl to Vlll brown, segments lll and lV each with forked sense cone; **pronotum** transversely striate with discal setae and 3 pairs of posteromarginal setae toward angulars, 2 pairs of posteroangular setae long, subequal in length; **forewings** brown with small subbasal pale area, anterior vein with 7 basal and 3 distal setae; **legs** bicolored with forelegs yellow, mid and hind femora brownish, mid and hind tibiae and tarsi yellow; mesonotum with transverse, closely spaced striae; **metanotal median sculpture** striate in form of subcircular pattern on anterior median half and longitudinally striate posteriorly and laterally, median setae inserted closed together at anterior margin, pair of campaniform sensilla present; mesosternal furca with spinula; metasternal furca without spinula; **abdominal tergite** Vlll with comb of fine microtrichia on posterior margin, tergites lX and X with B1 and B2 setae long, subequal in length; **abdominal sternites** lll to Vl with discal setae; **pleurotergites** without discal setae. Male bicolored, similar to female in structure; abdominal sternites lll to Vll each with transverse pore plate (Reyes 1994; Ng and Mound 2020).

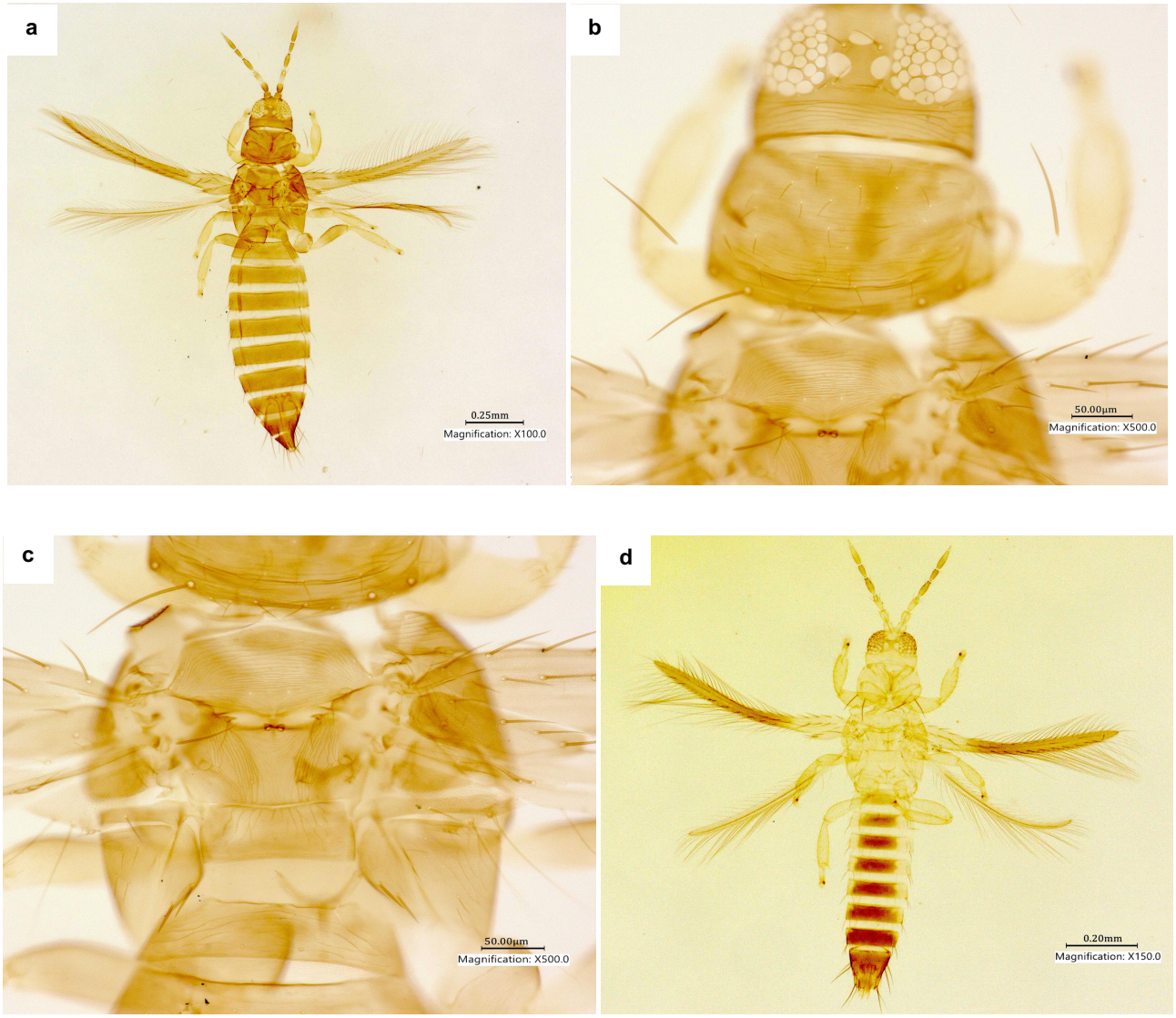


Figure 4: *Thrips brevistylus* (Priesner): a. female; b. head and thorax; c. meso and metanota; d. male [CP Reyes and RMC Catamora].

Material examined.
1♀ (PNM), Mt. Makiling Botanical Garden, Los Baños, Laguna, on baston ni San Jose, *Cordyline* sp. (Asparagaceae), C.P. Reyes, 4-Vll-1987; 6♀, 6♂(PNM), Mt. Tabiey, Cabigaan, Palawan, on flower of unknown plant, V. Fernando, 23-V-1987; 1♀(PNM), VISCA[VSU], Baybay, Leyte, on corn tassel, *Zea mays* L. (Poaceae), 12-V-1987, C.P. Reyes.

4. *Thrips coloratus* Schmutz, 1913
Thrips colorata Schmutz,1913: 1013.
Thrips coloratus Schmutz: Palmer, 1992: 9.

Diagnostic characters.
Body yellow with brown median patches on abdomen, and tergite X brown (Fig. 5). **Head** slightly wider than long, mouthcone elongate with rounded tip; ocellar setae pair lll inserted outside margin of ocellar triangle; eyes rounded; postocular setae 1 and lll well developed, ll very small;

antennae 7-segmented, l to lll pale, lV to Vll brown, segments lll and lV each with forked sense cone; pronotum transversely striate with discal setae and 3 pairs of posteromarginal setae toward angulars, 2 pairs of posteroangular setae long, subequal in length; **forewings** brown with pale basal quarter, anterior vein setae with 7 basal and 3 distal setae; **legs** yellow; mesonotum transversely striate; **metanotal median sculpture** transversely striate on anterior half and longitudinally striate on posterior half, median setae inserted near anterior margin, pair of campaniform sensilla present; mesosternal furca with spinula; metasternal furca without spinula; **abdominal tergites** VIII with irregular comb of microtrichia on posterior margin, tergites lX and X with B1 and B2 setae long, subequal in length; **abdominal sternites** lll to Vl with discal setae; **pleurotergites** without discal setae. Male yellow, similar to female in structure; abdominal tergites lll to Vll each with transverse pore plate (Bhatti 1980; Palmer 1992).

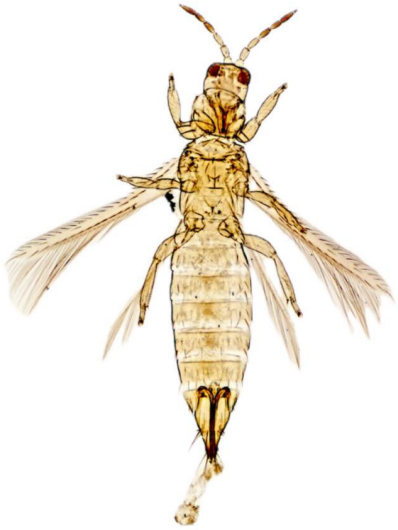


Figure 5: *Thrips coloratus* Schmutz: female [D Hall].

Material examined.
Other. 1♀(NHMUK), **Australia**: Queensland, on *Argyrodendron actinophyllum* (Bailey) Edlin (Malvaceae), 4-ll-1988 (NHMUK).

Remarks. The species was recorded in the Philippines (?Manila) by Palmer (1992) and Mound and Masumoto (2005).

5. *Thrips decens* Palmer, 1992
Thrips decens Palmer,1992: 35.

Diagnostic characters.
Body brown (Fig. 6). **Head** wider than long, transversely striate posteriorly, mouthcone elongate with rounded tip; ocellar setae pair lll inserted inside ocellar triangle, immediately behind foreocellus; eyes rounded, postocular setae pair l and lll well developed, subequal in length, ll very small; **antennae** 7-segmented, l and ll brown, lll light brown, lV to Vll brown, segments lll and lV each with forked sense cone; **pronotum** transversely striate with discal setae and 3 pairs of posteromarginal setae toward angulars, 2 pairs of posteroangular setae long, subequal in length; **forewings** brown with small pale area basally and subbasally, anterior vein with almost complete row of setae, and 2 distal setae; **legs** brown with yellowish foretibiae and tarsi; mesonotum with transverse striae; **metanotal median sculpture** reticulate, reticules with internal markings, median setae inserted behind anterior margin, pair of campaniform sensilla absent; mesosternal furca with spinula; metasternal furca without spinula; **abdominal tergite** Vlll with few small teeth-like microtrichia laterally on posterior margin, tergitex lX and X with B1 and B2 setae long, subequal in length; **abdominal sternites** lll to Vl usually with 1 or more discal setae; **pleurotergites** without discal setae. Male body color and structure similar to female; abdominal sternites lll to Vll each with transverse pore plate (Palmer 1992; Mound 2005).



Figure 6: *Thrips decens* Palmer: female [D Hall].

Material examined.
Holotype♀(NHMUK), **Malaysia**: Genting Highlands, on *Mussaenda mutabilis* L.
(Rubiaceae), L. A. Mound, 4-X-1973 (NHMUK).

Remarks. The species was recorded in the Philippines (?Manila) by Mound (2005).

6. *Thrips extensicornis* Priesner, 1934
Thrips extensicornis Priesner,1934: 276.

Diagnostic characters.
Body brown. **Head** wider than long, transversely striate posteriorly, mouthcone elongate with rounded tip; ocellar setae pair lll inserted inside ocellar triangle; eyes rounded; postocular setae l and lll well developed, subequal in length, ll very small; **antennae** 7-segmented, l and ll brown, lll predominantly yellow, lV and V bicolored, Vl and Vll brown, segments lll and lV each with forked sense cone; **pronotum** transversely striate with discal setae and 3 pairs of posteromarginal setae toward angulars, 2 pairs of posteroangular setae long, subequal in length, pronotal posterior subapodeme sometimes prominent; **legs** yellow with brownish shadings; **forewings** brown with pale basal quarter, anterior vein with 7 basal and 2 or 3 distal setae; mesonotum transversely striate; **metanotal median sculpture** reticulate, reticles equiangular posteromedially with few internal markings, median setae situated behind anterior margin, pair of campaniform sensilla absent; mesosternal furca with spinula; metasternal furca without spinula; **abdominal tergite** Vlll without comb of microtrichia on posterior margin, tergites lX and X with B1 and B2 setae long, subequal in length; **abdominal sternites** lll to Vl usually with 1 pair of discal setae; **pleurotergites** without discal setae. Male yellow, similar to female in structure; abdominal sternites lll to Vll with transverse pore plate (Palmer 1992; Mound and Masumoto 2005).

Remarks. The species was recorded in the Philippines (?Manila) by Palmer (1992). The diagnostic characters of *T. extensicornis* was based on the description of Palmer (1992) and Mound and Masumoto (2005) and Palmer. The holotype of the species is in SMFG.

7. *Thrips flavus* Schrank, 1776
Thrips flava Schrank,1776: 31.
Thrips flavus Schrank: Palmer, 1992: 27.

Diagnostic characters.
Body brownish yellow (Fig. 7a,b,c,d). **Head** about as long as wide and wider behind eyes, with transverse striae posteriorly, mouthcone reaching posterior margin of prosternum with rounded tip; ocellar setae pair lll inserted outside margin of ocellar triangle; eyes slightly elongate posteriorly; postocular setae pair l and lll well developed, ll small; **antennae** usually 8-segmented or 7-segmented in some individuals, l whitish, ll yellow, lll yellow anteriorly and brown posteriorly, lV and V brown with yellow base, Vl to Vlll brown, segments lll and lV each with forked sense cone; **pronotum** transversely striate, with numerous discal setae and 3 pairs of posteromarginal setae toward angulars, 2 pairs of posteroangular setae long, subequal in length; **forewings** yellow, anterior vein with 7 basal and 3 distal setae; mesonotum transversely striate; **legs** yellow, hindtibiae with row of small setae on inner margin; mesonotum transversely striate; **metanotal median sculpture** transversely striate anteriorly, longitudinally striate on posterior three quarters, median setae inserted behind anterior margin, pair of campaniform sensilla present; mesosternal furca with spinula; metasternal furca without spinula; **abdominal tergite** VIII with complete comb of microtrichia on posterior margin, tergites lX and X with B1 and B2 setae long, subequal in length; **abdominal sternites** lll to Vl without discal setae; **pleurotergites** without discal setae. Male yellow and similar to female in structure; abdominal sternites lll to Vll each with transverse pore plate.

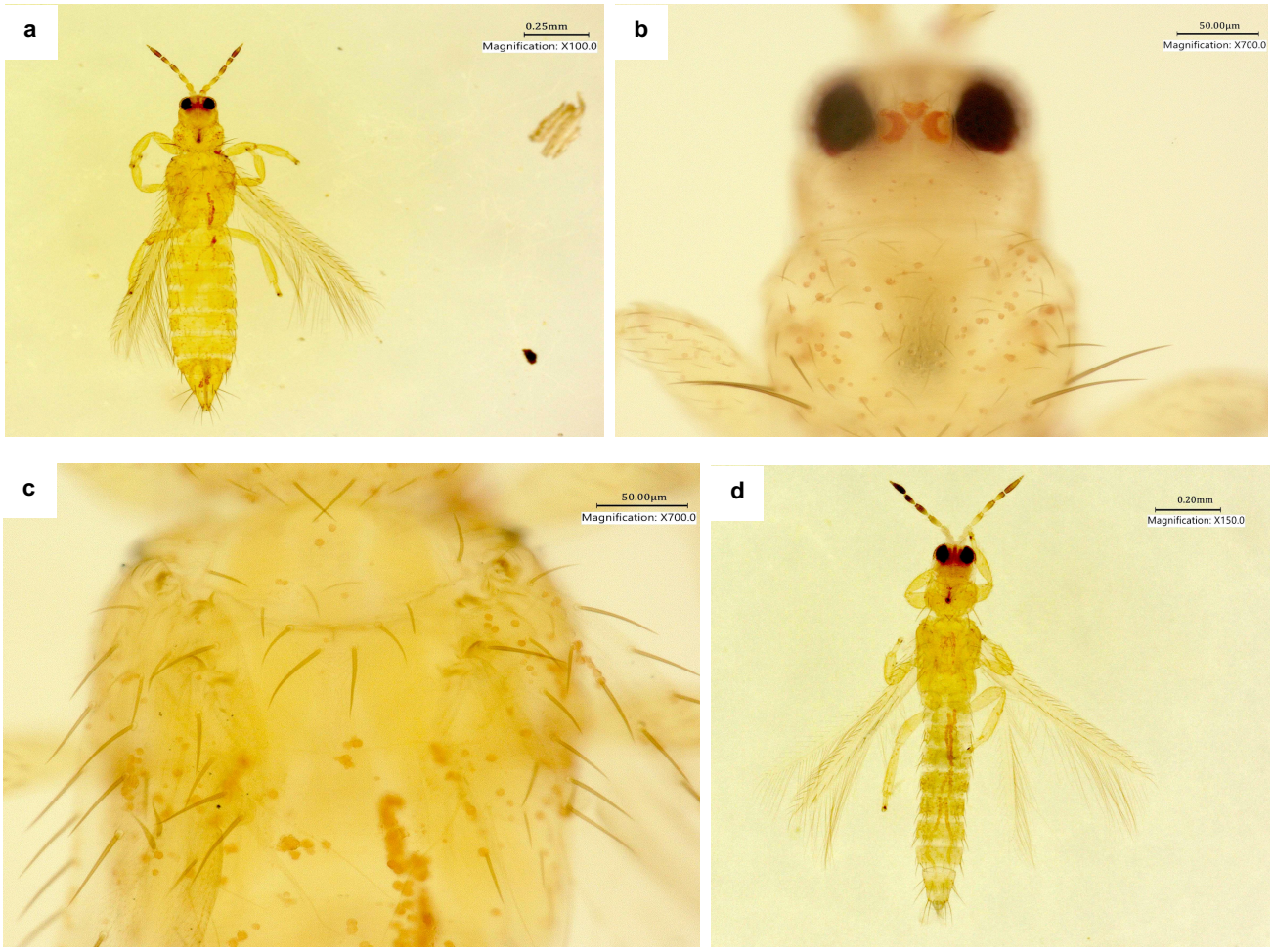


Figure 7: *Thrips flavus* Schrank: a. female; b. head and pronotum; c. meso and metanota; d. male [CP Reyes and RMC Catamora].

