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The Genus *Anascirtothrips* (Thysanoptera: Thripidae), from Leaves of *Ficus* Trees in India, Taiwan and Australia 【Research report】

台灣、印度及澳洲榕樹上之擬跳薊馬屬(纓翅目：薊馬科)【研究報告】

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Abstract

Three species are here recognised in the Oriental genus *Anascirtothrips* Bhatti. One of these species has apparently been widely dispersed by the horticultural trade. *A. arorai* bhatti is widespread in India on *Ficus religiosa*, has been recorded as damaging young *Ficus* leaves in commercial nurseries in Florida, and is here recorded from northern Australia for the first time on cultivated *Ficus* species. *A. discordiae* Chen & Lu was described from *Ficus septica* in Taiwan. *A. arafura* sp. n. is described from *Ficus opposita* and *F. ?microcarpa* on Melville and Bathurst Islands off the northern coast of Australia. The genus is redefined and compared with the worldwide genus *Scirtothrips* as well as the northern Australian genus *Labiiothrips*, and a key is provided to the three species.

摘要

擬跳薊馬屬已知3種，均分布於東方，其中1種經由園藝作物之貿易而在世界廣為擴散。*A. arorai* Bhatti原普遍存在於菩提樹上，曾在美國佛羅里達州曲園中被發現危害榕樹葉片，本文首次報告該薊馬在澳洲北部商業栽植之榕屬植物上發現。脊擬跳薊馬(*A. discordiae* Chen & Lu)曾在台灣菱果榕(*Ficus septica*)上採得。*A. arafura* sp. n.在澳洲北海岸Melville島與Bathurst島之榕樹(*Ficus opposita*, *F. ? microcarpa*)採得。本文重新定義本屬薊馬並與常見之跳薊馬屬(*Scirtothrips*)及澳洲北部之*Labiiothrips*屬比較，亦提供本屬3種之檢索表。

Key words: *Anascirtothrips*, *Scirtothrips*, *Ficus*, Taiwan, India, Australia.

關鍵詞: 擬跳薊馬屬、跳薊馬屬、榕、台灣、印度、澳洲

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The Genus *Anascirtothrips* (Thysanoptera: Thripidae), from Leaves of *Ficus* Trees in Taiwan, India and Australia

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ABSTRACT

Three species are here recognised in the Oriental genus *Anascirtothrips* Bhatti. One of these species has apparently been widely dispersed by the horticultural trade. *A. arorai* Bhatti is widespread in India on *Ficus religiosa*, has been recorded as damaging young *Ficus* leaves in commercial nurseries in Florida, and is here recorded from northern Australia for the first time on cultivated *Ficus* species. *A. discordiae* Chen & Lu was described from *Ficus septica* in Taiwan. *A. arafura* sp. n. is described from *Ficus opposita* and *F. microcarpa* on Melville and Bathurst Islands off the northern coast of Australia. The genus is redefined and compared with the worldwide genus *Scirtothrips* as well as the northern Australian genus *Labiothrips*, and a key is provided to the three species.

Key words: *Anascirtothrips*, *Scirtothrips*, *Ficus*, Taiwan, India, Australia.

Introduction

The palaeotropical plant genus *Ficus*, in the family Moraceae, supports a disproportionately large number of species from the insect order Thysanoptera. Mound (1994) indicated that 11 genera of Phlaeothripidae had been recorded from the leaves of these trees, with most of the species in the genera *Gynaikothrips*, *Liothrips*, *Mesothrips* and *Euoplothrips*. However, amongst the Thysanoptera it is not only phlaeothripines that have adopted *Ficus* leaves as their major food source. Two genera of Thripidae are known to have species associated with this genus, apparently feeding on the youngest leaves.

Pseudodendrothrips includes species from several host plants, including *Morus* and *Ficus* (Mound, 1999), and the related dendrothripine genus, *Ensiferothrips*, breeds on the leaves of another member of the Moraceae, *Malaisia scandens*, in New Caledonia (Bournier & Mound, 2000). In contrast, the second thripid genus known to be associated with *Ficus* leaves, *Anascirtothrips*, is possibly specific to this plant genus, although adults of *A. discordiae* are recorded from a species of *Ampelopsis* (Vitaceae), as discussed below. However, all of these thripid species are particularly small in body size, and their host relationships need careful study.

