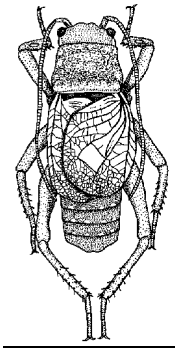

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THE GRASS-LIVING GENUS *APTINOTHRIPS* HALIDAY, 1836 (THYSANOPTERA: THRIPIDAE) FROM CHINA

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The review of the three species of the genus *Aptinothrips* (Thripidae: Thripinae) distributed in China is given. A. *elegans* Priesner is newly recorded from China. The genus *Aptinothrips* is also recorded for fauna of Taiwan for the first time. An illustrated key to these three species of genus *Aptinothrips* from China (including Taiwan) is provided.

KEY WORDS: Thripidae, *Aptinothrips*, new record, key, Taiwan, China.

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Дан обзор трех распространенных в Китае видов трипсов рода *Aptinothrips* (Thripidae: Thripinae). A. *elegans* Priesner впервые указывается для Китая. Род *Aptinothrips* первые отмечен на Тайване. Приведена иллюстрированная таблица известных из Китая (включая Тайвань) видов рода *Aptinothrips*.

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INTRODUCTION

Thysanoptera comprise an order of minute insects of considerable scientific and economic importance. Their habits range from forest and grasslands to gardens and crops. Members of many species are fungivorous, phytophagous or carnivorous, or

are gall makers or inquilines, and some are vectors of viral and bacterial diseases of plants, or are pollinators of flowers (Reyes, 1994).

In Thysanoptera, about 6000 species are known from the world, and they are classified into two suborders and nine families (Mound, 2011). The suborder Tubulifera includes 3500 species in only one family Phlaeothripidae, whereas the suborder Terebrantia consists of eight families that include 2000 species. The Thripinae is the largest subfamily in Thripidae, and includes in China about 213 species in 56 genera (Mirab-balou *et al*., 2011). In addition to numerous flower- or leaf-living species and many grass-living species of this subfamily, several species feed on mosses and a few species are predatory (Mound & Marullo, 1996). Among grass-living thrips, the species of *Aptinothrips* are probably distributed naturally throughout the Holarctic Region. However, the centre of distribution appears to be Europe, because all four species occur there as well as the forms of two of the species which differ in the number of antenna1 segments (Palmer, 1975).

Up to the present, two species of *Aptinothrips* Haliday i.e., *A. rufus* Haliday and *A. stylifer* Trybom has been recorded from China. In this paper, *A. elegans* Priesner is newly recorded from China; and the genus *Aptinothrips* is also recorded for fauna of Taiwan for the first time. An illustration key is provided to these three species of *Aptinothrips* from China (including Taiwan).

MATERIALS AND METHODS

The specimens were collected from China (including Taiwan); and they have been prepared and mounted on slides using the method of Mirab-balou & Chen (2010). All descriptions, measurements and photos were made with a Leica DM IRB microscope, a Leica MZ APO microscope with a Leica Image 1000 system. The specimens are deposited in the Institute of Insect Sciences, Zhejiang University, Hangzhou, China (ZJUH). All measurements are given in micrometers (μm). The comparison of some characters between three species of *Aptinothrips* is given in Table 1.

ORDER THYSANOPTERA
Family Thripidae
Genus *Aptinothrips* Haliday, 1836

Thrips (*Aptinothrips*) Haliday, 1836: 445. Type species: *Thrips* (*Aptinothrips*) *rufus* Haliday, by subsequent designation (Mound & Palmer, 1974: 228).

Aptinothrips Haliday: Amyot & Serville, 1843: 642 (footnote); 1894: 42; Stannard, 1968: 281; Palmer, 1975: 177-178; Palmer *et al*., 1989: 12, 24, 25; Mound & Marullo, 1996: 93; Han, 1997: 200.

Uzeliella Bagnall, 1908: 5. Type species: *Uzeliella lubocki* Bagnall, by monotypy. Synonymized by Priesner, 1926-28: 156.

Apothrips Dyadechko, 1964: 153. Type-species: *A. stylifer* Trybom, by subsequent designation (Jacot-Guillarmod, 1974: 593). Synonymized by Jacot-Guillarmod, 1974: 592.

Apithrips Dyadechko, 1964: 153, Type-species: *A. intermedius* Priesner, by monotypy. Synonymized by Jacot-Guillarmod, 1974: 592.