Material examined.
4 damaged specimens at CASC from the **Philippines**: Concepcion, Cadiz, Negros Occidental, on flower of 'Quigar', W. D. Pierce, 16-V-1928; Santa Margarita, Saravia, Negros Occidental, on *Stachytarpheta jamaicensis* (L.) Vahl (Verbenaceae), W. D. Pierce, 7-Vl-1929 (Reyes 1994). Other. 1♀(PNM), **Japan**: Mt. Tateyama, Bijodaira, Toyama, on *Aster ageratoides* Turchaninov (Asteraceae), I. Kudo, 18-lX-1976; 1♀(PNM), Mt. Tateyama, Senjugahara, Toyama, on *Polygonum* sp. (Polygonaceae), I. Kudo, 18-lX-1976; 1♀(PNM), Suganodai, Komagane, Nagano, on *Scirpus wichurae* Boeckeler (Cyperaceae), I. Kudo, 28-Vll-1977; 1♂, Mt. Kimpu, Yamanashi, on *Ligularia dentata* (Gray) Hara (Asteraceae), I. Kudo, 28-Vll-1980; 1♀ (PNM), **India**: Shembaganur, Tamil Nadu, on orchids (Orchidaceae), T. N. Ananthakrishnan, 27-V1963; 1♀(PNM), Mysore, Karnataka, on horse grass, *Setaria* sp. (Poaceae), T.N. Ananthakrishnan, 17-Xll-1966; 1♀(PNM), **Pakistan**: Naran, Kaghan-Tal, Hazara, W. Heinz, 30-Vll-1981; 1♂(PNM), Naran, Kaghan-Tal, Hazara, W. Heinz, 26-Vll-1981; 1♀(PNM), **Italy**: Monte Calamita, Toscana, on *Prunus* sp. (Rosaceae), A. Vesmanis, 11-lV-1982 (these specimens were donated by researchers to C.P. Reyes).

8. *Thrips florum* Schmutz, 1913
Thrips florum Schmutz,1913: 1003.

Diagnostic characters.
Body uniformly brown (Fig. 8a,b). **Head** wider than long, transversely striate posteriorly, mouthcone elongate with rounded tip; ocellar setae pair lll inserted outside margin of

ocellar triangle; eyes rounded; postocular setae pair 1 and lll well developed, ll small; **antennae** 7- segmented rarely 8-segmented, l brown, ll brown with pale apex, lll yellow, lV and V brown with pale base, Vl to Vll brown; **pronotum** with transverse striae and discal setae and 3 pairs of posteromarginal setae toward angulars, 2 pairs of posteroangular setae long, subequal in length; venal seta on the forewing clavus is shorter than the subterminal seta; **forewings** brown with pale basal quarter, anterior vein with 7 basal and 3 distal setae; **legs** bicolored with femora brownish, tibiae and tarsi yellowish; mesonotum with no striae around campaniform sensilla near anterior margin; **metanotal median sculpture** with transverse closely spaced striae on anterior half, longitudinal and widely spaced striae medially, and longitudinal and closely spaced striae posteriorly, median setae inserted at anterior margin, pair of campaniform sensilla present; mesosternal furca with spinula; metasternal furca without spinula; **abdominal tergite** Vlll with complete comb of microtrichia on posterior margin, tergites lX and X with B1 and B2 setae long, subequal in length; **abdominal sternites** lll to Vl with discal setae; **pleurotergites** lack discal setae. Male brownish, similar to female in structure; abdominal sternites lll to Vll each with transverse pore plate (Nakahara 1985; Palmer 1992).

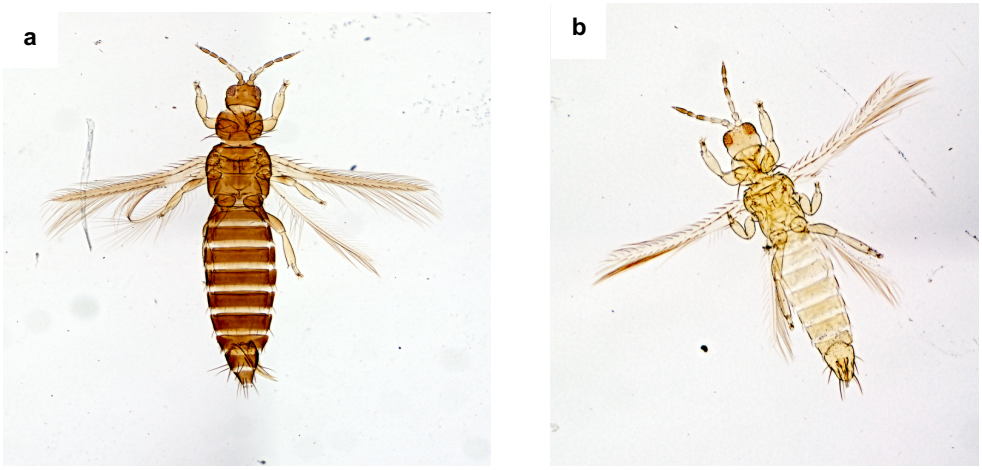


Figure 8: *Thrips florum* Schmutz: a. female; b. male [D Hall].

Material examined.
2♀ at USNM from the **Philippines**: Luzon: Manila, taken in quarantine at Honolulu, Hawaii, on cut flower (Reyes 1994). Other. 1♀ (NHMUK), **Thailand**: Bangkok, K. Sombatsiri, Vl-1973 (NHMUK); 1♂ (NHMUK), Chanthaburi, on coffee, *Coffea* sp. (Rubiaceae), K. Sombatsiri, Xll-1973 (NHMUK); 1♂ (NHMUK), **Malaysia**: Genting Tea Estate, [Genting Highlands], on flower of *Lantana* sp. (Verbenaceae), L. A. Mound, 6-X1973, (NHMUK).

9. *Thrips hanifahi* Mound and Azidah, 2009
Thrips hanifahi Mound and Azidah, 2009: 64.

Diagnostic characters.
Body yellow with abdominal tergites III–VIII with brownish area medially, and X brownish at apex (Fig. 9). **Head** wider than long with transverse striae posteriorly, mouthcone elongate with rounded tip; ocellar setae pair lll outside margin of ocellar triangle; eyes rounded; postocular setae pair 1 well developed, pair ll and lll small; **antennae** 7-segmented, yellow; **pronotum** with small discal and posteroangular setae; **forewings** light brown with small subbasal pale area, anterior vein setae with 7 basal and 3 distal setae; **legs** yellow; mesonotum transversely striate; **metanotal median sculpture** reticulate, reticles without internal marking, median setae behind anterior margin, pair of campaniform sensilla present; mesosternal furca with spinula; metasternal furca without spinula; **abdominal tergite** Vlll with complete comb of microtrichia on posterior margin, tergites lX and X with B1 and B2 setae long, subequal in length; **abdominal sternites** lll to Vll with 15 discal setae; **pleurotergites** without discal setae; ovipositor long, extending beyond abdominal apex. Male unknown.



Figure 9: *Thrips hanifahi* Mound and Azidah: female [D Hall].

Material examined.
1♀(PNM), **Philippines**: UPLB, Los Baños, Laguna, on *Coffea arabica* L. (Rubiaceae), G. Catalan, 1-X-1984. **Holotype**♀(NHMUK), **Malaysia**: MARDI, Serdang [Selangor], on *Melaleuca leucadendra* (L.) L. (Myrtaceae), Hanifah, 6-lll-2008 (NHMUK).

Remarks. The female specimen from the Philippines has relatively long inner pair and short outer pair of posteroangular setae on pronotum. The species is a new record in the Philippines.

10. *Thrips hawaiiensis* (Morgan, 1913)
Euthrips hawaiiensis Morgan,1913: 3.
Thrips hawaiiensis (Morgan): Priesner, 1934: 287.

Diagnostic characters.
Body bicolored with head and thorax yellowish orange and dark brown abdomen or yellowish brown with light brown abdomen in some individuals (Fig. 10a,b,c,d). **Head** wider than long with transverse striae posteriorly, mouthcone elongate with rounded tip; ocellar setae pair lll inserted outside margin of ocellar triangle; eyes rounded; postocular setae pair l long; ll and lll short, subequal in length; **antennae** 7- or 8-segmented, l light brown, ll brown, lll yellow, lV to Vll or Vlll brown; venal seta on the forewing of clavus is longer than the subterminal seta; **forewings** brown with pale subbasal quarter, anterior vein setae with 7 basal and 3 distal setae; **legs** yellow; pronotum transversely striate with discal setae and 3 pairs of posteromarginal setae toward angulars, 2 pairs of posteroangular setae long, subequal in length; mesonotum with striae around campaniform sensilla near anterior margin; **metanotal median sculpture** with transverse striae on anterior half and longitudinal and widely spaced striae on posterior half, median setae inserted near anterior margin, pair of campaniform sensilla present; mesosternal furca with spinula; metasternal furca without spinula; **abdominal tergites** VIII with complete comb of fine microtrichia on posterior margin, tergites lX and X with B1 and B2 setae long, subequal in length; **abdominal sternites** lll to Vl with discal setae; **pleurotergites** without discal setae. Male yellow, structure similar to female; abdominal sternites lll to Vll each with transverse pore plate.

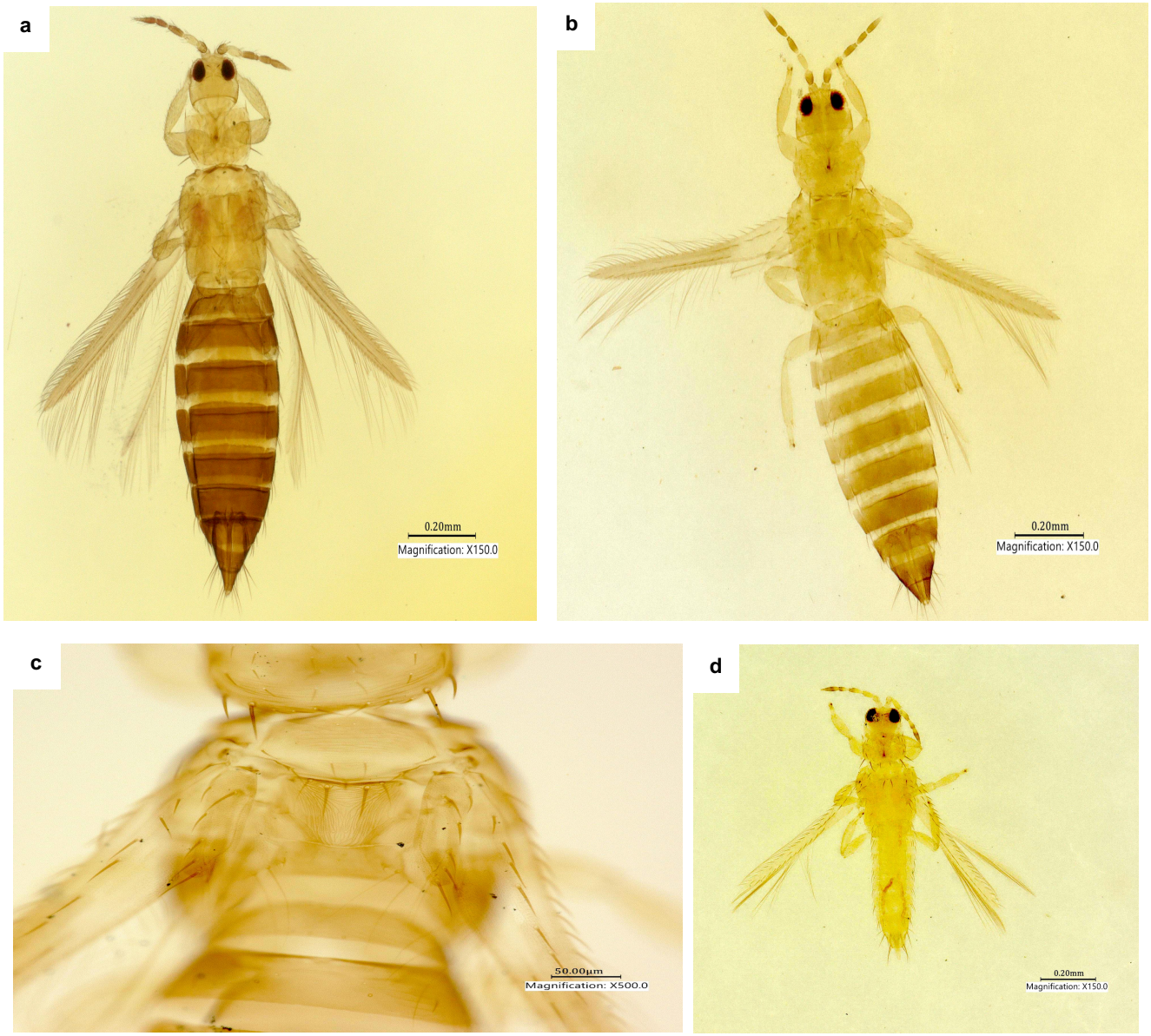


Figure 10: *Thrips hawaiiensis* (Morgan): a. female with dark brown abdomen; b. female with yellowish brown abdomen; c. thorax; d. male [CP Reyes and RMC Catamora].

Material examined.
2♀(PNM), MMSU, Batac, Ilocos Norte, on unidentified weed, E.C. Mituda, 12-lll-1988; 4♀(PNM), Sta. Barbara, Pangasinan, on *Gossypium* sp. (Malvaceae), E.C. Mituda, 17lll-1988; 13♀(PNM), DA-BPI Experiment Station, Baguio City, on *Solanum* sp. (Solanaceae), C.P. Reyes, 8-Vll-I984; 3♀(PNM), MSAC [BSU], La Trinidad, Benguet, on *Helianthus annuus* L. (Asteraceae) C.P. Reyes, 8-Vll-l984; 2♀(PNM), MSAC [BSU], La Trinidad, Benguet, on *Canna* sp. (Cannaceae), Oratai and Chantana, 8-Vll-1984; 2♀(PNM), MSAC [BSU], La Trinidad, Benguet, on Chinese lily, *Lilium* sp. (Liliaceae), Oratai and Chantana, 8-Vll-1984; 4♀ (PNM), Wright Park, Baguio City, on

