

ORIGINAL ARTICLE

Review of the genus *Ophthalmothrips* Hood (Thysanoptera: Phlaeothripidae) from China, with a new species

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Abstract The genus *Ophthalmothrips* from China is reviewed here, with the description of a new species, *O. elongatus* Li & Dang, **sp. nov.**, which was collected from the roots of weeds in Hunan Province. An illustrated key is given here to all five species known from China.

Key words Taxonomy, Idolothripinae, key, new species.

1 Introduction

The largest Thysanoptera family, Phlaeothripidae includes two subfamilies, of which Idolothripinae is the smaller one, with 744 species in 82 genera (ThripsWiki, 2022). *Ophthalmothrips* Hood, one of the genera usually with the eyes prolonged ventrally in this subfamily, was established by Hood (1919), with *O. pomeroyi* as the type species. Then, three genera, *Pyrgothrips* Karny (three species), *Fulgorothrips* Faure (three species) and *Derothrips* Jacot-Guillarmod (one species) were synonymised with *Ophthalmothrips* by Mound & Palmer (1983), who also transferred two further species to this genus, *Phoxothrips breviceps* Bagnall and *Idolothrips formosanus* Karny (Karny, 1913; Bagnall, 1914). Later, *Ophthalmothrips tenebronus* Han & Cui, 1991 was transferred to *Compsothrips* by Dang *et al.* (2013), and Cao *et al.* (2010) added a new species, *O. yunnanensis* from Yunnan Province. Therefore, there are 10 species under the genus worldwide.

In China, four species were recorded under the genus (Cao *et al.*, 2010; Dang & Qiao, 2013), namely *O. formosanus* (Karny), *O. longiceps* (Haga), *O. miscanthicola* (Haga) and *O. yunnanensis* Cao, Guo & Feng. In this study, specimens from Shaanxi University of Technology and Institute of Zoology, Chinese Academy of Sciences are studied, a new species is described from Hunan Province, and an illustrated key to Chinese species is provided.

2 Materials and methods

The descriptions, photomicrograph images and drawings were produced from slide-mounted specimens using an Olympus BX53 microscope with a drawing tube. The unit of measurements is the micrometre (µm). Type specimens are deposited in the School of Bioscience and Engineering, Shaanxi University of Technology (SUT), Hanzhong, China, and others are from the Institute of Zoology, Chinese Academy of Sciences (IZCAS), Beijing, China.

The abbreviations used for the pronotal setae are as follows:

aa—anteroangular;

am—anteromarginal;

epim—epimeral;

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ml—mid-lateral;
pa—posteroangular.

3 Taxonomy

Ophthalmothrips Hood

Ophthalmothrips Hood, 1919: 67. Type species: *Ophthalmothrips pomeroyi* Hood.

Pyrgothrips Kary, 1924: 35. Type species: *Pyrgothrips conocephalus* Karny, synonymised by Mound & Palmer, 1983: 70.

Fulgoroethrips Faure, 1933: 62. Type species: *Fulgoroethrips priesneri* Faure, synonymised by Mound & Palmer, 1983: 70.

Derothrips Jacot-Guillarmod, 1940: 133. Type species: *Derothrips amyae* Jacot-Guillarmod, synonymised by Mound & Palmer, 1983: 70.

Diagnosis. Medium sized. Head longer than broad usually with preocular projection; compound eyes distinctly prolonged posteriorly on ventral surface; interocellar and postocular setae usually developed; cheeks subparallel with short setae like spines. Antenna eight-segmented, slender, segment III with 2 sense cones, IV with 4. Mouth-cone short. Pronotal anterior margin setae usually reduced, epimeral setae well-developed, notopleural suture complete; basantra present and ferna usually developed. Macropterous or micropterous; for the macropterous specimens, forewing with numerous duplicated cilia. Fore tarsal tooth present or absent in both sexes. Metathoracic sternopleural sutures absent. Pelta developed, usually triangular; abdominal tergites II–VII with two pairs of wing-retaining setae; tergite IX with S1 and S2 setae usually as long as tube; tube smooth, shorter than head.

