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Original Research

Thrips (Insecta: Thysanoptera) from the Tama Abu Range, Sarawak

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ABSTRACT

Thrips, insects of the order *Thysanoptera*, play key roles as crop pests, pollinators across diverse plant families, predators of other arthropods, and contributors to forest ecosystem dynamics. Despite the high diversity of thrips in tropical regions, these areas remain insufficiently studied. A survey of thrips was conducted during the Tama Abu Scientific. A total of 46 species belonging to three families were collected. The majority (50%, or 23 species) of the collected species belonged to the family Thripidae. *Aoratothrips tenuis* Priesner (subfamily Panchaetothripinae) and *Elaphrothrips sensitivus* Priesner (subfamily Idolothripinae) had not been previously recorded from Malaysia. An annotated list of Thysanoptera collected is provided. This list is by no means exhaustive, as it is based on a limited collecting period; many further species can certainly be expected from the Tama Abu Range and its adjacent areas.

Keywords: Heart of Borneo, Sarawak, Thysanoptera.

INTRODUCTION

The Insect Order Thysanoptera, commonly known as thrips numbers more than 6000 described species classified into two suborders, the Terebrantia and Tubulifera (ThripsWiki 2025). Adult thrips have small bodies ranging from 0.5-15.0 mm, with asymmetric mouthparts, and narrow fringed wings (Mound & Tree 2020). Most thrips are phytophagous or fungivorous with a few exceptions being the predatory carnivorous thrips. These insects inhabit a wide range of environments, including flowers, leaves and dead plants. Though some thrips species are important as pests of agriculture, many of them play crucial roles in the ecosystem of tropical forest such as pollinators of Dipterocarpaceae (Appanah and Chan 1981) and well as food for other insect including birds, lizards, and spiders (Samaporn 2016).

Knowledge of the Thysanoptera fauna in the Tropics including Malaysia is still far from comprehensive. Recent and past field studies on

Thysanoptera have been concentrated in various parts of Peninsular Malaysia, and only very limited works on this group have been carried out in East Malaysia (Sabah and Sarawak). The species checklist of Thysanoptera published by Mound and Azizah (2009), and Eow et al. (2011) mainly refer to Peninsular Malaysia.

The documentation of Sarawak's biodiversity started during 1854-1862, when the eminent naturalist Alfred R. Wallace carried out a collecting expedition in the Malay Archipelago. The paper he wrote in 1855 during his expedition, 'On the law which has regulated the introduction of new species' is now often referred as the 'Sarawak Law' paper. Wallace collected huge numbers of beetles and butterflies from Borneo, but there was no mention of Thysanoptera in his collection (but see below).

The earliest known field work on Thysanoptera in Sarawak was by E. G. Bryant who collected many specimens from Mount Matang, Sarawak in between 1913 and 1914. Bryant's collection was later studied by R.S. Bagnall who described a large number of new species from there, including the important pest thrips the *Megalurothrips typicus* Bagnal 1914 and *Thrips orientalis* (Bagnall) 1915. In 1915, Bagnall wrote a paper entitled "A preliminary account of the Thysanoptera of Borneo" that was published in the Sarawak Museum Journal. This is probably the earliest paper on Thysanoptera to be published in a local journal. Palmer and Mound (1974) re-examined the E. G. Bryant collection with the addition of a few interesting specimens from Sarawak, including a male of *Elaphrothrips bakeri* and a male of *Machatothrips biuncinatus,* with no date of collection but apparently collected by A.R. Wallace.

Until the Tamu Abu collections the only recent field work on Thysanoptera in Sarawak was by Kudo (1997) who described four new species of *Hydatothrips* based on the specimens collected from the Taman Negara Bako, Sarawak. Mound and Okajima (2015) added another four new species of *Dolichothrips* based on specimens collected from Lambir Hill National Park. As a result from a previous expedition to Long Banga, Baram, Ng, Y.F. produced a list of 23 species of Thysanoptera, of which a few are potentially new species.

This paper presents the results of a short expedition to Tama Abu, located in the Southeast of Pulong Tau National Park, Sarawak. The following checklist is of Thysanoptera so far recorded from the expedition together with previous records between 1915-2017.