Rosa sp. (Rosaceae), Oratai and Chantana, 8-Vll-1984; 2♀ (PNM), Putinglupa, Calamba, Laguna, on flower of *Lantana camara* L. (Verbenaceae), C.P. Reyes, 5.ii. 1983; 1♀(PNM), UPLB, Los Baños, Laguna, on shasta daisy, *Leucanthemum* sp.(Asteraceae), C. P. Reyes, 22-lV-1982; 2♀, 4♂(NMP), UPLB, Los Baños, Laguna, unknown plant, 16-Vll-l982; 4♀, 1♂ (PNM), IRRI, Los Baños, Laguna, on silk of corn, *Zea mays* L. (Poaceae), C.P. Reyes, 25-Vll-1982; 2♀(PNM), UPLB, Los Baños, Laguna, on butterfly pea tree, *Clitoria fairchildiana* Howard (Fabaceae), C.P. Reyes, 30X-1982; 1♀ (PNM), UPLB, Los Baños, Laguna, on flower of sampaguita, *Jasminum sambac* (L.) Alton (Oleaceae), L. Ramos, 10-Xll-1982; 5♀ (PNM), UPLB, Los Baños, Laguna, on *Ervatamia pandacaqui* Lam. (Apocynaceae), C.P. Reyes, 13-X-1983; 4♀ (PNM), UPLB, Los Baños, Laguna, on papaya, *Carica papaya* L. (Caricaceae), C.P. Reyes,15-Vlll-1983; 1♂ (PNM), UPLB, Los Banos, Laguna, on *Pachystachys coccinea* Nees (Acanthaceae), C.P. Reyes, 13-X-1983; 3♀(PNM), UPLB, Los Baños, Laguna, on yellow bell, *Tecoma stans* (L.) Juss. (Bignoniaceae), M. Ma, 5-X-1983; 5♀(PNM), UPLB, Los Baños, Laguna, on flower of achiote, *Bixa orellana* L. (Bixaceae), C.P. Reyes, 13-X-1983; 1♀(PNM), IRRI, Los Baños, Laguna, on flower of kalachuchi, *Plumiera acuminata* Aiton (Apocynacea), C.P. Reyes, 4-X-1983; 5♀(PNM), IRRI, Los Baños, Laguna, on flower of kalachuchi, *Plumiera acuminata* Aiton (Apocynacea), C.P. Reyes, 4-X-1983; 4♀(PNM), IRRI, Los Banos, Laguna, on *Thevetia peruviana* (Pers.) Schum. (Apocynaceae), C.P. Reyes, 4-X-1983; 1♀(PNM), IRRI, Los Baños, Laguna, on flower of sampaguita, *Jasminum sambac* (L.) Alton (Oleaceae), C.P. Reyes, 10-X1983; 4♀(PNM), UPLB, Los Baños, Laguna, on silk of corn, *Zea mays* L. (Poaceae), B. Capunitan, 1-V-1984; 1♀(PNM), UPLB, Los Baños, Laguna, on silk of corn, *Zea mays* L. (Poaceae), M. Alba, 9-lX- 1984; 1♀(PNM), UPLB, Los Baños, Laguna, silk of corn, *Zea mays* L. (Poaceae), C.P. Reyes, 11-X-1984; 1♀(PNM), UPLB, Los Baños, Laguna, on banana, *Musa sapientum* L. (Musaceae), O. Estioko, 14-lX-1984; 1♀(PNM), UPLB, Los Baños, Laguna, on marigold, *Tagetes erecta* L. (Asteraceae), E. Mituda, 17-lX1984; 2♀(PNM), UPLB, Los Baños, Laguna, on champaca, *Michelia champaca* L. (Magnoliaceae), C.P. Reyes, 15-X-1984; 4♀(PNM), UPLB, Los Baños, Laguna, on *Haematoxylum* sp.(Fabaceae), V.P. Gapud, 16-ll-l985; 1♀(PNM), Makiling Botanical Garden, Los Baños, Laguna, on flower of unknown tree, C.P. Reyes, 4-Vll-1987; 2♀(PNM), UPLB, Los Baños, Laguna, on cashew, *Anacardium occidentale* L. (Anacardiaceae), C.P. Reyes, 5-V-1987; 2♀(PNM), UPLB, Los Baños, Laguna, on butterfly pea tree, *Clitoria fairchildiana* Howard (Fabaceae), C.P. Reyes, 8-V-1987; 3♀ (PNM), Mudspring, Mt. Makiling, Los Baños, Laguna, on flower of *Heliconia* sp.(Heliconiaceae), C.P. Reyes, 27-Vl-l987; 1♀(PNM), Brooks Point, Palawan, on flower of pepper, *Capsicum annum* L. (Solanaceae), C.P. Reyes, 29-l-1985; 2♀(PNM), Tagdidili, Maasin, Brooks Point, Palawan, *Physalis angulata* L. (Solanaceae), C.P. Reyes, 30-l-1985; 10♀(PNM), Sipit Saburan, Puerto Gallera, Oriental Mindoro, on *Citrus* sp. (Rutaceae), C.P. Reyes, 19-Vl-1987; 1♀(PNM), Hiwacloy, Goa, Camarines Sur, on flower of unknown plant, C.P. Reyes, 3-Vl-l987; 3♀and 1♂ (PNM), Hiwacloy, Goa, Camarines Sur, on *Solanum* sp. (Solanaceae), C.P. Reyes, 3-Vl-l987; 8♀(PNM), Hiwacloy, Goa, Camarines Sur, on flower of pepper, *Capsicum annum* L. (Solanaceae), C.P. Reyes, 3-Vl-l987; 1♀(PNM), Hiwacloy, Goa, Camarines Sur, on 'taratabaco', C.P. Reyes, 3-Vl-1987; 23♀(PNM), Hiwacloy, Goa, Camarines Sur, on flower of yellow bell, *Tecoma stans* (L.) Juss. (Bignoniaceae), C.P. Reyes, 3-Vl-l987; 1♀(PNM), DA-Bicol Experiment Station, Pili, Camarines Sur, on ipil-ipil, *Leucaena leucocephala* (Lam.) de Wit. (Fabaceae), C.P. Reyes, 5-Vl-1987; 1♀(PNM), DA-Bicol Experiment Station, Pili, Camarines Sur, on young leaf of Araceae, C.P. Reyes, 5-Vl-1987; 2♀(PNM), DA-Bicol Experiment Station, Pili, Camarines Sur, on leaves of croton, *Codiaeum variegatum* L. (Euphorbiaceae), C.P. Reyes, 4-Vl-1987; 2♀(PNM), DA-Bicol Experiment Station, Pili, Camarines Sur, on leaves of *Rosa* sp. (Rosaceae), C.P. Reyes, 4-Vl-1987; 3♀(PNM), Mt. Mayon rest house, Tabaco, Albay, on flowers of yellow bell, *Tecoma stans* (L.) Juss. (Bignoniaceae), C.P. Reyes, 6-Vl-1987; 2♀and 1♂ (NMP), San Rafael, Castilla, Sorsogon, on guava, *Psidium guajava* L. (Myrtaceae), C.P. Reyes, 6-Vl-1987; 1♀ (PNM), La Granja, La Carlota, Negros Occidental, on sweep grass, C.P. Reyes, 26-V1987; 6♀(PNM), DA- BPI Guimaras Experiment Station, Jordan, Guimaras, on *Rosa* sp. (Rosaceae), C.P. Reyes, 21-Vl-1987; 10♀(PNM), Tubigon, Bohol, on *Ageratum conyzoides* L. (Asteraceae), C.P. Reyes, 30-lV-1983; 1♀(PNM), Mt. Pangasugan, Baybay, Leyte, on flower of unknown plant, C.P. Reyes, 4-V-1983; 6♀(PNM), VISCA [VSU], Baybay, Leyte, on guava, *Psidium guajava* L. (Myrtaceae), C.P. Reyes, 4-V1983; 1♀(PNM), VISCA [VSU], Baybay, Leyte, on kalachuchi, *Plumiera acuminata* Aiton (Apocynaceae), C.P. Reyes, 4-V-1983; 1♀(PNM), VISCA [VSU], Baybay, Leyte, on *Zea mays* L.(Poaceae), C.P. Reyes, 5-V-1983; 7♀(PNM), VISCA [VSU], Baybay, Leyte, on Fabaceae, C.P. Reyes, 9-V-1983; 1♀(PNM), VISCA [VSU], Baybay, Leyte, on *Stachytarpheta cayennensis* (Rich.) Vahl (Verbenaceae), S.G. Reyes, 17-Vl-l984; 7♀ (PNM), VISCA [VSU], Baybay, Leyte, on *Lantana camara* L. (Verbenaceae), C. P. Reyes, 4-V-l987; 2♀(PNM), VISCA [VSU], Baybay, Leyte, on flower of *Glericidia* sp.(Fabaceae), C.P. Reyes, 12-V-1987; 1♀(PNM), VISCA [VSU], Baybay, Leyte, on unknown shrub, C.P. Reyes, 12-V- 1987; 4♀(PNM), VISCA [VSU], Baybay, Leyte, on flower of adelfa, *Nerium oleander* L. (Apocynaceae), C.P. Reyes, 13-V-1987; 6♀(PNM), VISCA [VSU], Baybay, Leyte, on *Solanum* sp. (Solanaceae), C. P. Reyes, 13-V-1987; 1♀(PNM), VISCA [VSU], Baybay, Leyte, on unknown shrub, C.P. Reyes, 12-V-1987; 7♀(PNM), Camp Susana, La Paz, Zamboanga City, on *Solanum* sp. (Solanaceae), C.P. Reyes, 12-Vll-1987; 6♀(PNM), Anuling, Pamocutan, Zamboanga City, on leaves of unknown shrub, 11-Vll-1987; 14♀and 2♂(PNM), Anuling, Pamocutan, Zamboanga City, on guava, *Psidium guajava* L. (Myrtaceae), C.P. Reyes, 11-Vll-1987; 2♀(PNM), Pasonanca Park, Zamboanga City, *on Caesalpinia* sp. (Fabaceae), 13-Vll-1987, C.P. Reyes; 2♀(PNM), Pasonanca Park, Zamboanga City, on flower of 'maria-maria' plant, 13-Vll-1987, C.P. Reyes.; 2♀(PNM), Pagadian City, on silk of corn, *Zea mays* L. (Poaceae), E. Decena, 1-Vlll-1985; 8♀ (PNM), Bago-Oshiro, Davao City, on flower of tambis, *Syzygium aqueum* (Burm.) Alston (Myrtaceae), C.P. Reyes, 14-lll-1985; 1♀(PNM), Bago-Oshiro, Davao City, on mango, *Mangifera indica* L. (Anacardiaceae), C.P. Reyes, 3-lll-1985; 1♀, 1♂ (PNM), Bago-Oshiro, Davao City, on coffee, *Coffea robusta* L. (Rubiaceae), C.P. Reyes, 3-lll-1985; 4♀(PNM), Bago-Oshiro, Davao City, on flower of Araceae, C.P. Reyes, 12-lll-1985; 2♀(PNM), Bago-Oshiro, Davao City, on *Lantana camara* L. (Verbenaceae), C.P. Reyes, 14-lll-1985; 15♀ (PNM), TADECO, Panabo, Davao del Norte, on banana, *Musa sapientum* L. (Musaceae), E. Oquias, 25-V- 1985; 4♀(PNM), Mt. Apo, Agko, Kidapawan, North Cotabato, on *Gardenia* sp. (Rubiaceae), C.P. Reyes, 16-lV-1983; 1♂ (PNM), Mlang, North Cotabato, on flower of *Amaranthus spinosus* L. (Amaranthaceae), C.P. Reyes, 17-ll-1985; 1♀(PNM), Mlang, North Cotabato, on leaves of taro, *Calocasia esculenta* (L.) Schott (Araceae), C.P. Reyes, 17-ll-1985; 1♀(PNM), Mlang, North Cotabato, on santol, *Sandoricum koetjape* (Burm.) Merr. (Meliaceae), C.P. Reyes, 17-ll-1985; 1♀(PNM), Malandag, Malungon, Sarangani, on sweet potato, *Ipomoea batatas* (L.) Lam. (Convolvulaceae), C.P. Reyes, 23-ll-1985; 1♂(PNM), Malungon, Sarangani, on Zingerberaceae, C.P. Reyes, 23-ll1985; 1♀(PNM), Malungon, Sarangani, on flower of coffee, *Coffea arabica* L. (Rubiaceae), C.P. Reyes, 23-ll-1985; 4♀, 1♂(PNM), Malungon, Sarangani, unknown plant, C.P. Reyes, 23-ll-1985; 1♀(PNM), Malungon, Sarangani, leaves of croton, *Codiaeum variegatum* L. (Euphorbiaceae), C.P. Reyes, 23-ll-

1985; 1♀(PNM), Mt. Apo, Agko, Kidapawan, North Cotabato, on flower of aguingay, *Rottboellia exaltata* L. (Poaceae), C.P. Reyes, 4-V-1987; 1♀(PNM), Mt. Apo, Sagpangan, Agko, Kidapawan, North Cotabato, on flower of everlasting, *Helichrysum stoechas* (L.) Moench. (Asteraceae), C.P. Reyes, 4-V-1987; 1♀(PNM), Mlang, North Cotabato, on flower of *Gardenia* sp. (Rubiaceae), C.P. Reyes, 13-V-1987.

11. *Thrips leytensis* sp. nov.
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Description.

Holotype female.

Body brown (Fig. 11a,b,c,d,e,f). **Head** wider than long, transversely striate posteriorly, mouthcone elongate with rounded tip; ocellar pair lll setae inserted inside ocellar triangle, immediately behind foreocellus; eyes about two-thirds of head length, slightly elongate posteriorly; postocular setae pair l well developed and about as long as ocellar pair lll; **antennae** 7-segmented, l brown, ll brown with pale apex, lll yellow with brown apex, lV brown with pale base, slightly longer than Vl, V to Vll brown, segments lll and lV each with forked sense cone; **pronotum** transversely striate, with 40-42 discal setae and 3 pairs of posteromarginal setae toward angulars; 2 pairs of posteroangular setae long, subequal in length; **forewings** brown with pale basal quarter, anterior vein with 7 basal setae and 3 distal setae; **legs** bicolored with femora and tibiae light brown, tarsi yellow; mesonotum with widely spaced transversely striae anteriorly, closely spaced striae medially and striae coverging toward posterior margin below median setae; **metanotal median sculpture** reticulate, with elongate reticles anteriorly, hexagonal reticles medially and posteriorly, reticles without internal marking, median setae inserted behind anterior margin, pair of campaniform sensilla absent; mesosternal furca with spinula; metasternal furca without spinula; **abdominal tergite** Vlll without comb of microtrichia on posterior margin, tergites lX and X B1 and B2 setae long, subequal in length; **abdominal sternites** lll to Vl without discal setae; and **pleurotergites** with 1 discal seta.

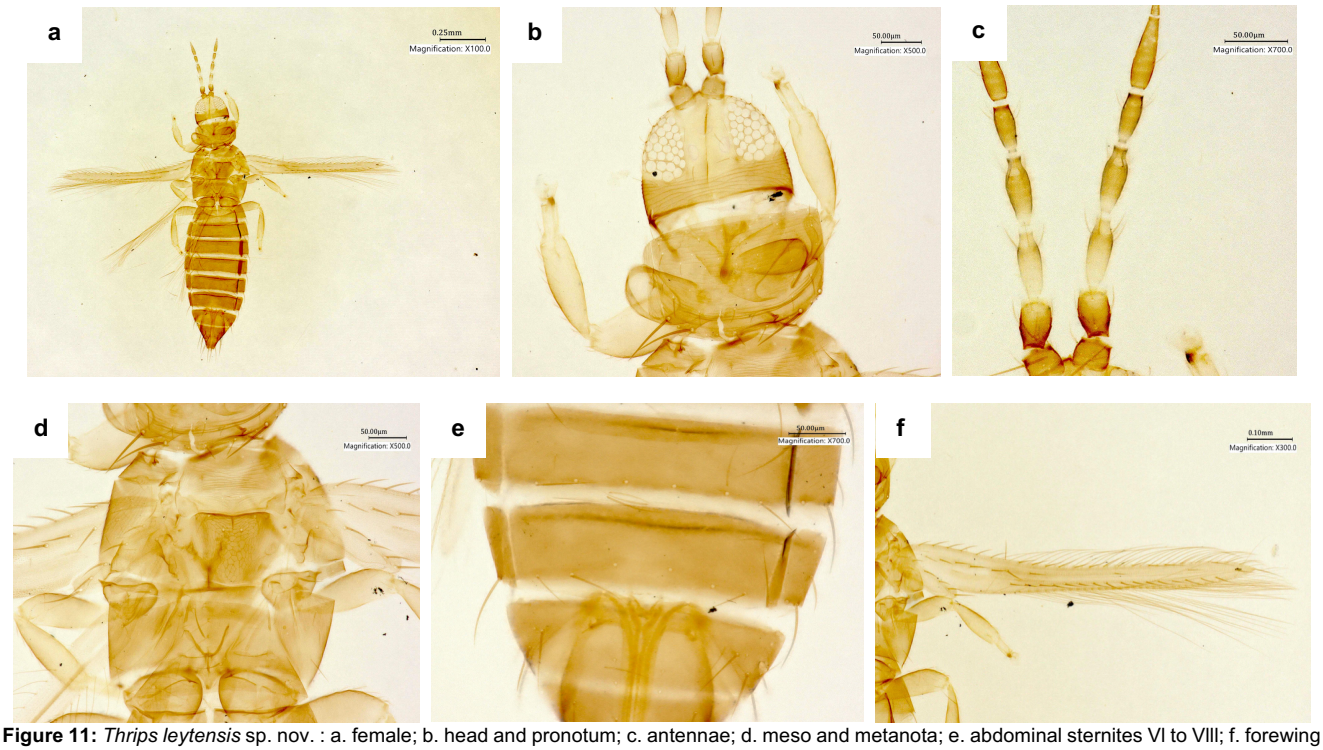


Figure 11: *Thrips leytensis* sp. nov. : a. female; b. head and pronotum; c. antennae; d. meso and metanota; e. abdominal sternites Vl to Vlll; f. forewing [CP Reyes and RMC Catamora].

Measurements (holotype female in micrometer). Body length: 1397.77; Head, length: 122.43; width across cheeks: 173.22. Eye length: 83.32. Ocellar setae, l: 180.21; II:149.74; III: 179.29. Postocular setae, l: 233.78; lll: 147.54; V: 159.17. Antennal segments length, l: 27.08; ll: 36.67; lll: 52.84; IV: 61.26; V: 40.23; Vl: 60.73 ; Vll: 15.53. Pronotum, length: 136.71; width: 218.46. Posteroangular setae, inner pair: 132.29; outer pair: 136.13. Forewing length: 812.93. Abdomen, tergite lX setae B1: 195.82; B2: 222.16; tergite X setae: B1: 199.13; B2:182.30.

Male. Unknown

Material examined.
Holotype ♀(PNM) **Philippines**: Baybay, Leyte, on *Stachytarpheta cayennensis* (Rich.) Vahl (Verbenaceae), S.G. Reyes, 17-Vl-1984 (PNM-18838). 1♀ **Paratype** (PNM), same data as holotype (PNM-18839).

Etymology. This species is named after the province of Leyte, the Philippines.

Distribution in the Philippines. Region 8: Baybay, Leyte

Host plant. *Stachytarpheta cayennensis* (Rich.) Vahl (Verbenaceae).

Remarks. The paratype female is similar to holotype female in structure.

Comparisons.

T. leytensis **sp. nov**. has eyes that are about two-thirds of the head with antennal segment lV longer than Vl, and metanotal

median sculpture with elongate reticles anteriorly, hexagonal reticles medially and posteriorly without internal marking.