Key to *Ophthalmothrips* species from China.

1. Wing-retaining setae small and straight in macropterous species *O. yunnanensis* Cao, Guo & Feng*
Wing-retaining setae developed and sigmoid in macropterous species (Fig. 11) 2
2. Fore tarsal tooth present in both sexes (Fig. 20)..... *O. miscanthicola* (Haga)
Fore tarsal tooth absent in both sexes (Figs 21–22) 3
3. Postocular setae distinctly longer than interocellar setae (Fig. 16)..... *O. formosanus* (Karny)
Postocular setae shorter than interocellar setae 4
4. Preocular projection wider than length; postocular setae usually developed..... *O. longiceps* (Haga)
Preocular projection elongated, distinctly longer than 1.0 time as long as wide (Figs 1, 8–9); postocular setae reduced, not reaching posterior margin of eyes (Fig. 1)..... *O. elongatus* Li & Dang, sp. nov.

*From original description (Cao *et al.*, 2010)

Ophthalmothrips elongatus Li & Dang, sp. nov. (Figs 1–15)

Description. Holotype female (macropterous). Body length 4.2 mm. Body uniform brown; antennal segment III yellow, but brownish apically, IV yellow at basal half, brown at apical half, V yellow at basal 1/3, rest of antennae uniform brown (Fig. 10); tube darkest; all major setae yellowish-brown.

Head. Head about two times as long as wide (Figs 1, 8); head elongate, preocular projection about 1.4 times as long as wide; compound eyes prolonged posteriorly on ventral surface (Fig. 1); interocellar setae well developed, longest setae on head, pointed at apex; postocular setae small, not reaching posterior margin of eyes, pointed at apex, arise behind inner margin of eyes; cheeks with several pairs of spine-like setae (Fig. 1). Antennae 8-segmented, slender, segment III longest, about 5 times as long as wide, III with 1+1 sense cone, IV with 2+2 (Figs 2, 10). Mouth-cone short and rounded, maxillary stylets V-shaped, retracted into head one third way to posterior margin of eyes (Fig. 1).

Thorax. Pronotum almost smooth, notopleural sutures complete (Figs 1, 8), aa and am slightly developed, pointed at apex, ml and pa developed, longer than aa, pointed at apex, epim well-developed, blunt at apex; basantra surround mouth-cone, ferna developed (Figs 1, 12). Mesopresternum boat-shaped (Figs 4, 12). Metanotal median setae well developed, metanotum smooth anterior middle, metathoracic sternopleural sutures absent. Fore wing broad, three pairs of sub-basal setae pointed at apex, S1 smaller, shorter than S2, S3 longest (Fig. 3), with 15–16 duplicated cilia. All tibia and tarsus without tooth.

Abdomen. Pelta triangular, with entire reticulation (Figs 5, 11); abdominal tergites II–VII dorsal with reticulation in front half, each with two pairs of wing-retaining setae (Fig. 11); tergite IX setae almost as long as tube; tube smooth, shorter than head, anal setae about as long as tube (Figs 7, 13).

Measurements (holotype female in microns). Body length 4200. Head length 540, width across eyes 240; preocular projection length 170, width 125; eyes length 130, ventral length 180; postocular setae length 20. Antennae length 810,

segment I–VIII lengths (maximum width) 70 (50), 80 (40), 170 (35), 140 (35), 115 (30), 90 (30), 65 (30), 65 (20). Pronotum length 225, width 300, length of pronotal setae, am 10, aa 15, ml 30, epim 75, pa 35. Metanotal median setae length 15. Fore wing length 1470, sub-basal setae S1–S3, 20, 55 and 90. Abdominal sternite IX S1–S3 length, 375, 445 and 265, tube length 375, basal width 115, at apex 60, anal setae length 410.