DIAGNOSIS. Both sexes apterous. Body very narrow, mainly yellow (Figs. 1, 7, 13). Head elongate, slightly prolonged in front of eyes. Ocelli absent (Figs. 3, 9, 15). Antennae 6- or 8-segmented, with simple sense cones on antennal segments III and IV (Figs. 2, 8, 14). Head and thorax without long setae (Figs. 3, 9, 15, 19). Maxillary palps 3-segmented. Pterothorax partially divided into the mesothorax and metathorax by an incomplete suture. Mesosternum without spinula. Legs stout, tarsi 1- or 2-segmented (Figs. 4, 12, 16). Abdomen long and slender. Abdominal tergites and sternites without craspeda. Abdominal sternites with discal setae. Abdominal tergite VIII without comb of setae on posterior margin. Male similar to female but smaller, with two pairs of thorn-like setae on abdominal tergite IX (Stannard, 1968; Palmer, 1975; Mound & Marullo, 1996; zur Strassen, 2003).

REMARKS. This grass-living genus includes four species in the world (Mound, 2011) of these two species has been recorded from China (Mirab-balou *et al*., 2011). The genus is included in the *Anaphothrips* genus-group (Mound & Masumoto, 2009). The members of this genus are wingless, without ocelli, and the head is longer than wide; and by these characters, they can readily distinguish from species of *Anaphothrips*. The members of this genus widespread on a wide range of herbaceous plants (family Poaceae), including the cereals. Herein genus *Aptinothrips* is newly recorded for fauna of Taiwan.

Key to species of *Aptinothrips* in China (including Taiwan)

1 Antennae 8-segmented (Fig. 14). Tarsi each 2-segmented (Fig. 16) ..... ***A. stylifer***
– Antennae 6-segmented (Figs. 2, 8). Tarsi each 1-segmented (Figs. 4, 12) 2
2 Antennal segment I more or less long; segment II broadest near its middle (Fig. 8). Sternites III-VI with postero-marginal setae all arising on the margin (Fig. 10). Abdominal tergites with variable discal setae (Fig. 11) ..... ***A. rufus***
– Antennal segment I short and wide; segment II broadest near its base (Fig. 2). Sternites III-VI with lateral postero-marginal setae arising anterior to the margin (Fig. 6). Abdominal tergites without discal setae (Fig. 5) ..... ***A. elegans***

Table 1. The comparison on some characters between three species of *Aptinothrips* (measurements in microns)

Morphological characters	***elegans***		***rufus***		***stylifer***	
	length	width	length	width	length	width
Body	1480	230	1400	350	1680	360
Head	120	150	137	150	140	160
Pronotum	150	180	140	200	140	200
Antennal segment I	19	28	13	22	14	26
Antennal segment II	26	22	24	20	29	19
Antennal segment III	22	15	22	13	24	14
Antennal segment IV	18	15	18	17	22	16
Antennal segment V	22	16	19	16	22	15
Antennal segment VI	55	15	51	17	17	14
Antennal segment VII	-	-	-	-	8	7
Antennal segment VIII	-	-	-	-	13	6

Figs. 1-6. *Aptinothrips elegans*. 1 – adult, female; 2 – antenna; 3 – head; 4 – fore leg; 5 – abdominal tergite VII; 6 – abdominal sternite VI. Scale bar=20µm.

Aptinothrips elegans Priesner, 1924
Figs 1–6

Aptinothrips elegans Priesner, 1924: 528. [Syntypes – ♀♀, Hungary: near Simontornya, on grass and *Lathyrus tuberosus*, vi-xii. ? 23 (F. Pillich); in Priesner Coll., Linz; not examined]; Palmer, 1975: 179.

Aptinothrips rufus (Gmelin) var. *mediterraneus* Priesner, 1926-28: 159. [Syntypes – 8♀, 1♂, Yugoslavia (Dalmatia): Ragusa, on grass, x.18; in Priesner Coll. Linz]. Synonymized by Speyer, 1935: 496.

MATERIAL EXAMINED. **China**: Taiwan, Baxianshan, 24°11'N, 121°E, 1♀ from grass (Poaceae), 4.VI 2011, coll. Pu Tang (in ZJUH).