It is similar to *T. extensicornis* for having ocellar pair lll setae inserted inside ocellar triangle immediately behind foreocellus, anterior vein of forewings with 7 basal and 3 distal setae, metanotum without campaniform sensilla, however, the abdominal tergite Vlll of *T. extensicornis* has a comb of microtrichia on posterior margin interrupted medially; metanotal median sculpture with few reticles with internal markings; and abdominal sternites lll to Vl with discal setae (Palmer 1992; Mound and Masumoto 2005).

T. leytensis **sp. nov**. is similar to *T. malloti* for having ocellar pair lll setae inserted inside ocellar triangle immediately behind foreocellus, abdominal tergite Vlll without comb of microtrichia on posterior margin, and discal setae on abdominal sternites lll to Vl absent, however, the anterior vein of forewings of *T. malloti* has a complete series of setae on the anterior vein, metanotal median sculpture with equiangular to elongate reticles and with campaniform sensilla.

T. leytensis **sp. nov**. is similar to *T. morindae* for having ocellar pair lll setae inserted inside ocellar triangle immediately behind foreocellus, metanotum without campaniform sensilla, abdominal tergite Vlll without comb of microtrichia on posterior margin, and discal setae on sternites lll to Vl absent, however, the eyes of *T. morindae* are protruded, postocular setae not prominent, anterior vein of forewings with 7 basal and 4 or 5 distal setae, metanotal median reticles transversely elongate anteriorly and longitudinally elongate posteriorly, and reticles with internal markings.

T. leytensis **sp. nov**. is similar to *T. orientalis* for lacking a pair of campaniform sensilla on metanotum, however, the forewings of *T. orientalis* are brown with small pale area subbasally and anterior vein series of setae almost complete, reticles on metanotal median sculpture with many internal markings, and abdominal sternites lll-Vl usually with discal setae.

T. leytensis **sp. nov**. is similar to *T. parvispinus* for lacking campaniform sensilla on metanotum, and abdominal tergite Vlll usually without a comb of microtrichia on posterior margin, however, *T. parvispinus* has forewings with pale basal quarter and complete row of setae on anterior vein; metanotal median sculpture with elongate reticles with faint internal markings, and abdominal sternites lll-Vl with discal setae.

12. *Thrips longicaudatus* (Bianchi, 1953)
Taeniothrips longicaudatus Bianchi,1953: 94.

Diagnostic characters.
Head, thorax, and abdominal tergites Vlll to X dark brown and tergites l to Vll yellowish brown (Fig. 12). **Head** wider than long with transverse striae posteriorly, mouthcone elongate with rounded tip; ocellar setae pair lll inserted outside margin of ocellar triangle; eyes rounded; postocular setae pair l well developed, ll small; **antennae** 8segmented, l and ll brown, lll yellow, lV and V brown with pale base, Vl to Vlll brown, segments lll and lV each with forked sense cone; **pronotum** transversely striate with discal setae and 3 pairs of posteromarginal setae toward angulars, 2 pairs of posteroangular setae long, subequal in length; **forewings** greyish brown with pale basal quarter; anterior vein with almost complete row of vein setae, with 1 distal seta; **legs** predominantly brown, foretibiae and tarsi light brown, hindtibiae with row of spine-like setae on inner margins; mesonotum with transverse striae; **metanotal median sculpture** transversely striate on anterior quarter and longitudinally reticulate on posterior three quarters, median setae inserted near anterior margin, pair of campaniform sensilla present; mesosternal furca with spinula; metasternal furca without spinula; **abdominal tergites** Vlll without comb of microtrichia on posterior margin, tergites lX and X unusually long, X about twice as long as Vlll, with B1 and B2 setae long, subequal in length; **abdominal sternites** lll to Vl with discal setae; **pleurotergites** lack discal setae. Male unknown.



Figure 12: *Thrips longicaudatus* (Bianchi): female [D Hall].

Material examined.
2♀ (SMFG) from the **Philippines**: UPCA [UPLB], Los Baños, Laguna, on *Citrus* sp. (Rutaceae), D. Z. Llamas, 28-lV-1968 (Reyes 1994). Other. 1♀(NHMUK), **Australia**: Rwanda Range State Forest, North Queensland, D. H. Colless, 20-lV-1964 (NHMUK).

13. *Thrips malloti* (Priesner, 1934)
Thrips (*Isoneurothrips*) *malloti* Priesner,1934: 269.

Diagnostic characters.
Body brown (Fig. 13a,b,c,d). **Head** wider than long, transversely striate posteriorly, mouthcone elongate with rounded tip; ocellar pair lll setae inserted inside ocellar triangle, immediately behind foreocellus; eyes slightly prolonged posteriorly; postocular setae pair l and lll well developed, ll very small; **antennae** 7-segmented, l brown, ll brown with pale apex, lll yellow, lV to Vll yellowish, segments lll and lV each with forked sense cone; **pronotum** with strong transverse striae with discal setae and 3 pairs of posteromarginal setae toward angulars, 2 pairs of posteroangular setae long, subequal in length; legs yellow; **forewings** brown with pale subbasal quarter, anterior vein with almost complete row of setae or 1 distal seta; mesonotum weakly striate; **metanotal median sculpture** reticulate, reticles equiangular to elongate posteriorly without internal marking, median setae inserted behind anterior margin, pair of campaniform sensilla present; mesosternal furca with spinula; metasternal furca without spinula; **abdominal tergite** Vlll without comb of microtrichia on posterior margin, tergites lX and X with B1 and B2 setae long, subequal in length; **abdominal sternites** and **pleurotergites** without discal setae. Male similar to female in structure; abdominal sternites lll to Vll each with transverse pore plate.

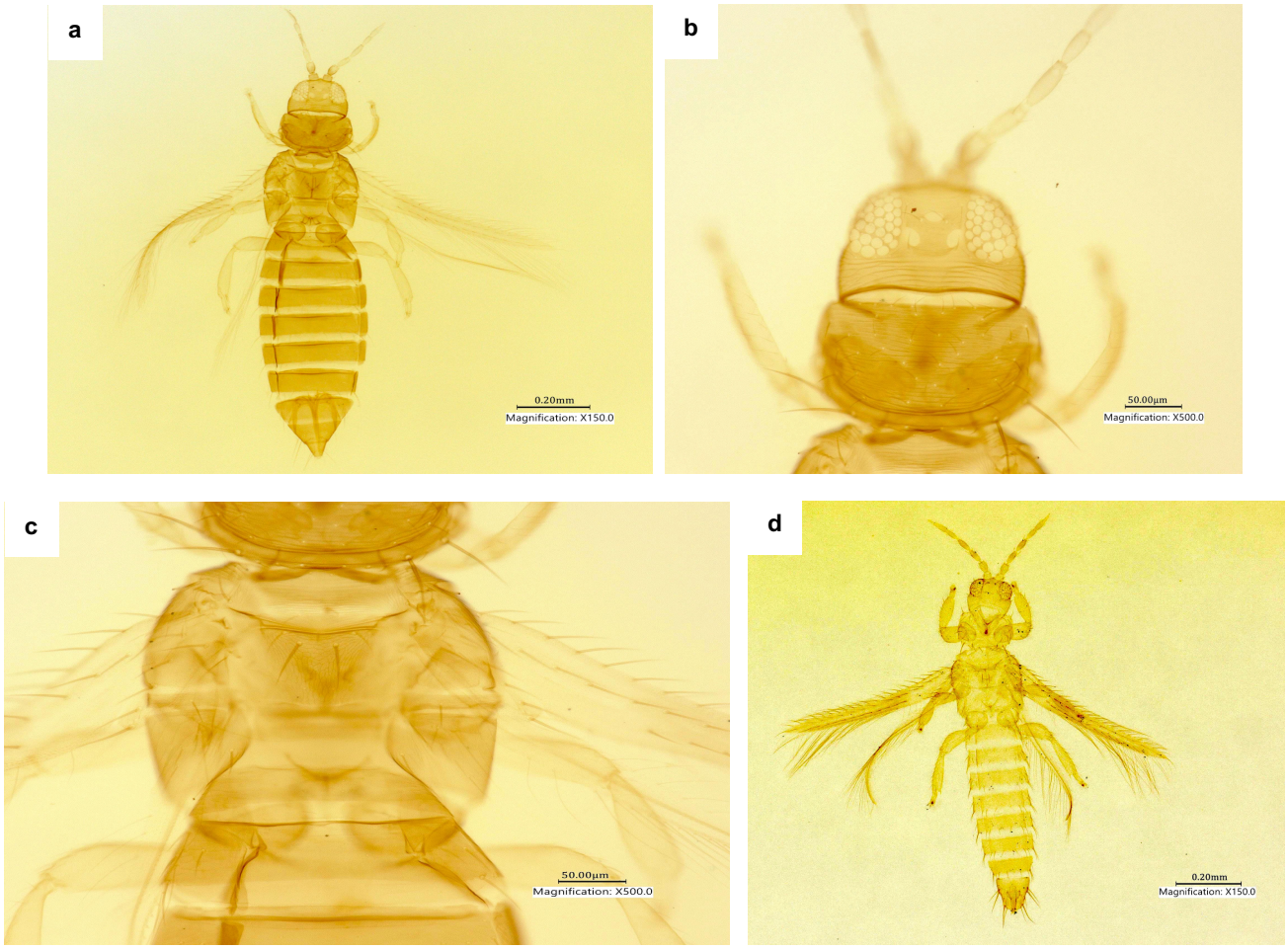


Figure 13: *Thrips malloti* Priesner: a. female; b. head and pronotum; c. meso and metanota; d. male [CP Reyes and RMC Catamora].

Material examined.
3♀(PNM), MMSU, Batac, Ilocos Norte, on flower of *Helianthus annuus* L. (Asteraceae), C.P. Reyes, 9-lV-1985; 1♂(PNM), UPLB, Los Baños, Laguna, on corn silk, *Zea mays* L. (Poaceae), M. Alba, 9-lX-1984; 1♀, 1♂ (PNM), UPLB, Los Baños, Laguna, on *Plumiera acuminata* Aiton (Apocynaceae), J. Catindig, 2-lll-1985; 1♀(PNM), UPLB, Los Baños, Laguna, on unknown plant, C.P. Reyes, 16-Vll-1982; 1♀(PNM), UPLB, Los Baños, Laguna, on *Ervatamia pandacaqui* (Poir) Markgr. (Apocynaceae), C.P. Reyes, 13-X-1983; 1♂(PNM), Hiwacloy, Goa, Camarines Sur, on flower of unknown plant, C.P. Reyes, 3-Vl-1987; 1♀ (PNM), VISCA [VSU], Baybay, Leyte, on *Plumiera acuminata* Aiton (Apocynaceae), C.P. Reyes, 4-V-1983; 1♀(PNM), VISCA [VSU], Baybay, Leyte, on *Nelumbium speciosum* Willd. (Nelumbonaceae), C.P. Reyes, 6-V-1983; 4♀, 1♂ (PNM), Mt. Apo, Agko, Kidapawan, North Cotabato, on flower of unknown plant, C.P. Reyes, 5-V-1987; 2♀(PNM), Mlang, North Cotabato, on flower of *Citrus* sp. (Rutaceae), C. P. Reyes, 17-ll-1985; 1♀(PNM), Mlang, North Cotabato, on *Cajanus cajan* L. (Fabaceae), C. P. Reyes, 18-ll-1985. Other. 1♀(NHMUK), **Malaysia**: Pamol, Sabah, on *Allamanda cathartica* L. (Apocynaceae), R. A. Syed, Vll-1978 (NHMUK) and 1♀(NHMUK), Tuaran, Sabah, on *Plumeria obtusa* L. (Apocynaceae), R. A. Syed, Vll1978 (NHMUK).

14. *Thrips melastomae* Priesner, 1934
Thrips melastomae Priesner,1934: 262.

Diagnostic characters.
Body uniformly brown. **Head** about as long as wide with transverse striae posteriorly, mouthcone elongate with rounded tip; ocellar setae pair lll inserted outside margin of ocellar triangle; eyes rounded; postocular setae setae pair 1 well developed, ll small; **antennae** 7-segmented, ll and ll brown, lll pale brown, lV to V pale brown, Vl brown to pale brown, Vll brown; **pronotum** transversely striate with discal setae and 3 pairs of posteromarginal setae toward angulars, 2 pairs of posteroangular setae short, subequal in length; **forewings** brown to dark brown, anterior vein with 7 basal and 3 distal setae; **legs** pale; mesonotum transversely striate; **metanotal median sculpture** transversely striate anteriorly and longitudinally striate posteriorly, median setae inserted near anterior margin, pair of campaniform sensilla present; **abdominal tergite** Vlll with comb of microtrichia on posterior margin, tergites lX and X with B1 and B2 setae long, subequal in length; **abdominal sternites** lll to Vl with discal setae; **pleurotergites** without discal setae. Male yellowish brown, similar to female in structure; abdominal sternites lll to Vll each with transverse glandular area (Palmer 1992).

Remarks. The diagnostic characters of the *T. melastomae* was based on the description of Palmer (1992) who examined the Philippine (Manila) thrips specimens at the USNM and recorded the species in the Philippines.

15. *Thrips morindae* Priesner, 1934
Thrips morindae Priesner, 1934: 275-276.

Diagnostic characters.
Body brown (Fig. 14a,b,c,d). **Head** wider than long, transversely striate posteriorly, mouthcone elongate with rounded tip; ocellar setae pair lll inserted inside ocellar triangle, immediately behind foreocellus; eyes protruded; postocular setae not prominent; **antennae** 7-segmented, l brown, ll brown with pale apex, lll yellow, lV and V yellow with brown apex, Vl brown with pale base, Vll brownish, segments lll and lV each with forked sense

cone; **pronotum** with weak transverse striae and 3 pairs of small posteromarginal setae toward angulars, and 2 pairs of posteroangular setae long, subequal in length; **forewings** brown with pale subbasal quarter, anterior vein with 7 basal and 4 or 5 distal setae; **legs** bicolored with forelegs yellow, mid and hindfemora brownish, tibiae and tarsi yellow; mesonotum transversely striate; **metanotal median sculpture** reticulate, reticles transversely elongate anteriorly and longitudinally elongate posteriorly, reticles with internal markings, median setae inserted far behind anterior margin, pair of campaniform sensilla absent; mesosternal furca with spinula; metasternal furca without spinula; **abdominal tergite** Vlll without comb of microtrichia on posterior margin, tergites lX and X with B1 and B2 setae long, subequal in length; **abdominal sternites** lll to Vl and **pleurotergites** without discal setae. Male similar to female in structure and color; abdominal sternites lll to Vll each with transverse pore plate.

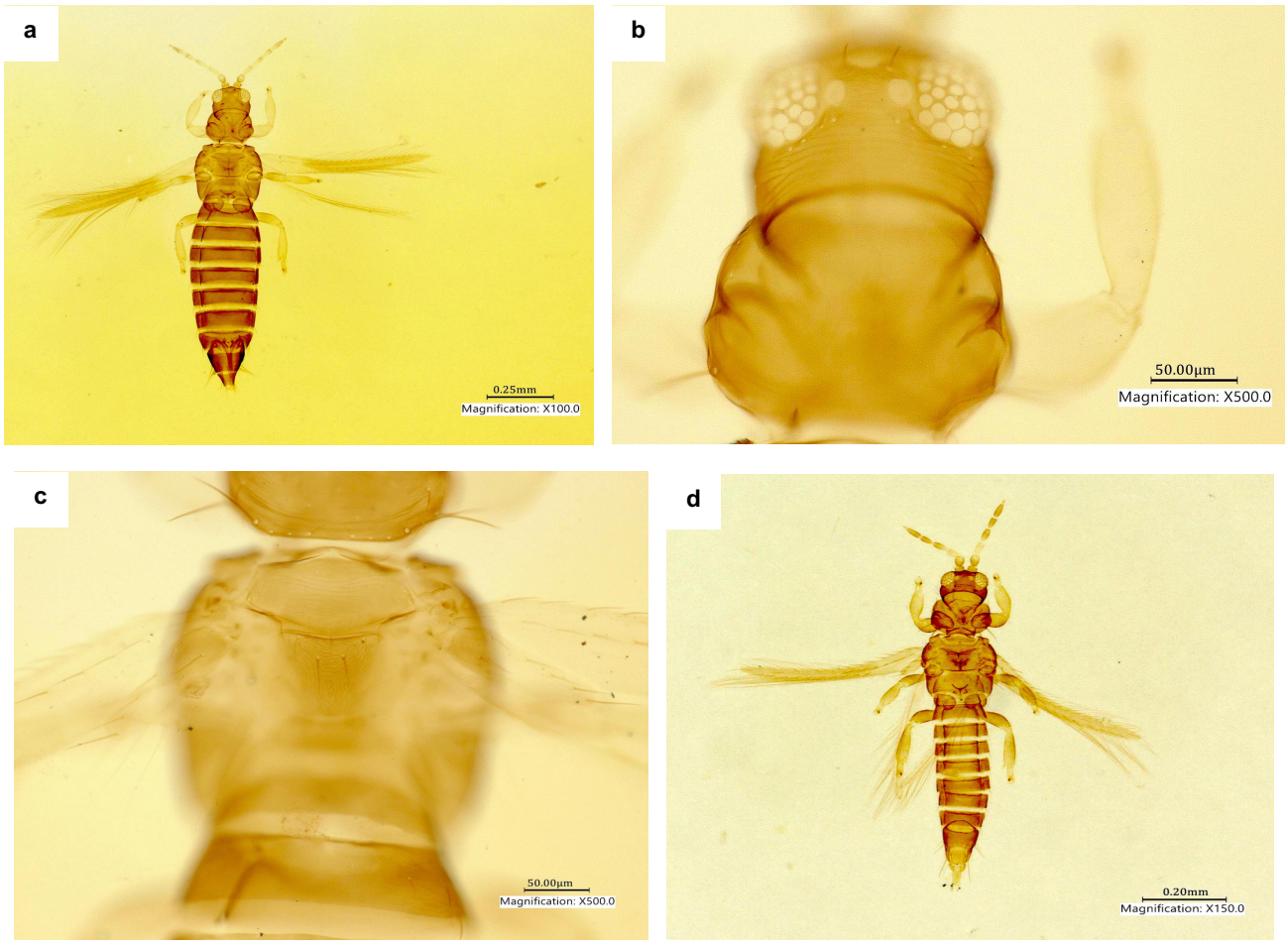


Figure 14: *Thrips morindae* Priesner: a. female; b. head and blurred pronotum; c. meso and metanota; d. male [CP Reyes and RMC Catamora].

