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# Antennal sense cone variation in *Teuchothrips* species of New Caledonia, with one new generic combination (Thysanoptera, Phlaeothripinae)

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## Abstract

Four species of *Teuchothrips* are recognised as endemic to New Caledonia and distinct from the many species of this genus in Australia. Three of these species are shown to have a variable number of sense cones on antennal segment IV, in contrast to most recorded species in the *Liothrips*-lineage. One endemic species is removed from *Teuchothrips* and considered here as *Neocecidothrips pacificus* (Bianchi) **comb.n**. together with illustrations and diagnostic notes. A key is provided for the four *Teuchothrips* species known from New Caledonia.

**Key words**: Biodiversity, thrips, systematics, Pacific region, endemics

## Introduction

The indigenous flora of New Caledonia is considered to comprise about 3400 species, of which 80% are endemic (Guillaumin 1948; Kaledonie.com 2022). Insects of the Order Thysanoptera are essentially plant dependent, either on living or decaying plants, hence there is an expectation that a considerable proportion of these insects is likely also to be endemic. Unfortunately, there have been no serious field surveys of the thrips of this island, but the most recent checklist included 68 species in 44 genera (Bournier & Mound 2000), with eight further species subsequently recorded (Mound & Masumoto 2005; Goldarazena *et al*. 2021; Mound & Ng 2021; Goldarazena & Michel 2022). Of these 76 recorded species, only 19 are considered endemic, and there are likely to be more species yet to be discovered in view of the restricted distributions recorded for other micro-organisms in New Caledonia (Caesar *et al*. 2017). However, a very large proportion of the thrips recorded on this island involve species that are widespread around the world, whereas only about 10 species are derived from the rich Australian fauna. The purpose of this article is to consider some leaf-feeding Phlaeothripidae that are endemic to New Caledonia. These are members of genera that are known particularly from Australia, and further emphasise the problems of recognizing genera among species of the *Liothrips*-lineage.

## The genus *Teuchothrips*

This genus is a member of the *Liothrips*-lineage (Mound & Marullo 1996), in which all species usually have a single sense cone on antennal segment III and three sense cones on segment IV. This condition is generally consistent among several hundred species of this lineage, whereas three of the five species currently listed in *Teuchothrips* from New Caledonia are here recognised as having the sense cone numbers irregular. Amongst these species one available female paratype of *T. ornatus* has two sense cones on segment III of one antenna (but not both), a condition that is likely to be an aberration. But segment IV of three available paratypes of *T. ornatus* bears two large sense cones, and a similar condition had been found on 14 males and one female of this species collected more recently

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(LAM5607). A similar condition was also observed on one male paratype of *T. kraussi* and one female paratype of *T. noumeaensis*. A further variation noted occurred on four females identified as *T. ornatus* (LAM5607) and one female paratype of *T. noumeaensis*; These five specimens each had two large sense cones on one antenna, but two large and one smaller sense cones on the other antenna. These variations from the typical condition amongst members of the *Liothrips*-lineage of three sense cones on antennal segment IV will need further consideration in the future. Detailed examination of both antennae on every individual specimen is needed to recognise this intraspecific variation in sense cone number, and the fact that it is recorded for so few species in the *Liothrips*-lineage may be due to lack of detailed study. Similar intraspecific variation in the number of antennal sense cones is recorded of some species of *Deplorothrips* in the *Phlaeothrips*-lineage (Mound & Tree 2016), and also of *Karnyothrips flavipes* in the Haplothripini (Okajima 2006). Finally, one of the species listed in *Teuchothrips* from New Caledonia, *T. pacificus*, has two large sense cones on both segments III and IV, and as discussed below this species is here transferred to the genus *Neocecidothrips*.