DIAGNOSIS. Female apterous. Body faintly reticulate, yellow to yellowish brown (Fig. 1), antennal segment VI pale brown (Fig. 2). Head longer than wide, without long setae, with 14 short setae behind compound eyes, ocelli absent (Fig. 3). Antennae 6-segmented, segment I broad; II with stalk, quite convex; V a little narrower, sides straighter, VI twice as long as V (Fig. 2); antennal segments III and IV each with simple sense cone. Pronotum without long setae. Meso- and metasternum without spinula. Tarsi each with one segment (Fig. 4). Abdominal tergites without discal setae (Fig. 5); tergites and sternites without craspedum; tergite VIII without comb on posterior margin; tergite IX with postero-median setae short, less than 0.2 times as long as lateral setae; tergite X with completed longitudinally split . Abdominal sternites with variable discal setae, between 2-8 setae (Fig. 6). Sternites III-VI with lateral postero-marginal setae arising anterior to the margin. Ovipositor well-developed.

REMARKS. This species is newly recorded for fauna of China.

DISTRIBUTION. China: Taiwan; Iran, Europe, Moldavia, Ukraine, Azerbaijan, Kazakhstan and Russia (West Siberia) (zur Strassen, 2003).

Aptinothrips rufus (Haliday, 1836)
Figs 7–12

Thrips (*Aptinothrips*) *rufa* Haliday, 1836: 445. [Syntypes – ♀, Great Britain: on grass and cereal, probably lost].

Aptinothrips rufus (Haliday): Bailey, 1957: 166; Mound & Palmer, 1974: 229; Mound & Marullo, 1996: 93.

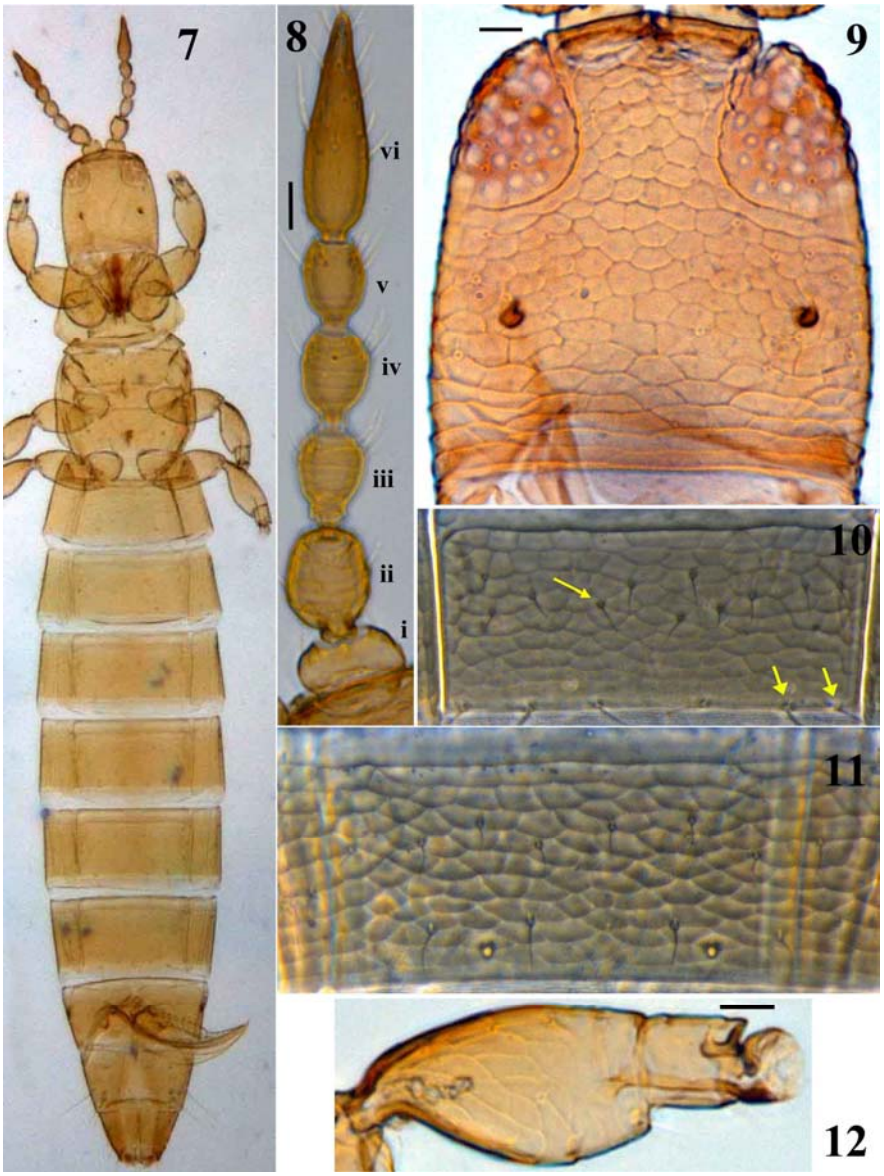
Aptinothrips rufa (Gmelin) var. *connaticornis* Uzel, 1895: 153. Synonymized by Watson, 1923: 46.