Material examined.
2♀,1♂(PNM), Sipit Saburan, Puerto Gallera, Oriental, Mindoro, on *Citrus* sp. (Rutaceae), C.P. Reyes, 19-Vl-1987; 3♀(PNM), Sipit Saburan, Puerto Gallera, Oriental, Mindoro, on Rubiaceae, C.P. Reyes, 20-Vl-1987; 9♀(PNM), Sipit Saburan, Puerto Gallera, Oriental, Mindoro, on leaves of *Musa* sp. (Musaceae), C.P. Reyes, 20-Vl-1987; 3♀(PNM), DA-Bicol Experiment Station, Pili, Camarines Sur, on flower of unknown plant, C.P. Reyes, 5-Vl-1987; 1♂ (PNM), VISCA [VSU], Baybay, Leyte, on arrowroot, *Maranta arundinacea* L. (Marantaceae), C.P. Reyes, 13-V-1987; 2♀, 6♂(PNM), Mt. Apo, Agko, Kidapawan North Cotabato, on flower of unknown plant, C.P. Reyes, 5-V1987.

16. *Thrips nigropilosus* Uzel, 1895
Thrips nigropilosa Uzel,1895: 198.
Thrips nigropilosus Uzel: Palmer, 1992: 29.

Diagnostic characters.
Body yellow with brown markings on thorax and abdomen (Fig. 15a,b,c). **Head** wider than long, mouthcone elongate with rounded tip; ocellar setae pair lll inserted outside margin of ocellar triangle; eyes rounded; postocular setae pair l well developed, ll very small; **antennae** 7-segmented, l whitish, ll brownish, lll yellowish with brown apex, lV brown with pale base, V to Vll brown; **pronotum** transversely striate with discal setae and 3 pairs of posteromarginal setae toward angulars, 2 pairs of posteroangular setae long, subequal in length; **forewings** brownish, with pale basal quarter, anterior vein with 7 basal and 3 distal setae; **legs** yellowish; mesonotum transversely striate; metanotal **median sculpture** striate or weakly reticulate, median setae inserted behind anterior margin, pair of campaniform sensilla absent; mesosternal furca with spinula; metasternal furca without spinula; **abdominal tergite** VIII with complete comb of microtrichia on posterior margin, tergites lX and X with long B1 and B2 setae, subequal in length; **abdominal sternites** lll to Vl without discal setae; **pleurotergites** without discal setae. Male similar to female in color and structure; abdominal sternites lll to Vll each with transverse pore plate (Palmer 1992).



Figure 15: *Thrips nigropilosus* Uzel: a. female; b. head and pronotum;c. meso and metanota [CP Reyes and RMC Catamora].

Material examined.
1♀(PNM), Putinglupa, Calamba, on *Cajanus cajan* (L.) Millsp. (Fabaceae), C.P. Reyes, 5-ll-1983; 2♀(PNM), VISCA [VSU], Baybay, Leyte, on African daisy, *Osteospermum* sp. (Asteraceae), C.P. Reyes, 4-V-1983. Other. 1♀(NHMUK), **Japan**: Kobe, on carrot, *Daucus carota* L. (Apiaceae), J.A. Lewis, 15-Vlll-1931 (NHMUK).

17. *Thrips orientalis* (Bagnall, 1915)
Isoneurothrips orientalis Bagnall,1915: 593.
Thrips orientalis (Bagnall): Sakimura,1967: 432.

Diagnostic characters.
Body brown (Fig.16a,b,c,d). **Head** about as long as wide or longer, transversely striate posteriorly, mouthcone elongate with rounded tip; ocellar setae pair lll inserted inside or outside margin of ocellar triangle; eyes slightly elongate posteriorly; postocular setae pair l and lll well developed, subequal in length, ll very small; **antennae** 7-segmented, l and ll brown, lll yellow with brownish apex, lV brownish, V to Vll brown, segments lll and IV each with forked sense cone; **pronotum** transversely striate, with discal setae and 3 pairs of posteromarginal setae toward angulars, 2 pairs of posteroangular setae long, subequal in length; **legs** bicolored with femora brown, foretibiae brown with pale apex, mid and hind tibiae brown, tarsi yellow; **forewings** brown with small pale subbasal area, anterior vein setae with almost complete row of setae, 7 basal and 8 to 10 distal setae; mesonotum transversely striate; **metanotal median sculpture** reticulate, reticles elongate anteriorly and hexagonal posteriorly, reticles with numerous internal markings, median setae inserted far behind anterior margin, pair of campaniform sensilla absent; mesosternal furca with spinula; metasternal furca without spinula; **abdominal tergite** Vlll with comb of microtrichia interrupted medially on posterior margin, tergites lX and X with B1 and B2 setae long, subequal in length; **abdominal sternites** lll to Vl with 1, 2 or more discal setae; **pleurotergites** without discal setae. Male similar to female in color and structure; abdominal sternites lll to Vll with transverse pore plate.

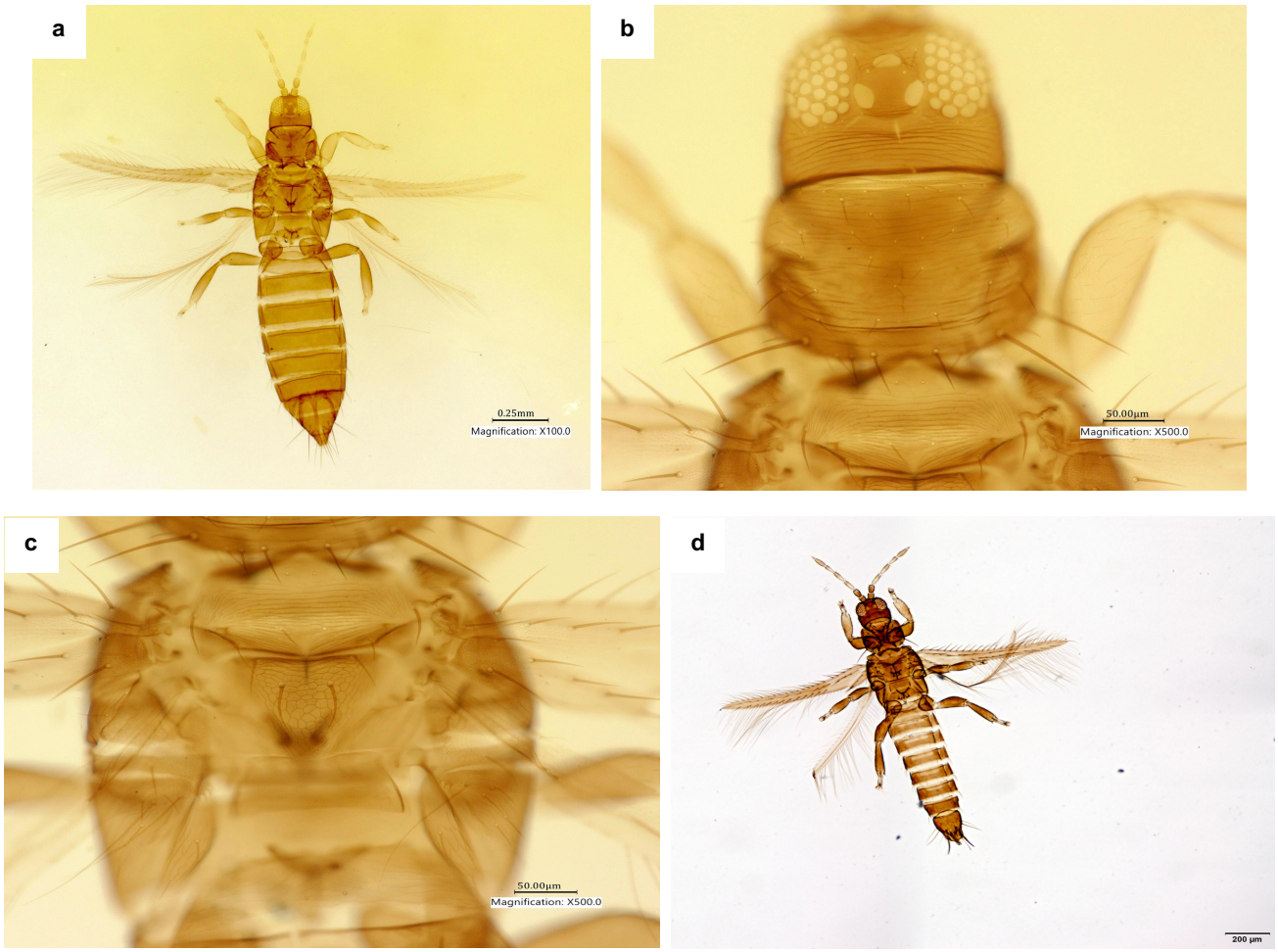


Figure 16: *Thrips orientalis* (Bagnall): a. female; b. head and pronotum; c. meso and metanota [CP Reyes, and RMC Catamora]; d. male [D Hall].

Material examined.
5♀(PNM), IRRI, Los Baños, Laguna, on flower of sampaguita, *Jasminum sambac* L. (Oleaceae), C.P. Reyes, 8-Vlll-1982; 1♂(PNM), IRRI, Los Baños, Laguna, on *Jasminum sambac* L. (Oleaceae), M. Ma, 4-X-1983; 2♀(PNM), Brooks Point, Palawan, on flower of sampaguita, *Jasminum sambac* L. (Oleaceae), C.P. Reyes, 30-l-1985; 3♀, 1♂ (PNM), DA-Bicol Experiment Station, Pili, Camarines Sur, on flower of sampaguita, *Jasminum sambac* L. (Oleaceae), C.P. Reyes, 4-Vl-1987; 4♀, 1♂ (PNM), Mt. Pangagusan, Baybay, Leyte, on flower of 'Manban', C.P. Reyes, 4-V-1983; 1♀, Mt. Pangagusan, Baybay, Leyte, on unknown plant, C.P. Reyes, 4-V-1983; 2♀ (PNM), Pasonanca Park, Zamboanga City, on flower Amyrallidaceae, C.P. Reyes, 13-Vlll-1987; 1♀, 1♂ (PNM), Mlang, North Cotabato, on sampaguita, *Jasminum sambac* L. (Oleaceae), C.P. Reyes, 18-ll-1985. Other. 1♀, 1♂ (NHMUK), **Malaysia**: Parliament Ground, Kuala Lumpur, on *Plumeira* sp. (Apocynaceae), 15-X-1973 (NHMUK).

18. *Thrips palmerae* Reyes, 1994
Thrips palmerae Reyes,1994: 283.

Diagnostic characters.
Body brown (Fig. 17a,b,c). **Head** wider than long with tranverse striae posteriorly, mouthcone elongate with rounded tip; ocellar setae pair lll inserted outside margin of ocellar triangle; eyes rounded; postocular setae pair l and lll well developed, subequal in length, ll small; **antennae** 7-segmented, brown, lll light brown; segments lll and lV each with forked sense cone; **pronotum** transversely striae with discal setae, 3 pairs of posteromarginal setae toward angulars, 2 pairs of posteroangular setae long, subequal in length; **forewings** brown with small subbasal pale area, anterior vein with 7 basal and 4 distal setae; **legs** light brown, hindtibiae with spine-like setae on inner margins; mesonotum with transverse striae; **metanotal median sculpture** striate anteriorly and reticulate medially with elongate reticles posteriorly, reticles with internal markings, median setae inserted far behind anterior margin, pair of campaniform sensilla absent; mesosternal furca with spinula; metasternal furca without spinula; **abdominal tergite** VIII posterior margin with irregular microtrichia laterally, tergites lX and X with B1 and B2 setae long, subequal in length; **abdominal sternites** lll to Vl with discal setae; **pleurotergites** without discal setae. Male unknown.

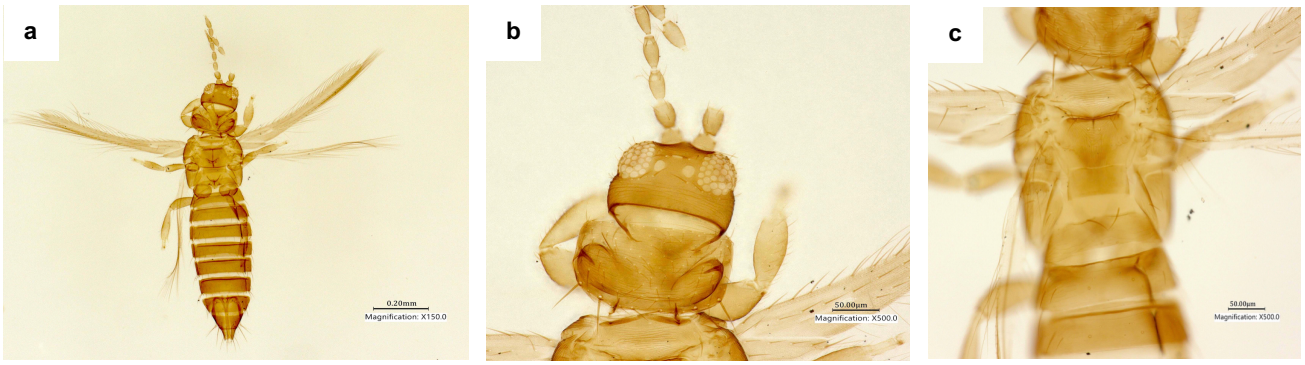


Figure 17: *Thrips palmerae* Reyes: a. female; b. head and pronotum; c. meso and metanota [CP Reyes and RMC Catamora].

Material examined.
2♀ **Paratypes** (PNM), Mt. Apo, Agko, Kidapawan, North Cotabato on flower of unknown plant, C.P. Reyes, 5-V-l987.

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

Diagnostic characters.
Body uniformly pale yellow (Fig. 18a,b,c,d). **Head** wider than long, transversely striate posteriorly, mouthcone almost reaching posterior margin of prosternum with rounded tip; ocellar setae pair lll inserted outside margin of ocellar triangle; eyes rounded; postocular setae pair l and lll well developed, ll very small; **antennae** 7-segmented, segments l and ll whitish, lll yellow with brownish apex, lV and V brown with pale base, Vl and Vll brown; **pronotum** transversely striate, with numerous discal setae and 3 pairs of posteromarginal setae toward angulars, 2 pairs of posteroangular setae long, subequal in length; **forewings** yellow, anterior vein with 7 basal and 3 distal setae; **legs** yellow; mesonotum transversely striate; **metanotal median sculpture** striate converging posteriorly, median setae inserted behind anterior margin, pair of campaniform sensilla present; mesosternal furca with spinula; metasternal furca without spinula; **abdominal tergite** VIII with complete comb of microtrichia on posterior margin, tergites lX and X with long B1 and B2 setae, subequal in length; **abdominal sternites** lll to Vl without discal setae; **pleurotergites** without discal setae. Male similar to female in color and structure; abdominal sternites lll to Vll each with transverse pore plate.

