

Biosecurity in a Biodiversity Hotspot: An Updated Checklist of the Thysanoptera Fauna of New Caledonia

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Abstract

The insect order Thysanoptera is used as an indicator of the vulnerability to foreign insect invasions of New Caledonian ecosystems—both the unique natural systems, and the agricultural and horticultural systems on which the economy is dependent. A total of 103 species in 67 genera of Thysanoptera are here listed from New Caledonia, in contrast to the 68 species in 44 genera that were recorded 23 years ago. Of the 103 species, 22 are not known from anywhere else in the world. Thus, up to 80% of these insect species have arrived in New Caledonia from other countries, with a very high proportion likely to have been introduced through modern trading patterns, despite vigorous efforts by quarantine services.

Keywords

Thrips, Biosecurity, Biodiversity, New Caledonia, Quarantine

1. Introduction

Thysanoptera are often tiny and inconspicuous insects, but for at least 500 years, some species have traveled around the world in the company of man, including the armies of Alexander marching from Europe to India, and the Portuguese and British sailing ships trading between continents [1]. Some traveler species represent a serious threat to agriculture, damaging valuable crops by feeding on leaves and young fruits or by transmitting harmful viruses [2]. Moreover, such species may rapidly acquire tolerance or resistance to insecticides, such that their invasions continually challenge pest management practices [3]. Despite this, a few

thrips species can be predatory on other small arthropods, and thus useful for biological control and sustainable pest management programs [4]. Despite this, at least 50% of Thysanoptera species feed only on fungal hyphae and fungal spores [2]. The objective here is to provide an up-to-date list of the thrips species recorded from New Caledonia, and to evaluate the relative importance of invasive and native species in the disharmonic fauna of this biogeographically isolated island.

2. Methods

2.1. Structure of the Checklist

All nomenclatural and description references in the checklist are available on the web at ThripsWiki (2023)¹, however, this URL is currently unavailable due to the use of ransom ware by cyber criminals in October 2023.

A map detailing the collected sites is provided to help to situate the material examined during the current and former studies (**Figure 1**).

Each species is listed under its family and subfamily, with the number of recorded species known from New Caledonia in each family and subfamily noted in brackets. Each species is listed under its currently valid scientific name, and the common name is provided when available. For each one, suitable references including the date of the first record in New Caledonia are provided, together with general biological information. Newly recorded species are indicated by *, whereas endemic species are indicated by E, species considered occurring naturally in New Caledonia are indicated by N (newly recorded native species by *N) and introduced species by I (newly introduced species by *I). Decisions on natural or introduced are essentially predictions, because the thrips fauna of territories around New Caledonia are not fully explored. Worldwide, almost 6,500 species of thrips in nearly 800 genera are recognized¹. Of these, 103 species in 67 genera are here listed from New Caledonia (**Table 1**), whereas the most recent checklist [5] included only 68 species in 44 genera. Of the extra 35 species, 14 are considered to be endemic or present naturally, whereas 21 are introduced, within 17 distinct genera (**Table 2**).

The checklist provided here is based largely on specimens available in collections, although a few species listed are based on published records. The main microscope slide reference collections are maintained in the following institutions with their abbreviations below.

2.2. Abbreviations and Acronyms

Cited Institutions and Collections

ANIC Australian National Insect Collection, CSIRO (Commonwealth Scientific and Industrial Research Organisation), Canberra, Australia;

¹Thrips Wiki—Providing information on the World's thrips. http://thrips.info/wiki/Main_Page, however, this URL is currently unavailable due to the use of ransom ware by cyber criminals in October 2023. This site is currently unavailable in late 2024, although it is expected to be recovered, information can be found at the following site: https://web.archive.org/web/20230926184940/https://thrips.info/wiki/Main_Page. Also, a copy of all Thysanoptera valid names is available on Catalogue of Life at: <https://www.catalogueoflife.org/data/taxon/9GKWK>, but it does not include any names that are now synonyms, nor any references.

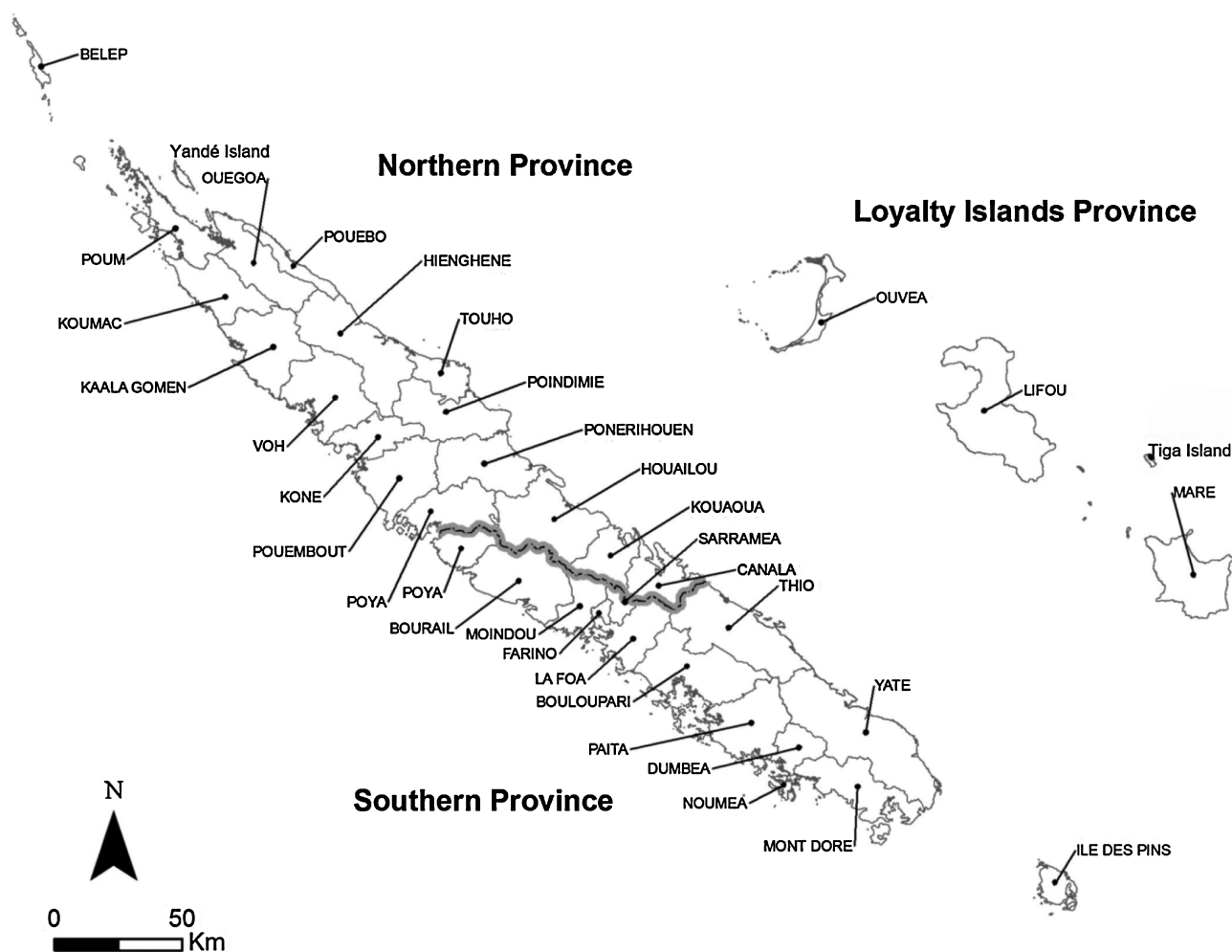


Figure 1. Map of the Archipelago of New Caledonia (after Frédéric RIGAUT, IRD). Parks and reserves locations: Bouloupari County: *Réserve spéciale de Faune et de Flore du Mont Dore*; Nouméa County: *Parc zoologique et forestier—Michel CORBASSON*; Ponerihouen County: *Réserve de nature sauvage du Massif de l'Aopupinié*; Thio County: *Réserve botanique du Pic Ningua*; Yaté County: *Parc Provincial de la Rivière Bleue* and *Réserve spéciale botanique du Pic du Pin*.

Table 1. List of the thrips species known from New Caledonia with their assigned biogeographic region of origin and their ecological function.

Subfamilies	Species	Biogeographic region of origin	Ecological function
Aeolothripinae Bagnall, 1913	<i>Aduncothrips inauditus</i> (Bianchi, 1945)	Australasian	B
	<i>Franklinothrips brunneicornis</i> Mound & Reynaud, 2005	Australasian	B
	<i>Franklinothrips vespiformis</i> (D.L. Crawford, 1909)	Nearctic	B
Merothripinae Hood, 1914	<i>Merothrips floridensis</i> (Watson, 1927)	Nearctic	F
Idolothripinae Bagnall, 1908	<i>Celidothrips dolichos</i> (Hood, 1918)	Australasian	F
	<i>Egchocephalothrips monstrosus</i> (Bagnall, 1909)	Australasian	F
	<i>Ethirothrips adventor</i> (Bianchi, 1945)	Australasian	F

Continued

	<i>Ethirothrips stenomelas</i> (Walker, 1859)	Oriental	F
	<i>Gastrothrips acuticornis</i> Hood, 1925	Nearctic	F
	<i>Neosmerinthothrips longisetis</i> Bournier, 1997	Australasian	F
	<i>Nesothrips lativentris</i> (Karny, 1913)	Pacific	F
	<i>Nesothrips propinquus</i> (Bagnall, 1916)	Australasian	F
	<i>Aleurodothrips fasciapennis</i> (Franklin, 1908)	Nearctic	B
	<i>Adraneothrips moundi</i> Goldarazena & Michel, 2022	Australasian	F
	<i>Adrothrips intermedius</i> (Bianchi, 1945)	Australasian	B
	<i>Bamboosiella cingulata</i> (Hood, 1919)	Australasian/Pacific	F
	<i>Dactylothrips priscus</i> (Girault, 1928)	Australasian	F
	<i>Dolichothrips indicus</i> (Hood, 1919)	Oriental	P
	<i>Gynaikothrips ficorum</i> (Marchal, 1908)	Oriental	P
	<i>Gynaikothrips uzeli</i> (Zimmerman, 1900)	Oriental	P
	<i>Haplothrips bituberculatus</i> (Girault, 1927)	Australasian	B/P/F
	<i>Haplothrips fusicornis</i> (Bagnall, 1929)	Oriental/Australasian	P
	<i>Haplothrips ganglbaueri</i> Schmutz, 1913	Oriental	P
	<i>Haplothrips gowdeyi</i> (Franklin, 1908)	Africa	B/P
	<i>Haplothrips pallescens</i> (Hood, 1919)	Australasian	F
	<i>Haplothrips victoriensis</i> Bagnall, 1918	Australasian	B/P
Phlaeothripinae	<i>Holothrips lafoae</i> Mound & Tree, 2014	Australasian	F
Uzel, 1895	<i>Holothrips oceanicus</i> Okajima, 1987	Australasian	F
	<i>Karnyothrips flavipes</i> (Jones, 1912)	Nearctic	B
	<i>Karnyothrips melaleucus</i> (Bagnall, 1911)	Oriental	B/F
	<i>Kellyia hoodianus</i> (Bagnall, 1924)	Australasian	B
	<i>Kellyia milmani</i> (Girault, 1927)	Australasian	B
	<i>Leeuwenia angulata</i> Bianchi, 1952	Australasian	P
	<i>Leichhardtithrips evanidus</i> Tree & Mound, 2013	Australasian	F
	<i>Litotethrips caledonensis</i> (Bournier, 1993)	Australasian	P
	<i>Macrophthalmothrips neocaledonensis</i> Bournier, 1997	Australasian	F
	<i>Neocecidothrips pacificus</i> (Bianchi, 1952)	Australasian	F
	<i>Neohoodiella grandisetis</i> Bournier, 1997	Australasian	F
	<i>Podothrips xanthopus</i> Hood, 1919	Australasian	B
	<i>Pseudophilothrips varicornis</i> (Hood, 1912)	Nearctic	P
	<i>Stephanothrips cf. cuneatus</i> Zhao & Tong, 2016	Oriental	F
	<i>Sophiothrips typicus</i> (Ananthakrishnan, 1964)	Oriental	F

Continued

	<i>Stephanothrips occidentalis</i> Hood & Williams, 1925	Oriental	F
	<i>Teuchothrips cleistanthi</i> (Bournier, 1975)	Australasian	P
	<i>Teuchothrips kraussi</i> (Bournier, 1993)	Australasian	P
	<i>Teuchothrips noumeaensis</i> Bournier, 1993	Australasian	P
	<i>Teuchothrips ornatus</i> Bournier, 1993	Australasian	P
	<i>Yarnkothrips kolourus</i> Mound & Walker, 1986	Australasian	B/F
Dendrothripinae Priesner, 1925	<i>Dendrothrips reticulatus</i> Bournier, 1997	Australasian	P
	<i>Ensiferothrips primus</i> Bianchi, 1945	Australasian	P
	<i>Filicopsothrips wellsae</i> Mound, 1999	Australasian	P
Panchaethripinae Bagnall, 1912	<i>Copidothrips octarticulatus</i> (Schmutz, 1913)	Oriental	P
	<i>Elixothrips brevisetis</i> (Bagnall, 1919)	Africa	P
	<i>Heliiothrips haemorrhoidalis</i> (Bouché, 1833)	Australasian	P
	<i>Hercinothrips bicinctus</i> (Bagnall, 1919)	Africa	P
	<i>Hercinothrips femoralis</i> (O.M. Reuter, 1891)	Africa	P
	<i>Pennathrips bournierorum</i> (Goldarazena, Michel & Mound, 2021)	Australasian	P
	<i>Phibalothrips longiceps</i> (Karny, 1913)	Australasian/Pacific	P
	<i>Selenothrips rubrocinctus</i> (Giard, 1901)	Africa	P
Sericothripinae Karny, 1921	<i>Neohydatothrips gracilipes</i> (Hood, 1924)	Nearctic	P
Thripinae Stephens, 1829	<i>Anaphotrips sudanensis</i> Trybom, 1911	Australasian	P
	<i>Anaphotrips swezeyi</i> Moulton, 1928	Australasian/Pacific	P
	<i>Arorathrips mexicanus</i> (D.L. Crawford, 1909)	Nearctic	P
	<i>Ayyaria chaetophora</i> Karny, 1927	Oriental	P
	<i>Bolacothrips pulcher</i> Girault, 1929	Australasian	P
	<i>Bregmatothrips binervis</i> (Kobus, 1893)	Oriental/Pacific	P
	<i>Caprithrips insularis</i> Beshear, 1975	Nearctic	P
	<i>Caprithrips orientalis</i> Bhatti, 1973	Oriental/Pacific	P
	<i>Chaetanaphothrips leeuweni</i> (Karny, 1914)	Oriental/Pacific	P
	<i>Chaetanaphothrips orchidii</i> (Moulton, 1907)	Australasian	P
	<i>Chaetanaphothrips signipennis</i> (Bagnall, 1914)	Australasian	P
	<i>Chirothrips ah</i> Girault, 1929	Australasian	P
	<i>Dendrothripoides innoxius</i> (Karny, 1914)	Oriental	P
	<i>Dichromothrips corbetti</i> (Priesner, 1936)	Oriental	P
	<i>Frankliniella occidentalis</i> (Pergande, 1895)	Nearctic	P
<i>Frankliniella schultzei</i> (Trybom 1910)	Australasian	P	