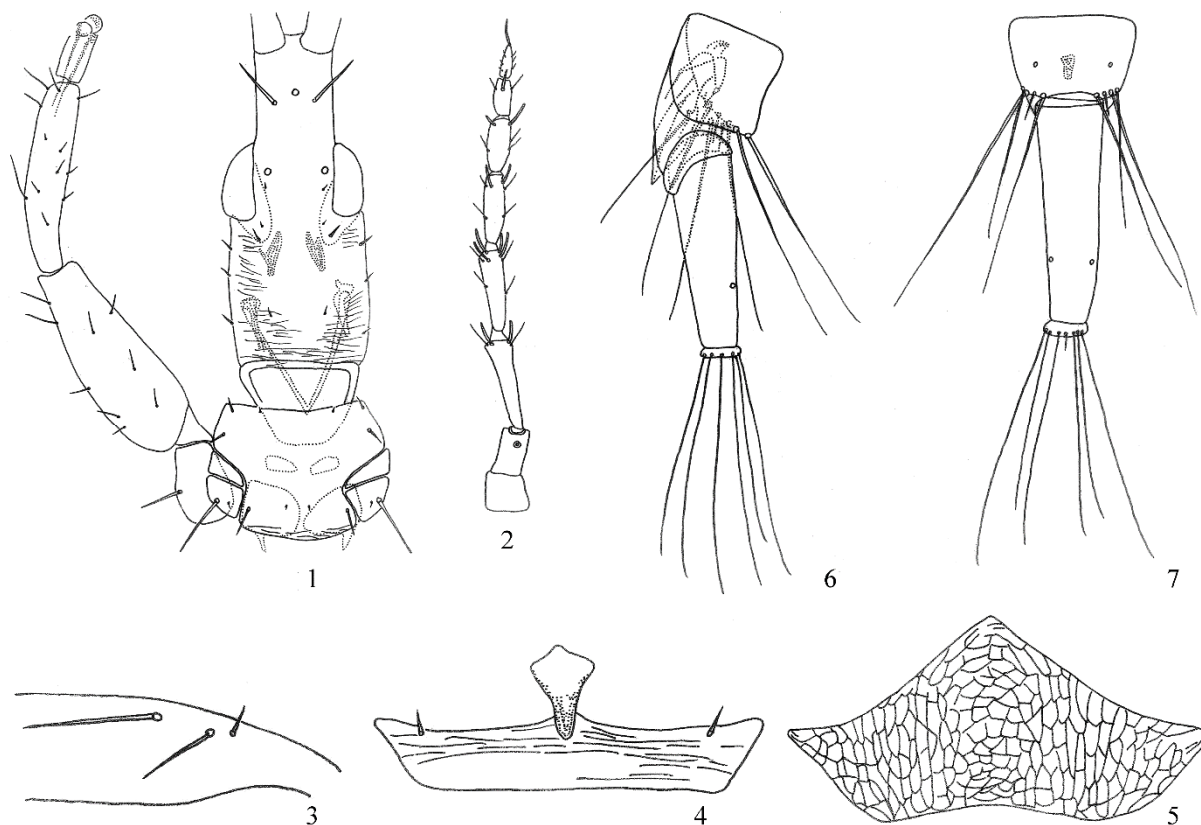
Male (macroptera). Very similar to female, but smaller, fore tarsal without tooth (Figs 9, 14).

Measurements (paratype male in microns). Body length 3860. Head length 505, width across eyes 230; preocular projection length 145, width 120; eyes length 115, ventral length 160; postocular setae length 20. Antennae length 740, segment I–VIII lengths (maximum width) 70 (50), 75 (35), 160 (35), 125 (35), 95 (30), 70 (30), 60 (25), 60 (20). Pronotum length 180, width 270, length of pronotal setae, am 15, aa 15, ml 25, epim 65, pa 35. Metanotal median setae length 20. Fore wing length 1120, sub-basal setae S1–S3, 20, 50 and 65. Abdominal sternite IX S1–S3 length, 265, 310 and 215, tube length 305, basal width 105, at apex 60, anal setae length 300.

Material examined. Holotype ♀, China, Hunan, Yongzhou, Dupangling National Nature Reserve (25.46°N, 111.37°E; elev. 380 m), from the root of Poaceae grasses (Fig. 15), 4.IX.2020, coll. Xia Wang. Paratype. 1♂, same data as holotype.