Aptinothrips rufus (Gmelin) var. *mediterranea* forma *stylifera* Priesner, 1926: 160. [Type – ♀, Yugoslavia (Dalmatia): Ragusa, on grass, x.18; in Priesner Coll. Linz]. Synonymized by Speyer, 1937: 89.

Thrips (*Aptinothrips*) *nitidula* Haliday, 1836: 446. [Syntypes – ♀, Great Britain: on *Plantago maritima*, probably lost]. Synonymized by Speyer, 1935: 493.

Uzelliella lubbocki Bagnall, 1908: 5. [Syntypes – ♀, Great Britain: Northumberland, Whitely Bay]. Synonymized by Priesner, 1926: 157.

MATERIAL EXAMINED. **China:** Zhejiang province: Hangzhou (Zijingang Campus at Zhejiang University), 2 ♀ from grass, 10.VI 2011, coll. M. Mirab-balou (in ZJUH).



Figs. 7-12. *Aptinothrips rufus*. 7 – adult, female; 8 – antenna; 9 – head; 10 – abdominal sternite VI; 11 – abdominal tergite VII; 12 – fore leg. Scale bar=20µm.

DIAGNOSIS. Female apterous. Body faintly reticulate, body and legs yellow to yellowish-brown (Fig. 7), antennal segment VI shaded brown (Fig. 8). Head longer than wide, without long setae, ocelli absent (Fig. 9). Antennae 6-segmented (Fig. 8); antennal segment VI pedicilate, twice as long as V and tapering to apex (Fig. 8), segments III and IV each with simple sense cone. Pronotum without long setae. Meso- and metasternum without spinula. Tarsi each with one segment (Fig. 12). Abdominal tergites and sternites with no posteromarginal craspedum; tergite IX postero-median setae short, about 0.2 times as long as lateral pair of setae; tergites with discal setae variable, 6-9 setae (Fig. 11); sternites with many discal setae (Fig. 10); sternites III-VI with postero-marginal setae all arising on the margin. Ovipositor well-developed.

DISTRIBUTION. China: Inner Mongolia, Ningxia (Yang *et al*., 1993), Zhejiang (herein this species is newly reported from Zhejiang province in China); found in countries with temperate climates throughout the world, including highland areas in tropical countries.

Aptinothrips stylifer **Trybom, 1894**

Figs 13–19

Aptinothtips stylifera Trybom, 1894: 43. [Syntypes – ♀, Sweden: Jonkoping Co., Sunnaryd on Lake Bolmen, on grasses, 29-30.VII and I.VIII.1893; depository unknown].

Aptinothrips stylifer Trybom: Mound *et al*., 1976: 20; Han, 1997: 200, 201.

Aptinothrips rufus f. *stylifera* Trybom: Priesner. 1921: 163.

Aptinothrips rufus (Gmelin) f. *intermedia* Priesner, 1921: 163. [Syntypes – 2 ♀, Austria: Upper Austria, on grass, VI. 8; in Priesner Coll., Linz.; not examined]. Synonymized by Speyer, 1937: 90.

Aptinothrips nitidulus f. *groenlandica* Richter, 1928: 850. [Holotype – ♀, West Greenland: Kagiarsuk, Igaliko-fjord, 23.VIII 1889 (W. Lundbeck); depository unknown]. Synonymized by Palmer, 1975: 182.