Continued

<i>Frankliniella williamsi</i> Hood, 1915	Nearctic	P
<i>Lefroythrips varatharanjani</i> Rachana & Manjunath, 2020	Oriental	P
<i>Megalurothrips usitatus</i> (Bagnall, 1913)	Oriental	P
<i>Microcephalothrips abdominalis</i> (D.L. Crawford, 1910)	Australasian	P
<i>Oxythrips festivus</i> Bianchi, 1952	Australasian	?
<i>Pezothrips kellyanus</i> (Bagnall, 1916)	Australasian	P
<i>Plesiothrips perplexus</i> (Beach, 1896)	Neartic	P
<i>Rhamphothrips pandens</i> Sakimura, 1983	Neartic/Pacific	P
<i>Salpingothrips aimotofus</i> Kudo, 1972	Oriental	P
<i>Scirtothrips albomaculatus</i> Bianchi, 1945	Australasian	P
<i>Scirtothrips australiae</i> Hood, 1919	Australasian	P
<i>Scirtothrips dorsalis</i> Hood, 1919	Oriental	P
<i>Thrips bianchii</i> (Sakimura, 1969)	Australasian	P
<i>Thrips diana</i> Mound & Masumoto, 2005	Australasian	P
<i>Thrips hawaiiensis</i> (Morgan, 1913)	Oriental/Pacific	P
<i>Thrips imaginis</i> (Bagnall, 1926)	Australasian	P
<i>Thrips insignis</i> (Bianchi, 1945)	Australasian	P
<i>Thrips maculicollis</i> (Hood, 1918)	Australasian/Pacific	P
<i>Thrips novocaledonensis</i> (Bianchi, 1945)	Australasian	P
<i>Thrips orientalis</i> (Bagnall, 1915)	Oriental	P
<i>Thrips palmi</i> Karny, 1925	Oriental	P
<i>Thrips safrus</i> Mound & Masumoto, 2005	Australasian/Pacific	P
<i>Thrips simplex</i> (Morrison, 1930)	Africa	P
<i>Thrips sumatrensis</i> Priesner, 1934	Oriental	P
<i>Thrips tabaci</i> Lindeman, 1889	Palaearctic	P
<i>Thrips vitticornis</i> Karny, 1922	Oriental	P
<i>Trichromothrips cf. fragilis</i> Masumoto & Okajima, 2005	Oriental	P

Endemic taxa are displayed in bold; Ecological functions: “B” for beneficial predators, “F” for fungivores and decomposers or scavengers, “P” for phytophagous pests.

Table 2. List of the 35 extra thrips species known from New Caledonia since the Bournier & Mound (2000)’s statement.

Family/Subfamily	Species	Statement
Aeolothripidae	<i>Franklinothrips brunneicornis</i> Mound & Reynaud	E
Phlaeothripidae: Idolothripinae	<i>Celidothrips dolichos</i> (Hood)	*N
Phlaeothripidae: Phlaeothripinae	<i>Adraneothrips mouni</i> Goldarazena & Michel	E
	<i>Dactylothrips priscus</i> (Girault)	*I

Continued

	<i>Dolichothrips indicus</i> (Hood)	N	
	<i>Gynaikothrips ficorum</i> (Marchal)		*I
	<i>Gynaikothrips uzeli</i> (Zimmermann)		*I
	<i>Haplothrips bituberculatus</i> (Girault)		*I
	<i>Haplothrips fuscicornis</i> (Bagnall)	N	
	<i>Holothrips lafoae</i> Mound & Tree	E	
	<i>Holothrips oceanicus</i> Okajima	N	
	<i>Kellyia hoodianus</i> (Bagnall)		*I
	<i>Leichhardtithrips evanidus</i> Tree & Mound	N	
	<i>Pseudophilothrips varicornis</i> (Hood)		*I
	<i>Sophiothrips typicus</i> (Ananthakrishnan)	N	
	<i>Stephanothrips cf. cuneatus</i> (Zhao & Tong)	E	
	<i>Yarnkothrips kolourus</i> Mound & Walker	N	
	<i>Copidothrips octarticulatus</i> (Schmutz)		*I
	<i>Elixothrips brevisetis</i> (Bagnall)		*I
Thripidae: Panchaetothripinae	<i>Hercinothrips femoralis</i> (Reuter)		*I
	<i>Pennathrips bournierorum</i> Goldarazena, Michel & Mound	E	
	<i>Neohydatothrips gracilipes</i> (Hood)		I
	<i>Ayyaria chaetophora</i> Karny		*I
	<i>Chaetanaphothrips leeuweni</i> (Karny)		*I
	<i>Chaetanaphothrips orchidii</i> (Moulton)		*I
	<i>Chaetanaphothrips signipennis</i> (Bagnall)		*I
	<i>Dichromothrips corbetti</i> (Priesner)		*I
	<i>Frankliniella williamsi</i> Hood		*I
Thripidae: Sericothripinae	<i>Lefroyothrips varatharajani</i> Rachana & Manjunath		I
	<i>Salpingothrips aimotofus</i> Kudo		*I
	<i>Thrips diana</i> Mound & Masumoto	E	
	<i>Thrips hawaiiensis</i> (Morgan)		I
	<i>Thrips safrus</i> Mound & Masumoto		*N
	<i>Thrips sumatrensis</i> Priesner		I
	<i>Trichomothrips cf. fragilis</i> Masumoto & Okajima		*I

*I Newly recorded; "E" Endemic; "N" Naturally occurring; "I" Introduced.

CIRAD Centre International de Recherche Agronomique pour le Développement, Montpellier, France;

CXMNC Collection de référence des invertébrés terrestres de Nouvelle-Calédonie Xavier-Montrouzier, IAC (Institut Agronomique néo-Calédonien), La Foa, New Caledonia;

NHM Natural History Museum, London, United Kingdom;

MNCN Museo Nacional de Ciencias Naturales, ICA-CSIC (Instituto de Ciencias Agrarias, Institute of Agricultural Sciences, Consejo Superior de Investigaciones Científicas), Madrid, Spain;

MNHN Muséum national d'Histoire naturelle, Paris, France.

3. Features of the New Caledonian Thrips Fauna

3.1. Endemicity in the Thrips Fauna

Only about 20% of the recorded thrips species in New Caledonia have been found nowhere else in the world, which is probably an underestimate of thrips endemicity. This rate is far lower than for many insect groups on this island, with for example, Cicadidae (Hemiptera) [6], Crickets (Orthoptera) [7] and Chrysomelidae (Coleoptera) [8] exhibiting some rates ranging from 100% to 90% endemicity [6]-[8]; while some other important pest fauna such as aphids [9], scale insects [10] or tephritid fruit flies [11] show some low endemicity rates with 0, 24.6 and 50%, respectively. Thus, the endemicity of Thysanoptera in New Caledonia may well be higher than the numbers suggest. This is because of sampling bias in thrips collecting; these insects are usually taken only by entomologists who are associated with crop production and protection. Within New Caledonia, very little collecting of thrips has been targeted at the rich native flora, and this flora is increasingly found only in remote areas due to the expanding areas used for agriculture. The relationships between Thysanoptera species and this rich endemic flora merits far greater exploration and study.

In considering the list given here, it is important to remember that the endemic thrips fauna of New Caledonia is largely unexplored. Specimens of several undescribed taxa have been seen, but these are known from too few specimens to warrant their description. This is particularly true in the highly diverse Family Phlaeothripidae, although there are also undescribed species in the common Thripidae genera *Scirtothrips* and *Thrips*. The low endemicity rate apparent from the following list will surely change with the description of these new taxa.

3.2. Biogeographic Relationships in the Thrips Fauna

The accuracy of some of the records listed here is doubtful. For example, the record of a little-known Malaysian species from New Caledonia, *Haplothrips fuscicornis*, remains unproven and is unlikely. Similarly, the identity and generic relationships of *Oxythrips festivus* remain doubtful. The identification of a specimen as *Stephanothrips cuneatus* is known to be conjectural, and the identification of several females from New Caledonia as *Trichromothrips fragilis* remains doubtful in the absence of conspecific males. Despite these problems a considerable number of the 100 species listed here are shared with Australia, and about 15 of these

almost certainly evolved on that continent. One surprising absence from New Caledonia is *Thrips australis*, a species that has been distributed around the world breeding in the flowers of *Eucalyptus* and a few related Myrtaceae species [12]. About 50% of the listed species are widespread in other parts of the world, and many of these are certainly cosmopolitan. As in Australia, the thrips fauna in peri-urban and cultivated areas is dominated by invasive species that have accompanied man in trading activities around the world. This human dispersal is by no means restricted to pests, but includes a surprising number of fungus-feeding species [13].

3.3. Importance of Thrips in Eco- and Agrosystems

The presence on a crop of even such known pest species as *Frankliniella occidentalis*, *F. schultzei*, *Thrips tabaci* and *T. palmi* is no guarantee that at any particular time and place that population of the species will constitute an economic problem [2]. The difficulty of estimating the importance of any thrips species as a pest depends on the crop and its state of growth, the season and time of year, the geographical area involved, and very often on the skill of a cultivator in avoiding or reducing pest injury by various cultivation strategies. Resorting to chemical control is seen as the easiest response, but it is not necessarily the most cost effective. Some thrips species are best known as pests of greenhouse crops, including *Heliotothrips haemorrhoidalis*, *Hercinothrips* spp., *Chaetanaphothrips* spp., but each of these can also be a problem on other crops in some warmer parts of the world. In contrast to the view of thrips as pests, many species make positive contributions to the health and longevity of ecosystems. Spore-feeding and fungal-feeding species are not merely interesting insects, they are part of the essential recycling of nutrients from dead plant tissues that makes such nutrients available for the growth of new plant tissues. More obviously, thrips can be essential pollinators of some plants, although this relationship is not broadly studied. Particular species of thrips have been demonstrated to be the essential pollinators of particular plants, including *Macaranga* trees in Southeast Asia; a species of *Antiaropsis* trees (Moraceae) endemic to New Guinea; an Australian cycad, *Macrozamia macdonnellii*; and a subtropical rainforest tree in eastern Australia [14]-[17]. However, there has been little critical study of thrips as more widespread pollinators, despite the ease with which species breeding in flowers can be observed as bearing many pollen grains on their bodies. One association that could be approached experimentally by excluding thrips could be the *Haplothrips* that are commonly found in the flowers of some Asteraceae. Moreover, in New Caledonia there are interesting early lineages of flowering plants, and these have not been studied for any association with thrips. A further contribution to ecosystems by thrips is as predators of other small arthropods. Among the 6,500 species of Thysanoptera 102 species in 24 genera have been listed as exhibiting such behaviour [4]. Of these, 35 species in 11 genera are members of the Family Aeolothripidae, 45 species in eight genera are Phlaeothripidae, and 22 species in six genera are Thripidae. Thus,

the predatory habit by thrips has apparently evolved multiple times, and it occurs in multiple ecosystems. These insects should thus be regarded as potentially providing a significant source of biological control agents and should be promoted in New Caledonian Integrated Pest Management (IPM) and Agroecological Crop Protection (ACP) programs. The relationships of some such predatory thrips with some weeds of cropping systems could be manipulated to benefit their biocontrol contribution to agrosystems.

3.4. Biosecurity

Exotic thrips are regularly and accidentally introduced because of their minute size. The larvae and pupae of pest species often position themselves close to a leaf vein where they can be almost impossible to detect. It is thus easy to plant a new crop using seedlings that are already infected – one example being the habit of using the terminal 5 cm from a mature chrysanthemum as the planting material for a new crop. New thrips incursions may have two main concerns: (1) the direct impacts on crops and/or environments, and (2) the indirect impact regarding biosecurity and quarantine consequences. This second concern can result in strict restrictions for export of some commodities. Fortunately, the two HTFA (High Temperature Forced Air) treatments developed (43°C during 3 h 30 and 47°C during 20 minutes) against true fruit flies (Diptera: Tephritidae) can also kill thrips [18].

Despite care by quarantine authorities, at least 19 of the species in the Checklist below have been officially recorded from New Caledonia in the past decade: *Ay-yaria chaetophora*, *Celidothrips dolichos*, *Chaetanaphothrips leeuweni*, *C. orchidii*, *C. signipennis*, *Copidothrips octarticulatus*, *Dactylothrips priscus*, *Dichromothrips corbetti*, *Elixothrips brevisetis*, *Frankliniella williamsi*, *Gynaikothrips ficorum*, *G. uzeli*, *Haplothrips bituberculatus*, *Hercinothrips femoralis*, *Kellyia hoodianus*, *Pseudophilothrips varicornis*, *Salpingothrips aimotofus*, *Thrips safrus* and *Trichromothrips cf. fragilis*.

Some species are more or less regularly intercepted from Australia, New Zealand and France, including the following 14 species in the Checklist. Aeolothripidae: *Aeolothrips fasciatus*, *Desmothrips propinquus*. Thripidae: *Anaphothrips moundi*, *A. obscurus*, *Chirothrips manicatus*, *Frankliniella intonsa*, *Limothrips denticornis*, *Pseudanaphothrips achaetus*, *Thrips australis*, *T. florum*, *T. obscuratus*, *T. trehernei* and *T. vulgatissimus*. Phlaeothripidae: *Haplothrips varius* (Table 3). Some of these species constitute a significant threat, because the detection of recurrent introductions suggests an increasing probability of settlement during a suitable period of the year when the climate range could match.