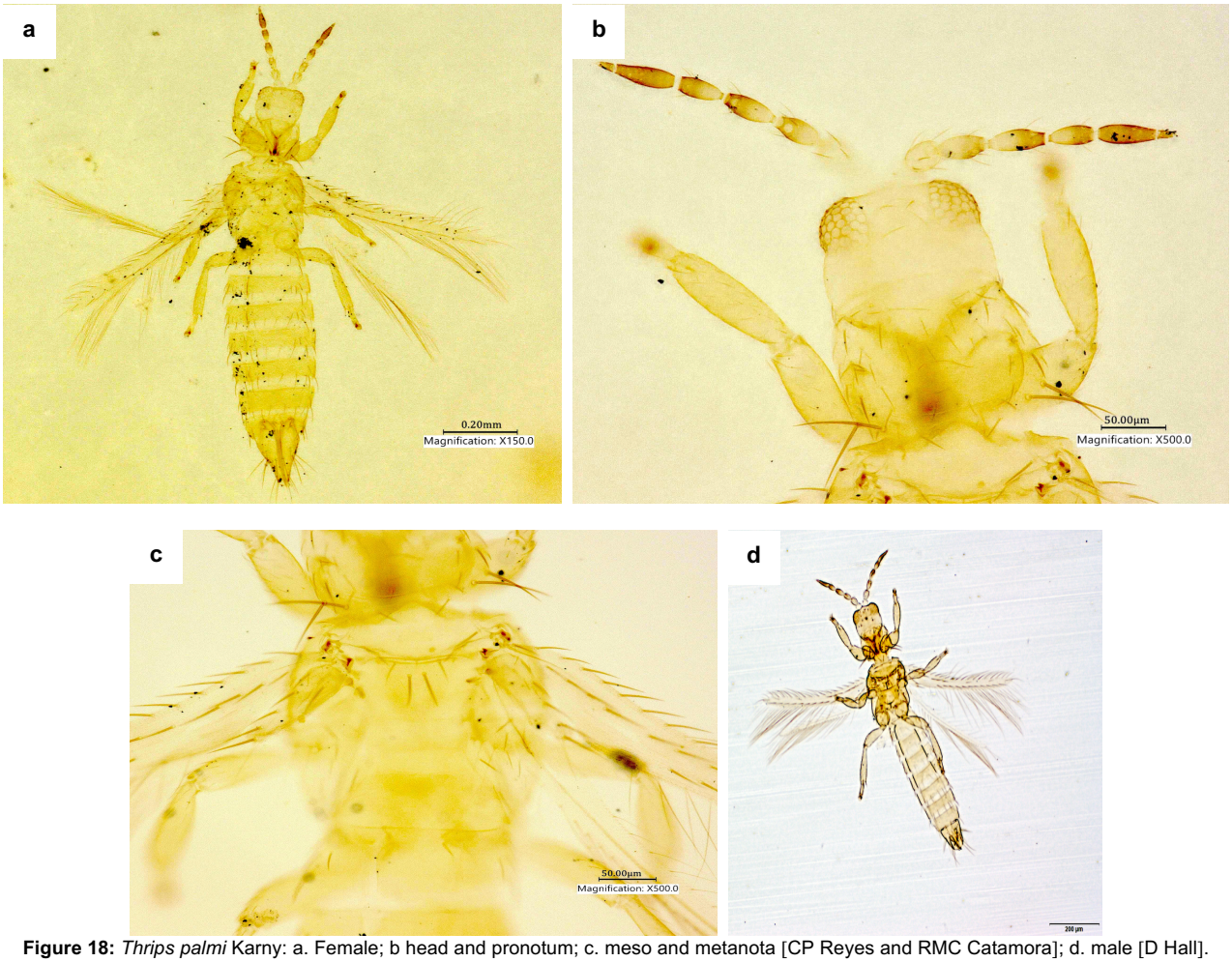


Figure 18: *Thrips palmi* Karny: a. Female; b head and pronotum; c. meso and metanota [CP Reyes and RMC Catamora]; d. male [D Hall].

Material examined.

6♀(PNM), Batac, Ilocos Norte, on pepper, *Capsicum annum* L. (Solanaceae), E.C. Mituda, 7-ll-1988; 2♀(PNM), Batac, Ilocos Norte, on squash, *Cucurbita maxima* Duchesne (Cucurbitaceae), E.C. Mituda, 7-ll-1988; 4♀(PNM), Carosucan, Asingan, Pangasinan, on tomato, *Lycopersicon lycopersicum* (Karst.) (Solanaceae), E.C. Mituda, 11-ll-1988; 2♀(PNM), Carosucan, Asingan, Pangasinan, on tobacco, *Nicotiana tabacum* L. (Solanaceae), E.C. Mituda, 11-ll-1988; 1♀(PNM), Bacnotan, La Union, on potato, *Solanum tuberosum* L. (Solanaceae), E.C. Mituda, 11-ll-1988; 1♀(PNM), MSAC[BSU], La Trinidad, Benguet, on gumamela, *Hibiscus rosa-sinensis* L. (Malvaceae), C.P. Reyes, 8-Xll-1984; 1♀(PNM), Manila, intercepted in Seattle, USA, on cut flower, R.F. Boodal, 14. V. 1968; 5♀, 1♂ (PNM), CLSU, Muñoz, Nueva Ecija, on watermelon, *Citrullus lanatus* (Thunb.) Matsum. and Nakai (Cucurbitaceae), M.D. Malabayabas, 15-ll-1988; 4♀, 3♂ (PNM), UPLB, Los Baños, Laguna, on flower of chicory, *Cichorium intybus* L. (Asteraceae), C.P. Reyes, 7-ll-1982; 4♀(PNM), UPLB, Los Baños, Laguna, on cucumber, *Cucumis sativus* L. (Cucurbitaceae), C.P. Reyes, 26-X-1982; 1♂ (PNM), UPLB, Los Baños, Laguna, on mulberry, *Morus alba* L. (Moraceae), C.P. Reyes, 26- X-1982; 2♂ (PNM), UPLB, Los Baños, Laguna, on eggplant, *Solanum melongena* L. (Solanaceae), C.P. Reyes, 26-X-1982; 6♀, 1♂ (PNM), UPLB, Los Baños, Laguna, on eggplant, *Solanum melongena* L. (Solanaceae), C.P. Reyes, 26-X-1982; 5♀(PNM), UPLB, Los Baños, Laguna, on watermelon, *Citrullus lanatus* (Thunb.) Matsum. and Nakai (Cucurbitaceae), I. Palacio, 23-V-1983; 5♀ (PNM), UPLB, Los Baños, Laguna, on eggplant, *Solanum melongena* L. (Solanaceae), C.P. Reyes, 11-Vll-1983; 6♂(PNM), UPLB, Los Baños, Laguna, on eggplant, *Solanum melongena* L. (Solanaceae), C.P. Reyes, 11-Vll-1983; 4♀, 1♂ (PNM), IRRI, Los Baños, Laguna, on *Borreria* sp. (Rubiaceae), C.P. Reyes, 4-X-1983; 5♀, 1♂ (PNM), UPLB-IPB, Los Baños, Laguna, on patola, *Luffa acutangula* (L.) Roxb. (Cucurbitaceae), C.P. Reyes, 5-X-1983; 1♀(PNM), UPLB, Los Baños, Laguna, on tomato, *Lycopersicon lycopersicum* (Karst.) (Solanaceae), C.P. Reyes, 13-X-1983; 1♀(PNM), UPLB, Los Baños, Laguna, on squash, *Cucurbita maxima* Duchesne (Cucurbitaceae), C.P. Reyes, 17-lX-1984; 4♀, 1♂ (PNM), UPLB-NCPC, Los Baños, Laguna, on leaves of cotton, *Gossypium* sp. (Malvaceae), R. Joshi, 1-X-1984; 1♀(PNM), UPLB-IPB, Los Baños, Laguna, on eggplant, *Solanum melongena* L. (Solanaceae), C.P. Reyes, 24-Vl-1987; 1♂ (PNM), UPLB-IPB, Los Baños, Laguna, on eggplant, *Solanum melongena* L. (Solanaceae), C.P. Reyes, 24-Vl-1987; 3♀(PNM), UPLB-IPB, Los Baños, Laguna, on pepper, *Capsicum annum* L. (Solanaceae), M.D. Malabayabas, 27-l-1988; 3♀(PNM), UPLB-IPB, Los Baños, Laguna, on sweet pepper, *Capsicum annum* L. (Solanaceae), M.D. Malabayabas, 27-l-1988; 3♀(PNM), UPLB-IPB, Los Baños, Laguna, on cotton, *Gossypium* sp. (Malvaceae), M.D. Malabayabas, 28-l-1988; 3♀(PNM), UPLB-IPB, Los Baños, Laguna, on squash, *Cucurbita maxima* Duchesne (Cucurbitaceae), M.D. Malabayabas, 28-l-1988; 6♀(PNM), UPLB-IPB, Los Baños, Laguna, on squash, *Cucurbita maxima* Duchesne (Cucurbitaceae), E.C. Mituda, 28-l-1988; 6♀(PNM), UPLB-IPB, Los Baños, Laguna, on pepper, *Capsicum annum* L. (Solanaceae), E.C. Mituda, 29-l-1988; 2♀, 1♂ (PNM), UPLB, Los Baños, Laguna, on raddish, *Raphanus sativus* L. (Brassicaceae), E.C. Mituda, 3-ll-1988; 6♀(PNM), UPLB, Los Baños, Laguna, on cucumber, *Cucumis sativus* L. (Cucurbitaceae), E.C. Mituda, 2-lll-1988; 4♀(PNM), UPLB, Los Baños, Laguna, on Thai weed, E.C. Mituda, 2-lll-1988; 4♀

(PNM), Banahaw, Quezon, on white potato, *Solanum tuberosum* L. (Solanaceae), E.C. Mituda, 14-lll-1988; 2♀, 1♂ (PNM), UPLB-IPB, Los Baños, Laguna, on potato, *Solanum tuberosum* L. (Solanaceae), E.C. Mituda, 24-lll-1988; 6♀(PNM), Padre Garcia, Batangas, on watermelon, *Citrullus lanatus* (Thunb.) Matsum. and Nakai (Cucurbitaceae), E.C. Mituda, 4-lV-1988; 6♀(PNM), Padre Garcia, Batangas, on *Chrysanthemum* sp. (Asteraceae), E.C. Mituda, 4-lV- 1988; 1♂ (PNM), Sipit Saburan, Puerto Gallera, Oriental Mindoro, on leaf of unknown tree, C.P. Reyes, 19-Vl-1987; 1♀(PNM), Hiwacloy, Goa, Camarines Sur, on *Solanum* sp. (Solanaceae), C.P. Reyes, 18-V-1987; 1♀(PNM), Piña, Guimaras, on tomato, *Lycopersicon lycopersicum* (Karst.) (Solanaceae), C.P. Reyes, 22-V-1987; 11♀, 7♂ (PNM), Piña, Guimaras, on bean, *Vigna* sp. (Fabaceae), C.P. Reyes, 22-V-1987; 2♀(PNM), Piña, Guimaras, on okra, *Abelmoschus esculentus* (L.) Moench (Malvaceae), C.P. Reyes, 22-V-1987; 2♀(PNM), Piña, Guimaras, on sweet pepper, *Capsicum annum* L. (Solanaceae), C.P. Reyes, 22-V-1987; 11♀, 3♂(PNM), Piña, Guimaras, on squash, *Cucurbita maxima* Duchesne (Cucurbitaceae), C.P. Reyes, 22-V-1987; 1♀, 1♂(PNM), Piña, Guimaras, on tomato, *Lycopersicon lycopersicum* (Karst.) (Solanaceae), C.P. Reyes, 22-V-1987; 1♂ (PNM), VISCA [VSU], Baybay, Leyte, on *Lantana* sp.(Verbenaceae, C.P. Reyes, 4-V-1983; 3♀(PNM), VISCA [VSU], Baybay, Leyte, on bush sitao, *Vigna* sp. (Fabaceae), C.P. Reyes, 5-V-1983; 1♀ (PNM), VISCA [VSU], Baybay, Leyte, on flower of mung bean, *Vigna radiata* (L.) Wilczek (Fabaceae), C.P. Reyes, 5-V-1983; 1♀(PNM), VISCA [VSU], Baybay, Leyte, on unknown plant, C.P. Reyes, 10-Vlll-1983; 1♂ (PNM), VISCA [VSU], Baybay, Leyte, on tassel of corn, *Zea mays* L. (Poaceae), C.P. Reyes, 12-V-1987; 6♀(PNM), Dalwangan, Malaybalay, Bukidnon, on pepper, *Capsicum annum* L. (Solanaceae), E.C. Mituda, 20-Vll-1988; 7♀ (PNM), Dalwangan, Malaybalay, Bukidnon, on Baguio bean, *Phaseolus vulgaris* L. (Fabaceae), E.C. Mituda, 20-Vll-1988; 4♀(PNM), CMU, Musuan, Bukidnon, on patola, *Luffa acutangula* (L.) Roxb. (Cucurbitaceae), E.C. Mituda, 22-Vll-1988; 1♂ (PNM), TADECO, Panabo, Davao del Norte, on eggplant, *Solanum melongena* L. (Solanaceae), E. Oquias, 26-Vl-1985; 1♂ (PNM), Mlang, North Cotabato, on squash, *Cucurbita maxima* Duchesne (Cucurbitaceae), C.P. Reyes, 18-ll-1985; 1♀(PNM), Bagontapay, Mlang, North Cotabato, on flower of tuba-tuba, *Jatropha curcas* L. (Euphorbiaceae), C.P. Reyes, 10V-1987.

20. *Thrips parvispinus* (Karny, 1922)
Isoneurothrips parvispinus Karny,1922: 106.
Thrips (*Isoneurothrips*) *parvispinus* (Karny): Priesner, 1934: 259.

Diagnostic characters.
Head and thorax light brown, abdomen dark brown (Fig. 19a,b,c). **Head** about as long as wide with transverse striae posteriorly, mouthcone elongate with rounded tip; ocellar setae pair lll inserted inside or on margin of ocellar triangle; eyes slightly elongate posteriorly; postocular setae pair l and lll well developed, subequal in length, ll very small; **antennae** 7-segmented, l and ll brown, lll yellow, lV brown with pale base, V to Vll brown, segments lll and lV constricted at apex, each with forked sense cone; pronotum transversely striate, with discal setae, 3 pairs of posteromarginal setae toward angulars, and 2 pairs of long posteroangular setae, subequal in length; **forewings** brown with pale subbasal quarter, anterior vein with almost complete row of setae; **forelegs** yellow, mid and hindfemora brown with pale apex, tibiae and tarsi yellow; mesonotum with transverse striae medially; **metanotal median sculpture** reticulate, reticles elongate with faint internal markings, median setae inserted behind anterior margin, pair of campaniform sensilla absent; mesosternal furca with spinula; metasternal furca without spinula; **abdominal tergite** Vlll without comb of microtrichia or with few microtrichia laterally on posterior margin, tergites lX and X B1 and B2 setae long, subequal in length; **abdominal sternites** lll and Vl with 5, 6 or more discal setae; **pleurotergites** without discal setae. Male yellowish brown and similar to female structure; abdominal sternites lll to Vll with transverse pore plate (Palmer 1992; Mound and Collins 2000).



Figure 19: *Thrips parvispinus* (Karny): a. female; b. head and thorax [CP Reyes and RMC Catamora]; c. meso and metanota [LA Mound].

Material examined.
1♀(PNM), UPLB, Los Banos, Laguna, on melon, *Citrullus vulgaris* (L.) Schrader (Cucurbitaceae), E.C. Mituda, 18-lV-1984; 1♀(PNM), Aborlan, Palawan, on flower of unknown plant, V. Fernando, 25-V-1987; 10♀, 2♂ (DABPI), Caliraya, Cavinti, Laguna, on Habib pepper, *Capsicum annum* L. (Solanaceae), G. Belarmino and N. Romero, 22l-2025.

21. *Thrips simplex* (Morison, 1930) *Physothrips simplex* Morison,1930: 12-13.
Thrips simplex (Morison): Bhatti, 1969: 380.

Diagnostic characters.
Body brown (Fig. 20a,b,c). **Head** wider than long with transverse striae posteriorly, mouthcone elongate with rounded tip; ocellar setae pair lll inserted inside ocellar triangle; eyes rounded; postocular setae pair l and lll well developed, ll small; **antennae** 8-segmented, l and ll brown, lll yellowish brown, lV to Vlll brown; segments lll and lV slightly constricted at apex, each with forked sense cone; **pronotum** transversely striate with discal setae and 3 pairs of posteromarginal setae toward angulars, 2 pairs of posteroangular setae long, subequal in length; forewings brown with pale basal quarter, anterior vein with 7 or 8 or basal and 5 or 6 distal setae; **legs** brown with apices of foretibiae and tarsi yellowish; mesonotum with transverse striae; **metanotal median sculpture** reticulate medially and reticles elongate posteriorly, reticles with faint internal marking, median setae inserted far behind anterior margin, pair of

campaniform sensilla absent; mesosternal furca with spinula; metasternal furca without spinula; **abdominal tergite** VIII with complete comb of microtrichia on posterior margin, tergites IX and X with B1 and B2 setae long, subequal in length; **abdominal sternites** III to VI with 14 or 15 discal setae; **pleurotergites** without discal setae. Male similar to female in color and structure; abdominal sternites III to VII each with transverse pore plate.



Figure 20: *Thrips simplex* (Morison): a. female; b. head and pronotum [CP Reyes and RMC Catamora]; c. meso and metanota [LA Mound].