METHODS

Study site

The expedition site was located at about N 03º 18' 37.1", E 115º 28' 48.7" (Southeastern of Pulong Tau National Park) (FIGURE 1 & 2). The expedition base camp (Fig 1) was set up at approximately 400-500 meter a.s.l., a site surrounded by old logged over hill forests and patches of pristine forests. At least 10 sampling trails were made during the expedition, including some stiff climbing trails that stretched up to heath forest at 1300 meter a.s.l. Our sampling sites also encompassed two nearby villages, Long Peluan and Long Beruan. Besides that, we also carried out sampling along the main logging road (route to Bario) between the expedition base camp and Long Beruan.

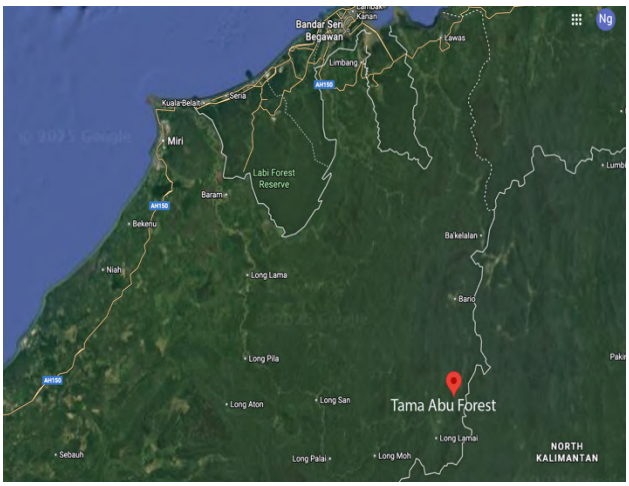

Figure 1. Tama Abu Forest Research (N 03º 18' 37.1", E 115º 28' 48.7")

Sampling

The sampling of Thysanoptera was carried out by beating plants over a plastic tray and searching for galled leaves along the sampling trails. Targeted plants included dead twigs and branches, bamboo trees, grasses (Poaceae), Ficus trees, climbers, orchids and any available flowers.

Figure 2. Base camp site the Tama Abu Expedition 15-26 August 2017.

RESULTS AND DISCUSSION

A total of 46 species of adult Thysanoptera was collected, belonging to three families and five subfamilies. The majority of species were from the family Thripinae, and this can be classified into three subfamilies namely Panchaetothripinae, Sericothripinae and Thripinae.

Species of Panchaetothripinae are all leaf feeding thrips, although an occasional adult may be found on a flower (Wilson 1975; Nonaka & Okajima 1992; Moritz et al. 2004; Mound & Ng 2009). A few species of panchaetothripines are pests of horticultural plants or as greenhouse pests, including on various species of ferns (Ng et al. 2018; Xie et al. 2022). During this expedition, we collected three panchaetothripines, *Aoratothrips tenuis* (Fig 2) on *Ficus* leaves is an infrequently collected species known from southern China to northern Australia (Li et al. 2018; Mound & Tree 2020). Similarly, *Helionothrips annosus* and *Phibalothrips rugosus* are recorded widely in Malaysia and southeast Asia. The latter species is widespread on grasses and is also called grass-thrips (Mound 2011; Mound et al. 2016; Elie et al. 2021).

Of the subfamily Sericothripinae only a single species, *Hydatothrips* sp., was collected. Species of this subfamily are very tiny, roughly about 1mm in body length. They are not commonly collected unless there is intensive sampling from leaves. Only three genera are recognized in this subfamily, and many species are usually not easy to identify (Priesner 1926; Mound & Marullo 1996; Kudo 1997; Wang 2007).

Thripinae is the second largest subfamily of Thysanoptera. Many species are important pests of agriculture causing physical damage (Mound & Ng 2009; Mound & Azidah 2009; Ng et al. 2010; Ng & Zaimi 2018), and a small number of species are vectors of plant diseases (Riley et al. 2011). Many species of Thripinae live in flowers and some live on leaves, and some species exhibit host preferences. During this expedition, we collected 19 species of Thripinae, most of which are common and widespread on various plant species (Ng et al. 2019; Nurul Hanida & Ng 2025). However, *Dichromothrips smithi* is usually collected on orchids (Okajima 1999).

