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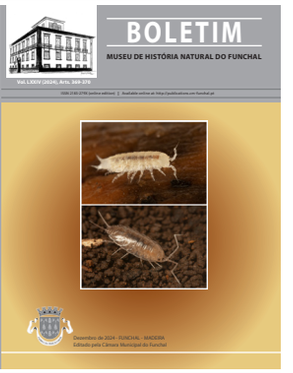

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New records of thrips (Thysanoptera: Terebrantia and Tubulifera) for Madeira Archipelago and Selvagens Islands and the first record of the thrips parasitoid *Thripastichus gentilei* (Del Guercio, 1931) (Hymenoptera: Eulophidae)

With 3 figures, 3 tables and 1 plate

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ABSTRACT: The study of thrips kept in the entomological collection of the Agricultural Quality Laboratory, from samples collected from a wide variety of plants and ecosystems, has allowed the identification of 27 new species for the fauna of these islands, mainly in Madeira, but also in Porto Santo, Desertas and Selvagens. These species, belonging to the families Aeolothripidae, Merothripidae, Thripidae and Phlaeothripidae, are the following: *Aeolothrips fasciatus* (L.), *A. intermedius* Bagnall, *A. versicolor* Uzel, *Merothrips floridensis* Watson, *Asprothrips seminigricornis* (Girault), *Dendrothrips* sp. near *oleae* Faure, *Pseudodendrothrips stuardoi* (Moulton), *Hercinothrips femoralis* (Reuter), *Monilothrips kempi* Moulton, *Parthenothrips dracaenae* (Heeger), *Selenothrips rubrocinctus* (Giard), *Neohydatothrips portoricensis* (Morgan), *Arorathrips fulvus* (Moulton), *Echinothrips americanus* Morgan, *Frankliniella musaeperda* Hood, *F. schultzei* (Trybom), *Pezothrips kellyanus* (Bagnall), *Psydrothrips luteolus* Nakahara & Tsuda, *Scirtothrips aurantii* Faure, *Scolothrips brevipilis* Priesner, *Thrips simplex* (Morison), *Aleurodothrips fasciapennis* (Franklin), *Gynaikothrips uzeli* (Zimmermann), *Liothrips vaneeckei* Priesner, *Mesandrothrips inquilinus* (Priesner), *Stephanothrips occidentalis* Hood & Williams and *Urothrips paradoxus* Bagnall. *Thrips tabaci* Lindemann, the most common thrips species in the Madeira archipelago is mentioned for the first time for Ilhéu Chão and Selvagem Grande, and both *Franklinothrips vespiformis* (D. L. Crawford) and *Thrips nigropilosus* Uzel are mentioned as new for the island of Porto Santo. The thrips parasitoid *Thripastichus gentilei* (Del Guercio) is recorded for the first time in Madeira, parasitising *Gynaikothrips uzeli* (Zimmermann) on *Ficus benjamina* L.

Keywords: Aeolothripidae, Merothripidae, Thripidae, Phlaeothripidae, Madeira, Porto Santo, Ilhéu Chão, Selvagem Grande, Macaronesia.

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RESUMO: O estudo de tripes depositados na coleção entomológica do Laboratório de Qualidade Agrícola, provenientes de amostras colhidas numa grande variedade de plantas e ecossistemas, permitiu identificar, maioritariamente na Ilha da Madeira, mas também no Porto Santo, Desertas e Ilhas Selvagens, 27 espécies que constituem novidades para a fauna destas ilhas. Estas espécies, pertencentes às famílias Aeolothripidae, Merothripidae, Thripidae e Phlaeothripidae, são as seguintes: *Aeolothrips fasciatus* (L.), *A. intermedius* Bagnall, *A. versicolor* Uzel, *Merothrips floridensis* Watson, *Asprothrips seminigricornis* (Girault), *Dendrothrips* sp. near *oleae* Faure, *Pseudodendrothrips stuardoi* (Moulton), *Hercinothrips femoralis* (Reuter), *Monilothrips kempi* Moulton, *Parthenothrips dracaenae* (Heeger), *Selenothrips rubrocinctus* (Giard), *Neohydatothrips portoricensis* (Morgan), *Arorathrips fulvus* (Moulton), *Echinothrips americanus* Morgan, *Frankliniella musaeperda* Hood, *F. schultzei* (Trybom), *Pezothrips kellyanus* (Bagnall), *Psydrothrips luteolus* Nakahara & Tsuda, *Scirtothrips aurantii* Faure, *Scolothrips brevipilis* Priesner, *Thrips simplex* (Morison), *Aleurodothrips fasciapennis* (Franklin), *Gynaikothrips uzeli* (Zimmermann), *Liothrips vaneeckei* Priesner, *Mesandrothrips inquilinus* (Priesner), *Stephanothrips occidentalis* Hood & Williams e *Urothrips paradoxus* Bagnall. São também referidas as espécies já conhecidas, *Franklinothrips vespiformis* (D. L. Crawford) e *Thrips nigropilosus* Uzel como novidade para a Ilha de Porto Santo e *T. tabaci* Lindemann para o Ilhéu Chão e para a Selvagem Grande. O parasitoide de tripes *Thripastichus gentilei* (Del Guercio) é registado pela primeira vez na Madeira parasitando a espécie *Gynaikothrips uzeli* (Zimmermann) em *Ficus benjamina* L.