The species included in *Teuchothrips* are closely similar in structure to species of *Liothrips*. The only recorded differentiating character states are that *Teuchothrips* species tend to have antennal segment VIII short and broadly based, and on the pronotum at least one of the five pairs of major setae is not elongate. In contrast, species of *Liothrips* have antennal segment VIII longer and constricted basally, and all five pairs of pronotal major setae are elongate (Mound 2008). With the transfer here of one species to *Neocecidothrips* there are 25 species listed under *Teuchothrips* (ThripsWiki 2021), including four from New Caledonia. Of the remaining species, 13 are known only from Australia, including the type species (Mound 2008). One species was described from New Guinea, two from Philippines, two from Java, two from Sri Lanka, and one from India. Each of the four species from New Caledonia is considered to be distinct from all of the species of *Teuchothrips* known from Australia, including many undescribed species in the collections at CSIRO, Canberra. This is not surprising, in view of the apparent specificity to particular plants by members of this genus.

## Key to the *Teuchothrips* species from New Caledonia

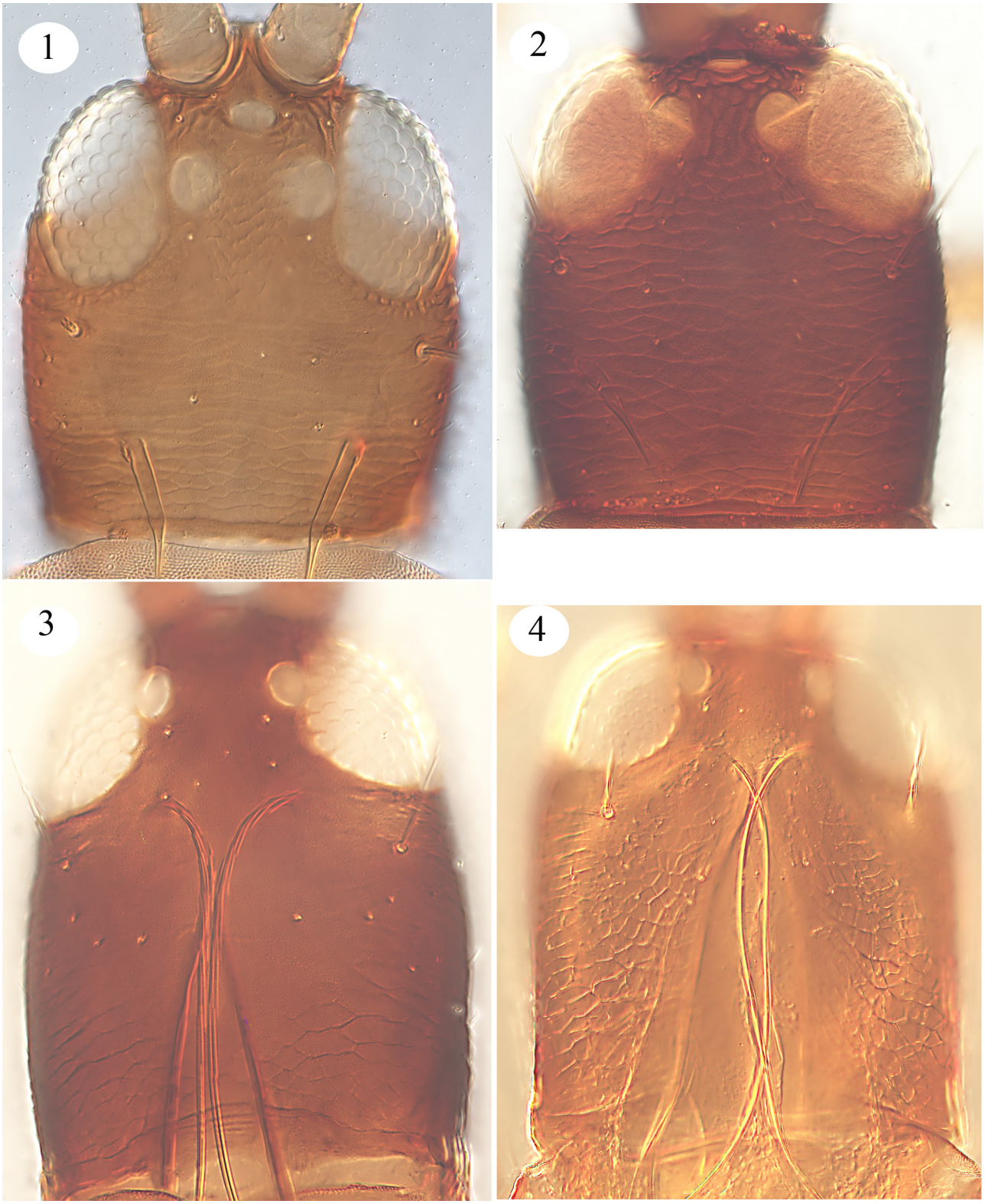
1. Maxillary stylets widely separated, about 50% of head width apart, retracted into head no more than one third of distance to posterior margin of eyes . . . . . 2
- Maxillary stylets close together, no more than 25% of head width apart and sometimes crossing over each other, retracted to posterior margin of eyes . . . . . 3
2. Fore tibia of both sexes with small tubercle at inner apex; postocular and pronotal major setae pointed; antennal segment III yellow, IV–V bicolored; fore wing with 13–16 duplicated cilia . . . . . *cleistanthi*
- Fore tibia of both sexes without apical tubercle; postocular and pronotal major setae weakly capitate; antennal segments III–V yellow; fore wing with 10–12 duplicated cilia . . . . . *kraussi*
3. Occipital ridge of head simple and transverse (Fig. 4); head extensively reticulate; pronotal anteromarginal setae small, 0.25 as long as antennal segment III, 0.16 as long as epimeral setae . . . . . *ornatus*
-. Occipital ridge of head with curved sculptured area medially (Fig. 3); head with transverse lines, reticulate posterolaterally; pronotal anteromarginal setae well developed, 0.5 as long as antennal segment III, 0.5 as long as epimeral setae . . . . . *noumeaensis*

