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Two new records of grass-inhabiting thrips from Japan (Thysanoptera ; Thripidae)

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Abstract: Two grass-inhabiting thrips belonging to the tribe Chirothripini, 1) *Arorathrips mexicanus* (CRAWFORD) and 2) *Chirothrips frontalis* WILLIAMS, are newly recorded from Japan. Previously, only one species, *Chirothrips manicatus* (HALIDAY), has been recorded from Japan in this tribe.
Key words: Thysanoptera, Thripidae, Chirothripini, *Arorathrips*, *Chirothrips*, Japan, grass

Introduction

The genus *Chirothrips*, mainly grass-inhabiting and very characteristic species group, used to be a large group containing about 65 species (MOUND & WALKER, 1982). Recently, this genus was divided into six genera by somewhat weak characteristics (BHATTI, 1990). As a result, the genus *Arorathrips* now contains 13 species, and is distinguishable from *Chirothrips* in having a forwardly protruding apical tooth on the outer side of the fore tibia, the reduction of the mesofurca. Only one species, *Chirothrips manicatus*, has been recorded from Japan in the tribe Chirothripini and it is widespread around the world in temperate region as a minor pest of grass seed (MOUND & MARULLO, 1996). On the other hand, *C. frontalis* is mainly widespread in southern hemisphere, such as Argentina and South Africa (JACOT-GUILLARMOD, 1971). *A. mexicanus* is widespread in tropical and subtropical region (JACOT-GUILLARMOD, 1971). In this paper, two grass-inhabiting thrips included in the tribe Chirothripini are newly recorded from Japan and are described briefly with illustrations.

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Genus *Arorathrips* BHATTI

Arorathrips BHATTI, 1990: 194-196. Type species: *Chirothrips mexicanus* CRAWFORD, 1909 : 114-115.

Arorathrips mexicanus (CRAWFORD)

(Figs. 2, 4, 6, 7, 10, 15-18, 20, 23-24)

Chirothrips mexicanus CRAWFORD, 1909: 114-115. Hood, 1953: 118-119. MOUND & PALMER, 1972: 337-338.
Arorathrips mexicanus (CRAWFORD); BHATTI, 1990: 194-196. MOUND & MARULLO, 1996: 93-94.

Female: Macropterous. Distended body length 1.2-1.4 mm. Colour uniformly dark brown; antennal segments I and IV to VIII dark brown, II and III pale brown, II slightly paler than III; all tarsi yellowish brown, fore tibiae brown with slightly yellowish, mid and hind tibiae brown to dark brown, all femora brown to dark brown; fore wings pale brown with basal half slightly paler; prominent body setae shaded.

Head (Fig. 2a) strongly prolonged forwardly, with three or four pairs of stout ocellar setae of prolongation. Postocular setae four pairs. Antennae (Fig. 4a) eight-segmented; segment I enlarged and almost as long as segment VI; segment II with sharply projected anterior outer angle bearing a stout setae, anterior margin 2.5-3.0 times as long as basal margin; segments III and IV each with simple sense-cone; each segment almost smooth, but III to VI sometimes with one or two very weakly transverse striae.

Pronotum (Fig. 2a) trapezoidal, sculptured with transverse intermittent striae, with 32-37 discal setae and two pairs of posteroangular setae; posterior margin usually with four (rarely five) pairs of setae. Mesonotum (Fig. 6) sculptured with scale-like striae and anastomosing striae, with a pair of campaniform sensillae near anterior margin; a pair of median setae situated medially. Metascutum (Fig. 6) sculptured with longitudinal reticulation, with a pair of campaniform sensillae; a pair of median setae situated medially. Costal vein of fore wing with 13-16 setae; first vein with four to seven basal and two distal setae; second vein with three setae; apical setae situated slightly apart from apex; posterior fringe cilia wavy; scale with four (rarely five) veinal and one discal setae. Prosternum (Fig. 8) with triangle weakly sclerotized basantra fused with ferna; prospinasternum interrupted medially, median process reduced. Meso-and metasternal spinula absent. Mesosternum (Fig. 8) with about forty setae near anterior margin; furca separated on right and left. Fore tibia (Fig. 10) prolonged around external margin of fore tarsus. Tarsus two-segmented.