Palavras-chave: Aeolothripidae, Merothripidae, Thripidae, Phlaeothripidae, Madeira, Porto Santo, Ilhéu Chão, Selvagem Grande, Macaronesia.

INTRODUCTION

Bagnall (1909) was the first author to write about the presence of Thysanoptera in Madeira when he described a new species, which he named *Leptothrips flavicornis*, a synonym of *Gynaikothrips ficorum* (Marchal, 1908). Although the Thysanoptera are not the most studied order on these islands, they are mentioned in nearly six dozen articles by 2021. Some papers stand out as important contributions, like Priesner (1938) with 5 new records and the description of a new species. However, the most productive and important contribution to our knowledge of this fauna is undoubtedly that of the late Dr. Richard zur Strassen of the Senckenberg Institute, Germany. This world-renowned Thysanoptera specialist published no less than 22 papers dealing with or mentioning many thrips species collected in the Madeira Archipelago, of which zur Strassen (1977) stands out as the most important, with a list of 58 species including 32 new records, and 8 species are described as new to science. zur Strassen (2008) is the most recent checklist of Thysanoptera for the archipelago of Madeira and the Selvagens Islands. Currently, a total of 69 species of Thysanoptera are known from these islands, of which 9 are endemic (13%), 37 are native (54%) and 23 are introduced (33%) (excluding the new records cited in this paper).

MATERIAL AND METHODS

All the specimens examined are deposited in the entomological collection of the Agricultural Quality Laboratory, labelled with the acronym "ICLAM" followed by a consecutive number preceded by the letter "T" and mounted on microscope slides. We follow the procedures described by Palmer *et al*. (1992), for specimen maceration and mounting, except for the mounting medium, for which we use the synthetic resin Entellan® instead of the suggested Canada balsam. The photographs of the slide-mounted specimens were taken with a Jenoptik ProgRes® CT5 digital camera with CapturePro 2.1 software, mounted on a Nikon Optiphot-2 microscope. The image of the unmounted specimen of *Stephanothrips occidentalis* was taken with a Leica Flexacam C1 digital camera mounted on a Leica M125 stereomicroscope controlled by Leica LAS X software with multifocus module for image stacking. All images were post processed on Adobe Photoshop version 25.11. Dichotomous identification keys are provided for some genera that are already represented in the islands by several species. These keys were created by the author and built with the help of DKey software (drawwing.org/dkey).

RESULTS

I – New records for the Archipelago of Madeira

Suborder **Terebrantia**

Family **Aeolothripidae**

Aeolothrips fasciatus (Linnaeus, 1758)

The genus *Aeolothrips* Haliday, 1836 has more than 100 described species, mainly from the Palaearctic region and about 30 from the Nearctic region (Mound *et al*., 2018). *A. fasciatus* is omnivorous, with a preference for flowers, where adults and nymphs feed on floral tissue and pollen, but they can also be facultative predators and feed on nymphs of other thrips species (Moritz & Mound, 2000; van Rijn, 2002; Moritz *et al*., 2013).

It is widely distributed across the Palaearctic region and North America. Dispersed throughout Europe, present in Japan, and introduced in Australia and New Zealand (Marullo, 1993; Moritz & Mound, 2000; Trdan *et al*., 2005; Gertsson, 2015; ThripsWiki, 2024). Already recorded in Macaronesia from the Canary Islands (Berzosa & Oromí, 2004) and the Azores (zur Strassen, 1973), *A. fasciatus* is a new record for Madeira Island.

Diagnostic characters: It was generally assumed that the females of *A. fasciatus* and *A. intermedius* Bagnall, 1934 cannot be reliably separated based on morphological characteristics (Mound *et al*., 1976; Marullo, 1993) if no males are present in the sample. The tergite IX of the males of *A. intermedius* has a short seta at the base of the clasper, which does not reach the apex, whereas in *A. fasciatus* it extends beyond it (Marullo, 1993). As the material from Madeira contains no males, we have used the morphology of the spermathecae to distinguish the females of the two species. This was first proposed by Bhatti (1988) and adopted by other authors such as Alavi & Minaei (2018), who in a key to *Aeolothrips* spp. from Iran separate *fasciatus* from *intermedius* by stating that the spermatheca of *intermedius* has 7-9 strong spiniform processes around the median groove, which are completely absent in the spermatheca of *fasciatus*. However, according to Masumoto & Okajima (2019), Japanese specimens of *fasciatus* may have some weak spiniform processes.

