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Studies on the genus *Mesandrothrips* from China, with a new species (Thysanoptera: Phlaeothripinae: Haplothripini)

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Abstract

In the recently re-instated genus *Mesandrothrips* Priesner, four species are recognized from China, and an illustrated key is provided here. This includes one new species, *M. acutisetis* **sp.n.**, together with the first record of *M. subterraneus* from China.

Key words: *Mesandrothrips acutisetis*, illustrated key, thrips, taxonomy

Introduction

The Phlaeothripidae belonging to the tribe Haplothripini are usually known as flower-feeding species, but some species within this group are related to be predators. Species of the genus *Androthrips* are probably all predators of gall-inducing thrips (Mound & Minaei 2007), and species of *Podothrips* are possibly all predators of small arthropods on various Poaceae (Mound & Minaei 2007; Okajima1978; Dang *et al.* 2019). But although a few species of *Haplothrips*, *Karnyothrips*, *Leptothrips* and *Mesandrothrips* are known as predators (Palmer & Mound 1990; Okajima 2006; Mound & Tree 2019), there is little evidence that this behaviour is widespread amongst all members of these genera. However, the feeding behaviour for some Haplothripini taxa is still unknown, especially because they are usually collected in low numbers. This is the situation for the genus *Mesandrothrips*, the target of the present study. Previous observations suggest that at least some of these thrips are predatory, including *M. inquilinus* (Priesner) which has been reported feeding on gall-inducing thrips in Asia (Priesner 1921; Ananthakrishnan & Jagadish 1969; Mound & Tree 2019).

The genus *Mesandrothrips* was recently re-diagnosed by Mound and Tree (2019) and comprises 20 species distributed in Asia and Australia (ThripsWiki 2020).This taxon was re-established including the *Haplothrips*-like species with three sense cones on antennal segment III and four on IV from *Xylaplothrips* and *Haplothrips* (Mound & Tree 2019; Minaei *et al*. 2018). In China, three species are listed in the genus '*Xylaplothrips'*, *inguilinus*, *palmerae* and *pictipes* (Mirab-balou *et al.* 2011), but then *palmerae* was treated as new combination to *Karnyothrips* (Dang *et al*. 2014). As part of ongoing studies on Haplothripini from China, all labelled '*Xylaplothrips'* specimens from the authors' collections and the National Zoological Museum of China are studied here. These specimens are now identified as four species of *Mesandrothrips*, including one new species and one new record from China, and a key is provided for their identification.

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Method and depositaries

The descriptions, photomicrograph images and drawings are produced from slide-mounted specimens with an Olympus BX53 and drawing tube. The abbreviations used for the pronotal setae are as follows: am - anteromarginal, aa - anteroangular, ml - midlateral, epim - epimeral, pa - posteroangular. The unit of measurements is micrometre. All specimens studied here are deposited in the School of Bioscience and Engineering, Shaanxi University of Technology, Hanzhong, China, with some specimens in the National Zoological Museum of China (NZMC), Institute of Zoology, Chinese Academy of Sciences, Beijing, China.

Key to *Mesandrothrips* species from China

1. Major setae acute at apex (Figs 1–2); fore wings without duplicated cilia (Fig. 20) . . . . . *M. acutisetis* **sp.n.**
-. Major setae expanded at apex (Figs 3–5); fore wings with several duplicated cilia 2
2. Pronotum with am setae well developed, as long as aa setae (Fig. 4) . . . . . *M. pictipes*
-. Pronotum with am setae minute, no longer than discal setae (Figs 3, 5) 3
3. Antennal segment VI brown with basal half yellow; mid- and hind tibiae brown (Fig. 19) . . . . . *M. inquilinus*
-. Antennal segment VI uniformly brown; all tibiae yellow (Fig. 18) . . . . . *M. subterraneus*

Mesandrothrips acutisetis sp.n.

(Figs 1, 2, 6, 10–14, 15, 16, 20)

Female macroptera. Body brown (Fig. 15); Antennae uniformly brown but basal third of segment III yellow; femora brown, tibiae brown in middle part but yellow at apex and base, tarsi yellow; fore wings pale with light shading; all major setae yellowish brown.