The genus *Anascirtothrips* was erected

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to include a single species from India, *A. arorai* Bhatti (1961), and two further species were subsequently added, *A. ficus* Bhatti (1967) from India and *A. discordiae* Chen & Lu (1994) from Taiwan. However, the comparative structure of these species, also the relationships of the genus, are not clear from the literature. Bhatti (1999) recognised that *A. ficus* is the same species as *A. arorai*, and this species has recently been discovered feeding on young leaves of cultivated *Ficus* in southern Florida (Cheryle O'Donnell, pers. comm.). The purpose of this paper is to clarify the relationship between the Indian species and the Taiwan species, to describe a third species from the northern coast of Australia, to redefine the genus, and to record *A. arorai* from Australia.

Anascirtothrips Bhatti, 1961

Small pale Thripidae with faint brown markings. Head relatively wide, ocellar region lacking sculpture (Fig. 1B); 3 pairs of ocellar setae present; 3 pairs of setae in row behind ocelli and inner margin of compound eyes; maxillary palps 3-segmented. Antennae 7-segmented (Fig. 1A), II with microtrichia on dorsal surface minute, both dorso-apical setae equally small; III distinctively wider at level of dorsal sub-apical setae; III & IV with forked sense cones short and stout. Pronotum (Fig. 1B) with 5 pairs of equally short posteromarginal setae; prosternal ferna meeting medially, basantra with or without one pair of setae. Mesonotum (Figs 1C, 2B) with setae B2 equal in size to B1, and arising lateral to B1 in a transverse straight line, or no more than one or two sculpture lines posterior to this line. Metanotum (Fig. 1C) with weak transverse lines of sculpture anteromedially, median pair of setae not at anterior margin. Metafurca with long slender spinula, mesofurca with or without spinula. Tarsi 2-segmented. Forewing first vein with 2 setae close to base, then a row of 3 to 6 setae, and 3 widely spaced setae on distal

half; second vein with 3 or 4 setae; fringe cilia wavy. Tergites I-VIII with median pair of setae arising closer together than their length (Figs 1D, 2C); tergites with posteromarginal comb of microtrichia on lateral thirds, complete medially on VIII (and sometimes VII); tergites II-VIII with 6 to 10 rows of discal microtrichia on lateral thirds; tergite IX with many discal microtrichia on posterior half, X without longitudinal division. Sternites with posteromarginal fringe of microtrichia (Figs 1E, 3), discal microtrichia present or absent laterally; III-VII with 3 pairs of setae arising at margin, II with 2 pairs. Male with no sternal glandular areas. Larvae II with body surface finely granulate; all major dorsal setae on head, thorax and abdomen with broadly expanded, asymmetric fimbriate apices; spiracles not visible on abdominal segment II, on VIII very small not larger than base of nearest seta.

Relationships

Superficially this genus appears to be closely related to *Scirtothrips*, judging from the abdominal tergites with the median pair of setae long and close together and the rows of closely set microtrichia laterally. However, not all members of *Scirtothrips* have the median pair of tergal setae longer than the distance between their bases (Mound & Marullo 1996). Moreover, whereas in *Scirtothrips* species these setae are progressively further apart from each other on each succeeding segment, in *Anascirtothrips* species the median pair of setae are almost equidistant from each other on tergites II-VIII. The two genera further differ from each other in the following character states.

Scirtothrips species: dorsal surface of antennal segment II with well developed microtrichia, and the two dorsal setae with inner usually much stouter than the outer; head with only 2 pairs of setae in a transverse row behind ocelli, and ocellar