Material studied: Madeira: ICLAM-T477, 3♀♀, ex *Suaeda vera* Forssk. ex J. F. Gmel. (Chenopodiaceae), Caniçal, Machico, 130 m, 32.749200, -16.706656, 29 Jan. 2004, José Jesus leg.; ICLAM-T734, 1♀, ex *Acacia mearnsii* De Wild. (Fabaceae), trail from Achada do Gramacho to the North coast, Santana, 281 m, 32.826324, -16.892561, 19 Aug. 2008, José Jesus leg.; ICLAM-T806, 3♀♀, ex *Vitis vinifera* L. (Vitaceae), Caniçal Agricultural Station, Machico, 57 m, 32.738227, -16.743737, 29 Aug. 2012, Celestina Brazão leg.; ICLAM-T820, 1♀, ex flowers of *Argyranthemum pinnatifidum* ssp. *succulentum* (Lowe) Humphries (Asteraceae), Ponta de São Lourenço, Machico, 79 m, 32.745805, -16.719022, 4 Jul. 2013, José Jesus leg.; ICLAM-T821, 1♀, ex flowers of *Crithmum maritimum* L. (Apiaceae), Ponta de São Lourenço, Machico, 86 m, 32.746757, -16.719450, 4 Jul. 2013, José Jesus leg.

Aeolothrips intermedius Bagnall, 1934

The behaviour and feeding habits of *A. intermedius* are similar to those of *A. fasciatus*, preferring floral tissue, including pollen, and as facultative predators are known to feed on at least 44 different thrips species, including *Heliothrips haemorrhoidalis* (Bouché, 1833) and *Thrips tabaci* Lindeman, 1889, both of which are very common in the archipelago, as well as phytophagous mites (Tetranychidae), eggs and nymphs of jumping plant-lice (Psylloidea), whiteflies (Aleyrodidae) and aphids (Aphidoidea) (Trdan *et al*., 2005).

It is the most common Palaearctic *Aeolothrips* species and is widespread in Europe from the Nordic countries to the Mediterranean and from the Iberian Peninsula to Iran (Marullo, 1993; Trdan *et al*., 2005; Gertsson, 2015; Mound *et al*., 2018). In Macaronesia Domingo-Quero *et al*. (2003) listed *A. intermedius* for the Canary Islands (La Palma). This is a new record for the Madeira archipelago.

Diagnostic characters: Please see the comments made for *A. fasciatus*.

Material studied: Madeira: ICLAM-T356, 1♀ ex *Echium nervosum* W. T. Aiton (Boraginaceae), Praia Formosa, Funchal, 10 m, 32.639426, -16.947645, 10 Feb. 2000, José Jesus leg.; ICLAM-T388, 1♀ ex *Echium nervosum* W. T. Aiton (Boraginaceae), Pico do Facho, Machico, 190 m, 32.725737, -16.757103, 24 Feb. 2000, José Jesus leg.; ICLAM-T854, 1♀ ex *Senecio* sp. (Asteraceae), Municipal Garden, Funchal, 29 m, 32.647876, -16.911269, 22 Apr. 2016, Celestina Brazão leg.

Aeolothrips versicolor Uzel, 1895

New record for Madeira and all of Macaronesia. Widespread in Europe, most of the Palaearctic region, and the northern USA, where it lives exclusively in forest ecosystems, in *Fraxinus* (Oleaceae), *Tilia* (Tiliaceae), *Betula* (Betulaceae) and *Corylus* (Fagaceae) trees, probably feeding on other thrips nymphs and mites (Marullo, 1993; Mound *et al*., 1976, 2018).

All 12 female specimens collected so far in Madeira were associated with chestnut trees – *Castanea sativa* Mill. (Fagaceae) – including those collected from yellow water pan traps, which in turn were placed in chestnut forests (see below under "Material studied").

Material studied: Madeira: ICLAM-T326, 1♀, ex *Castanea sativa* Mill. (Fagaceae), Curral das Freiras, 620 m, 32.719595, -16.965116, 18 Jun. 1998, José Jesus leg.; ICLAM-T328, 1♀, ex *Castanea sativa* Mill. (Fagaceae), Curral das Freiras, 620 m, 32.719595, -16.965116, 02 Jul. 1998, F. Aguiar leg.; ICLAM-T524, 1♀, ex *Castanea sativa* Mill. (Fagaceae), Pinheiro, Serra de Água, 360 m, 32.722188, -17.034261, 4 Aug. 2005, José Jesus leg.; ICLAM-T540, 2♀♀, ex Moericke type water-pan trap, Pinheiro, Serra de Água, 400 m, 32.721272, -17.034679, 19 Jul. 2005, José Jesus leg.; ICLAM-T603, 1♀, ex Moericke type water-pan trap, Curral das Freiras, 800 m, 32.743593, -16.962074, 26 Sep. 2006, José Jesus leg.; ICLAM-T606, 1♀, ex Moericke type water-pan trap, Jardim da Serra near Eira do Ribeiro, 1292 m, 32.710659, -16.991950, 12 Sep. 2006, José Jesus leg.; ICLAM-T634, 3♀♀, ex Moericke type water-pan trap, Jardim da Serra near Eira do Ribeiro, 1292 m, 32.710659, -16.991950, 24 Oct. 2006, F. Aguiar leg.; ICLAM-T844, 2♀♀, ex Moericke type water-pan trap, Pico da Ginda, Curral das Freiras, 804 m, 32.743541, -16.962771, 10 Oct. 2006, F. Aguiar leg.