Another concern is about the seven species that are regularly found by quarantine but are established on New Caledonia (Table 4). These are *Thrips tabaci*, *Frankliniella occidentalis*, *T. imaginis*, *F. schultzei*, *F. intonsa*, *T. obscuratus* and *T. australis*. In descending order of frequency, these are the most intercepted thrips species at the borders of New Caledonia since the beginning of systematic

Table 3. List of the 14 thrips species regularly intercepted by the New Caledonia Biosecurity Services (*DAVAR-SIVAP*) from Australia, New Zealand and France on several commodities and still considered unestablished in New Caledonia.

Family	Species and common name	Intercepted commodity	Country of origin
Aeolothripidae	<i>Aeolothrips fasciatus</i> (Linnaeus, 1758) Banded thrips	Asparagaceae Asparagus (<i>Asparagus officinalis</i>) Asteraceae Artichoke (<i>Cynara scolymus</i>)	Australia & New Zealand
	<i>Desmothrips propinquus</i> (Bagnall, 1916)	Apiaceae Celery (<i>Apium graveolens</i>)	Australia
Phlaeothripidae	<i>Haplothrips varius</i> Hood, 1918	Asparagaceae Asparagus (<i>Asparagus officinalis</i>)	Australia
Thripidae	<i>Anaphothrips moundi</i> Pitkin, 1978	Apiaceae Fennel (<i>Foeniculum vulgare</i>)	Australia
	<i>Anaphothrips obscurus</i> (Müller, 1776) Grain thrips or American grass thrips	Apiaceae Fennel (<i>Foeniculum vulgare</i>)	Australia
	<i>Frankliniella intonsa</i> Trybon, 1895 European flower thrips	Apiaceae Fennel (<i>Foeniculum vulgare</i>) Rosaceae Strawberry (<i>Fragaria</i> sp.)	New Zealand
	<i>Chirothrips manicatus</i> (Haliday, 1836) Timothy thrips	Asparagaceae Asparagus (<i>Asparagus officinalis</i>)	Australia
	<i>Limothrips denticornis</i> Haliday, 1836 Barley thrips	Caprifoliaceae Lamb's lettuce (<i>Valerianella locusta</i>)	France
	<i>Pseudanaphothrips achaetus</i> (Bagnall, 1916) Australian flower thrips	Apiaceae Fennel (<i>Foeniculum vulgare</i>)	Australia
	<i>Thrips australis</i> (Bagnall, 1915) Australia gum tree flower thrips	Apiaceae Celery (<i>Apium graveolens</i>), Fennel (<i>Foeniculum vulgare</i>)	Australia
	<i>Thrips florum</i> Schmutz, 1913 Oriental flower thrips	Apiaceae Fennel (<i>Foeniculum vulgare</i>)	New Zealand
	<i>Thrips obscuratus</i> (Crawford, 1941) New Zealand flower thrips	Brassicaceae Cabbage (<i>Brassica oleracea</i>), Cauliflower (<i>Brassica oleracea</i> var. <i>botrytis</i>)	New Zealand
	<i>Thrips trehernei</i> Priesner, 1927	Asteraceae Artichoke (<i>Cynara scolymus</i>)	Australia
<i>Thrips vulgatissimus</i> Haliday, 1836 White flower thrips	Brassicaceae Chinese cabbage "Wong bok" (<i>Brassica rapa</i> subsp. <i>pekinensis</i>)	New Zealand	

samplings in 2008 to 2023. This can be partly explained by the number of distinct imported commodities ranging from 26, 19, 6, 5, 4, 3 and 2 respectively (Table 4).

In Table 5, we present the number of specimens and the ratio of each of the seven most intercepted species from 2008 to 2023. *T. tabaci* represents 86.3% of the total of intercepted specimens, as might be expected due to the extreme

Table 4. List of the seven most regularly intercepted and established thrips species in New Caledonia on imported commodities on which they were collected from 2008 to 2023.

Family	Species	Intercepted commodities [= number of species]	Country of origin
Thripidae	<i>Frankliniella intonsa</i>	Apiaceae: Celeriac (<i>Apium graveolens</i> var. <i>rapaceum</i>), Fennel (<i>F. vulgare</i>); Rosaceae: Strawberry (<i>Fragaria</i> sp.); Alliaceae: Leek (<i>Allium ampeloprasum</i> var. <i>porrum</i>) [=4].	New Zealand
	<i>Frankliniella occidentalis</i>	Alliaceae: Leek (<i>Allium ampeloprasum</i> var. <i>porrum</i>); Amaranthaceae: Spinach (<i>Spinacea oleracea</i>); Apiaceae: Celery (<i>Apium graveolens</i>), Coriander (<i>Coriandrum sativum</i>), Fennel (<i>F. vulgare</i>), Parsley (<i>Petroselinum crispum</i>); Asparagaceae: Asparagus (<i>Asparagus officinalis</i>); Asteraceae: Lettuce (<i>Lactuca sativa</i>); Brassicaceae: Cabbage (<i>Brassica oleracea</i>), Chinese Cabbage “Wong bok” (<i>B. rapa</i> subsp. <i>pekinensis</i>), Cauliflower (<i>B. oleracea</i> var. <i>botrytis</i>), Red Cabbage (<i>B. oleracea</i> var. <i>capitata</i> f. <i>rubra</i>); Bromeliaceae: Bromelia (<i>Guzmania</i> sp.); Ericaceae: Blueberry (<i>Vaccinium myrtillus</i>); Moraceae: Blackberries (<i>Morus</i> sp.); Rosaceae: Strawberry (<i>Fragaria</i> sp.), Raspberry (<i>Rubus idaeus</i>); Solanaceae: Pepper (<i>Capsicum annuum</i>); fresh cut flowers [=19].	Australia, France, New Zealand & United States of America
	<i>Frankliniella schultzei</i>	Apiaceae: Coriander (<i>C. sativum</i>); Asparagaceae: Asparagus (<i>A. officinalis</i>); Asteraceae: Lettuce (<i>L. sativa</i>); Brassicaceae: Cabbage (<i>B. oleracea</i>); Rosaceae: Strawberry (<i>Fragaria</i> sp.) [=5].	Australia
	<i>Thrips australis</i>	Apiaceae: Celery (<i>Apium graveolens</i>), Fennel (<i>F. vulgare</i>) [=2].	Australia
	<i>Thrips imaginis</i>	Apiaceae: Celery (<i>Apium graveolens</i>), Fennel (<i>F. vulgare</i>); Asparagaceae: Asparagus (<i>A. officinalis</i>); Asteraceae: Artichoke (<i>Cynara cardunculus</i> var. <i>scolymus</i>); Brassicaceae: Cauliflower (<i>B. oleracea</i> var. <i>botrytis</i>), Broccoli (<i>B. oleracea</i> var. <i>italica</i>) [=6].	Australia
	<i>Thrips obscuratus</i>	Brassicaceae: Cauliflower (<i>B. oleracea</i> var. <i>botrytis</i>), Broccoli (<i>B. oleracea</i> var. <i>italica</i>), Red Cabbage (<i>B. oleracea</i> var. <i>capitata</i> f. <i>rubra</i>) [=3].	New Zealand
	<i>Thrips tabaci</i>	Alliaceae: Leek (<i>Allium ampeloprasum</i> var. <i>porrum</i>), Onion (<i>A. cepa</i> var. <i>aggregatum</i>), Bunching Onion (<i>A. fistulosum</i>), Shallot (<i>A. ascalonicum</i>); Amaranthaceae: Beet (<i>Beta vulgaris</i>); Apiaceae: Celery (<i>Apium graveolens</i>), Celeriac (<i>Apium graveolens</i> var. <i>rapaceum</i>), Dill (<i>Anethum graveolens</i>), Fennel (<i>F. vulgare</i>), Parsley (<i>Petroselinum</i> spp.); Asparagaceae: Asparagus (<i>A. officinalis</i>), Muguet (<i>Convallaria majalis</i>); Asteraceae: Artichoke (<i>Cynara cardunculus</i> var. <i>scolymus</i>), Lettuce (<i>Lactuca sativa</i>); Brassicaceae: Brussels sprouts (<i>B. oleracea</i> var. <i>gemmifera</i>), Cabbage (<i>B. oleracea</i>), Cauliflower (<i>B. oleracea</i> var. <i>botrytis</i>), Broccoli (<i>B. oleracea</i> var. <i>italica</i>), Red Cabbage (<i>B. oleracea</i> var. <i>capitata</i> f. <i>rubra</i>), Chinese Cabbage “Wong bok” (<i>B. rapa</i> subsp. <i>pekinensis</i>); Cucurbitaceae: Squash (<i>Cucumis pepo</i>); Fabaceae: Green bean (<i>Phaseolus vulgaris</i>), Peas (<i>P. sativum</i>); Geraniaceae: Geranium (<i>Pelargonium</i> sp.); Poaceae: Corn (<i>Triticum sativum</i>); Polygonaceae: Rhubarb (<i>Rheum</i> sp.); Rosaceae: Strawberry (<i>Fragaria</i> sp.); Solanaceae: Pepper (<i>Capsicum annuum</i>) [=26].	Australia, New Zealand & Ukraine

Table 5. Numbers and rates of the seven most intercepted species in the New Caledonia borders from 2008 to 2023.

	<i>T. tabaci</i>	<i>F. occidentalis</i>	<i>T. imaginis</i>	<i>T. obscuratus</i>	<i>T. australis</i>	<i>F. intonsa</i>	<i>F. schultzei</i>	Totals
Numbers	1904	213	67	6	6	5	5	2206
Rates (%)	86.3	9.7	3.0	0.3	0.3	0.2	0.2	100

T. for *Thrips*, *F.* for *Frankliniella*.

polyphagy of this species. The six remaining species only represent 13.7%. It is also interesting to note that all of them are Thripinae species. Among the seven intercepted species, three of them represent 99% of the thrips interceptions (**Figure 2**). **Figure 2** emphasizes that samplings increase and improve consistently on the period, undoubtedly because of a greater awareness of the Quarantine services.

One might think that such already established species are not of Quarantine importance, but the ability of different strains of *F. occidentalis*, *F. schultzei* and *T. tabaci* to transmit plant viruses, maintains such species at a high Quarantine significance. Viruses such as TSWV Tomato spotted wilt virus and TCSV Tomato chlorotic spot virus are currently absent from New Caledonia (Nicolas Hugo, CAP-NC/GDS-V, com. pers., 3rd May 2023). *T. imaginis* is not considered a virus vector and despite its large populations in Australia has not been considered a serious pest on crops in recent years. Some specific virus surveillance should be undertaken, especially on these potential vectors that are intercepted at the borders. Interestingly, *Thrips palmi*, another important pest species that is apparently established, is never intercepted at the borders despite its high-risk invasive potential from Australia (Northern Territory and Queensland). This species is known as “highly polyphagous, particularly on Cucurbitaceae and Solanaceae” [19], of which some plants are currently imported from Australia.

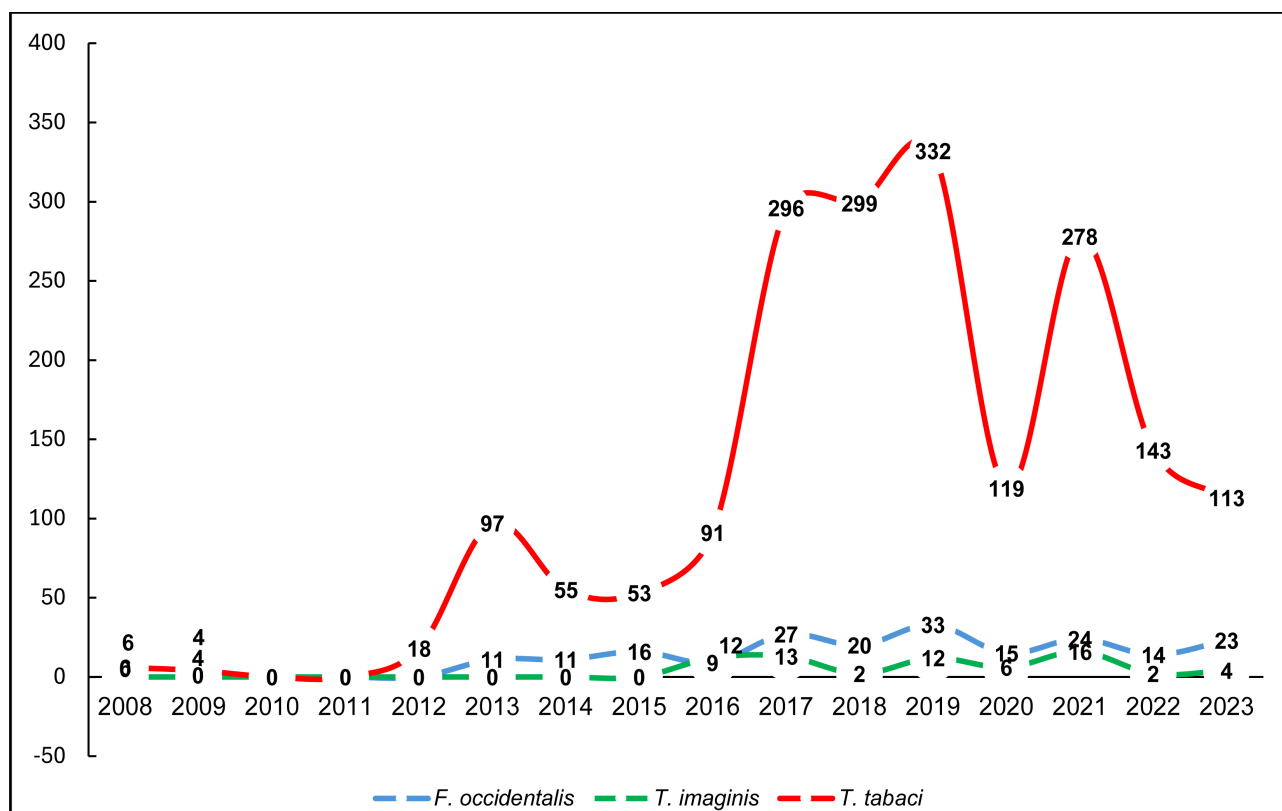


Figure 2. Evolution of the numbers of specimens of the three main species among the seven most intercepted at the borders (vertical axis) from 2008 to 2023 (horizontal axis).