Table 1. A Checklist of Thysanoptera recorded and described from Sarawak between 1915-2017. (* = new record for Malaysia)

No.	Family/subfamily/species	Tama Abu Expedition	Long Banga Expedition	Record (R) or Described (D) from Sarawak. (ThripsWiki 2025)
	THRIPIDAE			
	Dendrothripinae			
1	*Asprothrips* sp.n.		√	
	Panchaetothripinae			
2	*Aoratothrips tenuis* Priesner from *Ficus*	√		
3	*Helionothrips annosus* Wang [from *Litsea cubida* lvs]	√		
4	*Phibalothrips rugosus* Kudo	√	√	
	Sericothripinae			
5	*Hydatothrips* sp. indet.	√		
6	*Hydatothrips (Zonothrips) besar* Kudo, 1997: 350.			D
7	*Hydatothrips latisensibilis* Kudo, 1997		√	D
8	*Hydatothrips longicaudalis* Kudo, 1997: 332.			D
9	*Hydatothrips onari* Kudo, 1997: 329.			D
10	*Neohydatothrips medius* Wang, 1994		√	
	Thripinae			
11	*Anaphothrips sudanensis* Trybom	√		
12	*Arorathrips mexicanus* (Crawford)	√		
13	*Bolacothrips striatopennatus* (Schmutz)	√		
14	*Chaetanaphothrips leeuweni* (Karny) [from *Ipomoea batatas*]	√		
15	*Chaetanaphothrips ipomoeae* Nonaka and Okajima, 1992		√	
16	*Chaetanaphothrips* ?*machili*	√		
17	*Clypeothrips* sp?		√	
18	*Dendrothripoides innoxius* (Karny) [from *Ipomoea batatas*]	√		
19	*Dendrothripoides poni* Kudo, 1977		√	
20	*Dichromothrips smithi* (Zimmermann) [from *Arundina*]	√	√	
21	*Danothrips alis*		√	
22	*Echinothrips* sp.n		√	
23	*Filipinothrips baltazarae* Reyes	√		
24	*Frankliniella schultzei* (Trybom)	√		
25	*Megalurothrips usitatus* (Bagnall)	√		
26	*Megalurothrips typicus* Bagnall, 1915: 590.			D
27	*Microcephalothrips abdominals* (Crawford)	√	√	
28	*Rhamphothrips* spp. indet.	√	√	

29	*Scirtothrips dorsalis* Hood	√	√	
30	*Scirtothrips dobroskyi* Moulton, 1936		√	
31	*Takethrips* sp.		√	
32	*Stenchaetothrips bambusae* (Shumsher, 1946)		√	
33	*Thrips coloratus* Schmutz	√		
34	*Thrips florum* Schmutz	√	√	
35	*Thrips orientalis* (Bagnall), 1915: 593.			D
36	*Thrips palmi* Karny	√		
37	*Thrips parvispinus* (Karny)	√	√	
38	*Trichromothrips* spp. indet.	√		
39	*Trichromothrips trifaciatus* (Priesner)	√	√	
	PHLAEOTHRIPIDAE – IDOLOTHRIPINAE			
40	*Celidothrips* sp. indet.	√*		
41	*Dinothrips spinosus*			R
42	*Elaphrothrips* ?*bakeri* (1 male collcted by C.R. Wallace)	√	√	R
43	*Elaphrothrips sensitivus* Priesner	√*		
44	*Holurothrips ornatus* Bagnall, 1914: 376.			D
45	*Machatothrips antennatus* (Bagnall), 1915: 594.			D
46	*Machatothrips biuncinatus* Bagnall, 1908: 189			D
47	*Machatothrips lentus* Palmer & Mound	√	√	
48	*Mecynothrips simplex* Bagnall	√		
49	*Meiothrips annulipes* (Bagnall), 1914: 378.			D
50	*Nesothrips lativentris* (Karny)	√		
	PHLAEOTHRIPIDAE – PHLAEOTHRIPINAE			
51	*Adraneothrips* spp. Indet.	√		
52	*Andrethrips floydi* Mound	√		D
53	*Apelaunothrips consimilis* (Ananthakrishnan)	√		
54	*Azaleothrips richardi* Okajima & masumoto	√		
55	*Baenothrips murphyi* (Stannard)	√	√	
56	*Docessissophothrips laticeps*			D
57	*Dolichothrips chikakoae* Mound & Okajima, 2015: 82			D
58	*Dolichothrips eriae* Mound & Okajima, 2015: 85.			D
59	*Dolichothrips fialae* Mound & Okajima, 2015: 88			D
60	*Dolichothrips indicus* (Hood)	√*		
61	Dolichothrips utae Mound & Okajima, 2015: 93.			D