The number of *Aeolothrips* spp. recorded for the archipelago of Madeira now totals 6, namely *A. collaris* Priesner, 1919, *A. ericae* Bagnall, 1920 and *A. fallax* zur Strassen, 1977, listed by zur Strassen (2008), in addition to the new records listed above in the current work. The females of these 6 species can be identified using the following dichotomous key:

1. Posterior margin of forewing dark except at base and apex, forewing with two transverse dark bands. ..... ***A. versicolor*** Uzel
- Posterior margin of forewing pale medially between two dark cross bands. 2
2(1). Ring vein around apex of forewing darker than the membrane it surrounds, usually as dark as the veins in the transverse dark bands. ..... ***A. fallax*** zur Strassen
- Ring vein around apex of forewing as pale as the membrane it surrounds, much paler than the veins in the transverse dark bands. 3
3(2). Antennal segments I and II yellow, as pale as base of III; Female abdomen variable in colour, segments III-IV and X frequently pale. ..... ***A. ericae*** Bagnall
- Antennal segments I and most of II brown, darker than segment III; Female abdomen brown. 4
4(3). Pronotum mostly yellow. ..... ***A. collaris*** Priesner
- Pronotum dark brown. 5
5(4). Spermathecae without spiniform processes or only a few weak ones. ..... ***A. fasciatus*** (Linnaeus)
- Spermathecae with 7 to 9 strong spiniform processes. ..... ***A. intermedius*** Bagnall

Family **Merothripidae**

Merothrips floridensis Watson, 1927

According to Mound & O'Neill (1974), the genus *Merothrips* is mainly native to the Neotropics, although some of the 14 known species are widespread in the subtropics, which applies to *M. floridensis*. Originally described by Watson (1927) from Florida (USA), the species is now distributed worldwide, including the Afrotropical (South Africa), Eastern Palaearctic (Japan), Australian (Australia, New Zealand, Hawaii), Oriental (Malaysia), Nearctic, and Neotropical regions. It has been reported from Spain and France and is the only representative of this family in Europe (Berzosa, 1985; Reynaud, 2010; ThripsWiki, 2024).

This is a new record for Madeira itself. It is already known in Macaronesia from the Azores islands of São Miguel and Pico (zur Strassen, 2010).

Their biology is still largely unknown, but they probably feed on fungal hyphae in the leaf litter and dead twigs (Mound & Marullo, 1996; Ng & Mound, 2018). In Australia, *M. floridensis* is associated with dry sclerophyll forests and inhabits *Acacia* and *Eucalyptus* microhabitats in bark and leaf litter (Tree & Walter, 2012). The only female specimen representing this new record for Madeira was collected from dead parts of an apple tree trunk, which had been heavily infested by the sesiid moth *Synanthedon myopaeformis* (Borkhausen).

Material studied: Madeira: ICLAM-T338, 1♀, ex. *Malus domestica* (Suckow) Borkh. (Rosaceae), Curral das Freiras, 620 m, 32.719595, -16.965116, 17 Dec. 1998, José Jesus leg.

Family **Thripidae**
Subfamily **Dendrothripinae**

Asprothrips seminigricornis (Girault, 1926)

The subfamily Dendrothripinae is the smallest of the four subfamilies that make up the family Thripidae. It consists mainly of small-bodied species that prefer to feed on green (tender) leaves of trees and shrubs, although a few also develop on grasses. The most important morphological feature of Dendrothripines is their enlarged "lyre-shaped" metathoracic furca, which extends deep into the mesothorax. This overgrown furca is associated with the jumping activity of these insects, as the powerful muscles of their hind legs are attached there (Masumoto & Okajima, 2003; Noguchi & Masumoto, 2019).

This and the next species belong to the Dendrothripinae subfamily and are the first to be recorded for the Madeira Archipelago. The genus *Asprothrips* Crawford, 1938 is native to Asia and Australia (Velez-Gavilan, 2023) and currently comprises 8 recognised species, more than half of which originate from China (ThripsWiki, 2024). According to any of the following keys – key to genera of Dendrothripinae from Australia and New Caledonia by Mound (1999) or the global key by Mound & Tree (2016), the unique female specimen collected on Madeira Island belongs to this genus. The former key also allows us to identify this specimen as belonging to *A. seminigricornis* (Girault), whose morphological features match perfectly with the redescription of this species on page 259 of Mound (1999). *A. seminigricornis* is a new record for the Madeira archipelago and also for Macaronesia.

A. seminigricornis was described from a series of females from Queensland, Australia, and under two other names – *A. raui* Crawford from New York, USA and *Scirtothrips antennatus* Moulton from Hawaii (Mound, 1999). It is a tiny white thrips with dark brown to black antennae at the tip (Mound & Wells, 2015). It probably originates from Southeast Asia, but there are confirmed records from Australia, Norfolk Island, the Marquesas Islands, Bermuda and the USA in Hawaii, California, Florida and New York (Diffie *et al*., 2008; Mound & Wells, 2015; Mound *et al*., 2016; Mound & Tree, 2016).