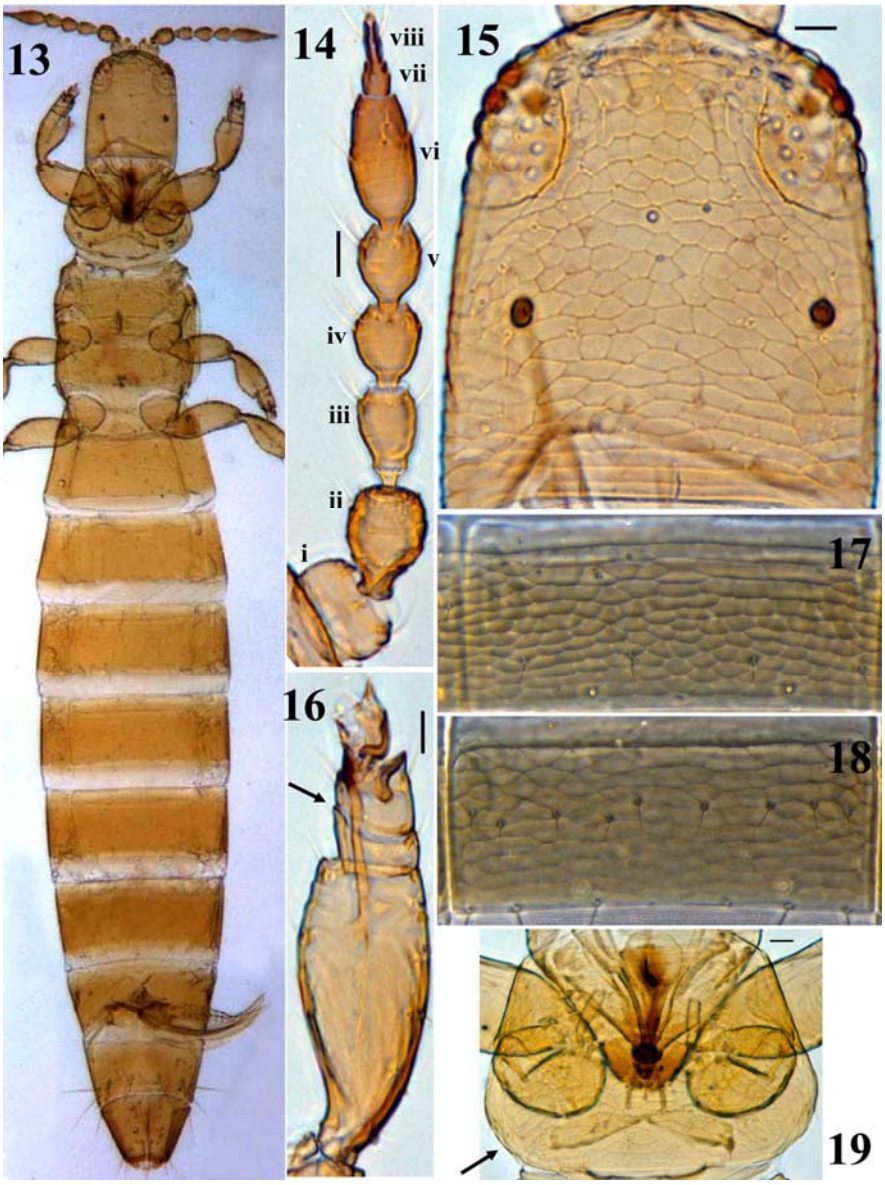
Thrips (*Aptinothrips*) *rufa* Haliday: Lindeman, 1887: 3 19-21 (misidentification).

Aptinothrips rufa (Gmelin): Uzel, 1895: 152 (misidentification).

MATERIAL EXAMINED. This species was reported for fauna of China by Han (1997). In this study, we examined one specimen that is deposited in the ZJUH. **Iran**: Hamedan province: Ganjnameh, 1♀ from *Trigonella corniculata* (Fabaceae), 20.VI 2009, coll. M. Mirab-balou (in ZJUH).

DIAGNOSIS. Female apterous. Body and legs yellow to yellowish brown (Fig. 13), antennal segments VI-VIII shaded brown (Fig. 14), also apex of abdomen. Head and pronotum without long setae. Head longer than wide, ocelli absent (Fig. 15). Antennae 8-segmented; segment VI pedicilate, 1.5 times as long as V (Fig. 14), antennal segments III and IV each with simple sense cone. Meso- and metasternum without spinula. Abdominal tergites and sternites with no posteromarginal craspedum; tergites without discal setae (Fig. 17); tergite IX postero-median setae about 0.6 times as long as lateral pair of setae; sternites with many discal setae (Fig. 18); sternite II with 2 pairs of posteromarginal setae, III-VII with 3 pairs, median pair on VII arising in front of margin. Ovipositor well-developed.

DISTRIBUTION. China: Tibet, Ningxia, Gansu, Shandong (Han, 1997); found in countries with temperate climates in many parts of the world.



Figs. 13-19. *Aptinothrips stylifer*. 13 – adult, female; 14 – antennae; 15 – head; 16 – fore leg; 17 – adominal tergite V; 18 – abdominal sternite V; 19 – pronotum. Scale bar=20μm.

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