Head a little longer than wide (Fig. 1); postocular setae developed, as long as eye, pointed at apex (Fig. 1); ocellar triangle slightly swollen; mouth cone short and rounded. Antennae 8-segmented, III–VI with distinct pedicel, VIII slightly contract at base but not pedicellate, III with 1+2 sense cones, IV with 2+2, V and VI with 1+1 respectively (Fig. 6). Pronotum with no sculpture, am setae reduced to minute, aa, ml, epim and pa setae well developed and pointed at apex, pa setae the longest (Fig. 1); notopleural sutures complete; basantra developed. Fore tarsal tooth large (Figs 1, 15). Mesonotum sculptured, lateral setae acute; mesopresternum entire with narrow in the middle; metathoracic sternopleural sutures absent. Fore wings without duplicated cilia (Fig. 20), sub-basal setae acute, S3 longer than S1 and S2 (Fig. 10). Pelta slightly triangular with a pair of campaniform sensilla (Fig. 12); tergites II–VII with two pairs of wing-retaining setae (Fig. 15); tergite IX setae S1, S2 and S3 acute and shorter than tube (Fig. 13); tube 0.7 times as long as head; anal setae shorter than tube (Fig. 13).

Measurements (holotype female in microns). Body length 2210. Head length 195, width across behind eyes 175; eye length 65; postocular setae 70. Antenna length 385, segments I–VIII length 30, 50, 65, 65, 55, 50, 40, 30. Pronotum length 125, width 235, aa 30, ml 60, epim 70, pa 85. Fore wing length 940, sub-basal wing setae 50, 55, 75. Tergite IX setae S1 100, S2 85, S3 75. Tube length 160, basal width 55; anal setae length 95.

Male macroptera. Similar to female (Fig. 16), but postocular setae clearly longer than eye (Fig. 2); tergite IX S1 and S2 short and stout; abdominal sternites without pore plate.

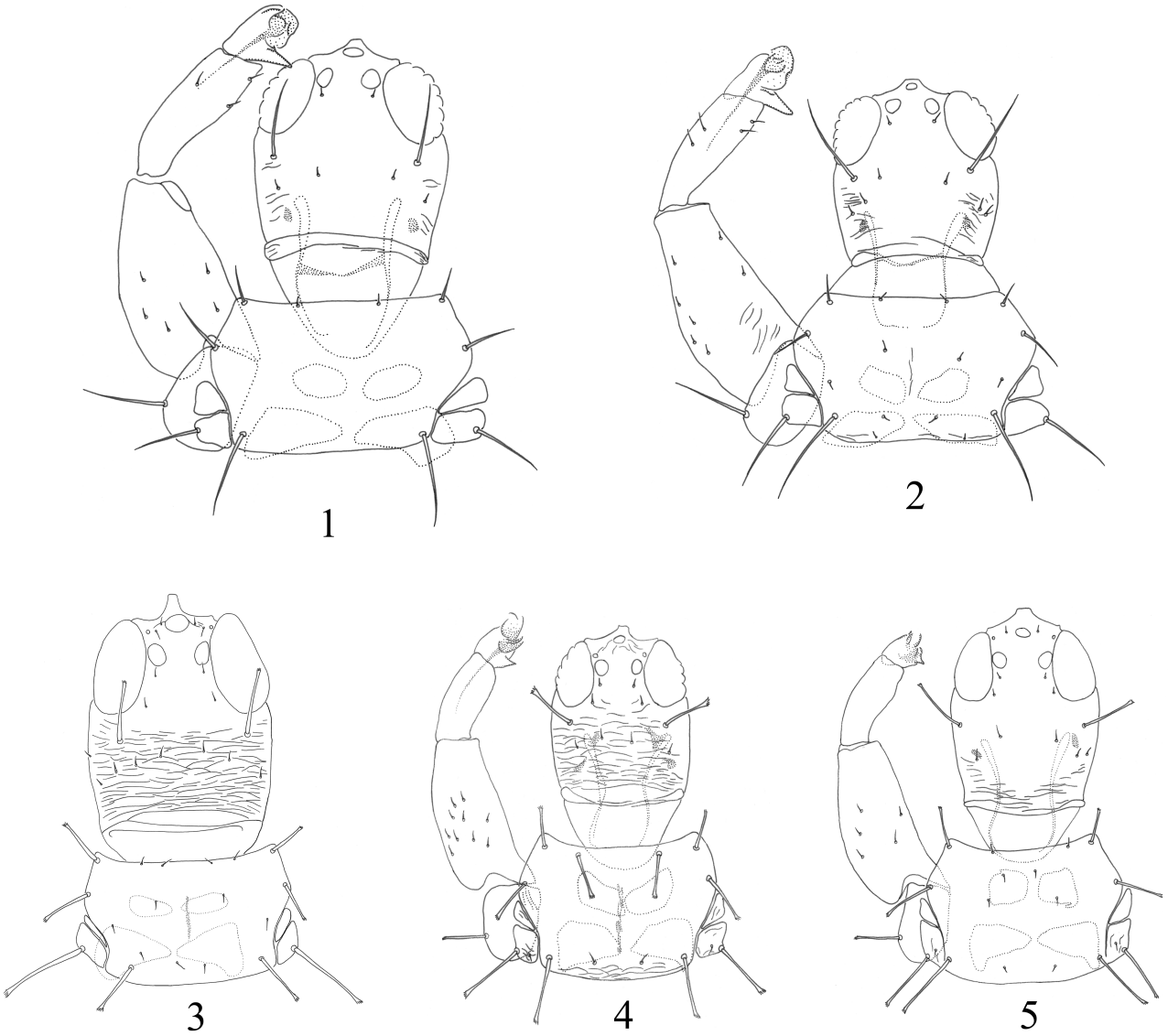
Measurements (in microns). Body length 1885. Head length 170, width across behind eyes 160; eye length 70; postocular setae 85. Antennae length 375, segments I–VIII length 30, 45, 65, 65, 55, 50, 40, 35. Pronotum aa 20, ml 35, epim 75, pa 95. Fore wing length 920, sub-basal setae 50, 70, 75. Tergite IX setae S1 50, S2 30, S3 95. Tube length 125; anal setae length 105.