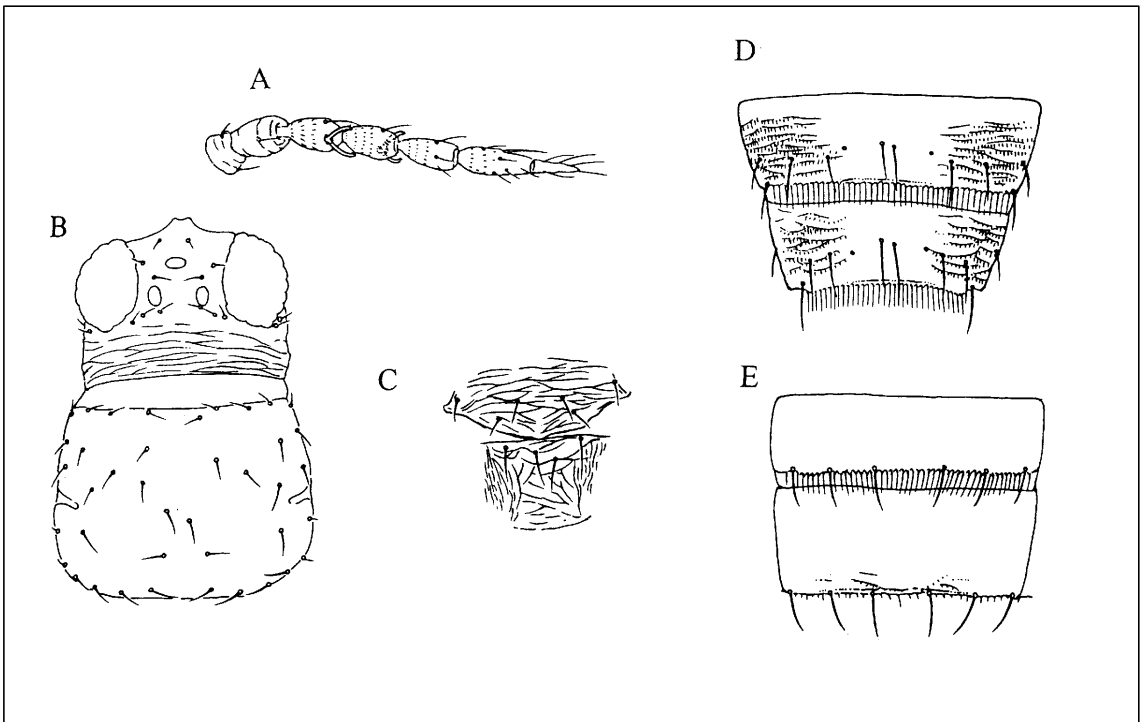


Fig. 1. *Anascirtothrips arafura* : A. antenna; B. head and pronotum; C. meso- and metanotum; D. abdominal tergites VII and VIII; E. abdominal sternites VI and VII.

region with lines of sculpture; mesonotal setae B2 much smaller than B1 and arising close to posterior margin of this sclerite; metanotal sculpture comprising longitudinal lines or elongate reticulation; pronotum usually with transverse row of setae at about anterior third, but no discal setae on posterior half, four pairs of posteromarginal setae.

Anascirtothrips species: dorsal surface of antennal segment II with weak microtrichia, and the two dorsal setae equally weak; head with 3 pairs of setae in transverse row, and ocellar region lacks sculpture; mesonotal setae B2 arising lateral to setae B1; metanotal sculpture with transverse lines; pronotum with discal setae present on posterior half, posterior margin with five pairs of setae.

Labiothrips Bhatti & Mound, with a single species on the young leaves of *Cycas*

species in northern Australia and New Guinea (Mound 1996), is a further related genus. The only known species, *L. tener* has an exceptionally long mouth cone, antennal segment II with no microtrichia and both dorsal setae weak, only one pair of postocular setae and ocellar region sculptured weakly, the mesonotum and metanotum as in *Scirtothrips* species, the pronotum with four pairs of small setae but two pairs of discal setae on posterior half, and tergal median setae further apart on tergites VII and VIII than on preceding segments.

Amongst *Scirtothrips* species, only *Scirtothrips albomaculatus* Bianchi has 3 pairs of postocellar setae and 5 pairs of pronotal posteromarginals, and only *S. helenae* Palmer & Mound has the metanotal sculpture transverse. Both of these species are from the Australian region.