Abdominal terga (Figs. 15-16 & 20) without ctenidia; terga I to VIII throughout sculptured with anastomosing striae, with sculptured craspeda on posterior margin, with a row of scale-like striae near anterior margin; tergum IX with two pairs of campaniform sensillae; tergum X divided and with a pair of campaniform sensillae; sterna without discal setae; sterna (Fig. 17) I to VII sculptered with scale-like striae, but weakly at middle of sterna VI and VII; B1 setae on posterior margin of sternum VII situated slightly ahead of posterior margin. Ovipositor 0.5-0.7 times as long as pronotal median length.

Male: Micropterous. Distended body length 0.9-1.2 mm. Colour usually bicoloured, sometimes uniformly brown, but paler than female; head brown, thorax yellowish brown,

abdomen yellowish brown, often segments IX and X dark brown; antennae often uniformly brown, segments I and II yellowish brown, III pale brown, V brown, VI to VIII dark brown; all tarsi, fore tibiae and fore femora yellowish brown, mid tibiae and mid femora, hind tibiae and hind femora brown; prominent body setae slightly shaded.

Head (Fig. 2b) without ocelli, preocular prolongation shorter than that of female. Antennae (Fig. 4b) very similar to female. Metanotum (Fig. 23) not divided into scutum and scutellum, with a pair of campaniform sensillae at basal fourth; a pair of median setae situated medially. Fore wings reduced to small lobe with four setae. Abdominal terga (Fig. 24) I to VIII with distinct sculptured craspeda on posterior margin; tergum IX with two pairs of campaniform sensillae; tergum X with a pair of campaniform sensillae, with two pairs of setae at each side of posterior margin; sterna without discal setae and posteromarginal craspeda, posteromarginal setae inserted on posterior margin; sterna (Fig. 18) II to V or VI distinctly sculptured with scale-like striae; sterna III to VII each with a large rounded glandular area.

Distribution: Japan (Ryukyu Is.); widespread throughout the tropic and subtropic, Africa (Transvaal, Natal, Mozambique), Thailand, Australia.

Specimens examined: 2♂♂6♀♀: Japan, Okuma, Okinawa-hontou Is., on Poaceae, 11-iii-1997, M. MASUMOTO 1♂: Japan, Ginowan, Okinawa-hontou Is., on *Bidens* sp., 6-viii-1997, M. MASUMOTO 1♂: Japan, Kaihou, Okinawa-hontou Is., on *Bidens* sp., 15-x-1996, Y. ODA 1♀: Mozambique, Umbeluzi SW., Lourenco Morques, on *Urochloa* sp., 18-ix-1963, C. RODRIGUES.

Genus *Chirothrips* HALIDAY

Thrips (*Chirothrips*) HALIDAY, 1836: 444. Type species: *Thrips* (*Chirothrips*) *manicata* HALIDAY, by monotypy. *Chirothrips* HALIDAY: AMYOT & SERVILLE, 1843: 642.

Chirothrips frontalis WILLIAMS

(Figs.1, 3, 5, 7, 9, 11-14, 19, 21-22)

Chirothrips frontalis WILLIAMS, 1914: 51. Hood, 1953: 115-118. MOUND & PALMER, 1972: 336. MOUND & MARULLO, 1996: 109.

Female: Macropterous. Distended body length 1.5-1.8 mm. Colour uniformly dark brown; antennae almost uniformly dark brown, segment III slightly paler; all tarsi yellow, fore tibiae dark brown with apex yellowish, mid and hind tibiae, and all femora dark brown; fore wings shaded, with subbasal part slightly paler; prominent body setae shaded.

Head (Fig. 1a) strongly prolonged, preocular prolongation almost as long as width of posterior margin of antennal segment I. Ocellar setae I and II situated on prolongation, setae III situated beside of anteocellus and near compound eyes. Postocular setae four pairs. Antennae (Fig. 3a) eight-segmented; segment II with projected anterior outer angle bearing a small seta, anterior margin 2.2-2.6 times as long as posterior margin; segments III and IV each with a simple sense-cone; segments III to V usually with three or four weak transverse striae; segments VI the longest, with four weak transverse striae and

a few weak microtrichia.

Pronotum (Fig. 1a) trapezoidal, sculptured with transverse intermittent striae, with 36-49 discal setae and two pairs of posteroangular setae; posterior margin with five pairs of setae, B1 setae slightly elongate and sometimes situated ahead of posterior margin.