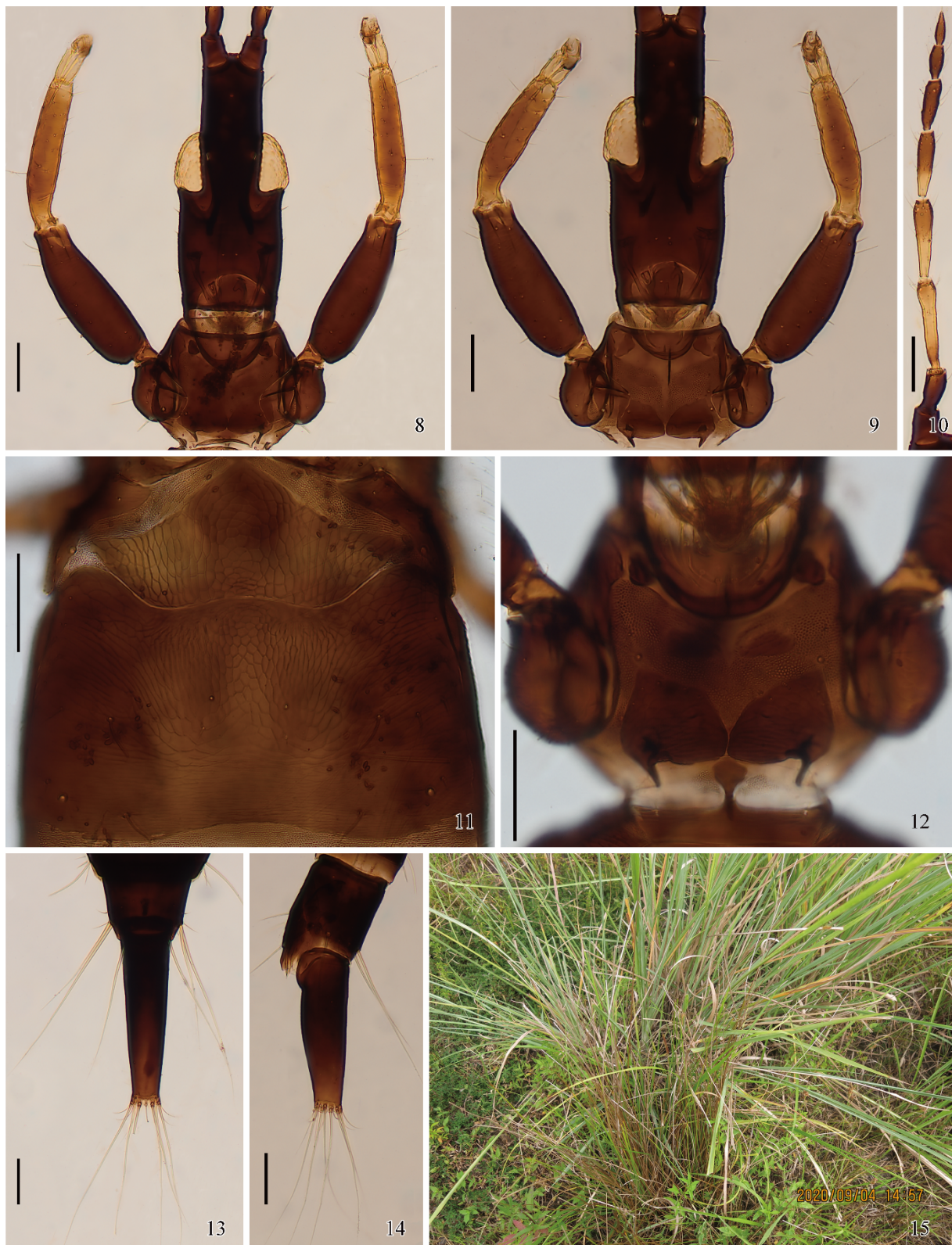
Etymology. This species name is composed of the Latin word, “*elongatus*”, based on its elongated preocular projection of head.