Key to *Anascirtothrips* species

1. Sternite VI with longest median posteromarginal microtrichia weakly developed, less than 0.3 times as long as median posteromarginal setae and about equal in length to tergal lateral discal microtrichia (Fig. 3) [head with ocellar setae II arising almost lateral to ocellar setae I, usually anterior to anterior margin of first ocellus by more than diameter of an ocellus; mesonotum with 2 pairs of setae arising in transverse straight line; mesothoracic furca with no median spinula; tergite VII with posteromarginal comb of microtrichia absent medially; sternites IV-VI with several rows of discal microtrichia laterally, one row present medially close to posterior margin; male with median setae B1 on tergite IX arising on a transverse line joining setae B2] *arorai*
- Sternite VI with longest median posteromarginal microtrichia long, more than 0.5 times as long as median posteromarginal setae and at least 3 times as long as tergal lateral discal microtrichia (Fig. 1E) 2
2. Mesothoracic furca with no median spinula; head with ocellar setae II arising almost lateral to ocellar setae I, more than diameter of an ocellus anterior to anterior margin of first ocellus (Fig. 2A); mesonotum with 2 pairs of setae arising in transverse straight line (Fig. 2B); tergite VII with

- posteromarginal comb of microtrichia absent medially (Fig. 2C); sternites III-VII with antecostal ridge strongly shaded; sternites IV-VI with several rows of discal microtrichia laterally, one row present medially close to posterior margin; male with median setae B1 on tergite IX arising anterior to a line joining setae B2 *discordiae*
- Mesothoracic furca with median spinula well developed; head with ocellar setae II arising lateral to anterior margin of first ocellus (Fig. 1B); mesonotum with median pair of setae arising slightly anterior to a transverse straight line between the lateral pair of setae (Fig. 1C); tergite VII with posteromarginal comb of microtrichia complete or very briefly interrupted medially in both sexes (Fig. 1D); sternites III-VII with antecostal ridge pale; sternites IV-VI with no discal microtrichia laterally or medially (Fig. 1E); male with median setae B1 on tergite IX arising posterior to a line joining setae B2 *arafura*

Anascirtothrips arafura sp.n.

Female macroptera Body and legs mainly yellow, tergites II, V & VI with brown area laterally; antennal segments I-II white, III-V and base of VI light brown, VI-VII brown; forewing pale with two indistinct brown transverse markings, sub-basally and medially. With the character states indicated in the generic

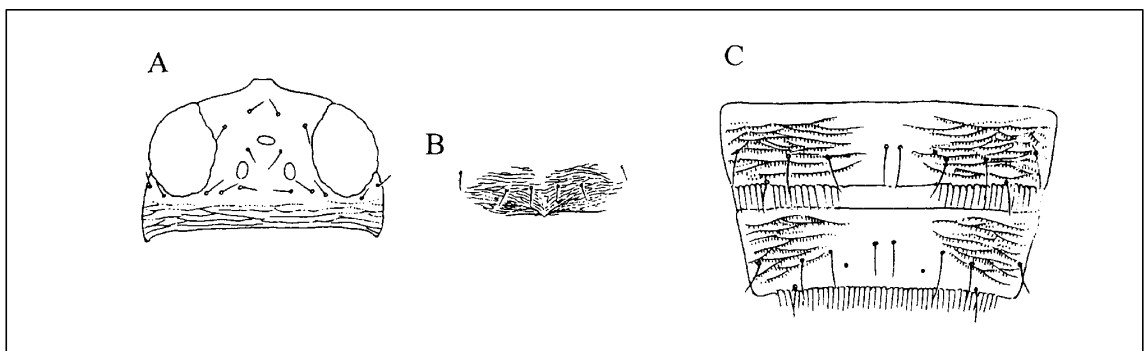


Fig. 2. *Anascirtothrips discordiae*: A. head; B. mesonotum; C. abdominal tergites VII and VIII.

definition and key to species above; head with ocellar setae II arising lateral to anterior margin of fore ocellus but close to compound eyes (Fig. 1B); posterior half of pronotum with 2 pairs of discal setae medially (Fig. 1B); mesonotal B1 setae arising a little anterior to B2 setae (Fig. 1C); metanotum with weakly transverse reticulation (Fig. 1C); tergite VII & VIII with complete posteromarginal comb of microtrichia (Fig. 1D); sternites II-VI with groups of long microtrichia between posteromarginal setae (Fig. 1E).