Mesonotum (fig. 5) sculptured with transverse reticulation, with a pair of campaniform sensillae; a pair of median setae situated medially. Metascutum (Fig. 5) with a pair of campaniform sensillae medially, sculptured with concentric reticulation; a pair of median setae situated at one-third from anterior margin. Costal vein of fore wing with 20-24 setae; first vein with usually six (rarely five, seven or eigth) basal and two distal setae; second wein with four or five (rarely six) setae; apical setae situated at apex; posterior fringe cilia wavy; scale usually four (rarely three) veinal and one discal setae. Prosternum with triangle wrinkled basantra fused to rounded ferna; prospinasternum not interrupted, median process present. Meso-and metasternal spinula absent. Mesosternal furca (Fig. 7) not divided. Fore tibiae not prolonged around fore tarsus (Fig. 9). Tarsus two-segmented.

Abdominal terga (Figs. 11, 12 & 19) without ctenidia; terga I to VIII throughout sculptured with transverse striae, with posteromarginal craspeda bearing irregular teeth; tergum IX with two pairs of campaniform sensillae; tergum X divided and with a pair of campaniform sensillae; sterna (Fig. 13) without discal setae, posterior margin without craspeda but very weakly rugged; B1and B2 setae on sternum VII situated slightly ahead of posterior margin. Ovipositor about 1.1 times as long as pronotal median length.

Male: Micropterous. Distended body length 1.3-1.6 mm. Colour bicoloured; head and thorax yellowish brown, abdomen brown; antennal segments I to III yellowish brown, IV brown, V to VIII dark brown; all tarsi yellow, fore tibiae and femora yellowish brown, mid tibiae and mid femora, hind tibiae and hind femora dark brown; prominent body setae slightly shaded on abdomen.

Head (Fig. 1b) without ocelli, preocular prolongation shorter than that of female and with a pair of setae. Ocellar setae III situated at middle of head and near compound eyes. Antennal segment II (Fig. 3b) not so projected, anterior margin 1.7-2.0 times as long as posterior margin.

Mesonotum (Fig. 21) with a pair of campaniform sensillae, sculptured with transverse reticulation. Metanotum (Fig. 21) not divided into scutum and scutellum, with a pair of campaniform sensillae at basal third; a pair of median setae situated medially. Fore wings reduced to rounded lobe with three setae.

Abdominal terga (Fig. 22) I to VIII and sterna II to VIII with posteromarginal craspeda bearing irregular teeth; tergum IX with two pairs of campaniform sensillae; tergum X with a pair of campaniform sensillae, with two pairs of small setae on posterior margin and behind campaniform sensillae; sterna (Fig. 14) III to VII usually each with a rounded glandular area, 20-43 μm in diameter, often small and occasionally wanting (HOOD, 1953); B1 setae of sternum II, and B1 and B2 setae of sterna III to VIII situated ahead of posterior margin.

Distribution: Japan (Honshu: Niigata); Argentina; U. S. A.; Australia; Kenya; South Africa.

Specimens examined: 3♂♂13♀♀: Japan, Niigata City, Niigata pref., on *Bromus uniol-*

oides, 21-ix-1998, M. KADOI. 14♂♂18♀♀: Japan, Niigata City, Niigata pref., on *Bromus unioloides*, 19-x-1999, M. KADOI. 1♂1♀: Basutoland, Mamathes, 20-Ⅳ-1957, on *Bromus catharticus* VAHL, C.F. JACOT-GUILLARMOND (SMF T41025).

Remarks: *C. frontalis* can be easily distinguished from *C. manicatus* by the following characteristics: preocular prolongation of head much longer; posterior margin of abdominal sterna scarcely with tubercle; B4 setae on abdominal terga Ⅵ-Ⅷ minute, longer than B2 setae on terga Ⅱ-Ⅴ; mesonotum without scale-like striae; posteromarginal setae of abdominal sterna situated ahead of posterior margin.