4. Discussion

Considering thrips within the context of biosecurity programs in New Caledonia, one major threat is the South African citrus thrips (*Scirtothrips aurantii* Faure). This is present in parts of eastern Queensland but is not found in citrus. It is widespread on the common succulent pasture weed, Mother of Millions (*Bryophyllum delagoense*). Under experimental conditions, populations of this strain have been shown to breed on several cultivated species, including mango trees (*Mangifera indica*, Anacardiaceae), grape (*Vitis vinifera*, Vitaceae), chili (*Capsicum* spp., Solanaceae), pea and green bean (*Pisum* sp. and *Phaseolus* sp., Fabaceae), and blueberry (*Vaccinium myrtillus*, Ericaceae) [20]. As a result, it has to be considered a potential threat to the production of these valuable crops in New Caledonia. It could easily be introduced to New Caledonia and become a threat to the citrus industry and also to some endemic basal citrus species of the former genus *Oxanthera* in New Caledonia that are now included in the genus *Citrus* (Rutaceae).

The need for strong regulatory measures, accompanied by construction of a Plant Quarantine facility, becomes mandatory in such a biodiversity hotspot. These measures were first requested in 1953—that is now 70 years ago—by the late Dr François COHIC from the ORSTOM research institute [21]-[23], also regularly and more recently renewed [9] [10] [24]. These measures and this Quarantine facility are needed because thrips are found mainly on the imported leaves, flowers, fruits and vegetables, considering that over 300,000 units of ornamental plants are imported annually. Amongst all imported commodities, including imported fruits and vegetables, these ornamental plants represent the most significant invasion pathway for Quarantine insects in general and of course for thrips species. Samplings are already intensively done by the Biosecurity officers on all introduced plant materials; however, these samplings could be improved by some trappings within the Quarantine zone. The renowned biodiversity of New Caledonia and its agriculture deserve an increased protection in the face of global changes and future agricultural challenges.

5. A Checklist of New Caledonian Thysanoptera

AEOLOTHRIPIDAE (3)

Aduncothrips inauditus (Bianchi, 1945)^B

Aeolothrips inauditus Bianchi, 1945: 261.

Biology: Flower-living, possibly predator of other thrips [25].

Distribution: Known only from New Caledonia; recorded in *Province Sud*, La Foa County (*Oua Tom*) on *Melaleuca* sp. flowers; Nouméa County on *Mangifera indica* flowers; Poya County from *Citrus*; Boulouparis County (*Réserve spéciale de faune et de flore du Mont Do*), Dumbéa County in *Mont Nondoué* and District of Yahoué [5] [26] [27].

Material examined: South part of Poya County (*Province Sud*), from *Citrus* sp. (Rutaceae) leaves and flowers through a funnel trap, 20.X.2004, in ANIC.

***Franklinothrips brunneicornis* Mound & Reynaud, 2005^B**

Franklinothrips brunneicornis Mound & Reynaud, 2005: 10.

Biology: Females ant-like in appearance; predators on other small arthropods; usually found at ground level on herbs and at base of grasses.

Distribution: Known only from New Caledonia; first collected in 2001 from Poindimié County, Pic d'Amoa in *Province Nord* and Thio County, *Réserve botanique du Pic Ningua* in *Province Sud*, both areas on the East Coast of Main Island.

Material examined: North part of Poya County, *Massif de l'Aoupinié*, summit (Alt. 1,000 m), by fogging, 02.X.2004, in ANIC.

***Franklinothrips vespiformis* (D.L. Crawford, 1909)^I**

Aeolothrips vespiformis D.L. Crawford, 1909: 109.

Biology: Vespiform in appearance and behaviour, adult females with basal abdominal segments white in contrast to black body. Often in low herbage; predatory on various Thripidae eggs and larvae, possibly also on various small arthropods [28]; useful biological control agent in greenhouses against pest thrips [29]. The association with Carambola tree flowers is interesting because this is a multiple-cropping species that might provide a permanent host around cultivated plots to protect against various phytophagous thrips.

Distribution: Presumably originally from the Caribbean or Central American regions, now present in various tropical countries; sold in Europe and Israel for use in greenhouses [4]; Listed in New Caledonia from Pouembout in *Province Nord* [5].

Material examined: Païta County, on taken on courgette/zucchini (*Cucurbita pepo*, Cucurbitaceae), 19.III.1987; Nouméa County, on *Wikstroemia indica* (Thymelaeaceae), 08.IV.2012; La Foa County, Fruit Pocquereux Research Station (IAC), from beating over a white tray the flowers of *Averrhoa carambola* (Oxalidaceae), 09.IV.2012; Pouembout County, taken on *Cucumis melo* and *C. lanatus* leaves (Cucurbitaceae), 01.VIII.2014; Sarraméa County, in pitfall trap, 17.IV.2015, in CXMNC and ANIC.

MEROTHIRIPIDAE (1)***Merothrips floridensis* Watson, 1927^I**

Merothrips floridensis Watson, 1927: 60.

Biology: Fungivore on dead branches and twigs.

Distribution: Widespread in the Americas, also known from Azores, southern France, South Africa, Japan, Australia, and New Zealand; here recorded in New Caledonia from Farino (Falls) in *Province Sud* [5].

Material examined: Farino County, collected from dead wood near a waterfall, 15.IV.2012, in ANIC and CXMNC.

PHLAEOTHIRIPIDAE—IDOLOTHRIPINAE (8)***Celidothrips dolichos* (Hood, 1918)^{*N}**

Cryptothrips dolichos Hood, 1918: 144.

Biology: Fungivore on spores on dead plant.

Distribution: Described from Australia, north Queensland, recorded in Northern Territory from Torres Strait islands to Darwin; here newly recorded from La Foa County in New Caledonia (but recorded in ThripsWiki²).

Material examined: La Foa County, Fruit Pocquereux Research Station (IAC), collected by beating dead stems of *Ocimum* sp. (Lamiaceae), 05.IV.2012, in ANIC.

***Egchocephalothrips monstrosus* (Bagnall, 1909)²**

Docessiophothrips monstrosus Bagnall, 1909: 538.

Biology: A single rare, spore-feeding, species is placed in this genus.

Distribution: Described from Dumbéa County in *Mont Koghi* and also known from Farino County (*Province Sud*).

Material examined: Apart from the holotype, only one other specimen known, from Farino County, collected by beating vegetation, 07.X.2004, in ANIC.

***Ethirothrips adventor* (Bianchi, 1945)²**

Dichaetothrips adventor Bianchi, 1945: 259.

Biology: Feeds on fungal spores on dead branches [5].

Distribution: Known only from New Caledonia in Nouméa (*Province Sud*), on sugarcane and croton leaves [26].

Material examined: Not observed during the present study.

***Ethirothrips stenomelas* (Walker, 1859)¹**

Phlaeothrips stenomelas Walker, 1859: 224.

Biology: Feeds on fungal spores on dead branches and leaves, also in litter or at the base of grass tussocks; dispersing adults found on various plants.

Distribution: Described from Sri Lanka but widespread in tropical areas including Eastern Australia; recorded from New Caledonia, Nouméa in *Province Sud* [5].

Material examined: La Foa County, collected by beating from branches of *Citrus* sp. (Rutaceae), 23.III.2002, also in vicinity of the Fruit Pocquereux Research Station (IAC), collected by beating unknown plants, 03.IV.2012; Koné County, Mont Kathépahié (*Province Nord*), collected by beating unknown plants, 28.X.2009; in ANIC and CXMNC.

***Gastrothrips acuticornis* (Hood, 1925)¹**

Cryptothrips acuticornis Hood, 1925: 65.

Biology: Feeds on fungal spores on leaves and dead branches but dispersing adults found on various plants.

Distribution: Described from the Caribbean Island of St Croix, but recorded widely in tropical countries under several other names; Reference [25] described this species under the name *noumeae*, from specimens taken in hills back of Nouméa.

²Same as footnote 1.

Material examined: Not observed during the present study.

***Neosmerinthothrips longisetis* Bournier, 1997^B**

Neosmerinthothrips longisetis Bournier, 1997: 150.

Biology: Fungus-feeding on dead branches.

Distribution: Described from Yaté County, *Parc Provincial de la Rivière Bleue*, and recently found in Farino County (*Province Sud*).

Material examined: Farino County, collected from *Plerandra gabriellae* (Araliaceae) by beating dead wood trap ‘branch-cutting’, hanging from the tree, 01.V.2004, in CIRAD and CXMNC.

***Nesothrips lativentris* (Karny, 1913)^N**

Rhaebothrips lativentris Karny, 1913: 128.

Biology: Feeds on fungal spores on dead branches and leaves; dispersing adults may fly onto crops.

Distribution: Probably originated in Pacific area, but widespread in Old and New World tropics; recorded from New Caledonia, Koné County in *Province Nord* [5], also known from Futuna Island, in the Wallis & Futuna Archipelago [30].

Material examined: Ouvéa Island County, in pitfall trap, 16.III.2017; Païta County (Port-Laguerre District), Province-Sud Fruit Nursery, taken on young plants of *Albizia lebbbeck*, 11.III.2009, in ANIC.

***Nesothrips propinquus* (Bagnall, 1916)^I**

Oedemothrips propinquus Bagnall, 1916: 408.

Biology: Feeds on fungal spores, commonly breeding at base of grass tussocks in Australia.

Distribution: Possibly originally from New Zealand but common in southern Australia and recorded in South Africa and Atlantic islands; recorded in *Province Sud* of New Caledonia, Nouméa County [26] and Bourail County, Le Cap District, on grasses along the road [5].

Material examined: Not observed during the present study.

PHLAEOTHIRIPIDAE—PHLAEOTHIRIPINAE (36)

***Aleurodothrips fasciapennis* (Franklin, 1908)^I**

Cryptothrips fasciapennis Franklin, 1908: 727.

Biology: Predatory on larvae of whitefly and scale insects on various unrelated plants.

Distribution: Described from Caribbean islands, but widely distributed in tropical and subtropical areas; recorded from New Caledonia, Thio County in *Province Sud*, on *Psidium* sp. leaves [5].

Material examined: La Foa County (Nili District), taken on *Cycas revoluta* (Cycadaceae), 09.VIII.2008; on fruit of *Citrus latifolia* (Rutaceae) at the same

location, 17.VII.2011; Nouméa County (Magenta District), taken on leaves of *Mangifera indica* (Anacardiaceae), 15.V.2013; Païta County (Tontouta District) in International Airport area, taken on leaves of *Phoenix* sp. (Arecaceae) 24.XI.2015, in ANIC and CXMNC.

***Adraneothrips moundi* Goldarazena & Michel, 2022^E**

Adraneothrips moundi Goldarazena & Michel, 2022: 170.

Biology: Feeds on fungi in leaf litter and on dead stems.

Distribution: Known only from New Caledonia on dead palm fronds, Yaté County, *Parc Provincial de la Rivière Bleue*, in *Province Sud*, in CIRAD.

Material examined: Not observed during the present study.

***Adrothrips intermedius* (Bianchi, 1945)^N**

Scopaeothrips intermedius Bianchi, 1945: 254.

Biology: Breeds on green stems of various Casuarinaceae. This species has extremely long maxillary stylets [31].

Distribution: Described from New Caledonia, Nouméa and Thio Counties from green stems of several *Casuarina* spp. (Casuarinaceae) [5]; widespread and common in Eastern Australia.

Distribution: Not observed during the present study.

***Bamboosiella cingulata* (Hood, 1919)^I**

Zygothrips cingulata Hood, 1919: 80.

Biology: Species of this genus lives on grass leaves of grasses; dispersing adults may land on various plants.

Distribution: Described from Australia (Queensland), but found in Hawaii and Florida (USA), Thailand and Jamaica; listed from New Caledonia, *Province Sud*, Bourail County [5] and here newly recorded from Ouvéa Island (*Province des Iles Loyauté*).

Material examined: Boulouparis County, La Ouenghi District (in an experimental plot of the ADECAL), collected on *Oryza sativa* (Poaceae) and *Crotalaria juncea* (Fabaceae), 16.IV.2012; Bourail County, Gouaro District, by pitfall trap under an avocado tree (*Persea americana*, Lauraceae), 25.VI.2015; Ouvéa Island, Hwadrilla District, by pitfall trap in a garden, 14.III.2017; in ANIC and CXMNC.

***Dactylothrips priscus* (Girault, 1928)^{*I}**

Hannibalia priscus Girault, 1928: 2.

Biology: This genus comprises 30 species from Australia living in cavities on phyllodes of *Acacia* spp. (Fabaceae).

Distribution: Newly recorded here from Dumbéa in New Caledonia (*Province Sud*); known previously from Queensland and New South Wales.

Material examined: Dumbéa County, Mont Koghi District, collected by beating vegetation, 29.X.2009; in ANIC.

Dolichothrips indicus* (Hood, 1919)^NNeoheegeria indica* Hood, 1919: 96.

Biology: Leaf-feeding, taken on various plants but common in terminal buds of some Malvaceae.

Distribution: Described from India but now widespread in tropical countries including Pacific Islands; listed in New Caledonia from *Province Sud*, Bourail and La Foa counties in 2012 [14] by beating *Talipariti tiliaceum* (= *Hibiscus tiliaceus*) (Malvaceae), in ANIC.

Material examined: Not observed during the present study.

***Gynaikothrips ficorum* (Marchal, 1908)^{*I}**

“Cuban laurel thrips”

Phloeothrips ficorum Marchal, 1908: 252.

Biology: Breeding primarily on young leaves of *Ficus benjamina* (Moraceae) causing leaf curls and leaf galls. The presence of the thrips egg parasitoid *Adactylidium* sp. *ficorum* Goldarazena & Ochoa, 2001 (Acari: Trombidiformes: Acarophenacidae) was confirmed recently (Arturo Goldarazena, com. pers., 28th January 2024).

Distribution: The “Cuban laurel thrips” is widespread from India to the Pacific area and readily transported internationally by the horticultural trade in *Ficus*. Closely similar to, and sometimes difficult to distinguish from *Gynaikothrips uzeli*. First intercepted in New Caledonia in 2008 on strawberry from Australia [32] but not clearly identified.

Material examined: Subsequently found in 2011 and 2014 [33], and large colonies in 2018, on *Ficus benjamina* leaves; Païta County, La Tamoia District, on *F. benjamina*, 07.XI.2023. in ANIC, MNCN and CXMNC. However, many submitted samples could not be clearly identified as *G. ficorum* or *uzeli* to date.

***Gynaikothrips uzeli* (Zimmermann, 1900)^{*I}**

“Weeping fig thrips”

Mesothrips uzeli Zimmermann, 1900: 12.