Mound *et al*. (2016) consider this species to be very polyphagous and we found evidence of at least 16 different plant hosts from 11 families, half of which are fruit trees or shrubs and the other half mostly ornamental plants (Mound, 1999; Mound & Wells, 2015; Velez-Gavilan, 2023). Human trade in these plants certainly contributes

to the spread of this and other thrips species around the world (Mound & Tree, 2016).

Material studied: Madeira: ICLAM-T968, 1♀, ex *Citrus limon* (L.) Burm. fil. (Rutaceae), near Quinta do Conde, Boaventura, São Vicente, 32.80187, -16.95822, 406 m, 8 Oct. 2024, Maria L. Cortezão leg.

Dendrothrips sp. near ***oleae*** Faure, 1960

The genus *Dendrothrips* Uzel, 1895 has 58 recognised species (ThripsWiki, 2024). The only specimen we have collected has nine-segmented antennae (Plate Ia) and a pair of prominent postero-angular pronotal setae (Plate Ib) (see end of article).

These characteristics are shared by 4 species: *D. eastopi* Pitkin & Palmer, 1975 from Europe, *D. oatleyi* Faure, 1964 and *D. oleae* Faure, 1960 from South Africa and *D. saniishi* Yakhontov, 1958 from Khazakstan (zur Strassen, 1968; Rasool *et al*., 2021). The key of zur Strassen (1968) for the then known *Dendrothrips* species does not include *D. eastopi*, which was later described by Pitkin & Palmer (1975). Still, *D. eastopi* differs from our specimen by three pairs of short posteromarginal setae (our specimen has four) and the lyre-shaped metathoracic furca is greatly enlarged and reaches the end of the metathoracic cavity (see Mound *et al*., 1976, Fig. 77, p. 30) and not quite enlarged in our specimen (Plate Id). Pitkin & Palmer (1975) clearly state that *D. eastopi* resembles *D. oleae*. With the help of the key of zur Strassen (1968) our specimen can be identified as *D. oleae*. However, if we compare its morphological features with the original description of *D. oleae*, by Faure (1960), we note several differences, such as the position and size of the posteroangular seta, which is twice as large as the equivalent in *D. oleae* and is located further away from the pronotum angle. The pronotum itself has a different shape and a more pronounced sculpture if we compare it with Figure 16 in Faure's description. The sculpture of tergite V (Plate Ie) is also different and more similar to that of *D. degeeri* Uzel, 1895 than that of Faure in Figure 28. As measurements and colour descriptions show, the antennae are different in both species (Table 1) (see end of article).

Our specimen has a body length of 1296 µm, at least 15% longer than the larger *D. oleae* specimens. All these differences indicate that we are dealing with a different, closely related, and probably undescribed species. The fact that it was collected on *Jasminum odoratissimum* (L.) Banfi, an Oleaceae native to Madeira and the Canary Islands, further strengthens this hypothesis.

Material studied: Madeira: ICLAM-T901, 1♀, ex *Jasminum odoratissimum* (L.) Banfi (Oleaceae), on the trail from Prazeres to Paúl do Mar, 180 m, 32.753127, -17.221585, 10 Mar. 2020, Rubina Leça leg.

Pseudodendrothrips stuardoi (Moulton, 1930)

Pseudodendrothrips Schmutz, 1913 currently has 22 valid species (ThripsWiki, 1924). This Dendrothripine genus can be morphologically distinguished from the previous one by the following characteristics: it usually has 3 pairs of ocellar setae (2 in *Dendrothrips*), the forewing is not curved at the tip (in *Dendrothrips* it is curved at the tip to join the posterior margin), long fringe cilia and stout, long apical setae (in *Dendrothrips* all cilia are small at the tip), fringe cilia on the anterior margin arise close to the margin (in *Dendrothrips* fringe cilia on the anterior margin arise ventrally far behind the margin), hind tarsus more than half as long as the hind tibia (in *Dendrothrips* the hind tarsus is at most one third as long as the hind tibia) (Mirab-Balou & Dosty, 2015; Rasool *et al*., 2021).

The only specimen of this genus that we have collected in Madeira resembles *Pseudodendrothrips mori* (Niwa, 1908), the mullberry thrips, a species close to *P. stuardoi*. Until Rasool *et al*. (2021) revised the status of *P. stuardoi* as a valid species, it was considered a synonym of *P. mori* (Niwa). Based on the *Pseudodendrothrips* key provided by this author, it is clear that the specimen collected in Madeira is *P. stuardoi*.

Although it was originally described from Chile, Rasool *et al.* (2021) state that it is most likely an introduced species to South America based on its association with a Mediterranean host, the tree *Ficus carica* L. (Moraceae). In addition to Chile and Brazil in South America, *S. stuardoi* also occurs in Saudi Arabia. However, our specimen was collected from leaves of *Euphorbia pulcherrima* Willd. ex Klotzch (Euphorbiaceae), it is more likely that its true host is *Ficus carica*, a common fruit tree in Madeira.