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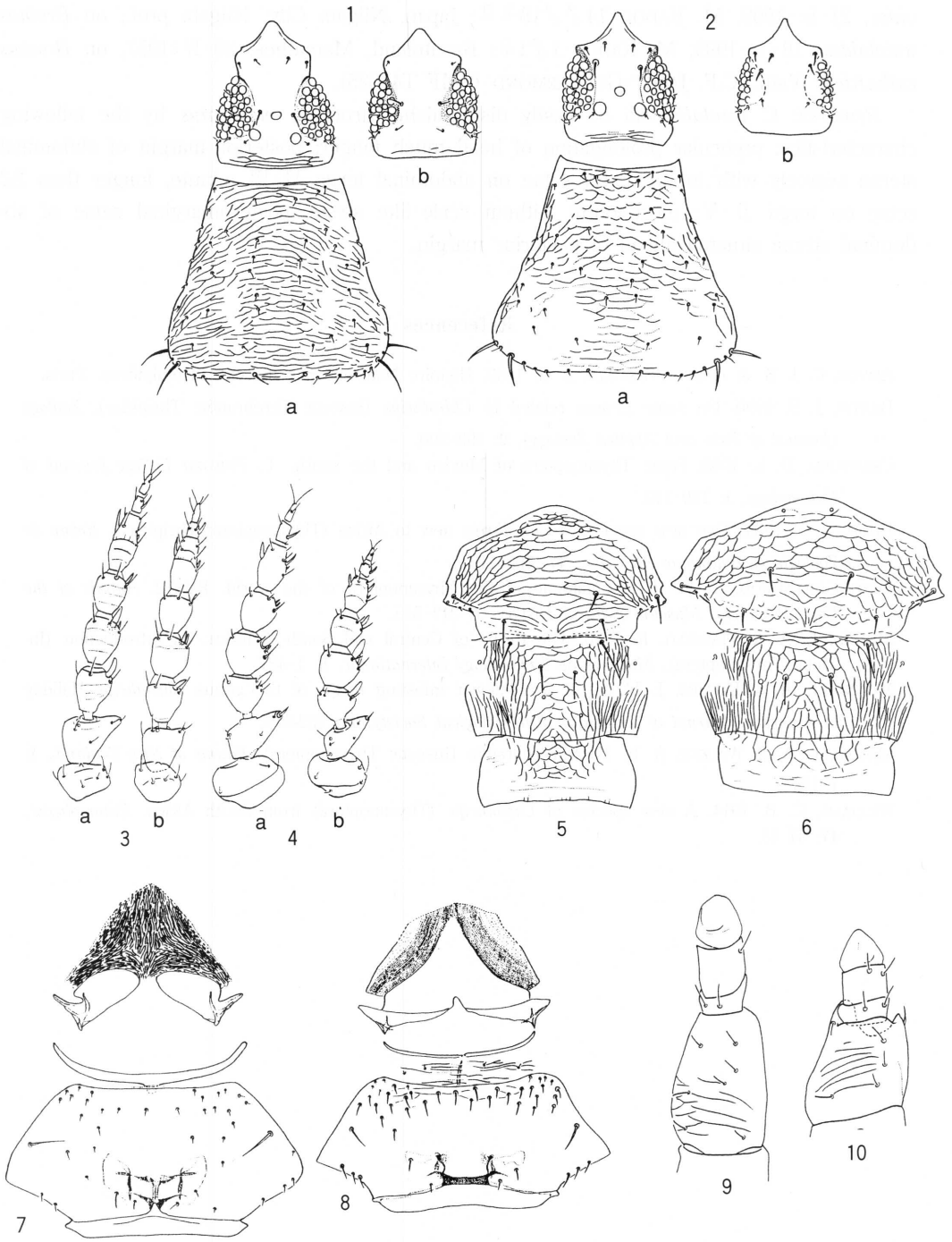
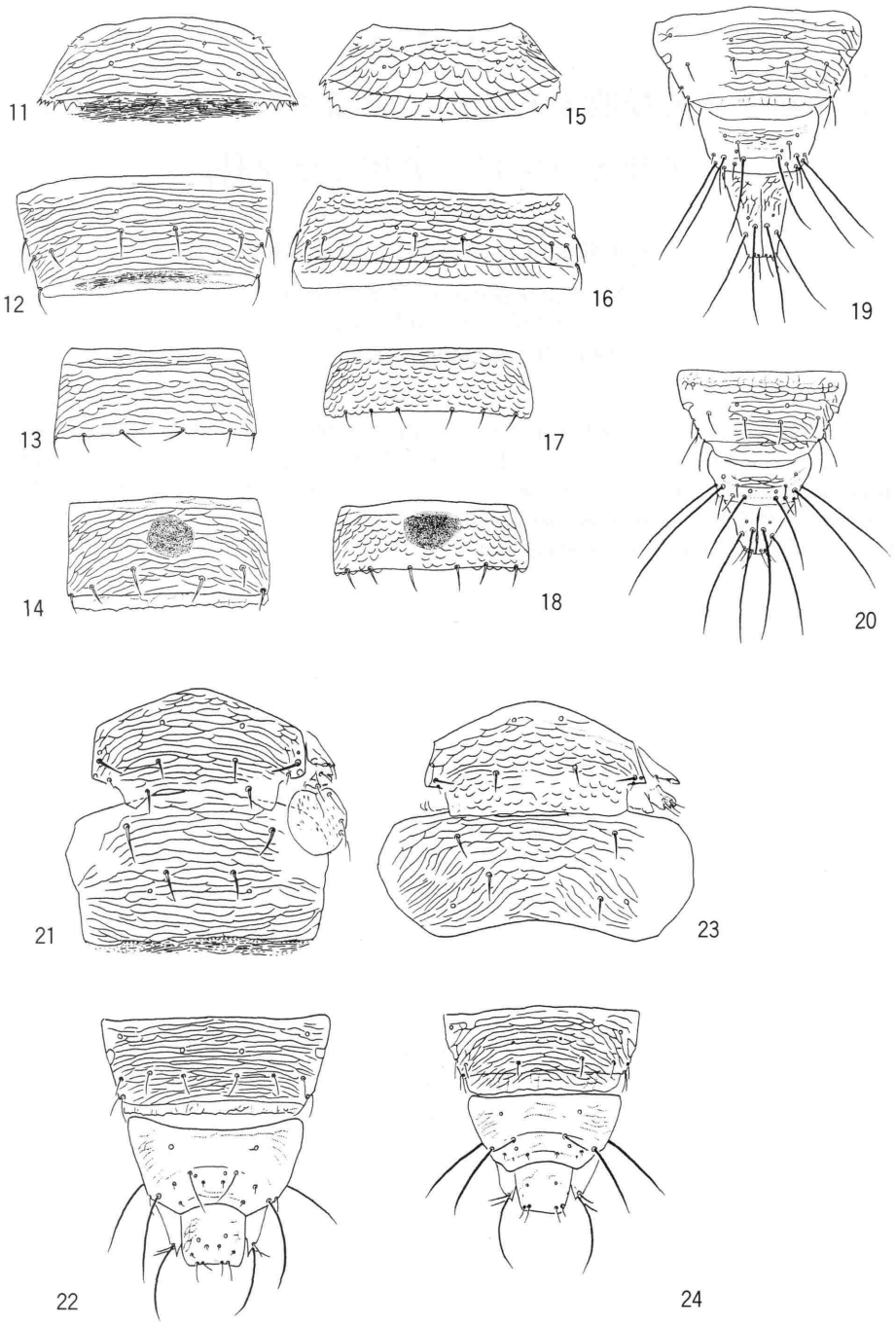