Biology: Inducing young leaves of *Ficus benjamina* to roll forming galls with large colonies of adults and larvae. The wasp *Thripastichus gentilei* (Del Guercio) (Hymenoptera: Eulophidae) can be a useful biocontrol agent, that also attacks species of *Hoplothrips*, *Schedothrips*, *Mallothrips* and *Liothrips* [34].

Distribution: Widespread across Asia and introduced into several American countries; here newly recorded from New Caledonia (*Provinces Sud* and *Nord*) but first mentioned here in 2011 [35]; detected in Australia at the same period [36].

Material examined: Bourail County, Gouaro District, more than thousand females and males combined were taken on *Ficus benjamina* rolled leaves, 18.XII.2011; same place and same plant, 14.IV.2012; Voh County, taken on leaves of tomato plants (*Lycopersicon esculentum*, Solanaceae), 30.V.2017; Dumbéa County, Koutio District, taken on *Ficus benjamina*, 16.VI.11; Nouméa County:

Tina District, taken on *Ficus* sp., 25.IV.2011; Vallée des Colons District, from a child's clothing, 06.III.2015; Dumbéa County, La Couvelée District, taken on *Anthurium* sp. (Araceae), 09.IV.2015; Païta County: La Tamoá District, Pacifique Jardin nursery, taken on *Ficus benjamina* leaves, 14.I.2014; Karenga La Tontouta District, taken on *Ficus* sp. leaves, 21.IX.2018, in ANIC and CXMNC.

***Haplothrips bituberculatus* (Girault, 1927)*^I**

Podothrips bituberculatus Girault, 1927: 2.

Biology: Found in Australia, on dead branches, in galls and on leaves, probably as a predator on small arthropods [37].

Distribution: Described from Queensland, Australia, and widespread across that continent, but also known from Norfolk Island, Papua New Guinea (Sand-aun) and Timor-Leste; here newly recorded from La Foa County in New Caledonia.

Material examined: La Foa County (Thia District), on fruit of *Citrus latifolia* (Rutaceae), 22.X.2013, in ANIC.

***Haplothrips fuscicornis* (Bagnall, 1929)^N**

Adraneothrips fuscicornis Bagnall, 1929: 606.

Biology: Known only from a single winged female taken in Malaysia from a gall on Ironwood (*Messua*).

Distribution: Reference [38] records two males and some larvae as possibly representing this species, collected New Caledonia, at an unspecified locality in rolled leaves of an undetermined plant by Noel Krauss; this record seems unlikely and needs confirmation.

Material examined: Not observed during the present study.

***Haplothrips ganglbaueri* Schmutz, 1913^I**

Haplothrips ganglbaueri Schmutz, 1913: 1034.

Biology: In inflorescences of Poaceae and Cyperaceae [37], but may be found on various dicotyledonous plants [39].

Distribution: Described from Sri Lanka, but widely recorded across Old World tropics from Sudan to Japan and Australia [39]; listed in New Caledonia (under the synonymic *Haplothrips angustus* Hood) from Nouméa County [40], also from the North part of Poya County (Népouï District) in *Province Nord* [5].

Material examined: Not observed during the present study.

***Haplothrips gowdeyi* (Franklin, 1908)^I**

Anthothrips gowdeyi Franklin, 1908: 724.

Biology: Apparently highly polyphagous, in various flowers including Asteraceae and Poaceae; in New Caledonia recorded from *Argenome mexicana*, *Ipomea* sp., cucumber and sugarcane [26].

Distribution: Probably originally from tropical Africa [39], but now widespread in tropical and subtropical countries; recorded in New Caledonia, at or near

Nouméa [26] and newly recorded here from Ouvéa Island in the *Province des Iles Loyauté* in New Caledonia, and from Futuna Island on avocado (*Persea americana*) in the Archipelago of Wallis and Futuna [30].

Material examined: Nouméa County, taken on young leaves of *Cucumis melo*, 26.XII.2007; Farino County (Focola District), on *Solanum melongena*, 03.V.2010; La Foa County, from flowers of *Canavallia* sp. (Fabaceae) by beating over a white tray, 12.IV.2012; same locality, on *Cuphea* sp. (Lythraceae), 17.VI.2022; Sarraméa County, in pitfall trap, 17.IV.2015; same locality, collected on *Datura* sp. (Solanaceae), 13.VIII.2021; Ouvéa Island, in Winkler extractor, 07.IV.2017, in ANIC and CXMNC.

***Haplothrips pallescens* (Hood, 1919)^I**

Zygothrips pallescens Hood, 1919: 78.

Biology: Breeding on leaves and flowers of Poaceae.

Distribution: Described from Queensland Australia; recorded from New Caledonia, Bourail County, Le Cap District (*Province Sud*), along the road, on grasses and Houailou County (*Province Nord*) [5], and known from Chinese mainland, Fiji Islands, India, Japan, Pakistan, Taiwan region and Thailand.

Material examined: Bourail County, Gouaro District, in trap, 26.VI.2015, in ANIC and CXMNC.

***Haplothrips victoriensis* Bagnall, 1918^N**

Haplothrips victoriensis Bagnall, 1918: 208.

Biology: In flowers of many plants, including *Jasminum* sp., *Melaleuca* sp., *Che-nopodium* sp. and on wild grasses; in Tasmania, it has caused contamination problems by entering the fruits of raspberries.

Distribution: Described from Victoria, Australia, but widespread across southern half of Australia; not known from anywhere other than Australia, apart from New Caledonia, *Province Nord*, from the North part of Poya County (Népoui District), on grasses, where first recorded [26] under a varietal name *nepouiensis*.

Material examined: Boulouparis County (*Réserve spéciale de faune et de flore du Mont Do*), from *Smilax* sp. (Smilacaceae), 16.IV.2012, in ANIC.

***Holothrips lafoae* Mound & Tree, 2014^B**

Holothrips lafoae Mound & Tree, 2014: 130.

Biology: Presumably feeding on fungal hyphae.

Distribution: Known only from New Caledonia, La Foa and Farino counties, *Province Sud*.

Material examined: La Foa County, taken on *Ocimum* dead stems, 05.IV.2012; Farino County, collected on unknown plant, 07.X.2004, in ANIC and CXMNC.

***Holothrips oceanicus* Okajima, 1987^N**

Holothrips oceanicus Okajima, 1987: 37.

Biology: Presumably feeding on fungal hyphae, found on dead leaves and twigs.

Distribution: Originally from Australia, New South Wales, where it is widespread; recorded from New Caledonia, Bourail County by a single female on an unidentified plant [41], in ANIC.

Material examined: Not observed during the present study.

***Karnyothrips flavipes* (Jones, 1912)^I**

Anthothrips flavipes Jones, 1912: 18.

Biology: Presumably predaceous on scale insects, whiteflies and mites, and other small arthropods [12]. Collected from diverse habitats on many plants, but mostly from dead leaves and grasses rather than flowers and live leaves [39]; a beneficial species that needs to be enhanced in New Caledonian Agroecological Crop Protection (ACP) programs.

Distribution: Possibly originally from southern USA, now widespread in tropical and subtropical regions; recorded in New Caledonia, *Province Nord*, from Pouembout County on *Acacia nilotica* [5].

Material examined: La Foa County (Nili District), taken on *Citrus* fruits, 17.VIII.2011; La Foa County, collected by beating on *Averrhoa carambola* flowers, 09.IV.2012, in ANIC and CXMNC.

***Karnyothrips melaleucus* (Bagnall, 1911)^I**

Hindsiana melaleuca Bagnall, 1911: 61.

Biology: Apparently predaceous on Coccoidea and possibly also mites, on leaves, dead branches and dead twigs [39]; a beneficial species that should be enhanced in New Caledonian IPM or ACP programs.

Distribution: Probably originally from Oriental region, now widespread in tropical and subtropical regions [39]; recorded in New Caledonia, Bourail County from grasses [5].

Material examined: La Foa County (Nili District), taken in colony of the red spider mites *Dolichotetranychus floridanus* (Banks, 1900) (Acari: Trombidiformes: Tenuipalpidae), on *Ananas comosus* (Bromeliaceae), 01.VIII.2011; Boulouparis County (*Réserve spéciale de faune et de flore du Mont Do*), by beating *Smilax*, 16.IV.2012; La Foa County (Thia District), on fruits of *Citrus latifolia*, 26.XI.2013, in ANIC and CXMNC.

***Kellyia hoodianus* (Bagnall, 1924)^{*I}**

Teuchothrips hoodianus Bagnall, 1924: 630.

Biology: Living on phyllodes of various *Acacia* spp. in Australia.

Distribution: An Australian species reported in New Caledonia (*Province Sud*) from Dumbéa, since 2010 [42], but here newly recorded.

Material examined: Dumbéa County (Mont Koghi District), from unknown trees and shrubs, 29.X.2010, in ANIC.

***Kellyia milmani* (Girault, 1927)^I**

Cryptothrips milmani Girault, 1927: 2.

Biology: Recorded from New Caledonia [43] under the synonymic name *Kellyia biadenes* in *Acacia spirorbis* galls; in Australia on *Acacia harpophylla* [44].

Distribution: Known only from Australia Queensland; recorded in New Caledonia, from Koné County (Oundjo District) in *Province Nord* [43].

Material examined: Not observed during the present study.

***Leeuwenia angulata* Bianchi, 1952^B**

Leeuwenia angulata Bianchi, 1952: 388.

Biology: *Leeuwenia* species breed on leaves, sometimes inducing galls or leaf rolls.

Distribution: Described from New Caledonia *Province Sud*, Mont-Dore County (*Saint-Louis*) from single female in 1950.

Material examined: Farino County, collected by beating unknown vegetation, 07.X.2004; Koumac County (*Néhoué*), in rainforest, 09.XII.2004; Ouégoa County (*Mont Mandjélia*), 12.XII.2004; Sarraméa County, *Mont Rembaï*, fogging palms, 19.XII.2004, in ANIC.

***Leichhardtithrips evanidus* Tree & Mound, 2013^N**

“Leichhardt’s vanishing thrips”

Leichhardtithrips evanidus Tree & Mound, 2013: 377.

Biology: Feeding on fungal hyphae on dead plant tissues or in leaf-litter.

Distribution: Described from one female taken by bark spraying in Australia, Queensland; recorded from New Caledonia, Dumbéa County (*Mont Nondoué*) in *Province Sud* by fogging in sclerophyll forest [45], in CIRAD.

Material examined: Not observed during the present study.

***Litotetothrips caledonensis* (Bournier, 1993)^N**

Athlibothrips caledonensis Bournier, 1993: 361.

Biology: Breeding on and inducing curling of leaves of *Codia discolor*, *Geissois racemosa* and *Pancheria alaternoides*.

Distribution: Described from New Caledonia in *Province Sud*, Dumbéa County (*Mont Koghi*) [5]; subsequently recorded from Boulouparis County (*Réserve spéciale de faune et de flore du Mont Do*) and Yaté County; also in Queensland, Australia [46].

Material examined: Yaté County (Goro District), from young rolled leaves of *Codia spathulata* (Cunoniaceae), 21.IV.2017 and 17.VIII.2017; also from *Arillastrum gummiferrum* (Myrtaceae), 21.XII.2016; Boulouparis County (*Réserve spéciale de faune et de flore du Mont Do*), from apical leaves of *Pancheria*, 16.IV.2012; Yaté County (*Parc Provincial de la Rivière Bleue*), from rolled leaves of *Pancheria*, 07.IV.2012, in ANIC and CXMNC.

***Macrophthalmothrips neocaledonensis* Bournier, 1997^N**

Macrophthalmothrips neocaledonensis Bournier, 1997: 147.

Biology: Fungus-feeding on dead branches of *Araucaria*, *Toona* and *Melia*;

adults brightly colored, with large red eyes and black body with white and yellow markings.

Distribution: Described from New Caledonia, Dumbéa County (*Mont Nondoué*); recorded subsequently from Norfolk Island, Australia [47].

Material examined: Farino County, collected by beating unknown vegetation, 07.X.2004 and 13.IV.2012; Boulouparis County (La Ouenghi District), on *Acropogon* sp. (Malvaceae), 28.V.2015; Dumbéa County (*Mont Nondoué*), paratype male, 03.VII.1992, in ANIC and CXMNC.

***Neocecidothrips pacificus* (Bianchi, 1952)^E**

Arrhenothrips pacificus Bianchi, 1952: 385.

Biology: Living in rolled leaves of unidentified plants [48].

Distribution: Known only from New Caledonia (*Province Sud*), Yaté County (*Bois du Sud*) in 1950.

Material examined: Not observed during the present study.

***Neohoodiella grandisetis* Bournier, 1997^B**

Neohoodiella grandisetis Bournier, 1997: 145.

Biology: Fungus-feeding on dead branches.

Distribution: Known only from New Caledonia, Yaté County in *Parc Provincial de la Rivière Bleue* [5].

Material examined: Not observed during the present study.

***Podothrips xanthopus* Hood, 1919^N**

Podothrips xanthopus Hood. 1919: 82.

Biology: Predator of Coccoidea on Poaceae and Bambusaceae [5]. There is a doubtful record of the species as a pest on *Vitis* spp. under the bark and on fallen leaves [49]. This species could be enhanced in New Caledonian ACP or IPM programs.

Distribution: From Australia, subsequently recorded from New Caledonia, Nouméa County [26].

Material examined: Not observed during the present study.

***Pseudophilothrips varicornis* (Hood, 1912)^{*I}**

“Hollyhock thrips”

Liothrips varicornis Hood, 1912: 74.

Biology: Large colonies including bright red larvae on several genera of Malvaceae: *Althea*, *Hibiscus*, *Sida* and *Sphaeralcea* [39]; dispersing adults sometimes on grass and weeds [4].

Distribution: Described from Mexico, now known from Bahamas, California, and French Polynesia; reported in New Caledonia (*Province Sud*) from Païta, originally in 2010 [42], but here newly recorded.

Material examined: Païta County (La Tamoia District), on *Hibiscus rosa-sinensis* leaves, 15.VII.2010; also, same place and same plant, 25.III.2011, and 21.I.2020,

in ANIC and CXMNC.

***Sophiothrips typicus* (Ananthakrishnan, 1964)^N**

Nanothrips typicus Ananthakrishnan, 1964: 120.

Biology: Fungivore on dead branches and in leaf-litter; adults are amongst the smallest Phlaeothripidae.

Distribution: Described from Madras in India, recorded from Taiwan region and Indonesia; recorded in New Caledonia, Dumbéa County (*Mont Nondoué*) in *Province Sud*, by fogging in sclerophyll forest, 3.VII.1992 [45], in CIRAD.