Material studied: Madeira: ICLAM-T920, 1♀, ex *Euphorbia pulcherrima* Willd. ex Klotzch (Euphorbiaceae), Tabua, Ribeira Brava, 168 m, 32.677224, -17.066687, 7 Jul. 2021, Celestina Brazão leg.

Subfamily **Panchaetothripinae**

Hercinothrips femoralis (Reuter, 1891)

This is the second species of the genus *Hercinothrips* Bagnall, 1932 to occur in Madeira, alongside *H. bicinctus* (Bagnall, 1919), which is well established and widespread throughout the island. The genus *Hercinothrips* comprises 10 extant species, probably all originating from Africa, with *H. femoralis* being widely distributed in tropical and subtropical areas, mainly through the trade in ornamental plants, so that it is now considered a pantropical cosmopolitan species and is also associated with greenhouses in temperate regions (Houston *et al*., 1991; Varga, 2008; Goldarazena & Vierbergen, 2022). It was already cited as a new record by Aguiar (1999) but without details on the specimens analysed and where they were deposited. *H. femoralis* is a new record for Madeira and in Macaronesia is already known from the Canary Islands (BIOTA, 2024).

The banded greenhouse thrips is extremely polyphagous with more than 50 different host plants, including ornamentals such as *Amaryllis*, *Aralia*, *Begonia*, *Chrysanthemum*, *Croton*, *Cyclamen*, *Dieffenbachia*, *Dracaena*, *Gardenia*, *Hydrangea*, *Impatiens*, *Philodendron*, *Schefflera*, *Schlumbergera* and important crops such as figs, sugar beet, peanuts, bananas, cotton, pineapple, sugar cane and beans (Houston *et al*., 1991; Trdan *et al*., 2007; Goldarazena & Vierbergen, 2022).

Material studied: Madeira: ICLAM-T201, 4♀♀, ex *Ruscus hypophyllum* L. (Asparagaceae), Lugar de Baixo, Ponta do Sol, 32.677924, -17.088495, 40 m, 23 Nov. 1995, José Jesus leg.; ICLAM-T269, 6♀♀, ex *Musschia aurea* (L. f.) Dumort. (Campanulaceae), Lugar de Baixo, Ponta do Sol, 32.677924, -17.088495, 40 m, 9 May 1997, Maria J. Dragovic leg.; ICLAM-T323, 1♀, ex *Anthurium andraeanum* Linden ex André (Araceae), São Martinho, Funchal, 32.648581, -16.953170, 172 m, 17 Nov. 1999, Zita Vasconcelos leg.; ICLAM-T922, 6♀♀, ex *Ficus elastica* Roxb. ex Hornem. (Moraceae), Rua Dr. Pita (indoors), Funchal, 32.647083, -16.932197, 169 m, 7 Aug. 2021, F. Aguiar leg.

The females of the *Hercinothrips* species present on Madeira can be differentiated with the morphological characteristics presented in Table 2 (see end of article).

Monilothrips kempi Moulton, 1929

Moulton (1929) established the monotypic genus *Monilothrips* for this species. The name is derived from *monile* or necklace and refers to the bead-like appearance of the antennae. In his "Monograph of the Panchaetothripinae", Wilson (1975) established the tribe Monilothripini, which includes *Monilothrips* Moulton and *Zaniothrips* Bhatti, 1967, to which Zhang *et al*. (2019) added *Bradinothrips* Hood, 1954 and *Parascolothrips* Mound, 1967. We used the keys and the species description of Wilson (1975) to identify the material collected in Madeira.

Although the type material was collected in northern India (Eastern Himalaya), followed by other regions of the Indian continent such as Arunachal Pradesh, Sikkim and Tamil Nadu in the south, *M. kempi* has a very scattered worldwide distribution, with populations in South Africa (Lesotho, Transvaal), USA (California, Hawaii), Japan (Kyushu), Korea, China (Yunnan, Sichuan, Guizhou) and Taiwan (Hood & Jacot-Guillarmod, 1959; Wilson, 1975; Kudô, 1992; Mound, 2002; Mirab-Balou *et al*., 2011; Maisnam *et al*., 2012; Mound *et al*., 2017; Chiru *et al*., 2023). This species develops exclusively on ferns as *Anemia caffrorum* (L.) Christenh. (Anemiaceae), *Hypolepis sparsisora* (Schrad.) Kuhn and *Microlepia strigosa* (Thunb.) C. Presl (Dennstaedtiaceae), *Dryopteris marginata* (C.B. Clarke) Christ and *Polysticum* sp. (Dryopteridaceae), *Adiantum aethiopicum* L. and *Hemionitis andromedifolia* (Kaulf.) Christenh. (Pteridaceae), *Blechnum australe* L., *B. punctulatum* Sw. and *Woodwardia* sp. (Blechnaceae).