Material examined.
13♀(PNM), MSAC [BSU], La Trinidad, Benguet, on Chinese lily, *Lilium* sp. (Liliaceae), Oratai and Chantana, 8-XII-1984; 3♀(PNM), MSAC [BSU], La Trinidad, Benguet, on chayote, *Sicyos edulis* Jacq. (Cucurbitaceae), C.P. Reyes, 8-XII- 1984; 24♀(PNM), MSAC [BSU], La Trinidad, Benguet, on *Gladiolus* sp. (Iridaceae), C.P. Reyes, 8-XII- 1984; 8♀(PNM), MSAC [BSU], La Trinidad, Benguet, on *Hibiscus rosa-sinensis* L. (Malvaceae), C.P. Reyes, 8-XII-1984; 1♀(PNM), MSAC [BSU], La Trinidad, Benguet, on sunflower, *Helianthus annuus* L. (Asteraceae), C.P. Reyes, 8-XII-1984; 1♀(PNM), MSAC [BSU], La Trinidad, Benguet, on unknown plant, C.P. Reyes, 8-XII-1984; 4♀ (PNM), Wright Park, Baguio City, on *Dahlia* sp. (Asteraceae), C.P. Reyes, 8-XII-1984; 19♀(PNM), Wright Park, Baguio City, on *Gladiolus* sp. (Iridaceae), C.P. Reyes, 8-XII-1984; 2♀(PNM), IRRI, Los Banos, Laguna, on *Plumiera acuminata* Aiton (Apocynaceae) C.P. Reyes, 4-X-1983; 1♀(PNM), UPLB, Los Baños, Laguna, on leaf of *Ficus* sp. (Moraceae), I. Lit, Jr., 5-I-1980; 1♀(PNM), Mt. Apo, Agko, Kidapawan, North Cotabato, on African daisy, *Osteospermum* sp. (Asteraceae), C.P. Reyes, 16-IV-1983; 8♀(PNM), Mt. Apo, Agko, Kidapawan, North Cotabato, on *Crinum asiaticum* L. (Amaryllidaceae), C.P. Reyes, 16-IV-1983. Other. **Holotype** ♀ (NHMUK), **Australia**: Urrbrae, South Australia, on flower of carnation, *Dianthus caryophyllus* L. (Caryophyllaceae), 19-IX-1928 (NHMUK).

22. *Thrips subnudula* (Karny, 1926)
Ramaswamiahiella subnudula Karny,1926: 208.
Thrips subnudula (Karny): Ramakrishna Ayyar, 1934: 4.

Diagnostic characters.
Body yellow (Fig. 21a,b,c). **Head** wider than long with transverse striae posteriorly, mouthcone elongate with rounded tip; ocellar setae pair III inserted inside ocellar triangle; eyes rounded; postocular setae pair 1 well developed, II and III small; **antennae** 7-segmented, I whitish, II and III yellowish, IV and V brownish with pale base, VI and VII brownish, segments III and IV each with forked sense cone; **pronotum** transversely striate with numerous discal setae, 5 pairs of posteromarginal setae toward angulars, 2 pairs of relatively short posteroangular setae compared to other species; **forewings** yellow, anterior vein with 7 basal and 3 discal setae; **legs** yellow; mesonotum transversely striate; **metanotal median sculpture** reticulate, reticles elongate, median setae inserted behind anterior margin, pair of campaniform sensilla present; mesosternal furca with spinula; metasternal furca without spinula; **abdominal tergite** VIII with comb of microtrichia interrupted medially on posterior margin, tergites IX and X with B1 and B2 setae long, subequal in length; **abdominal sternites** III to VI with 24 to 30 discal setae; **pleurotergites** with 3 to 5 discal setae. Male similar to female in structure; abdominal sternites III to VII with transverse pore plate (Palmer 1992; Reyes 1994).



Figure 21: *Thrips subnudula* (Karny): a. female; b. head and pronotum; c. meso and metanota [CP Reyes and RMC Catamora].

Material examined.
3♀(PNM), UPLB, Los Baños, Laguna, on *Amaranthus spinosus* L. (Amaranthaceae), C.P. Reyes, 21-VI-1987; 1♀(PNM), UPLB, Los Baños, Laguna, on flower of mungbean, *Vigna radiata* (L.) Wilczek, Oratai and Chantana, 23-I-1985; 4♀(PNM), VISCA [VSU], Baybay, Leyte, on *Amaranthus spinosus* L. (Amaranthaceae), S.G. Reyes, 14-VI-1985; 9♀ (PNM), USM, Kabacan, North Cotabato, on *Amaranthus spinosus* L. (Amaranthaceae), C. P. Reyes, 18-II-1985; 1♀(PNM), Malungon, Sarangani, on birds of paradise, *Strelitzia reginae* Banks (Strelitziaceae), C.P. Reyes, 28-II-1985. Other. 1♀(NHMUK): **India**: Uruli Kanchan [Pune], 11-VI-1965 (NHMUK).

23. *Thrips sumatrensis* Priesner, 1934
Thrips sumatrensis Priesner,1934: 254.

Diagnostic characters.
Body uniformly brown (Fig. 22a,b,c). **Head** wider than long with transverse striae posteriorly, mouthcone elongate with rounded tip; ocellar setae pair lll inserted outside margin of ocellar triangle; eyes rounded; postocular setae pair 1 well developed, ll and lll small; **antennae** 7-segmented, 1 brown, ll brown with pale apex, lll yellow and pedicellate, lV and V brown with pale base, Vl and Vll brown; **pronotum** transversely striate with discal setae and 3 pairs of posteromarginal setae toward angulars, 2 pair of posteroangular setae long, subequal in length; **forewings** brown with small subbasal pale area or pale base, anterior vein with 7 or more basal setae and 3 to 5 distal setae; **legs** bicolored with femora brown with pale apices, tibiae yellowish, tarsi yellow; mesonotum with transversely striae; **metanotal median sculpture** with transverse striae anteriorly and longitudinal striae posteriorly, median setae inserted at anterior margin, pair of campaniform sensilla present; **abdominal tergite** Vlll with complete comb of microtrichia on posterior margin; mesosternal furca with spinula; metasternal furca without spinula; abdominal tergite Vlll with complete comb of microtrichia on posterior margin, tergites lX and X with B1 and B2 setae long, subequal in length; **abdominal sternites** lll to Vl with discal setae; **pleurotergites** lack discal setae. Male yellow, similar to female in structure; abdominal sternite lll to Vll with transverse pore plate (Palmer 1992; Mound and Masumoto 2005).



Figure 22: *Thrips sumatrensis* Priesner: a. female; b. head and pronotum; c. meso and metanota [CP Reyes and RMC Catamora].

Material examined.
1♀(PNM), Batac, Ilocos Norte, on *Solanum melongena* L. (Solanaceae), C.P. Reyes, 9lV-1985; 1♀(PNM), Mt. Tabiey, Cabigaan, Palawan, on flower of unknown plant, V. Fernando, 23-V-1987; 1♀(PNM), Aborlan, Palawan, on flower on unknown plant, C.P. Reyes, 25-V-1987; 6♀(PNM), VISCA [VSU], Baybay, Leyte, on flowers of *Gliricidia* sp. (Fabaceae), C.P. Reyes, 12-V-1987; 1♀(PNM), VISCA [VSU], Baybay, Leyte, on Anubing, *Artocarpos* sp. (Moraceae), C.P. Reyes, 13-V-1987; 1♀(PNM), Mt. Apo, Agko, Kidapawan, North Cotabato, on million flower, *Hydrangea* sp. (Hydrangeaceae), C.P. Reyes, 5-V-1987; 1♀(PNM), Mlang, North Cotabato, on *Areca catechu* L. (Arecaceae), C.P. Reyes, 17-ll-1985; 1♀(PNM), Malungon, Sarangani, on Zingerberaceae, C.P. Reyes, 23-ll-1985; 2♀(PNM), Malungon, Sarangani, on unknown plant, C.P. Reyes, 23-ll-1985. Other. 1♀(NHMUK), **Timor Leste**: Ermera, on sunflower, *Helianthus* sp. (Asteraceae), 21-Xl-1967 (NHMUK).

24. *Thrips tabaci* Lindeman, 1889
Thrips tabaci Lindeman,1889: 61.

Diagnostic characters.
Body yellow, brown or bicolored (Fig. 23a,b,c). **Head** wider than long with transverse striae posteriorly, mouthcone elongate with rounded tip; ocellar setae pair lll inserted inside ocellar triangle; eyes rounded; postocular setae well developed, pair 1 longest; **antennae** 7-segmented, 1 whitish, ll brown, lll slightly constricted at apex, pale with brownish apex, lV and V pale with brownish distal third, Vl and Vll brown, segments III and IV each with forked sense cones; **pronotum** transversely striate, with discal setae and 3 pairs of posteromarginal setae toward angulars, 2 pairs of posteroangular setae long, subequal in length; **forewings** brownish yellow, anterior vein setae with 7 basal and 4 to 6 distal setae; **legs** yellow; mesonotum with transverse striae medially; **metanotal median sculpture** striate with few reticulations medially and lines converging toward posterior margin, median setae inserted behind anterior margin, pair of campaniform sensilla absent; mesosternal furca with spinula; metasternal furca without spinula; **abdominal tergite** VIII with complete comb of microtrichia on posterior margin, tergites lX and X B1 and B2 setae long, subequal in length; **abdominal sternites** lll to Vl without discal setae; **pleurotergites** and lateral side of tergites with rows of fine microtrichia. Male similar to female in color and structure; abdominal sternites lll to Vll each with transverse pore area.

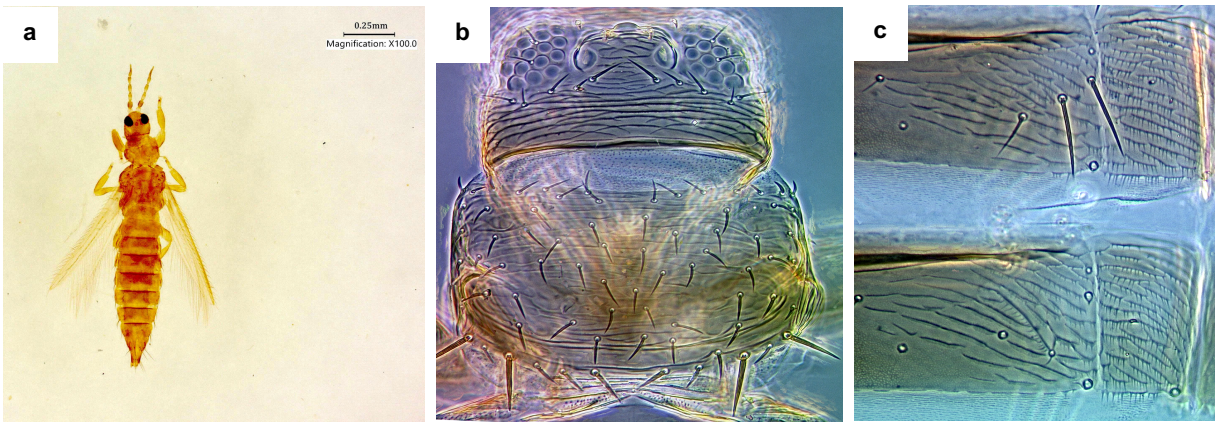


Figure 23: *Thrips tabaci* Lindeman: a. female [CP Reyes and RMC Catamora]; b. head and pronotum [LA Mound]; c. pleurotergite V to Vl [LA Mound].

Material examined.
9♀(PNM), Quinarayan, Narvacan, Ilocos Sur, on garlic, *Allium sativum* L. (Liliaceae), M.J.B. Beltran, 8-lll-2019; 10♀(PNM), Batac, Ilocos Norte, on *Allium* sp. (Liliaceae), E.C. Mituda, 2-Vll-1988; 80♀ (BPIM), DA-Batanes Experiment Station, Basco, Batanes, on garlic, *Allium sativum* L. (Liliaceae), C.P. Reyes, 12-ll-2020. Other. 1♀(PNM), **India**: Udumalpet, Tamil Nadu, T.N. Ananthakrishnan, on leaf of onion, *Allium cepa* L. (Liliaceae), 27-lX-1965; 1♀(PNM), **Iran**: Tabriz, Azerbaidjan, U. Heinz, 20-Vll-1975 and 1♀(PNM), on *Osteospermum fructicosum* (L.) Norl. (Asteraceae), 14-lll-196 (these specimens were donated by researchers to C.P. Reyes).

25. *Thrips vitticornis* (Karny, 1922)
Physothrips vitticornis Karny,1922: 103.
Thrips vitticornis (Karny): Bhatti, 1969: 380.

Diagnostic characters.
Body brown (Fig. 24a,b,c). **Head** wider than long with transverse striae posteriorly, mouthcone elongate with rounded tip; ocellar setae lll inserted outside margin of ocellar triangle; eyes rounded; postocular setae small; **antennae** 8-segmented, l and ll brown, lll yellow, lV brown with pale base, V to Vlll brown; **pronotum** transversely striate with discal setae and 3 pairs of posteromarginal setae toward angulars, 2 pairs of posteroangular setae long, subequal in length; **forewings** brown with small subbasal pale area, anterior vein with 7 basal and 4 to 5 distal setae; **legs** bicolored with femora brown, foretibiae yellowish brown, mid and hindtibiae brown with pale apex, tarsi yellow; mesonotum transversely striate; metanotal median sculpture closely striate medially and posteriorly, median setae inserted at anterior margin, pair of campaniform sensilla present; mesosternal furca with spinula; metasternal furca without spinula; **abdominal tergite** Vlll with comb of microtrichia interrupted medially on posterior margin, tergites lX and X with B1 and B2 setae long, subequal in length; **abdominal sternites** lll to Vl with discal setae; **pleurotergites** lack discal setae. Male similar to female in color and structure; abdominal sternites lll to Vll each with transverse pore plate.



Figure 24: *Thrips vitticornis* (Karny): a. female; b. head and pronotum; c. meso and metanota [CP Reyes and RMC Catamora].

Material examined.
1♀(PNM), PNAC [WPU], Aborlan, Palawan, on *Chromolaena odorata* (L.) King and Robinson (Asteraceae), C.P. Reyes, 25-l-1985; 1♀(PNM), PNAC [WPU], Aborlan, Palawan, on *Gliricidia sepium* (Jacq.) Steud (Fabaceae), C.P. Reyes, 27-l-1985; 1♀ (PNM), BFD, Brooks Point, Palawan, on *Gliricidia* sp. (Fabaceae), C.P. Reyes, 27- l- l985. Other. 1♂ (PNM), **India**: Tabaram, Tamil Nadu, on flower of *Pongamia* sp. (Fabaceae), T. N. Ananthakrishnan, 20-lV-1965 (this specimen was donated by researcher to C.P. Reyes).

26. *Thrips wedeliae* Priesner, 1934
Thrips (*Isoneurothrips*) *sumatrensis* var *wedeliae* Priesner,1934: 257. *Thrips wedeliae* Priesner: Palmer, 1992: 60.

Diagnostic characters.
Body brown (Fig. 25). **Head** about as long as wide with transverse striation posteriorly, mouthcone elongate with rounded tip; ocellar setae pair lll inserted outside margin of ocellar triangle; eyes rounded; postocular setae developed; **antennae** 7-segmented or 8-segmented, segment l and ll brown, lll yellow, lV and V yellow with brown apex, Vl to Vll or Vlll brown; **pronotum** transversely striate with discal setae and 3 pairs of posteromarginal setae toward angulars, 2 pairs of posteroangular setae long, subequal in length; **forewings** brown with pale basal quarter, anterior vein setae with 8 basal and 4 or more distal setae; **legs** bicolored with femora brown with pale apex, tibiae and tarsi yellowish brown; mesonotum transversely striate; **metanotal median sculpture** with transverse striae anteriorly and longitudinal striae posteriorly, median setae inserted at anterior margin, pair of campaniform sensilla present; **abdominal tergite** Vlll with irregular comb of microtrichia on posterior margin, tergites lX and X with B1 and B2 setae long, subequal in length; **abdominal sternites** lll to Vl with discal setae; **pleurotergites** without discal setae. Male unknown.



Figure 25: *Thrips wedeliae* Priesner: female [D Hall].

Material examined.
Other. 1♀(NHMUK), **Solomon Is**.: San Cristobal, Kirakira, N. L. M. Krauss, Xl-1970 (NHMUK).

Remarks. The species was recorded by Palmer (1992) in the Philippines (?Manila). The Holotype of *T. wedeliae* is in SMFG.

DISCUSSION

Thrips is the most species- rich genus in the insect order Thysanoptera but it is poorly studied in the Philippines with only 26 (8.58%) species recorded of the 303 species known worldwide (Catalogue of Life 2024). The low species diversity in the country is due to inadequate information and perhaps a reflection of researchers survey bias that tended to overlook small insects over big and colorful crawlers when collecting samples in the field, and lack of more intensive thrips surveys in the many regions of the country. There are two (7.69%) *Thrips* species endemic to the country, and 24 (92.31%) invasive or introduced species. Of these, 12 (46.15%) species are in the quarantine pests list of EPPO (2024).