Material examined: Not observed during the present study.

***Stephanothrips cf. cuneatus* (Zhao & Tong, 2016)^B**

Baenothrips cf. cuneatus Zhao & Tong, 2016: 68.

Biology: Species of this genus live in leaf litter but flying adults land on various plants.

Distribution: Described from southern China from a single female [13]; one female macroptera recorded in New Caledonia, Yaté County, *Parc Provincial de la Rivière Bleue*, in *Province Sud*, in CIRAD [45]. This identification remains tentative.

Material examined: Not observed during the present study.

***Stephanothrips occidentalis* Hood & Williams, 1925^I**

Stephanothrips occidentalis Hood & Williams, 1925: 69.

Biology: Fungivore, usually apterous, on dead branches, twigs and leaves.

Distribution: Described from Caribbean Islands but widespread in tropical and subtropical countries, including Australia, Torres Strait Islands, northern Queensland, and Norfolk Island; recorded New Caledonia for the first time in 1992 [27], from the North of Poya County (Pindaï District) in *Province Nord*, and Yaté County, *Parc Provincial de la Rivière Bleue* [5], in ANIC.

Material examined: La Foa County, collected by beating twigs, 05.IV.2012, in ANIC.

***Teuchothrips cleistanthi* (Bournier, 1975)^B**

Hoplothrips (Odontoplothrips) cleistanthi Bournier, 1975: 323.

Biology: Living in rolled leaves of *Cleistanthus* sp.

Distribution: Known only from New Caledonia, *Province Nord*, Koumac County (*Palachidji*), single female on leaves galls of *Cleistanthus* in 1973 [5], in MNHN.

Material examined: Not observed during the present study.

***Teuchothrips kraussi* (Bournier, 1993)^B**

Oncothrips kraussi Bournier, 1993: 363.

Biology: Living in rolled leaves of an unidentified plant.

Distribution: Known only from New Caledonia, Dumbéa County (*Mont Koghi*) in rolled leaves of an unidentified plant [48], in MNHN.

Material examined: Not observed during the present study.

***Teuchothrips noumeaensis* Bournier, 1993^B**

Teuchothrips noumeaensis Bournier, 1993: 357.

Biology: Living in rolled leaves of *Hibbertia tontoutensis* (Dilleniaceae).

Distribution: Known only from New Caledonia *Province Sud*, Païta County (*Vallée de La Tontouta*) 50km north of Nouméa, male and females [48], in MNHN.

Material examined: Not observed during the present study.

***Teuchothrips ornatus* Bournier, 1993^B**

Teuchothrips ornatus Bournier, 1993: 359.

Biology: Living in rolled leaves of *Hibbertia lucens*, a species considered endangered (EN) by the IUCN Red List of Threaten Species [50].

Distribution: Known only from New Caledonia *Province Sud*, described from *Mont Koghi*, subsequently recorded from Boulouparis County (*Réserve spéciale de faune et de flore du Mont Do*) located at 80km northwest of Nouméa a series of both sexes taken from the apical buds of a *Hibbertia* species [48], in ANIC.

Material examined: Not observed during the present study.

***Yarnkothrips kolourus* Mound & Walker, 1986^N**

Yarnkothrips kolourus Mound & Walker, 1986: 83.

Biology: Possibly a predator of scale insects (Coccoidea), often taken on dead stems or dead branches and possibly also a predator of small arthropods.

Distribution: Described from New Zealand, subsequently collected in Australia (New South Wales, Queensland, Tasmania, and Norfolk Island); recorded from New Caledonia, La Foa County, from dead *Ocimum* stems [51].

Material examined: Not observed during the present study.

THRIPIDAE—DENDROTHRIPINAE (3)

***Dendrothrips reticulatus* Bournier, 1997^B**

Dendrothrips reticulatus Bournier, 1997: 140.

Biology: Breeding on leaves.

Distribution: Known only from New Caledonia, Dumbéa County (*Mont Non-doué*) and Thio County on *Psidium* leaves [5].

Material examined: Not observed during the present study.

***Ensiferothrips primus* Bianchi, 1945^N**

Ensiferothrips primus Bianchi, 1945: 266.

Biology: Breeding on leaves of several Moraceae, including *Trophis scandens*, *Streblus brunonianus* and *Malaisia scandens* [5].

Distribution: Described from New Caledonia, Dumbéa and Bourail counties in *Province Sud*, also known from Poya, Pouembout and Hienghène counties in *Province Nord*; subsequently recorded in eastern Australia [52].

Material examined: Bourail County, collected by beating *Diospyros fasciculosa* (Ebenaceae), 14.IV.2012, in ANIC and CXMNC.

***Filicopsothrips wellsae* Mound, 1999^B**

Filicopsothrips wellsae Mound, 1999: 268.

Biology: Collected from a tree fern.

Distribution: Known only from the original specimens, described from New Caledonia in Yaté County (*Parc Provincial de la Rivière Bleue*) in wet forest, taken from young fronds of *Dicksonia* sp. and from La Foa County on ?*Cyathea* frond in wet forest, in MNHN and ANIC.

Material examined: Not observed during the present study.

THRIPIDAE—PANCHAEOTHRIPINAE (8)

***Copidothrips octarticulatus* (Schmutz, 1913)^{*I}**

“Sweet-potato thrips”

Heliothrips (Parthenothrips) octarticulata Schmutz, 1913: 993.

Biology: Often on *Ipomoea* leaves, but apparently polyphagous; recorded from *Piper methysticum* in Pohnpei (Federated States of Micronesia), and damaging leaves of *Spathoglottis* sp. and *Aglaonema* sp. in Darwin, Australia [53].

Distribution: Described from Sri Lanka but recorded from Taiwan region, Seychelles Islands, northern Australia including Christmas Island, some Pacific Islands and recently from French Polynesia [54]; here newly recorded from New Caledonia main island (*Grande Terre*) in La Foa County (*Province Sud*) and from Hwadrilla District in Ouvéa Island (*Province des Iles Loyauté*).

Material examined: La Foa County, Fruit Pocquereux Research Station (IAC), pitfall trap in *Citrus* orchard, 27.V.2015; Ouvéa Island County (Hwadrilla District), from soil in coconut plantation, 14.III.2017; Yaté County (Port Boisé camp) on *Decalobanthus peltatus* (Convolvulaceae), 30.VIII.2022, in ANIC and CXMNC.

***Elixothrips brevisetis* (Bagnall, 1919)^{*I}**

“Banana rind thrips”

Tryphactothrips brevisetis Bagnall, 1919: 257, 1921: 264.

Biology: Leaf feeding on many different plants, including rust damage to banana fruit in Martinique.

Distribution: Described from Seychelles but recorded from Taiwan region, Philippines, Pacific Islands and northern Australia [12]; here newly recorded from Bourail County in New Caledonia, *Province Sud*.

Material examined: Bourail County, from *Talipariti tiliaceum* (= *Hibiscus tiliaceus*) 14.IV.2012, in ANIC and CXMNC.

***Heliothrips haemorrhoidalis* (Bouché, 1833)^I**

“Greenhouse thrips” or “Black tea thrips”

Thrips haemorrhoidalis Bouché, 1833: 42.

Biology: Leaf-feeding on many plants, including tea, *Pinus* spp. and ferns [12]; in New Caledonia on avocado, citrus, guava, macadamia, and mango trees [55]; particularly on older senescing leaves and on stressed plants, but sometimes a pest on young avocado fruits [55].

Distribution: Found worldwide in tropical and subtropical regions, and in greenhouses in temperate areas [53]; listed from New Caledonia [5], in Dumbéa County (*Mont Nondoué*), Yaté County (*Parc Provincial de la Rivière Bleue*) and Farino County near waterfall.

Material examined: Bourail County, by beating unknown plants, 14.IV.2012, in ANIC.

***Hercinothrips bicinctus* (Bagnall, 1919)^I**

“Banana thrips”

Heliothrips bicinctus Bagnall, 1919: 258.

Biology: Feeding on leaves of many plant species and often abundant on older leaves [53]; in New Caledonia recorded from *Passiflora* leaves.

Distribution: An African species but now pantropical; listed from Thio County in New Caledonia, *Province Sud*, several females and abundant larvae taken on *Passiflora* leaves [5].

Material examined: Not observed during the present study.

***Hercinothrips femoralis* (Reuter, 1891)^{*I}**

“Banded greenhouse thrips”

Heliothrips femoralis O.M. Reuter, 1891: 166.

Biology: Causing leaf damage on many different plants [53]; larvae soil leaves with unsightly dark droplets; feeding causes irregular discolored areas on leaves.

Distribution: An African species, but now widespread in glasshouses of temperate areas, including North America, Europe, Japan, Korea, Australia, and New Zealand; here newly recorded from Nouméa and Mont-Dore counties in New Caledonia.

Material examined: Nouméa County, Magenta District, on lettuce leaves, 20.IV.2021; Mont-Dore County, Mourange District, from parsley stems and leaves, 11.I.2023, in CXMNC.

***Pennathrips bournierorum* Goldarazena, Michel & Mound, 2021^B**

Pennathrips bournierorum Goldarazena, Michel & Mound, 2021: 145.

Biology: Presumably feeding on leaves of some plant species.

Distribution: Known only from New Caledonia, Dumbéa County (*Mont Nondoué*) by fogging in sclerophilous forest; Yaté County (*Parc Provincial de la Rivière Bleue*); Farino County, waterfall, from dead twigs and, from Boulouparis County (*Réserve spéciale de faune et de flore du Mont Do*) by beaten vegetation, in ANIC, CIRAD, MNHN, NHM.

Material examined: Not observed during the present study.

***Phibalthrips longiceps* (Karny, 1913)^N**

Heliothrips longiceps Karny, 1913: 123.

Biology: Breeding on Poaceae leaves [53].

Distribution: Described from New Britain, recorded from Fiji Islands, Papua New Guinea, and across tropical Australia; recorded from New Caledonia, Farino County waterfall (*Province Sud*); also in Houaïlou County (*Province Nord*), both on herbs [5]. Also intercepted from Australia on cauliflower in February 2021 (CXMNC).

Material examined: Bourail County, Poe Beach, 20.XII.1998; La Foa County, 05.IV.2012, in ANIC.

***Selenothrips rubrocinctus* (Giard, 1901)^I**

“Red-banded thrips”

Physopus rubrocincta Giard, 1901: 264.

Biology: Breeding on many unrelated hard-leaves plants, including *Cacao*, *Persea* and *Mangifera*, causing considerable leaf silverying and distortion, injury to fruit, and dark colored droplets on leaf surface; recorded on avocado, guava, macadamia and mango trees in New Caledonia [55]; on Malay apple (*Syzygium malaccense*) and *S. inophylloides* on Wallis Island; on avocado on Futuna Island [30]; water-stressed plants are more susceptible.

Distribution: Originally from Neotropics, now pantropical, extending into subtropical areas such as Florida [53]; recorded from New Caledonia at or near Nouméa County [26], and from Nouméa, La Foa and Bourail counties [5], also known from the Archipelago of Wallis and Futuna [30].

Material examined: Koné County, on *Litchi chinensis*, 23.III.2005; La Foa County, on same plant, 16.VI.2006; Koné County, on *Syzygium malaccense* 15.VI.2017; La Foa County, on *Psidium guajava* 29.IV.2020; La Foa County, Popidéry District, on *Cuphea* sp., 17.VI.2022, in ANIC and CXMNC.

THRIPIDAE—SERICOTHRIPINAE (1)***Neohydatothrips gracilipes* (Hood, 1924)^I**

Sericothrips gracilipes Hood, 1924: 149.

Biology: Breeding on leaves of various weedy species of *Sida*, as well as other Malvaceae.

Distribution: Described from Mexico but occurs widely in tropical and subtropical countries including India, Northern Australia to Hawai'i; recorded from New Caledonia, *Province Nord*, Koné District at 40 km East [56], in ANIC.

Material examined: Not observed during the present study.

THRIPIDAE—THRIPINAE (43)***Anaphothrips sudanensis* Trybom, 1911^I**

“Wheat thrips” or “Maize thrips”

Anaphothrips sudanensis Trybom, 1911: 1.

Biology: Feeding in leaf axils of Poaceae [39].

Distribution: Worldwide in tropical and subtropical areas including Australia; listed from New Caledonia, from Nouméa County in *Province Sud* and from the North part of Poya County (Népoui District) in *Province Nord* [5].

Material examined: Bourail County, from small Poaceae, 13.IV.2012, in ANIC and CXMNC.

***Anaphothrips swezeyi* Moulton, 1928^I**

Anaphothrips swezeyi Moulton, 1928: 107.

Biology: Breeding on leaves of various Poaceae [39].

Distribution: Described from Hawai'i (USA) on sugarcane, also found in coastal regions of Queensland, Australia; listed from New Caledonia [5], from Nouméa and Bourail counties (Le Cap District) in *Province Sud*, also from the North of Poya County (Népoui District) in *Province Nord*, in ANIC.

Material examined: Not observed during the present study.

***Arorathrips mexicanus* (D.L. Crawford, 1909)^I**

Chirothrips mexicana D.L. Crawford, 1909: 114.

Biology: Breeding in individual florets of several Poaceae [39].

Distribution: A Neotropical species but now worldwide in tropical and subtropical regions; recorded in New Caledonia [5] from Bourail County (Le Cap District) in *Province Sud* and Houaïlou County in *Province Nord*.

Material examined: Bourail County, collected on grasses, 13.IV.2012, in ANIC and CXMNC.

***Ayyaria chaetophora* Karny, 1927^{*I}**

Ayyaria chaetophora Karny, 1927: 193.

Biology: Breeding on *Canavallia* sp. and *Glycine max* leaves, but adults sometimes found on various plants.

Distribution: Here newly recorded from La Foa in New Caledonia. An Asian species recorded in northern Australia, Christmas Island (Indian Ocean), Tahiti (French Polynesia), India, Japan, Philippines and Taiwan region [53].

Material examined: La Foa County, along the RM 16 road between the farm "La Petite Ferme" and the Fruit Pocquereux Research Station (IAC), on *Canavallia* and *Pueraria* leaves, 12.IV.2012, in ANIC.

***Bolacothrips pulcher* (Girault, 1929)^N**

Plesiothrips pulcher Girault, 1929: 3.

Biology: Breeding on leaves of native Poaceae in Australia [53].