Comments. This new species can be recognized as the genus *Ophthalthrips* by the elongated preocular projection of the head, which is about 1.4 times as long as its wide. Similarly, this character is also present to *O. faurei* and *O. longiceps*. But the new species differs by having postocular setae small (not reaching at posterior margin of eyes), interocellar setae, pronotal epimal setae well-developed and pelta triangular with slightly rounded laterally. In *O. faurei*, the original description showed that it had postocular setae well-developed (Ananthakrishnan, 1964); Ananthakrishnan (1973) redescribed both sexes of *O. faurei* in detail, of which its postocular setae were also developed, interocellar setae absent, and one pair of median dorsal setae of head well-developed (but we think that these setae were probably located ventrally.); Haga (1975) studied Ananthakrishnan’s specimens of *O. faurei*, and showed that the pronotal epimeral setae are small and the interocellar setae developed. The genus *Ophthalthrips* was reviewed worldwide by Minoura & Mound (2019) as the latest research. They recorded only one female represented as *O. faurei* from Guilin City in China, but the author helped to re-check this



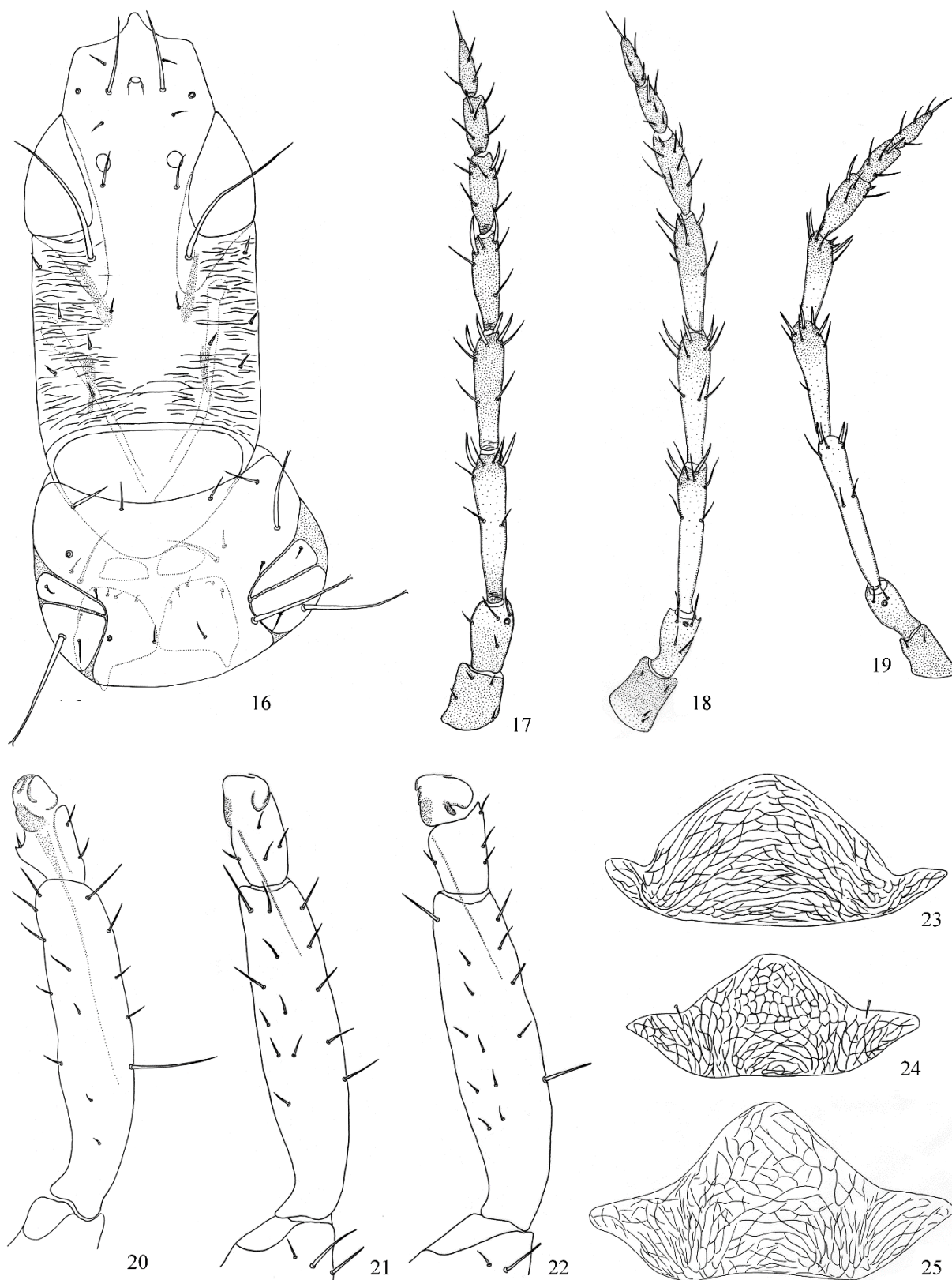
Figures 1–7. Dorsal view of *Ophthalthrips elongates* Li & Dang, **sp. nov.** 1. Head, pronotum and forelegs of female; 2. Antenna; 3. Sub-basal setae; 4. Mesopresternum; 5. Pelta; 6. Tergites IX–X of male; 7. Tergites IX–X of female.