### *Teuchothrips cleistanthi* (Bournier)

(Fig. 1)

*Hoplothrips (Odontoplothrips) cleistanthi* Bournier, 1975: 323.

The description of this species was stated to be based on the female holotype plus 14 females and 13 males, taken from nail galls on leaves of a species of *Cleistanthus* [Phyllanthaceae] at Koumac, Palachidji, near the northern coast of New Caledonia. It is one of the few species of *Teuchothrips* in which the maxillary stylets are about one-third of the head width apart, a condition shared also with *T. kraussi*. Transferred to *Teuchothrips* by Bournier and Mound (2000), it is particularly unusual in having a small tubercle at the inner apex of each fore tibia. For the present study, one male paratype was obtained on loan from Museum National d'Histoire Naturelle, Paris (Fig. 1).




**FIGURES 1–4**. Heads of paratypes of *Teuchothrips* species. **(1)** *cleistanthi*; **(2)** *kraussi*; **(3)** *ornatus*; **(4)** *noumeaensis*.

### ***Teuchothrips kraussi* (Bournier)**
(Fig. 2)

*Oncothrips kraussi* Bournier, 1993: 363.

This species was described from the female holotype plus eight females and five males, taken in rolled leaves of an unidentified plant at Mont Koghi just north of Noumea, New Caledonia. Transferred to *Teuchothrips* by Bournier and Mound (2000), it is an unremarkable member of that genus although with antennae that are extensively yellow. For this study, one female and one male paratypes were obtained on loan from Museum National d'Histoire Naturelle, Paris.

### ***Teuchothrips noumeaensis* Bournier**
(Fig. 3)

*Teuchothrips noumeaensis* Bournier, 1993: 357.

This species was described from the female holotype and eight further females, taken in the rolled leaves of *Hibbertia tontoutensis* [Dilleniaceae] at Tontouta Valley not far from Noumea, New Caledonia. In common with many species of *Teuchothrips* the maxillary stylets are long, but they are particularly close together medially (Fig. 3). It seems to be very similar to *T. ornatus* but has a curious sculptured area medially on the postoccipital ridge of the head, and the pronotal anteromarginal setae are longer with the posteroangular setae shorter. It remains known only from the type series, of which four female and one male paratypes were studied on loan from the Museum National d'Histoire Naturelle, Paris.