Distribution: Previously known only from Australia until found from Bourail County (Le Cap District), New Caledonia [5], in ANIC.

Material examined: Not observed during the present study.

***Bregmatothrips binervis* (Kobus, 1893)^N**

Thrips binervis Kobus, 1893: 158.

Biology: Breeding on leaves of Poaceae [53].

Distribution: Described from Java, but also described from New Caledonia under the name *Diarthrothrips saccharicollus* Bianchi (1945); recorded from Australia, India, Indonesia and Papua New Guinea; New Caledonia, *Province Sud*, counties of Nouméa, Bourail (Le Cap District) and Yaté (*Parc Provincial de la Rivière bleue*) [5].

Material examined: Not observed during the present study.

***Caprithrips insularis* Beshear, 1975^I**

Caprithrips insularis Beshear, 1975: 500.

Biology: Breeding on leaves of Poaceae [53].

Distribution: Described from USA (Georgia), but known from Australia (Queensland), Surinam, Trinidad and Kiribati; recorded in New Caledonia Bourail County (Le Cap District) [5], in ANIC.

Material examined: Not observed during the present study.

***Caprithrips orientalis* Bhatti, 1973^I**

Caprithrips orientalis Bhatti, 1973: 478.

Biology: An apterous species breeding on leaves of Poaceae [53].

Distribution: Probably originally from India but known from Australia (Queensland) and Fiji Islands; recorded in New Caledonia [5], Bourail County (Le Cap District), in ANIC.

Material examined: Not observed during the present study.

***Chaetanaphothrips leeuweni* (Karny, 1914)^{*I}**

“Rust thrips of banana”

Euthrips leeuweni Karny, 1914: 358.

Biology: Leaf-feeding and sometimes a pest on *Musa* leaves, but also taken on *Grevillea* leaves.

Distribution: Described from Java but widespread in tropical and subtropical countries, Australia (Northern Territory), Guam, India, Indonesia, West Indies and China; here newly recorded from Boulouparis County in New Caledonia, *Province Sud*.

Material examined: Boulouparis County (*Réserve spéciale de faune et de flore du Mont Do*), taken on young leaves of *Grevillea*, 16.IV.2012, in ANIC and CXMNC.

***Chaetanaphothrips orchidii* (Moulton, 1907)^{*I}**

“Anthurium thrips”

Euthrips orchidii Moulton, 1907: 52

Biology: A leaf-feeding pest of orchids, also on *Anthurium*, avocado, banana, citrus and many ornamentals.

Distribution: Widespread in tropical and subtropical countries, and greenhouses of temperate regions [53]; here newly recorded from Païta County in New Caledonia, *Province Sud*.

Material examined: Païta County (Mont Mou District), on cut flowers of *Anthurium*, 08.III.2004; on unknown host and without precise location, 08.III.2005, in ANIC.

***Chaetanaphothrips signipennis* (Bagnall, 1914)[¶]**

“Banana rust thrips”

Scirtothrips signipennis Bagnall, 1914: 22.

Biology: Feeding on young immature fruits, flowers and foliage of *Anthurium*, *Cordyline*, *Dracaena*, and *Musa*; also immature orange, tangerine, tomato and green beans causing discoloration, silvering or bronzing of injured tissues [57].

Distribution: Widespread in tropical countries [53] including America, Australia, Brazil, Fiji Islands, India and Sri Lanka; here newly recorded from New Caledonia in *Province Sud*.

Material examined: Nouméa County, on *Anthurium*; Païta County (Mont Mou District), on cut flowers of *Anthurium*, 08.III.2004; Dumbéa County (La Couvelée District), on *Anthurium*, 02.IV.2015; Yaté County (Goro District) in Prony Resources New Caledonia Nursery, on *Cordyline neocaledonica*, 10.IX.2015, 21.IV.2017 and 17.VIII.2017; Dumbéa County, on *Anthurium* flowers, 30.VI.2020 and 24.VII.20; Dumbéa County, on *Dendrobium* flowers; Sarraméa County, on *Anthurium* flowers, 21.VII.20, in ANIC and CXMNC.

***Chirothrips ah* Girault, 1929[†]**

Chirothrips ah Girault, 1929: 1.

Biology: Breeding and pupating within individual florets of Poaceae; transported around world in commercial grass seeds [58].

Distribution: Described from Australia (Queensland and Northern New South Wales), recorded from Fiji, Papua New Guinea, South Africa [53]; listed from New Caledonia [59] in Nouméa County and Bourail County (Le Cap District) from grasses.

Material examined: Bourail County, on dead twigs and *Eichhornia crassipes* flowers (Pontederiaceae), 13.IV.2012; Boulouparis County (*Réserve spéciale de faune et de flore du Mont Do*), 16.IV.2012, in ANIC.

***Dendrothripoides innoxius* (Karny, 1914)[†]**

Euthrips innoxius Karny, 1914: 359.

Biology: Breeding on leaves of *Ipomoea* sp. [53].

Distribution: Described from Java, but widespread around world in tropics and subtropics; in New Caledonia, adults were found in East of Pouembout County in *Province Nord* [5].

Material examined: Not observed during the present study.

***Dichromothrips corbetti* (Priesner, 1936)*^I**

“Orchid thrips”

Anaphothrips corbetti Priesner, 1936: 209.

Biology: Considered a minor pest on leaves and flowers of orchids, such as *Vanda* spp [53].

Distribution: Originally Oriental, now worldwide on cultivated orchids; here newly recorded from Nouméa County in New Caledonia.

Material examined: Nouméa County (Val Plaisance District), on flower buds of orchids, 03.VII.2015, in CXMNC.

***Frankliniella occidentalis* (Pergande, 1895)^I**

“Western flower thrips”

Euthrips occidentalis Pergande, 1895: 392.

Biology: Breeds on leaves and in flowers of many different plants; an important tospovirus vector; causes some feeding damage on developing fruits, locally reported as biocontrol agent against leaf mites [53].

Distribution: Originally from Western USA, but now worldwide in temperate areas; listed from Païta County in New Caledonia [5]. Since 2008, regularly intercepted on the New Caledonia borders on imported vegetables [59], from Australia, New Zealand and France, in CXMNC.

Material examined: Païta County, Mont Mou District at the nursery *Pépinière Dheurle*, taken on *Rosa* flowers, 20.II.2003, Katiramona District, on *Lactuca sativa*, 15.IV.2003 and 04.VI.2008; La Tamoia District, on *Capsicum annuum*, 30.III.2007 and 04.VI.2008; Dumbéa County, on *Rosa* flowers, 24.IV.2020 and 30.VI.2020; on *Lycopersicon esculentum* and *Lactuca sativa*, 18.XII.2015, 30.VIII.2018, 10.IX.2019; also taken on *Anthurium*, 30.VI.2020; on *Dendrobium*, 24.VII.2020; on *Brassica rapa* subsp. *pekinensis* and on *Solanum lycopersicum*, 06.X.2023, in CIRAD, ANIC and CXMNC.

***Frankliniella schultzei* (Trybom, 1910)^I**

“Common blossom thrips”, “Tomato thrips” or “Cotton bud thrips”

Physopus schultzei Trybom, 1910: 151.

Biology: Breeds on leaves and in flowers of many different plants; a vector of tospoviruses on many crops, sometimes feeds on leaf mites and possibly useful in biocontrol.

Distribution: Recorded from New Caledonia on *Nerium* sp. (Apocynaceae) without any place record [59], but widespread in tropical countries [53].

Material examined: La Foa County, Fruit Pocquereux Research Station (IAC), on *Citrus* flowers, 03.IX.2002, in CIRAD; Pouembout County, from *Cucumis melo*, 21.VI.2007; Boulouparis County (La Ouenghi District), on *Oryza* and *Crotalaria*, 16.IV.2012; Bourail County, by beating dead stems of *Eichhornia crassipes*, 13.IV.2012; Sarraméa County, from trap under *Cajanus* and *Carica*, 17.IV.2015, in ANIC and CXMNC.

***Frankliniella williamsi* Hood, 1915*^I**

“Corn thrips”

Frankliniella williamsi Hood, 1915: 19.

Biology: Breeding on *Zea mays* leaves, particularly in leaf axils; causing heavy damage on maize seedlings in New Caledonia in 2014 [60]; considered a minor pest in Australia but has caused up to 100% seed loss on *Zea mays* in Hawai'i [61]; possibly living on other Poaceae such as *Saccharum* [53].

Distribution: Originally from Central America but recorded widely in tropical areas around the world; reported from Boulouparis and Pouembout counties in New Caledonia [62], here newly recorded.

Material examined: Boulouparis County (La Ouenghi District), from leaf axils of *Zea mays*, 31.X.2014; Pouembout County, from leaf axils of maize and *Sorghum*, 05.XI.2014, in ANIC and CXMNC.

***Lefroyothrips varatharajani* Rachana & Manjunath, 2020^I**

Lefroyothrips varatharajani Rachana & Manjunath, 2020: 592.

Biology: Apparently breeding in flowers rather than on leaves.

Distribution: Described from southern India, but subsequently recorded from Western Australia and New Caledonia in La Foa from *Pouteria sapota* flowers [63], in ANIC.

Material examined: Not observed during the present study.

***Megalurothrips usitatus* (Bagnall, 1913)^I**

“Bean flower thrips”

Physothrips usitatus Bagnall, 1913: 293.

Biology: Breeding in Fabaceae flowers, including *Arachis*, *Glycine* and *Vigna* spp.

Distribution: An Oriental species, India to Japan including northern Australia, Fiji Islands and Eastern Mediterranean [53]; listed from New Caledonia in Païta County (*Province Sud*), also from Pouembout and Hienghène counties in *Province Nord* [5].

Material examined: La Foa and Bourail counties, from *Canavallia* flowers, 12-16.IV.2012; Boulouparis County (La Ouenghi District), from *Crotalaria*, 16.IV.2012, in ANIC and CXMNC.

***Microcephalothrips abdominalis* (D.L. Crawford, 1910)^I**

“Sunflower thrips”

Thrips abdominalis D.L. Crawford, 1910: 157.

Biology: Breeding in flowers of various Asteraceae.

Distribution: Worldwide in tropical and subtropical areas [53]; listed from New Caledonia, Farino County waterfall by only one female [5].

Material examined: Dumbéa County, on *Allium ampeloprasum* var. *porrum*, 26.X.2017; La Foa County, Fruit Pocquereux Research Station (IAC), from *Citrus sinensis* flowers, 04.X.2022, in ANIC and CXMNC.

***Oxythrips festivus* Bianchi, 1952^B**

Oxythrips festivus Bianchi, 1952: 389.

Biology: Nothing is known of the biology of this species.

Distribution: Known only from the original description, based on specimens taken in New Caledonia, Yaté County, *Bois du Sud* in *Province Sud*.

Material examined: Not observed during the present study.

***Pezothrips kellyanus* (Bagnall, 1916)^I**

“Kelly’s citrus thrips”

Physothrips kellyanus Bagnall, 1916: 219.

Biology: Breeding in scented flowers and immature fruit of various unrelated plants; considered a serious pest causing feeding damage on *Citrus* in southern Australia as well as Mediterranean countries [53].

Distribution: Described from Australia, but found widely in New Zealand, southern France, Greece, southern Italy, Sicily, Spain, Cyprus, and Turkey; both sexes with larvae seen from Washington State, northwest USA; listed from New Caledonia, Nouméa and Bourail counties (*Province Sud*), also from Hienghène County (*Province Nord*) on Apocynaceae [5].

Material examined: Nouméa County, from flower of *Wikstroemia indica*, 08.IV.2012; Païta County, Mont Mou District, on *Cerbera mangas*, 20.X.2020, in ANIC and CXMNC.

***Plesiothrips perplexus* (Beach, 1896)^I**

Sericothrips perplexus Beach, 1896: 216.

Biology: Breeding in Poaceae florets, including sugarcane [53] and *Cynodon dactylon*.

Distribution: Possibly originally from Southeastern USA, but now widespread in tropical and subtropical regions; in Australia from Queensland, New South Wales and Lord Howe Island [53]; listed from New Caledonia, Bourail County with one female [5], in ANIC.

Material examined: Not observed during the present study.

***Rhamphothrips pandens* Sakimura, 1983^I**

Rhamphothrips pandens Sakimura, 1983: 299.

Biology: In Western Australia adults recorded with larvae on *Cassythia*; adults recorded on leaves of various plants.

Distribution: Described from Hawai’i, but present in Florida (USA) and Jamaica; recorded widely on Caribbean and Pacific Islands including Kiribati, as well as Australia (Queensland, Northern Territory and Western Australia) [53]; listed from New Caledonia, *Province Nord*, Pouembout County, females from *Malaisia scandens* leaves and in *Province Sud*, Bourail County [5], in ANIC.

Material examined: Not observed during the present study.

***Salpingothrips aimotofus* Kudo, 1972^{*I}**

Salpingothrips aimotofus Kudo, 1972: 230.

Biology: Breeding on leaves of *Pueraria* (Kudzu) [53].

Distribution: Described from Japan, but recorded from Georgia and Florida, USA, and known from Australia (Queensland); here newly recorded from La Foa County in New Caledonia (*Province Sud*).

Material examined: La Foa County, collected by beating leaves of *Pueraria*, 12.IV.2012, in ANIC and CXMNC.

***Scirtothrips albomaculatus* Bianchi, 1945^N**

Scirtothrips albomaculatus Bianchi, 1945: 263.

Biology: Breeding on leaves of many plants in Australia [53], sometimes causing minor damage to citrus fruits.

Distribution: Described originally from New Caledonia, Nouméa County [26] and next, from Yaté (*Parc Provincial de la Rivière Bleue*) and Bourail counties in the *Province Sud*, and in the *Province Nord* in Pouembout and Koné counties [5]; otherwise known only from Australia (New South Wales, Queensland, South Australia, Lord Howe Island) [53].

Material examined: La Foa County, Fruit Pocquereux Research Station (IAC), on *Citrus* flowers, 28.II.2003; Nili District, on *Litchi chinensis* leaves, 16.VI.2006; on *Acacia spirorbis* (Fabaceae), Nouméa County, 08.IV.2012, in ANIC, CIRAD and CXMNC.

***Scirtothrips australiae* Hood, 1919^N**

Scirtothrips australiae Hood, 1919: 75.

Biology: Recorded on leaves of many plants in Australia [53], but possibly representing a species complex.

Distribution: Described from, and recorded widely across, Australia, also in Samoa; recorded from New Caledonia, in 1992, Yaté County in *Parc Provincial de la Rivière Bleue* [27].