specimen, and found its head was too dark to see any characters. And the specimens from Japan identified as *O. faurei* together with Chinese specimen showed developed postocular setae. Thus, the only female specimen identified as *faurei*



Figures 8–15. *Ophthalmothrips elongatus* Li & Dang, **sp. nov.** 8. Head and prosternum, female; 9. Head and prosternum, male; 10. Antenna; 11. Pelta and tergites II; 12. Pronotum and mesopresternum; 13. Tergites IX–X, female; 14. Tergites IX–X, male; 15. Habitat, from Poaceae grasses of Dupangling National Nature Reserve, Hunan. Scale bars: 8–14=100 μm.

need to further study in the future. In *O. longiceps*, it is distinguished from *O. elongatus* Li & Dang, **sp. nov.** by the shorter preocular projection (wider than long), the well-developed postocular setae, and the pelta sharply pointed laterally.



Figures 16–25. *Ophthalthrips formosanus* (16–17, 21–22, 24), *O. miscanthicola* (18, 20, 23) and *O. longiceps* (19, 25). 16. Head and pronotum; 17–19. Antenna; 20, 22. Fore leg, female; 21. Fore leg, male; 23–25. Pelta.

Ophthalmothrips formosanus* (Karny)Idolothrips formosanus* Karny, 1913: 130.*Pyrgothrips formosanus* (Karny): Haga, 1975: 270.*Ophthalmothrips formosanus* (Karny): Mound & Palmer, 1983: 71.

Diagnosis. Head about two times as long as wide; head elongate, preocular projection wider than long; postocular setae well-developed, distinctly longer than interocellar setae, pointed at apex (Fig. 16). Antennae 8-segmented, segment III longest, about 3.6 times as long as wide, III with 1+1 sense cones, IV with 2+2 (Fig. 17). Maxillary stylets V-shaped, retracted into head but not reaching to posterior margin of eyes (Fig. 16). Pronotum with five pairs of developed major setae, blunt to expanded at apex (Fig. 16). Mesopresternum boat-shaped. Fore tarsal tooth absent in both sexes (Figs 21–22). Pelta triangular, with entire reticulation (Fig. 24); abdominal tergites II–VII with two pairs of wing-retaining setae; tube smooth, shorter than head, anal setae slightly shorter than tube.

Distribution. China (Henan, Taiwan).

Material examined. China, Henan, 2♀1♂, 13.VII.1985, coll. Yunfa Han (IZCAS); China, Henan, 2♂, from dried-up elm bark, 18.IV.1957, coll. Yunfa Han (IZCAS).

Comments. This species was described originally from Taiwan based on one female specimen. Dang & Qiao (2013) recorded it from the Chinese mainland in Henan Province. Two females and three males from dried-up elm bark are studied here.

Ophthalmothrips longiceps* (Haga)Pyrgothrips longiceps* Haga, 1975: 264.*Ophthalmothrips longiceps* (Haga): Mound & Palmer, 1983: 71; Han, 1997: 337; Okajima, 2006: 138.