### ***Teuchothrips ornatus* Bournier**
(Figs 4, 5)

*Teuchothrips ornatus* Bournier, 1993: 359.

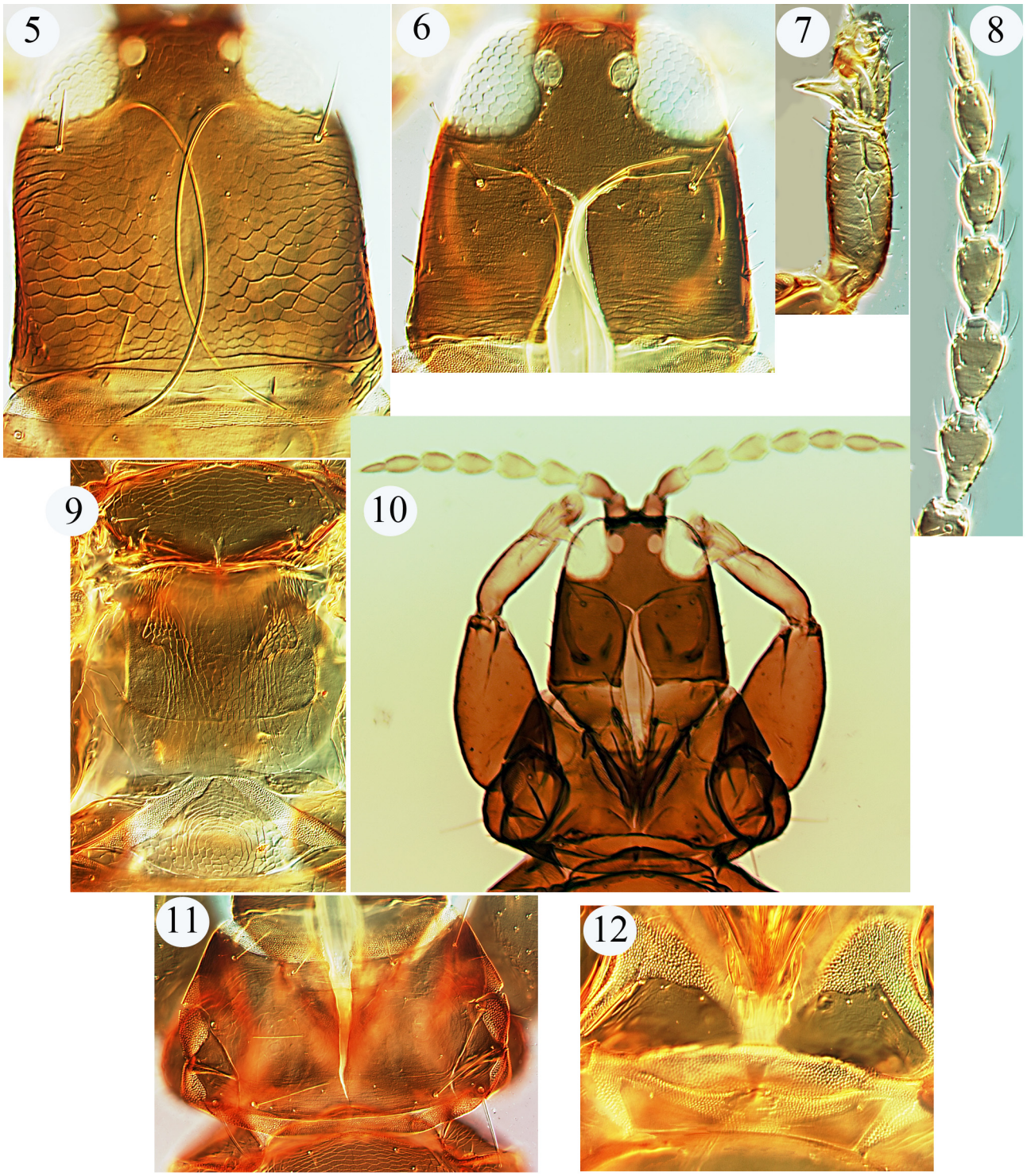
This species was described from the female holotype plus ten females and seven males, taken in the rolled leaves of *Hibbertia lucens* [Dilleniaceae] at Mont Koghi just north of Noumea, New Caledonia. The maxillary stylets are exceptionally long, and commonly cross over each other medially in the head (Figs 4, 5). The vertex is extensively reticulate, the postoccipital ridge simple, and the pronotal anteromarginal setae very small with the posteroangular setae elongate. From the type series, three female and two male paratypes were studied on loan from the Museum National d'Histoire Naturelle, Paris. In addition, a series of eight females and 14 males more recently collected were studied. These were taken from the apical buds of an *Hibbertia* species on Mont Do, about 70km northwest of Noumea in April, 2012 (LAM 5607).