According to Hood & Jacot-Guillarmod (1959), *M. kempi* is a very slow-moving insect that lives on the underside of the host's leaves along the midrib. The life cycle is temperature-dependent and a complete cycle outdoors can last from 15 days to more than a month, from egg to adult insect, which can live for several months and produce several generations per year. Indoors, such as in a greenhouse, the developmental cycle can be shortened from half to 1/8 of the time (Lewis, 1973).

M. kempi is a new record for the island of Madeira and was previously unknown in Macaronesia.

Material studied: Madeira: ICLAM-T2, 1♀, 60 immatures, ex unidentified fern, Rochão, Camacha, 935 m, 32.694911, -16.832808, 3 Oct. 1989, Gil Lucas leg.; ICLAM-T471, 6♀♀, ex *Rumohra adiantiformis* (G. Forst.) Ching (Dryopteridaceae), in a greenhouse, Vale, Ribeira Brava, 300 m, 32.670916, -17.050245, 18 Feb. 2004, José Jesus leg.

Parthenothrips dracaenae (Heeger, 1854)

The genus *Parthenothrips* Uzel, 1895 is monotypic and was created for the only species described so far, *P. dracaenae*, the first known thrips species to reproduce

by parthenogenesis. This characteristic inspired the genus name (Trdan *et al*., 2005). Although it was originally described by Heeger (1854) from material collected from *Dracaena* sp. in a greenhouse in Austria, Mound (2009) considers it an Australian endemic species. Wilson (1975) stated that it was frequently found on various ferns so that it possibly originates from Australia. Currently, *P. dracaenae* is considered a circumpolar species that survives in colder climates only in greenhouses (Jenser *et al*., 2003). *P. dracaenae* is a new record for Madeira Island. However, it was already cited as a new record by Aguiar (1999b), without details of the specimens examined or the collection deposited. It is already known from the Azores (ABP, 2024).

As it is polyphagous, the number of registered host plants is large, most of which are ornamental plants whose global trade has contributed to the spread of this species throughout the world. In Madeira, many specimens have been collected indoors (houses, buildings and commercial greenhouses).

Material studied: Madeira: ICLAM-T10, 5♀♀, 9♂♂, ex *Ruscus hypophyllum* L. (Asparagaceae), Ribeirinha (indoors), Camacha, 32.669981, -16.844439, 644 m, 11 May 1990, F. Aguiar leg.; ICLAM-T15b, 1♀, ex *Anthurium andraeanum* Linden ex André (Araceae), Santo António (greenhouse), Funchal, 32.658101, -16.927982, 210 m, 5 Apr. 1991, F. Aguiar leg.; ICLAM-T61, 18♀♀, ex *Ctenanthe* sp. (Marantaceae), Ribeirinha, Camacha, 32.669981, -16.844439, 644 m, 7 Jan. 1994, F. Aguiar leg.; ICLAM-T208, 5♀♀, ex *Passiflora edulis* Sims (Passifloraceae), Ribeirinha (indoors), Camacha, 32.669997, -16.843373, 644 m, 11 Apr. 1995, F. Aguiar leg.; ICLAM-T319, 8♀♀, ex *Citrus sinensis* (L.) Osbeck (Rutaceae), Ribeirinha (indoors), Camacha, 32.642932, -16.843884, 644 m, 9 Dec. 1997, F. Aguiar leg.; ICLAM-T409, 2♀♀, ex *Citrus sinensis* (L.) Osbeck (Rutaceae), Ribeirinha (indoors), Camacha, 32.669980, -16.844439, 644 m, 4 May 2001, José Jesus leg.; ICLAM-T459, 7♀♀, ex *Schefflera* sp. (Araliaceae), São Gonçalo (probably indoors), Funchal, 32.656946, -16.874453, 467 m, 5 Aug. 2003, José Jesus leg.; ICLAM-T483, 6♀♀, 2♂♂, ex *Schefflera* sp. (Araliaceae), Rua Dr. Pita (indoors), Funchal, 32.647073, -16.932215, 163 m, 4 Mar. 2004, F. Aguiar leg.; ICLAM-T718, 1♀, ex *Jasminum* sp. (Oleaceae), Praça das Madalenas, Funchal, 32.660184, -16.930667, 209 m, 21 Jan. 2008, Celestina Brazão leg.

Selenothrips rubrocinctus (Giard, 1901)

Selenothrips Karny, 1911 is also a monotypic genus and the only species described is *S. rubrocinctus*, commonly known as red-banded thrips due to the conspicuous red bands that the 2nd instar larvae and pupae display in the first 2-3 abdominal segments. Like the previous species, *S. rubrocinctus* is a very polyphagous thrips that has spread worldwide from its area of origin through the trade in tropical fruits and ornamental plants. It is a cosmopolitan species (Grové *et al*., 2001) that has spread from its original range, northern South America (Cooper, 1977; Denmark & Wolfenbarger, 1999), to North America, Central America, the West Indies, South America, Europe (Denmark, Italy) and the Atlantic Islands, Africa, Asia, Australasia and the Pacific Islands (Denmark & Wolfenbarger, 1999; Gertsson, 2015; Taddei *et al*., 2021). It is a new record for the archipelago of Madeira. In Macaronesia, it has already been recorded for the islands of Fogo and Santiago in the Cape Verde archipelago (Berzosa *et al*., 2005).