Diagnosis. Head about two times as long as wide; head elongate, preocular projection wider than long; postocular setae well-developed, but shorter than interocellar setae, blunt at apex. Antennae 8-segmented, segment III longest, about 5 times as long as wide, III with 1+1 sense cones, IV with 2+2 (Fig. 19). Maxillary stylets V-shaped. Pronotum with five pairs of developed major setae, pointed to blunt at apex. Mesopresternum boat-shaped. Fore tarsal tooth absent in both sexes. Pelta triangular, with entire reticulation (Fig. 25); abdominal tergites II–VII with two pairs of well-developed wing-retaining setae; tube shorter than head, anal setae slightly shorter than tube.

Distribution. China (Hainan, Taiwan); Japan.

Material examined. China, Taiwan (Kenting), 1♀1♂, from dead leaves, 22–24.V.1972, coll. Shuji Okajima (IZCAS); China, Hainan, 1♂, 11.IV.1958, coll. Xiangling Meng (IZCAS).

Comments. Described from Japan on decayed grasses by Haga (1975), this species was recorded from Taiwan, China by Han (1997). Here, one female and one male from Taiwan, and one male from Hainan were studied. *O. longiceps* is similar to *O. elongatus* Li & Dang, **sp. nov.** by having an elongate preocular projection of the head and lacking fore tarsal teeth in both sexes, but they have obvious distinct characters (see Comments of the new species).

Ophthalmothrips miscanthicola* (Haga)Pyrgothrips miscanthicola* Haga, 1975: 265.*Ophthalmothrips miscanthicola* (Haga): Mound & Palmer, 1983: 71; Han, 1997: 339.

Diagnosis. Head about two times as long as wide; head elongate, preocular projection wider than long; postocular setae developed, as long as interocellar setae. Antennae 8-segmented, segment III longest, about 4 times as long as wide, III with 1+1 sense cones, IV with 2+2 (Fig. 18). Maxillary stylets V-shaped, retracted into head. Pronotum with five pairs of developed major setae, pointed at apex. Mesopresternum boat-shaped. Fore tarsal tooth present in both sexes (Fig. 20). Pelta triangular, with entire reticulation (Fig. 23); abdominal tergites II–VII with two pairs of well-developed wing-retaining setae; tube shorter than head, anal setae shorter than tube.

Distribution. China (Fujian, Guangdong, Sichuan, Hainan); Japan.

Material examined. China, Sichuan, 6♀4♂, 2.VII.1984, coll. Shuyong Wang (IZCAS); China, Guangxi, 1♂, from dead leaves, 2.VI.2011, coll. Lihong Dang (IZCAS); Japan, 1♀1♂, 2.VIII.1976, coll. Kobayashi (IZCAS).

Comments. Described originally from Japan (Haga, 1975), *O. miscanthicola* was also recorded from Korea (Okajima, 2006). In China, it is widely distributed in the temperate regions of southern China (Zhang, 1984; Han & Cui, 1992; Han, 1997; Cao *et al.*, 2010). In here, seven females and four males are studied from Sichuan and Guangxi.

Ophthalthrips yunnanensis* Cao, Guo & FengOphthalthrips yunnanensis* Cao, Guo & Feng, 2010: 263.

Diagnosis. Head about two times as long as wide, head elongate, preocular projection wider than long; postocular setae developed, slightly shorter than interocellar setae. Antennae 8-segmented, segment III longest, about 8 times as long as wide. Maxillary stylets V-shaped, retracted into head. Pronotum with five pairs of developed major setae, blunt at apex. Mesopresternum boat-shaped. Fore tarsal tooth present in both sexes. Pelta triangular, with entire reticulation, abdominal tergites II–VII with two pairs of small and straight wing-retaining setae in macropterous; tube shorter than head, anal setae slightly shorter than tube.

Distribution. China (Yunnan).

Comments. Known only from Yunnan, China, this species is distinguished by the small and straight wing-retaining setae in macropterae according to the original description (Cao *et al.*, 2010). The character is relatively rare in the genus, even in *Idolothripinae* species.

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