Material studied. Female holotype, **China, Shaanxi Province**, Changqing National Nature Reserve, Yangjia ravine, from weeds with some dried leaves, 5.Viii.2017 (JM2017325-1), L.H. Dang (in Shaanxi University of Technology, SUT).

Paratypes: two females and one male with same data as holotype (JM2017325-2, -3, -4) (in SUT & NZMC); one female and one male, Sichuan Province, Guangyuan City, Cangwangxia Reserve, on grass, 5.Viii.2018 (JM2018196-7, JM2018195-4), L.H. Dang, Y. Hu & D.L. Xie (in SUT).

Comments. This new species is defined as a species of *Mesandrothrips* because, as a species of Haplothripini,

it has of the three sense cones on antennal segment III and four on IV. It can be distinguished from the other members of this genus by having all major setae pointed (Figs 1–2) and by lacking duplicated cilia on the fore wings (Fig. 20). It is similar to *M. reedi* in having postocular setae and the fore wing sub-basal setae S3 acute, but this new species can be recognised by the pointed pronotal setae (which are weakly capitate in *M. reedi*) and by the short setal pair S1 on tergite IX, which is shorter than tube.



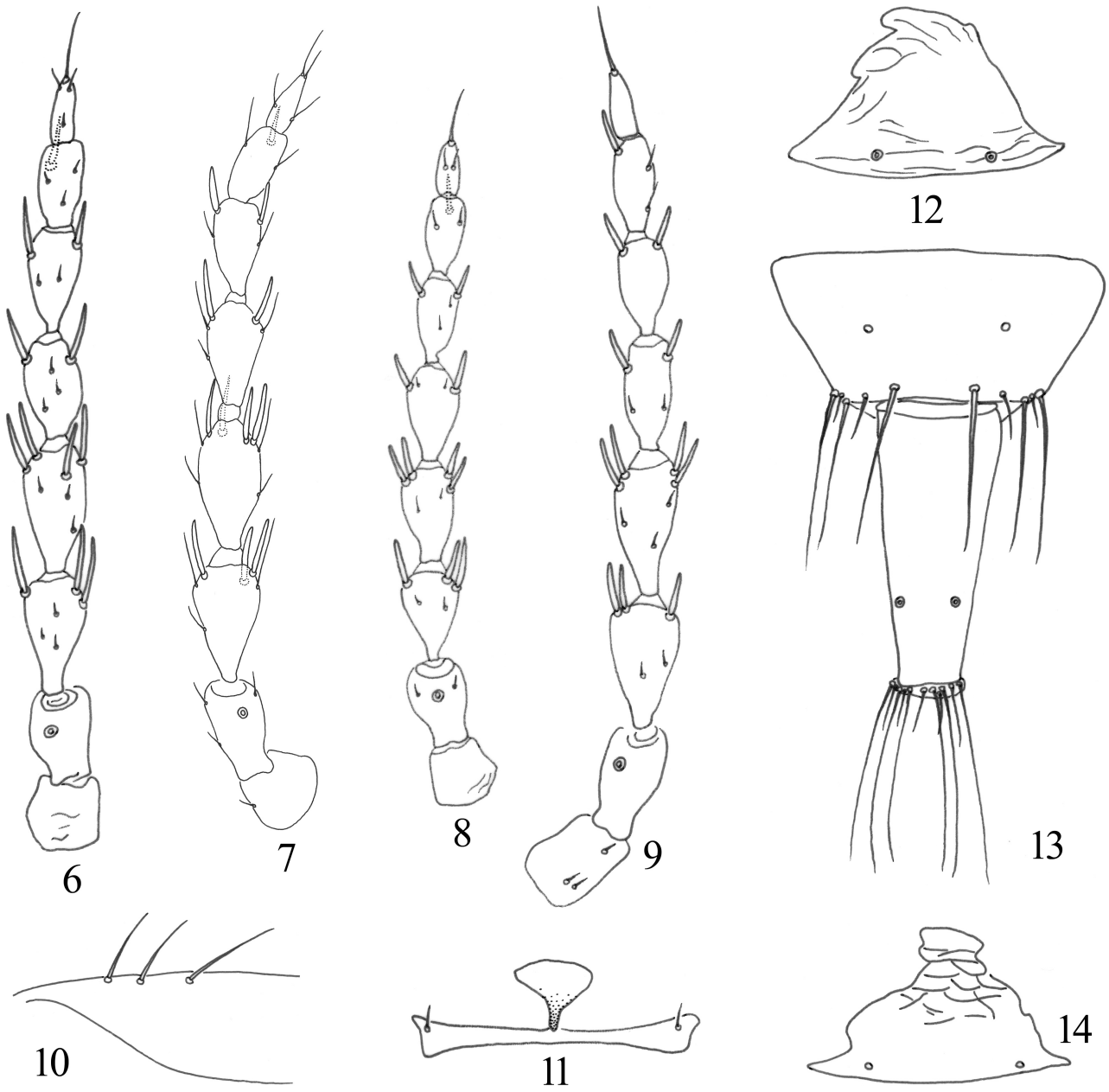
FIGURES 1–5. Head, pronotum & fore legs: 1. *M. acutisetis* **sp.n.**, female; 2. *M. acutisetis* **sp.n.**, male; 3. *M. inquilinus*; 4. *M. pictipes*; 5. *M. subterraneus*.