Figs. 1-2: head and pronotum (a: female, b: male). 1: *C. frontalis*, 2: *A. mexicanus*
Figs. 3-4: right antenna (a: female, b: male). 3: *C. frontalis*, 4: *A. mexicanus*
Figs. 5-6: mesonotum and metanotum (female). 5: *C. frontalis*, 6: *A. mexicanus*
Figs. 7-8: prosternum and mesosternum (female). 7: *C. frontalis*, 8: *A. mexicanus*
Figs. 9-10: left fore tibia and tarsi (female). 9: *C. frontalis*, 10: *A. mexicanus*



Figs. 11-18: abdominal terga and sterna. 11-14: *C. frontalis*, 11: tergum Ⅰ (female), 12: tergum Ⅶ (female), 13: sternum Ⅶ (female), 14: sternum Ⅲ (male). 15-18: *A mexicanus*, 15: tergum Ⅰ (female), 16: tergum Ⅲ (female), 17: sternum Ⅲ (female), 18: sternum Ⅲ (male).
Figs. 19-20: abdominal terga Ⅷ-Ⅹ (female). 19: *C. frontalis*, 20: *A. mexicanus*
Figs. 21-24: male. 21-22: *C. frontalis* (21: mesonotum and metanotum, 22: abdominal terga Ⅷ - Ⅹ). 23-24: *A.mexicanus* (23: mesonotum and metanotum, 24: abdominal terga Ⅷ - Ⅹ).

和 文 摘 要

日本産イネ科植物から新たに記録されたアザミウマ (アザミウマ目；アザミウマ科)

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主にイネ科植物に見られる Chirothripini 族(アザミウマ目;アザミウマ科)は日本からはこれまで，*Chirothrips manicatus* (HALIDAY)のみ記録があったが，今回新たに，沖縄から *Arorathrips mexicanus* (CRAWFORD)，本州から *Chirothrips frontalis* WILLIAMS の計2種が記録された。前者は，熱帯及び亜熱帯地方に広く分布し，後者は南半球(南米，オーストラリア，南アフリカ)に広く分布している。