Measurements (holotype female in microns) Body length 900. Head, length 65; length 125. Pronotum, length 90; width 140. Forewing length 400. Antennal segments III-VII length 33, 30, 25, 35, 20.

Male macroptera Similar to female in colour and structure, but smaller and paler; tergite IX with median pair of setae B1 arising posterior to submedian pair B2.

Measurements (paratype male in microns) Body length 720. Tergite IX setae B1 30, B2 20.

Second instar larva Body colour white, antennal segments VI & VII brown, II light brown; fore tibiae shaded; dorsal surface with many fine dot-like markings; dorsal setae with apices broadly expanded, asymmetric and fringed; abdominal spiracles very small.

Material studied: Holotype, AUSTRALIA, Northern Territory, Melville Island, Garden Point, from *Ficus ?microcarpa* young leaves, 14-v-1999 (LAM 3706) in Australian National Insect Collection, Canberra.

Paratypes: 2, 3 (also 1

larva II) taken with holotype; Bathurst Island, 3 from leaves of *Ficus opposita*, 14-v-1999 (LAM 3704), in ANIC with one female in Taiwan Agricultural Research Institute.

Comments

The females from *F. opposita* leaves on Bathurst Island have the tergal sculpture stronger than in the holotype and associated specimens. On the lateral thirds of the posterior tergites they have about 10 transverse lines of microtrichia, and on tergite I they have about 7 lines of well developed microtrichia. In contrast, the holotype and associated specimens have only about 7 lines of microtrichia on the posterior tergites, and on tergite I the discal microtrichia are weakly developed.

Anascirtothrips arorai Bhatti, 1961

Bhatti (1999) has recognised *A. ficus* Bhatti 1967 as a synonym of *A. arorai*. This species is recorded as common on *Ficus religiosa* leaves, with an extensive distribution across India (Bhatti, 1990). Cherylle O'Donnell of the University of California, Davis, found this thrips breeding on the young leaves of *Ficus microcarpa* in a plant nursery at Homestead in southern Florida between December 1997 and February 1998. Moreover, 24 females and 3 males, together with larvae, were found in June 2000 on the young leaves of several different cultivated *Ficus* species, including *F. microcarpa*, at the campus of the University of the Northern Territory, Darwin, Australia. Presumably this thrips

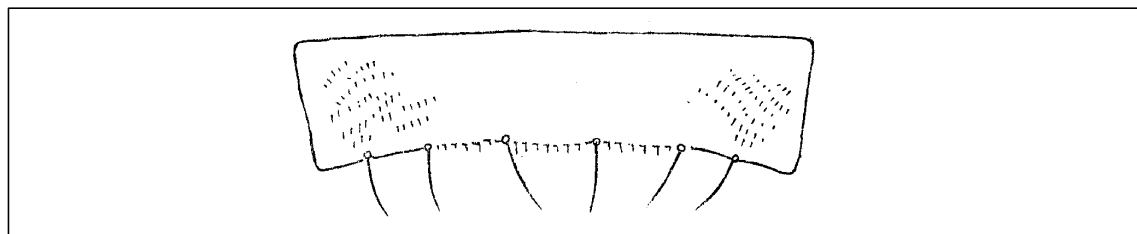


Fig. 3. Abdominal sternite VI of *Anascirtothrips arorai*.

is being distributed by the international trade in *Ficus* plants. The larvae are similar in colour and structure to those of *A. arafura*, but the dot-like sculptured markings on the dorsal surface are smaller and more densely spaced.

Anascirtothrips discordiae Chen & Lu, 1994

The original published illustration of the head of this species indicates a pair of long setae anterior to the first ocellus, but these setae actually arise on the ventral, not dorsal, surface of the head. In other structural details, this species is intermediate between *A. arorai* and *A. arafura*, as indicated above in the key to species.

The original description refers to specimens taken from both *Ficus septica* and from a species of *Ampelopsis* (Vitaceae). However, no details were given of the relative numbers on the two plants, nor any indication of the presence of larvae, so the true host-plant relationship remains unclear. In addition to the original series taken in Taipei, a further three females and one male were taken from *Ficus* leaves during December 1992 in Taichung.

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台灣、印度及澳洲榕樹上之擬跳薊馬屬(纓翅目：薊馬科)

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摘 要

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