Mesandrothrips inquilinus (Priesner)

(Figs 3, 7, 19)

Haplothrips inquilinus Priesner, 1921: 4.

Known as an invader of galls, this species was described originally from Indonesia and Indiain association with *Ficus* leaf galls and *Pavetta* galls. Mound and Tree (2019) recorded *inquilinus* in Java, Thailand, Singapore and Timor Leste respectively from galls on *Smilax*, *Ficus*, *Polyalthia* and *Piper*. One female and two males from Chengdu City of Sichuan Province are here recognised as *inquilinus*. These were found in or around leaf galls induced by a *Liothrips* species on *Schefflera octophylla*.



FIGURES 6–14. Antennae: 6. *M. acutisetis* **sp.n.**; 7. *M. inquilinus*; 8. *M. pictipes*; 9. *M. subterraneus*. *M. acutisetis* **sp.n.**: 10. Base of fore wing; 11. Mesopresternum; 12. Pelta; 13. Tergites IX–X; 14. Pelta of male.

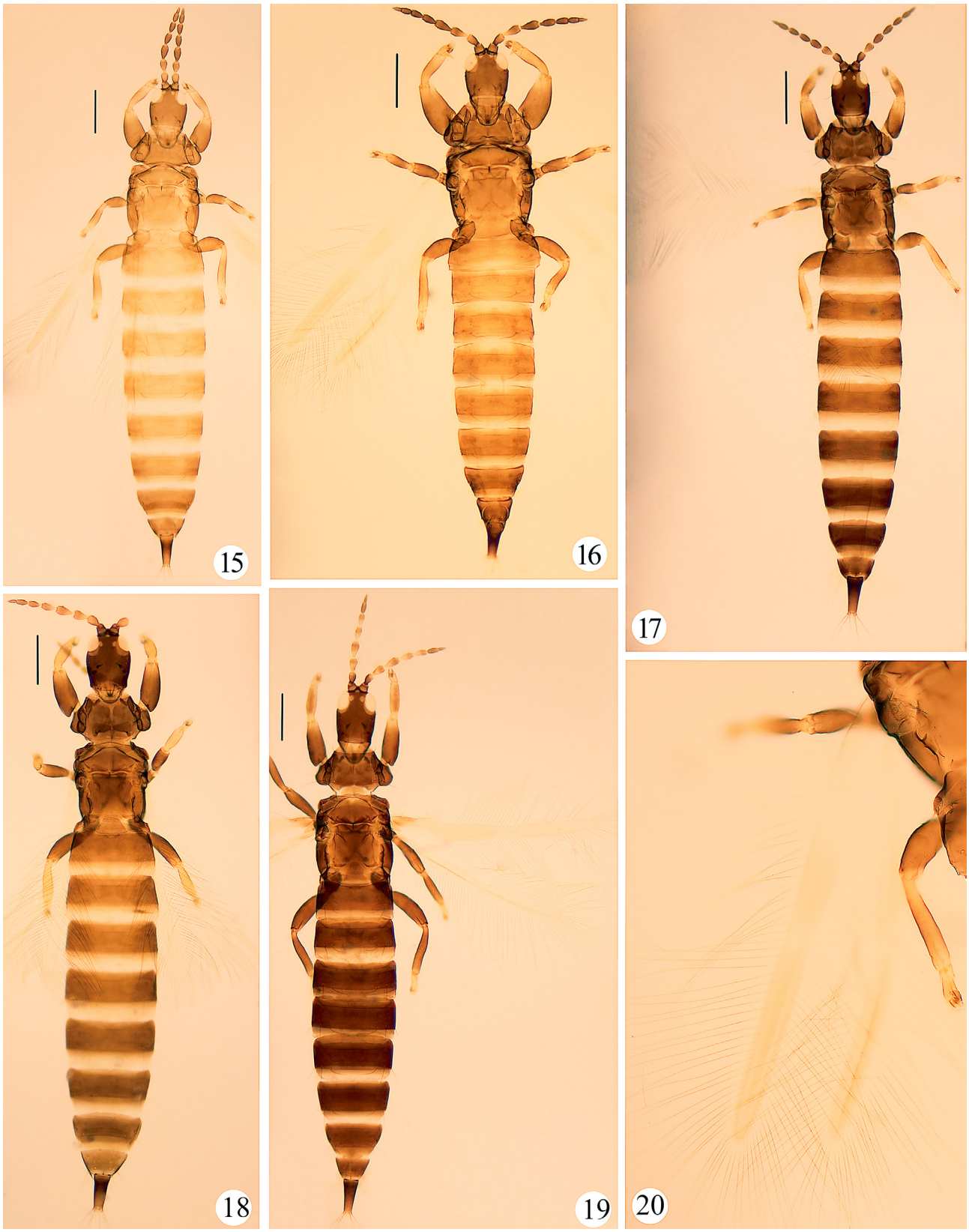
***Mesandrothrips pictipes* (Bagnall)**
(Figs 4, 8, 17)

Haplothrips pictipes Bagnall, 1919: 273.

Described originally from Indonesia (Sumatra) and India (Talimbaramta) and recorded on diseased pepper berries, the feeding habits of this species are not clear. Mound and Tree (2019) recorded the species living on the leaves and flowers of live plants, various weeds, dried fruits and dead branches. In this study, 38 females and 19 males have been beaten from weeds, bamboo leaves and pine tree with isolated individuals from southwest of China, including Tibet, Sichuan, Jiangxi and Yunnan. Some males have armed fore tarsi and somewhat enlarged fore femora, and the species may be a predator rather than a fungus-feeder. It is easily distinguished from the other three *Mesandrothrips* species from China in having the pronotal am setae well developed (Fig. 4).