### ***Neocecidothrips pacificus* (Bianchi) comb.n.**
(Figs 6–12)

*Arrhenothrips pacificus* Bianchi, 1952: 385.

This species was described from three females and three males, taken in New Caledonia at Bois du Sud, July 1950, from the rolled leaves of an undetermined plant. The descriptive notes below are based on the holotype female that was studied in Canberra, on loan from the Bishop Museum, Hawaii. The genus *Arrhenothrips* was erected by Hood (1919) for a single species that he described from India as *ramakrishnae*. That species has the typical antennal sense cone formula of members of the *Liothrips* lineage, 1 on III, 3 on IV, but both sexes have a stout fore tarsal tooth and females have the fore femora enlarged. However, the relationships of this genus require further study, including a further four species from India and two from Africa that were subsequently included (ThripsWiki 2021). The species considered here from New Caledonia seems unrelated to *ramakrishnae* in having two stout sense cones on antennal segments III and IV, and antennal segment VIII elongate and narrowed to the base. Moreover, contrary to the description by Bianchi, the fore femora are not particularly enlarged, and the fore tibial inner apex is simple and does not have "a broad tubercle-like distal production" (Fig. 7). The elongate antennal segment VIII of *pacificus* (Fig. 8) is similar to *Litotetothrips* species (Mound & Tree 2021), but the maxillary stylets are deeply retracted and

close together (Fig. 6). The species is here referred to *Neocecidothrips*, because the two known species of that genus (Mound 2008) are the only members of the *Teuchothrips*-group that share a similar antennal sense cone formula.




**FIGURES 5–12**. *Teuchothrips* and *Neocecidothrips*. **(5)** *T. ornatus* head (LAM5607). *N. pacificus* holotype 6–12: **(6)** head; **(7)** fore tibia & tarsus; **(8)** antenna; **(9)** mesonotum, metanotum & pelta. **(10)** head & pronotum; **(11)** pronotum; **(12)** prosternum.

*Descriptive notes*: Antennae 8-segmented, segments III–VI each with 2 stout sense cones, on III both sense cones 0.7 as long as width of segment; VII sharply narrowed to base but neck not as distinct as on VI; VIII slender and narrowed to base. Head posterior to postocular setae with faint narrowly transverse reticulate lines of sculpture; maxillary stylets long, retracted to posterior margin of eyes and close together medially (Figs 6, 10). Pronotum without sculpture lines medially (Fig. 11); all five pairs of major setae capitate but anteromarginals weakly capitate and

35 microns long; anteroangulars 60, epimerals 105; notopleural sutures complete. Basantra absent (Fig. 12); ferna transverse but not meeting medially; mesopresternum of paired lateral triangles with a weak median sclerite anterior to mesosternal margin; metathoracic sternopleural sutures present but not long. Metanotum reticulate on posterior half but very weakly sculptured on anterior half (Fig. 9). Pelta broadly triangular, with pair of CPS. Tergite IX setae S1 capitate and shorter than tube.

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