Thrips alius was first described in the Philippines on banana and subsequently in China (Palmer 1992). In Malaysia, the species is associated with *Alpinia speciosa* (J.C. Wendl.) K. Schum (Mound and Azidah 2009), and in India on *Guizotia abssinica* (L.f.) Cass. (Patidar et al. 2023).

Thrips apicatus was first described in India (Priesner 1934) and recorded in Malaysia, and the Philippines on *Acacia* flowers (Bhatti 1980; Palmer 1992; Alavi 2021). In India, *T. apicatus* is associated with sweet potato and tomato (Aravintharaj and Asokan 2023).

Thrips brevistylus was first described in Java, Indonesia (Priesner 1938), and recorded in the Philippines on corn, *Zea mays* L., white cinnamon orchid, *Corymbis veratrifolia* (Reinw.) Rchb., 'baston ni San Jose', and *Cordyline fruticosa* L. (Reyes 1994). It is also known in Indonesia and Malaysia (Palmer, 1992), on *Aristolochia* sp. (Ng and Mound 2020).

Thrips coloratus was first described in Sri Lanka (Schmutz 1913), and recorded in the Philippines and Malaysia on flowers of *Macaranga* (Palmer 1992; Mound and Azidah 2009). In Indonesia, it is associated with *Rosa* spp. (Sartiami and Mound 2013). The species is polyphagous with widespread distribution including Australia, Brunei, China, Japan, India, Indonesia, Iran, Lao PDR, Malaysia, New Guinea, Pakistan, Sri Lanka, Taiwan and Thailand (Bhatti 1980; Masumoto and Okajima 2013; Mound and Masumoto 2005; Mirab-balou 2016; Palmer 1992). The species is in the quarantine pests list of EPPO (2024).

Thrips decens was first described in Genting Highlands, Malaysia on *Mussaenda mutabilis* L. (Palmer 1992; Mound and Azidah 2009), and recorded in the Philippines on *Mussaenda* sp. (Mound 2005).

Thrips extensicornis was first described in Java, Indonesia (Priesner 1934), and recorded in the Philippines by Palmer (1992). It is usually found on flowers of spider lily, *Crinum asiaticum* L., *Clerodendron*, *Erythrostemon*, *Rhodomyrtus*, *Gardenia, Pavetta*, and *Glossocarya* in Australia, Japan, Indonesia, and Taiwan (Mound and Masumoto 2005; Masumoto and Okajima 2013).

Thrips flavus was first described in Austria (Schrank 1776), and recorded in the Philippines on snake weed, *Stachytarpheta jamaicensis* (L.) Vahl., *Amaranthus spinosus* L., *Melastoma*, and 'Quigar' (Reyes 1994). In Malaysia, it is associated with *Gaultheria* and *Melastoma* (Mound and Azidah 2009; Ng and Mound 2020). The species is polyphagous with widespread distribution including Australia, China, Japan, India, **Iran**, Korea, Malaysia, Nepal, Pakistan and Taiwan (Palmer 1992; Masumoto and Okajima 2013; Mirab-balou 2016). The species is in the quarantine pests list of EPPO (2024).

Thrips florum was first described in Peradenya, Sri Lanka (Schmutz, 1913), and recorded in the Philippines on cut flowers (Nakahara 1985; Reyes 1994). In Indonesia, the species was recorded on *Lantana camara* L. and *Rosa* spp. (Sartiami and Mound 2013). *T. florum* is polyphagous with widespread distribution including Brazil, Indonesia, Malaysia, North and South America, and the Caribbean (Palmer 1992; Bhatti 1999; Mound and Masumoto 2005; Mound and Azidah 2009; Mound et al. 2016). The species is in the quarantine pests list of EPPO (2024).

Thrips hanifahi was first described in Selangor, Malaysia on flowers of *Melaleuca leucadendra* L. and *Averrhoa carambola* L. (Mound and Azidah 2009). In the Philippines, it is associated with *Coffea arabica* L.

Thrips hawaiiensis was first described in Hawaii (Morgan 1913). It is the most widespread species in the Philippines, and pest of banana, cashew, citrus, coffee, corn, *Gardenia*, guava, mango, mangosteen, pummelo and roses (Reyes 1994; Celiz and Ubaub 2018; Granada et al. 2021). In Davao del Norte, it is a serious pest of Cavendish banana (Reyes et al. 2022) while in Cagayan, it is the most abundant species on flower of Carabao mango (Reyes et al. 2020, Reyes et al. 2021a). In Indonesia (Bogor), it is a pest of chilli and cayenne pepper, citrus, corn, guava, mango and other crops (Sartiami and Mound 2013; Hutasoit et al. 2019), however, it is also considered as important insect pollinator of oil palm trees (Anggraeni et al. 2013). *T. hawaiiensis* is a significant pest especially on lemon trees that flower year-round in Mediterranean countries such as Spain and Turkiye (Goldarazena 2011; Etakan et al. 2015). The species is highly polyphagous with widespread distribution in many countries including Australia, China, Jamaica, Japan, India, Indonesia, Iran, Malaysia, Europe, and North and South America (Bhatti 1980; Palmer 1992; Mound and Masumoto 2005; Mound and Azidah 2009; Masumoto and Okajima 2013; Mirab-balou 2016; Mound et al. 2016). The species is in the quarantine pests list of EPPO (2024).

Thrips longicaudatus was first described in Afiamalu, Samoa (Bianchi 1953), and recorded in the Philippines on *Citrus* sp. (Reyes 1994), and Australia and New Guinea (Bhatti 1978; Palmer 1992; Mound and Masumoto 2005).

Thrips malloti was first described in Java, Indonesia (Priesner 1934), and recorded in the Philippines on many plants including corn, citrus, *Gardenia* and *Helianthus* (Reyes 1994). In Indonesia, it was recorded on *Citrus* spp., *Lantana camara* L., *Mimosa pudica* L. and other plants (Sartiami and Mound 2013). *T. malloti* is polyphagous with widespread distribution including Australia, Japan, India, Indonesia, Malaysia, New Guinea, Palau, Solomon and Taiwan (Palmer 1992; Mound and Masumoto 2005; Mound and Azidah 2009; Masumoto and Okajima 2013).

Thrips melastomae was first described in Java, Indonesia (Priesner 1934), and recorded in the Philippines, Thailand and Malaysia on *Melastoma* by Palmer (1992). The species was also recorded in Malaysia (Mound and Azidah 2009) and Indonesia on *Elais guineensis* Jacq. (Sartiami and Mound 2013).

Thrips morindae was first described in Java, Indonesia (Priesner 1934) and recorded in the Philippines on many plants including banana, citrus and sugarcane (Palmer 1992; Reyes 1994). The species was also recorded in Malaysia and Thailand (Mound 2005; Mound and Azidah 2009).

Thrips nigropilosus was first described in Bohemia, Czechoslovakia (Uzel 1895), and recorded in the Philippines on ornamentals including African daisy, *Chrysanthemum*, and pigeon pea (Reyes 1994). In Indonesia, it is associated with

Allamanda cathartica L., *Brassica rapa* L., *Cyperus* sp., *Daucus carota* L. and *Zea mays* L. (Sartiami and Mound 2013). The species is polyphagous with widespread distribution including Australia, China, Fiji, Japan, Indonesia, Iran, Kenya, Korea, Mauritius, New Zealand, Tanzania, and North and South America (Palmer 1992; Mound and Masumoto 2005; Masumoto and Okajima 2013; Mirab-balou 2016; Mound et al. 2016). The species is in the quarantine pests list of EPPO (2024).

Thrips orientalis was first described in Sarawak, Malaysia (Bagnall 1915), and recorded in the Philippines on many plants including *Gardenia* and *Jasminum* (Reyes 1994). The species is polyphagous with widespread distribution including Australia, Brazil, China, Japan, India, Indonesia, Malaysia, New Caledonia, Tahiti, Thailand, Trinidad, North and South America, and the Caribbean (Palmer 1992; Mound and Masumoto 2005; Mound and Azidah 2009; Masumoto and Okajima 2013; Mound et al. 2016). The species is in the quarantine pests list of EPPO (2024).

Thrips palmerae was first described in the Philippines on unknown plant (Reyes 1994). The species is endemic to the country.

Thrips palmi was first described in Sumatra, Indonesia (Karny 1925), and recorded on numerous plants in the country including cucumber, cotton, eggplant, legume, melon, pepper, potato, squash, and tomato (Okajima et al. 1992; Reyes 1994, 2021; Calilung et al.1997; Fernandez and Bernardo 1999; Hafeez et al. 2000; Galvez et al. 2005; Mituda and Calilung 1989; Navasero and Calumpang 2013). In India, the *Wolbachia* supergroup B strain bacteria was detected on *T. palmi* (Saurav et al. 2016). Additionally, *T. palmi* is a confirmed vector of Calla lily chlorotic spot virus, Groundnut bud necrosis virus, Melon yellow spot virus, and Watermelon silver mottle virus (Riley et al. 2011; Mound et al. 2022). The species is polyphagous with widespread distribution including Australia, Brunei, China, Japan, India, Indonesia, Korea, Malaysia, Pakistan, Singapore, Taiwan, Thailand, and North and South America (Bhatti 1980; Palmer 1992; Mound and Masumoto 2005; Mound and Azidah 2009; Masumoto and Okajima 2013; Sartiami and Mound 2013; Mound et al. 2016). The species is in the quarantine pests list of EPPO (2024).

Thrips parvispinus was first described in Bangkok, Thailand (Karny 1922), and recorded in the Philippines on melon, legume and cut flowers (Reyes 1994). In Australia, it was found in large number on flower of mango (Mound and Masumoto 2005) while in India and Indonesia, *T. parvispinus* is a serious pest of Chilli and Cayenne pepper (Sartiami and Mound 2013; Tasmin et al. 2018; Hutasoit 2019; Rachana et al. 2022). The species is polyphagous with widespread distribution including Australia, China, France, Greece, India, Indonesia, Malaysia, New Guinea, New Zealand, Singapore, Spain, Solomon, Taiwan, Timor-Leste, Thailand, Tanzania, Uganda, North and South America and the Caribbean (Palmer 1992; Mound et al. 2016). The species is in the quarantine pests list of EPPO (2024).

Thrips simplex was first described in Urrbrae, Australia (Morison 1930), and recorded in the Philippines on *Hibiscus*, *Gladiolus*, and other ornamental plants (Reyes 1994). The species is polyphagous with wide distribution including Australia, China, Japan, India, Indonesia, Iran, Malaysia, New Guinea, New Zealand, North and South America (Bhatti 1980; Palmer 1992; Mound and Masumoto 2005; Mound and Azidah 2009; Masumoto and Okajima 2013; Sartiami and Mound 2013; Mirab-balou 2016; Mound et al. 2016). The species is in the quarantine pests list of EPPO (2024).

Thrips subnudula was first described in Coimbatore, India (Karny 1926) on *Parthenium hysterophorus* L. (Ng and Mound 2020), and recorded in the Philippines on *Phaseolus vulgaris*, *Amaranthus spinosus*, bird of paradise, and *Strelitzia reginae* Banks (Reyes 1994). The species is polyphagous with widespread distribution including Australia, Japan, India, Indonesia, Malaysia, Nigeria, Pakistan, South Africa and Uganda (Palmer 1992; Mound and Masumoto 2005; Masumoto and Okajima 2013). The species is in the quarantine pests list of EPPO (2024).

Thrips sumatrensis was first described in Sumatra, Indonesia (Priesner 1934), and recorded in the Philippines on many plants including *Canna*, *Cannavalia*, *Dahlia*, *Gliricidia*, *Jasminum* and *Solanum* (Reyes 1994, 2021). The species is polyphagous with widespread distribution including Australia, Guam (USA), Indonesia, India, New Caledonia, Tahiti, Thailand, and Timor-Leste (Bhatti 1980; Palmer 1992; Mound and Masumoto 2005). The species is in the quarantine pests list of EPPO (2024).

Thrips tabaci was first described in Bessarabia, Union of Soviet Socialist Republics (Lindeman 1889), and recorded in the Philippines on garlic, *Allium sativum* L. and onion, *Allium cepa* L. (Reyes 1994, 2021; Reyes and Copuyoc 2021; Beltran 2023). Thrips collected on garlic in Ilocos Norte were associated with two species of fungi, *Fusarium proliferatum* (Matsushima) Nirenberg and *Aspergillus candidus* Link, (Reyes et al. 2021b), and seven species of bacteria, namely; *Bacillus amyloliquefaciens* Priest, Goodfel., Shute and Berk., *Brevundimonas diminuta* Leifson & Hugh, *Camamonas koreensis* Chang, Chun, Lee, Rhee, Kim & Bae, *Enterobacter ludwigii* Hoff., Stindl, Stumpf, Mehlen, Monget, Heesem., Schl. Roggen., *E. hormaechei* O'hara, Steiger., Hill, Farm., Fann. and Bren., *Peribacillus frigoritolerans* Delaporte and Sasson, and *Staphyococcus Sciuri* Kloos, Scleifer and Gotz (Manaday et al. 2023). Moreover, in Netherlands and India, *Erwinia* sp. and *Wolbachia* sp. were also isolated from *T. tabaci* (De Vries et al. 2008; Gawande et al. 2019). *T. tabaci* is a vector of Iris yellow spot virus, Garlic common latent virus, Tomato spotted wilt virus, and Tomato yellow fruit ring virus (Riley et al. 2011; Mound et al. 2022). The species is polyphagous with widespread distribution including Australia, India, Indonesia, Iran, Japan, Malaysia and New Zealand (Bhatti 1980; Palmer 1992; Mound and Masumoto 2005; Masumoto and Okajima 2013; Mirab-balou 2016). The species is in the quarantine pests list of EPPO (2024).

Thrips vitticornis was first described in Thailand (Karny 1922), and recorded in the Philippines on *Chromolaena odorata* (L.) King. and Rob., and *Gliricidia sepium* (Jacq.) Steud. (Reyes 1994). The species is polyphagous with widespread distribution including Australia, Guam and Hawaii (USA), India, Indonesia, Japan, Malaysia, New Guinea, Samoa, Solomon Island, Thailand, and Vietnam (Palmer 1992; Mound and Masumoto 2005; Mound and Azidah 2009; Masumoto and Okajima 2013).

Thrips wedeliae was first described in Java, Indonesia (Priesner 1934), and recorded in the Philippines, Tahiti, Thailand, Taiwan, Timor-Leste and Solomon Island on Compositae (Palmer 1992).

In summary, eight of the 26 *Thrips* species in the Philippines were first described in Indonesia; three species from Malaysia; two species each from Thailand, India and Sri Lanka; and one species each from Australia, Austria, Hawaii (USA), Samoa, and Union of Soviet Socialist Republics. Of the 26 species recorded in the country, 17 species are also known in Indonesia and Malaysia which is expected because these two southeast Asian countries are the nearest neighbors of the Philippines. In addition, the spread of thrips is being accelerated by global trade

of fresh produce, foliage and cut flowers resulting in biosecurity risks to many importing countries in Asia and Europe. Further studies on biology, host plants, and management of quarantine pests are recommended.

CONCLUSION

The present knowledge of *Thrips* species in the Philippines is low. Of the 26 species in the country, two species, namely: *Thrips leytensis* **sp. nov**. and *Thrips palmerae* Reyes, are endemic to the country, and 24 species are invasive or introduced including 12 species that are in the quarantine pests list of the European and Mediterranean Plant Protection Organization (EPPO), namely: *T. coloratus*, *T. flavus*, *T. florum*, *T. hawaiiensis*, *T. nigropilosus*, *T. orientalis*, *T. palmi*, *T. parvispinus*, *T. simplex*, *T. subnudula*, *T. sumatrensis*, and *T. tabaci*. The flower thrips, *T. hawaiiensis*, is a pest of banana, cashew, citrus, coffee, corn, *Gardenia*, guava, mango, mangosteen, pummelo and roses. *T. palmi* is pest of cucumber, cotton, eggplant, legume, melon, pepper, potato, squash and tomato, and known as vector of viral pathogens in many countries. *T. orientalis* is a pest of *Gardenia* and *Jasminum* while *T. parvispinus* is a pest of melon, and known as serious pest of Chilli pepper in many countries. *T. simplex* is a pest of *Hibiscus* and *Gladiolus* while *T. sumatrensis* is a pest of *Dahlia*, *Jasminum* and *Solanum*. *T. tabaci* is a pest of garlic and onion, and known as vector of viral pathogens. Further studies on biology, host plants, and management of quarantine pests are recommended.

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CONFLICT OF INTEREST

There is no conflict of interest to be disclosed by any of the authors.

CONTRIBUTIONS OF INDIVIDUAL AUTHORS

The study was conceived by all authors with CPR providing taxonomic review, supervision and direction. NMB was also responsible for clearing and processing of some specimens in the laboratory while PACB and RMCC were responsible for taking photomicrographs of specimens at PNM and DABPI, and DH was responsible for some photomicrographs and processing of images of type materials at NHMUK.

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