***Mesandrothrips subterraneus* (Crawford JC)**
(Figs 5, 9, 18)

Haplothrips subterraneus Crawford JC, 1938: 41.



FIGURES 15–20. The colour photos of *Mesandrothrips*: 15. *M. acutisetis* **sp.n.**, female; 16. *M. acutisetis* **sp.n.**, male; 17. *M. pictipes*; 18.*M. subterraneus*; 19. *M. inquilinus*; 20. *M. acutisetis* **sp.n.**, fore wing without duplicated cilia.

Described from England and Japan, this species was also recorded from Korea and the Netherlands with the biological information of injuring lily bulbs and as a predator of *Liothrips vaneeckei* (Kurosawa 1938; Okajima 2006). Specimens from China identified as *M. subterraneus* have antennae uniform brown, postocular seate longer than eyes, major body setae expanded at apex, and prothoracic anteromarginal setae reduced to minute as described by Okajima (2006). The species is recorded from China (Guangdong, Yunnan) for the first time based on five females from unknown grasses. The structural characters are very similar to *M. inquilinus*, but it differs in antennal segment VI uniformly brown (Fig. 18) and all tibiae yellow (Fig. 18). Whereas *M. inquilinus* has the antennal segment VI brown with basal half yellow and at least mid- and hind tibiae brown (Fig. 19).

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