Material examined: Boulouparis County (*Réserve spéciale de faune et de flore du Mont Do*), on young leaves of *Grevillea*, 16.IV.2012, in CXMNC. This identification needs further confirmation.

***Scirtothrips dorsalis* Hood, 1919^I**

“Yellow tea thrips” or “Chilli thrips”

Scirtothrips dorsalis Hood, 1919: 90.

Biology: Breeding on young tissues damaging many crops including chilli pepper, tea, grapes and strawberry plants; significant pest in several countries and recorded as a virus vector (YSV and TSWV) in India; heavy damage on *Litchi chinensis* in New Caledonia early in the 2000’s, with distorted, curled, often crispy leaves showing virus-like damage [55].

Distribution: Described from India, but widespread from Pakistan to Japan and Australia in tropical areas; known in Israel and Caribbean region, and more recently in Southern Europe; listed in New Caledonia, *Province Nord*, from

Pouembout and Voh counties, on *Leucaena* [5].

Material examined: Nouméa County, on *Bougainvillea spectabilis*, 21.I.2009; Païta County, from *Fragaria*, 18.I.2011; La Foa County, Fruit Pocquereux Research Station (IAC), on *Citrus sinensis* flowers, 04.X.2022, in ANIC and CXMNC.

***Thrips bianchii* (Sakimura, 1969)^B**

Taeniothrips (Isochaetothrips) bianchii Sakimura, 1969: 77.

Biology: Apparently polyphagous, large numbers on white flowers of *Psychotria* and *Melaleuca quinquenervia* [64].

Distribution: Known only from New Caledonia; described from Bourail (Poe Beach) on ?*Psychotria* flowers (Rubiaceae), La Foa, Thio and Nouméa counties in *Province Sud*, also from Hienghène County in *Province Nord*.

Material examined: Boulouparis County, from *Melaleuca quinquenervia* flowers, 21.V.2001; La Foa County, Fruit Pocquereux Research Station (IAC), on *Citrus*, 03.IX.2002, also 08.X.2018; Yaté County (*Réserve botanique spéciale du Pic du Pin*), from *Lethedon* sp. (Thymelaeaceae), 15.VIII.2005; Nouméa County, from *Wikstroemia indica* flowers, 08.IV.2012, in ANIC, CIRAD, CXMNC.

***Thrips diana* Mound & Masumoto, 2005^B**

Thrips diana Mound & Masumoto, 2005: 22.

Biology: The biology of this species remains unknown.

Distribution: Known only from New Caledonia, *Province Sud* in Nouméa at the *Parc Zoologique et Forestier Michel Corbasson*, in MNHN; here newly recorded from Yandé Island (Poum County) in *Province Nord*.

Material examined: La Foa County, from purple flowers of vine, 09.IV.2012; Poum County, Yandé Island, from *Eugenia* sp., 05.X.2005, in ANIC and CXMNC.

***Thrips hawaiiensis* (Morgan, 1913)^I**

“Hawaiian flower thrips”

Euthrips hawaiiensis Morgan, 1913: 3.

Biology: Found in flowers of many plants; sometimes considered a pest causing feeding damage [53].

Distribution: Widespread in Asia and Pacific, also southern states of USA and Jamaica; common in Australia in northeastern coastal regions [64]; first noted in New Caledonia from La Foa, in 2002 [65], in CIRAD, officially recorded subsequently [66].

Material examined: La Foa County, Fruit Pocquereux Research Station (IAC), *Musa* flowers, 31.V.2002, 08.IV.2012; Païta County (La Tontouta District), on *Rosa*, 11.IV.2006; Dumbéa County (Nondoué District), on *Musa* flowers, 02.IV.2010; Bourail County (Gouaro District), on garden flowers, 13.IV.2012; same place, on *Musa* flowers, 30.VIII.2022, Moindou County, on *Kyllinga* sp. leaves, 16.VI.2022, in ANIC, CIRAD and CXMNC.

***Thrips imaginis* Bagnall, 1926^I**

“Australian plague thrips”

Thrips imaginis Bagnall, 1926: 111.

Biology: In flowers of many unrelated native and introduced plant species; an important pest in 1930's on apple trees, grape vines, and strawberries [64] but less significant in recent years [53].

Distribution: Described from, and widespread across Australia, also recorded from New Zealand [53]; listed from New Caledonia in Nouméa on *Rosa* and *Lantana* flowers [56]; same locality on *Citrus* flowers and from La Foa on *Acacia spirorbis* flowers and from Bourail on grasses [5]; regularly intercepted each year since 2016 in New Caledonia on fruit and vegetables imported from Australia [67].

Material examined: Not observed during the present study.

***Thrips insignis* (Bianchi, 1945)^B**

Isochaetothrips insignis Bianchi, 1945: 274.

Biology: Host unknown, but both sexes collected from flowers *Eriaxis rigida* [5].

Distribution: Known only from New Caledonia in the *Province Sud*, described from Dumbéa County, District of Yahoué, but recorded from Yaté County, *Parc Provincial de la Rivière Bleue*.

Material examined: Not observed during the present study.

***Thrips maculicollis* (Hood, 1918)^I**

Physothrips maculicollis Hood, 1918: 122.

Biology: In New Caledonia, recorded from *Fagraea berteriana* flowers [53], on *Citrus* flowers; and flowers of unidentified Apocynaceae, and Cunoniaceae species [64].

Distribution: Described from Australia (Queensland) and known from Hawai'i; listed from New Caledonia, *Province Sud*, in Farino County (Waterfall) from *Fagraea schlechteri* flowers and in Bourail County [5], in ANIC.

Material examined: Not observed during the present study.

***Thrips novocaledonensis* (Bianchi, 1945)^N**

Taeniothrips novocaledonensis Bianchi, 1945: 270.

Biology: In flowers of various herbs and shrubs; in New Caledonia from *Oxera neriifolia*; in Australia from *Lantana* and *Rosa* flowers [64].

Distribution: Described from New Caledonia, *Province Sud*, from Dumbéa (*Vallée de Yahoué*) [26] and listed from Yaté, La Foa, Farino and Bourail counties [5]; recorded from Vanuatu and Australia, also Norfolk Island where it is the dominant flower thrips [47].

Material examined: Bourail County, Gouaro District and La Foa County, Fruit Pocquereux Research Station (IAC), 20.VI.2002, 03.IX.2002 and 08.X.2018, both sexes taken from *Citrus* flowers; Païta County, Mont Humboldt, from *Hedycarya*, 12.II.2005; Mont Dore County, Saint-Louis Research Station, on *Ixora* and on

Atractocarpus flowers, 31.VII.2006 and 13.IV.2007; Farino County, on *Passiflora quadrangularis* flowers, 18.VIII.2010; Païta County, from *Capsicum annuum* flowers and leaves, 04.IX.2010; La Foa County, Fruit Pocquereux Research Station (IAC), 03.VII.2002; on *Acacia spirorbis* flowers, 06.IV.2012; Bourail County, Gouaro District, also on garden flowers, 13.IV.2012; Boulouparis County (*Réserve spéciale de faune et de flore du Mont Do*), on *Smilax* flowers, 07.IV.2012 and 16.IV.2012, in ANIC, CIRAD, CXMNC.

***Thrips orientalis* (Bagnall, 1915)^I**

Isoneurothrips orientalis Bagnall, 1915: 593.

Biology: In white, scented flowers such as *Gardenia*, *Jasminum*, *Plumeria* and *Glossocarya hemiderma* [53].

Distribution: Widespread in tropical Asia from India to Japan, also recorded in Australia (Queensland), Florida and Hawai'i (USA), Tanzania and Trinidad [53]; listed from New Caledonia, in Bourail County, *Province Sud* [5].

Material examined: Bourail County, Gouaro District, on *Jasminum* white flowers, 01.IV.1999, in ANIC.

***Thrips palmi* Karny, 1925^I**

“Melon thrips”

Thrips palmi Karny, 1925: 10.

Biology: Breeding in flowers and on leaves of many plants, particularly crops of Cucurbitaceae and Solanaceae, but also on cultivated orchids; a tospovirus vector and major pest on several food crops [53].

Distribution: Originally from tropical Asia but now widespread in tropical countries, including northern Australia, some Caribbean islands and southern Florida [53]; recorded in New Caledonia from Païta County [40] where presumably introduced in 1980 [5]; listed from Mont-Dore, Dumbéa, Boulouparis and La Foa counties in *Province Sud*, also from Koné and Hienghène counties in *Province Nord*.

Material examined: Bourail County, Gouaro District, on *Cucumis sativus*, 01.III.1997; Dumbéa County, on *Citrullus lanatus*, 27.XI.1998; on *Cucumis sativus*, 20.V.2008, and 10.IX.2019; Mont Dore County, Saint-Louis Research Station (IAC), on flowers of *Atractocarpus*, 13.IV.2007; Pouembout County, on *Cucumis melo* leaves, 21.VI.2007; Nouméa County, on young leaves of *Cucumis melo*, 26.XII.2007; Païta County, on *Capsicum annuum*, 30.III.2007 and 04.IX.2010; La Foa County, on *Solanum tuberosum* leaves, 31.VIII.2015; in ANIC, CXMNC and CIRAD.

***Thrips safrus* Mound & Masumoto, 2005^{*N}**

Thrips safrus Mound & Masumoto, 2005: 45.

Biology: Polyphagous flower living species, described from *Cochlospermum fraseri* in Queensland (Australia), and found on many plant species across warmer parts of Australia.

Distribution: Described from, and widespread across, Australia, also recorded from New Caledonia, from Poe Beach in Bourail County [64] and it is here newly recorded from Yandé Island (Poum County) in the *Province Nord*. It is also apparently established in Hawai'i [68].

Material examined: Poum County, Yandé Island, on *Eugenia gacognei*, 18.VIII.2005, in ANIC.

***Thrips simplex* (Morison, 1930)^I**

“*Gladiolus* thrips”

Physothrips simplex Morison, 1930: 12.

Biology: Breeding mainly in *Gladiolus* flowers, causing streaking and discoloration [53], but also found breeding on other Iridaceae, such as *Crocasmia* and *Neomarica*.

Distribution: Originally from South Africa, but now widespread around the world wherever *Gladiolus* is grown [53]; recorded from New Caledonia in Nouméa County [21].

Material examined: Not observed during the present study.

***Thrips sumatrensis* Priesner, 1934^I**

Thrips (Isoneurothrips) sumatrensis Priesner, 1934, 1934: 254.

Biology: Reported from flowers of many plants in Asian countries; from *Solanum* flowers in Australia.

Distribution: Widespread in Asia from Thailand to Pacific Islands, including Guam, Tahiti and northern Australia; recorded from New Caledonia in 1983, without host or place record from basis of some specimens, in Senckenberg Museum, Frankfurt [64].

Material examined: Not observed during the present study.

***Thrips tabaci* Lindeman, 1889^I**

“Onion thrips”, “Tabacco thrips” or “Cotton thrips”

Thrips tabaci Lindeman, 1889: 61.

Biology: In flowers and on leaves of many plants, including *Allium*, cereals, potatoes, vines and glasshouse crops; a tospovirus vector [53]; known as a predator of mites but effectiveness for biological control is unknown; occurs mainly on weeds and crops but in low numbers on native vegetation; males reported only from Eastern Mediterranean countries and New Zealand.

Distribution: Originally from eastern Mediterranean and now found worldwide, but scarce in wet tropics; the most intercepted species in New Caledonia in 2017, from Australia and New Zealand, representing 85% of all intercepted thrips [59]; first record in New Caledonia [56] from Canala County (Nakety District) in *Province Nord*, on onion plants.

Material examined: Pouembout County, on leaves of *Allium cepa*, 21.VI.2007; Païta County, on *Capsicum annum*, 04.VI.2008; La Foa County (Nili District), from a garlic clove, 17.VIII.2010; Dumbéa County, La Couvelée District, on

Allium ampeloprasum var. *porrum* and *Brassica oleracea*, 10.IX.2019, in flower farm on *Gerbera* leaves, 30.VI.2020, in ANIC and CXMNC.

***Thrips vitticornis* (Karny, 1922)¹**

Physothrips vitticornis Karny, 1922: 103.

Biology: Breeding in flowers of *Calopogonium* [64].

Distribution: Described from Thailand and widespread from India to the Pacific, present in northern Australia [53]; listed in New Caledonia from *Province Nord* in Houaïlou, Pouembout and Hienghène counties [5].

Material examined: Bourail County, on flowers of *Canavallia maritima*, 14.IV.2012, in ANIC and CXMNC.

***Trichromothrips* cf. *fragilis* Masumoto & Okajima, 2005^{*1}**

Trichromothrips fragilis Masumoto & Okajima, 2005: 17.

Biology: Described from the leaves of several unrelated plants.

Distribution: This species was described from Japan and recorded from Taiwan region, but the genus *Trichromothrips* is widespread in tropical countries, and males are important for species identification. *T. fragilis* is tentatively identified here from Sarraméa in New Caledonia, *Province Sud*, based only on several females that are slightly darker than the original specimens.

Material examined: Sarraméa County, many females in pitfall traps under various unrelated tree species, 15.VI.2015, in CXMNC.

6. Conclusions

The purpose of the present article is to consider the fragile nature of the endemic Thysanoptera fauna of New Caledonia in the face of multiple introduced exotic species. This is based on a revised checklist of recorded thrips species, of which 80 percent are exotic, although new and undescribed species are known to exist. Thrips represent significant challenges for the biodiversity and agriculture of the New Caledonia Archipelago. Over more than a decade, interceptions by border surveillance have shown a constant increase in this pressure of intrusive foreign species.

Regarding the management of the exotic fauna in crops, the development of IPM and ACP managing methods must be strengthened through farming extension services. For instance, flower strips can be arranged along the plots to maintain beneficial insects, or the “push & pull” strategy can be used to install repellent and attractive plants to protect those that are cultivated. Also, resistance to some insecticides and a strong societal demand for healthy fresh products push agronomists and farmers to practice biological control. Then, the use of entomopathogenic fungi or nematodes, predators and parasitoids must be developed in the New Caledonian and insular context.

Moreover, cooperation between farmers, extension authorities and researchers, is essential to improve the knowledge of this important fauna which shows some various ecological functions going from pests, detritivores, and pollinators to beneficials. Lastly, on the Biosecurity point of view, some sound measures, such as the

building of a Quarantine Facility, must be built to keep and preserve the fragile balance of New Caledonia's fauna and flora.

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Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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