62	*Ecacanthothrips andrei* Palmer & Mound	√			
63	*Ecacanthothrips leai* Moulton	√			
64	*Ecacanthothrips tibialis* (Ashmead) collected 1913 by E. G. Bryant at Mount Matang	√			R
65	*Haplothrips gowdeyi* (Franklin)	√			
66	*Haplothrips imperatae* Priesner	√*			
67	*Haplothrips ganglebaueri* Schmutz	√			
68	*Heliothripoides boltoni* Dang, Mound & Qiao, 2014: 18.				D
69	*Holothrips caudatus* (Bagnall), 1915: 595.				D
70	*Holothrips falcatus* Okajima	√*			
71	*Psalidothrips ?grandis*	√			
72	*Psalidothrips ?ascitus*	√			
73	*Propesolomonthrips mindorensis* Reyes	√*			
74	*Tetracanthothrips borneensis* Bagnall, 1915: 595.				D
75	*Veerabahuthrips* sp.		√		
76	*Xylaplothrips pictipes* (Bagnall)	√*			

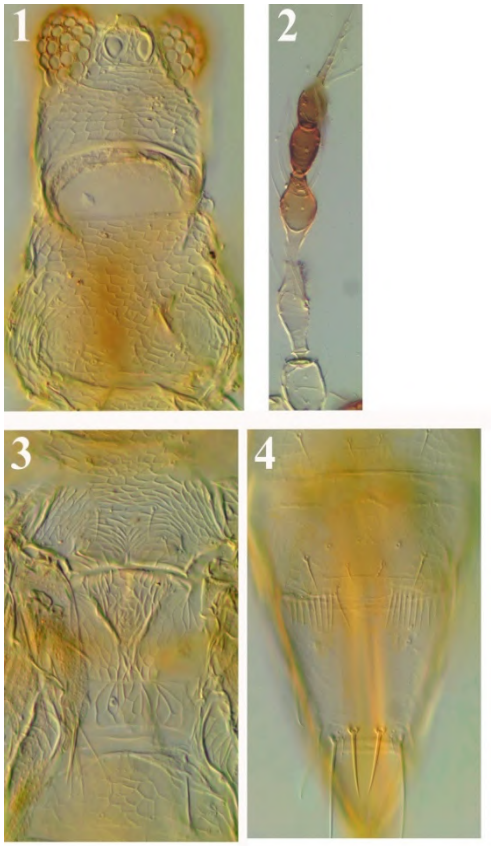

Figure 3. *Aorathrips tenuis* (collected on *Ficus* leaves)

Phlaeothripidae are classified into two subfamilies, the Idolothripinae and Phlaeothripinae. The species of these subfamilies are robust in body structure, often highly sexually dimorphic, and many live on dead twigs and branches. Idolothripinae are fungus spore feeders, while many members of Phlaeothripinae feed on fungal hyphae many feed on leaves or on flowers. A total of 23 species of Phlaeothripidae was recorded. Of these *Celidothrips* sp., *Elaphrothrips sensitivus*, *Dolichothrips indicus*, *Holothrips falcatus*, *Propesolomonthrips mindorensis*, *Haplothrips imperatae* and *Xylaplothrips pictipes* are new records to Malaysia.

Table 1 present the list of Thysanoptera collected from Sarawak. This data is established on information of Thysanoptera's catalogue available in ThripsWiki and combined the results from recent expedition.

CONCLUSIONS

This study presents the first systematic documentation of Thysanoptera from the Tama Abu Range, Sarawak. A total of 46 species representing three families and five subfamilies were recorded, with the majority belonging to the family Thripidae. Two species, *Aoratothrips tenuis* and *Elaphrothrips sensitivus*, are newly recorded for Malaysia, further underscoring the underexplored diversity of thrips in this region. The findings also include several uncommon and potentially undescribed taxa, indicating the ecological richness of the Tama Abu forest ecosystem.

Given the limited sampling duration, the current checklist is not exhaustive, and additional surveys are likely to reveal many more species. Continued taxonomic and ecological investigations are therefore essential to enhance our understanding of the Thysanoptera fauna in Sarawak and to support conservation efforts within the Heart of Borneo.

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