Its host range includes numerous species of mostly tropical fruit trees such as Surinam cherry, guava, cacao, mango, avocado, cashew, tropical almond, rose apple, macadamia, banana, citrus, coffee and papaya (Sakimura, 1939; Cooper, 1977; Steyn *et al*., 1993; Zanuncio-Junior *et al*., 2016), and various ornamentals.

As it is a tropical species, it survives indoors in colder regions such as Denmark (Gertsson, 2015), but in Italy, it has been found outdoors (Taddei *et al*., 2021). The females reproduce by parthenogenesis and males are rare (Steyn *et al*., 1993).

Material studied: Madeira: ICLAM-T764, 7♀♀, ex *Persea americana* Miller (Lauraceae), Santa Maria Maior, Funchal, 32.649835, -16.896274, 71 m, 17 Nov. 2010, Natália Nunes leg.; ICLAM-T852, 1♀, ex *Arbutus unedo* L. (Ericaceae), Urbanização Quinta do Faial, Funchal, 32.652863, -16.891565, 162 m, 29 Feb. 2016, Margarida Costa leg.

Subfamily **Sericothripinae**

Neohydatothrips portoricensis (Morgan, 1925)

This tropical species from Puerto Rico was originally described in the genus *Sericothrips* Haliday, 1836 and later transferred to *Neohydatothrips* John, 1929 by Mound & Marullo (1996) and is widely distributed in South America: Bermuda, Puerto Rico, Lesser Antilles (Nakahara & Hilburn, 1989), Florida (Childers & Nakahara, 2006), Mexico-Chiapas (Infante *et al*., 2018), Cuba (González & Suris, 2009), Jamaica, Santa Lucía, Trinidad & Tobago (Lima, 2016), Guadeloupe (Etienne *et al*., 2015), Costa Rica (Mound & Marullo, 1996), Panama (Goldarazena *et al*., 2012), Ecuador-Galapagos Archipelago (Causton & Sevilla, 2007), Brazil-several states (Monteiro, 1999) and Argentina-Tucumán, Jujuy (Zamar *et al*., 2018).

The available data indicate that the favoured plant hosts are *Ipomoea* spp. (Convolvulaceae), in particular sweet potato, *Ipomoea batatas* (L.) Lam. (Nakahara & Hilburn, 1989; Monteiro, 1999; González & Suris, 2009; Etienne *et al*., 2015), although Childers & Nakahara (2006) mentions red morning glory, *I. hederifolia* L. in Florida as a host plant. Other recorded host plants are *Allium cepa* L. (Amarylidaceae) in Bermuda (Nakahara & Hilburn, 1989) and Cuba (González *et al*., 2010); *Capsicum annuum* L. (Solanaceae) also in Cuba; *Coffea* sp. (Rubiaceae) in Brazil (Monteiro, 1999); *Ricinus communis* L. (Euphorbiaceae) in Guadeloupe (Etienne *et al*., 2015) and *Solanum melongena* L. (Solanaceae) also in Guadeloupe.

N. portoricensis is a new record for the Madeira archipelago and Macaronesia. It was probably not brought to the island by Portuguese sailors in the fifteenth century, but much more recently by its most common host plant, the sweet potato.

Material studied: Madeira: ICLAM-T497, 2♀♀, ex *Ipomoea batatas* (L.) Lam (Convolvulaceae), Lamaceiros, Porto Moniz, 415 m, 32.854111, -17.170496, 25 Nov. 2004, José Jesus leg.; ICLAM-T534, 1♀, ex Moericke type water-pan trap, Curral das Freiras, 800 m, 32.743593, -16.962074, 23 Aug. 2005, José Jesus leg.; ICLAM-T577, 1♀, ex *Ipomoea batatas* (L.) Lam (Convolvulaceae), Covão, Estreito de Câmara de Lobos, 310 m, 32.663980, -16.963751, 6 Jul. 2006, José Jesus leg.; ICLAM-T616, 1♀, ex Moericke type water-pan trap, Jardim da Serra near Eira do Ribeiro, 1292 m, 32.710659, -16.991950, 19 Sep. 2006, Celestina Brazão leg.; ICLAM-T624, 1♀, ex Moericke type water-pan trap, Jardim da Serra near Eira do Ribeiro, 1292 m, 32.710659, -16.991950, 17 Oct. 2006, José Jesus leg.; ICLAM-T627, 1♀, ex Moericke type water-pan trap, Pinheiro, Serra de Água, 400 m, 32.721272, -17.034679, 10 Oct. 2006, José Jesus leg.

Subfamily **Thripinae**

Arorathrips fulvus (Moulton, 1936)

It was originally described from the Hawaiian Islands in the genus *Chirothrips* Haliday, 1836 (zur Strassen, 1960) and later transferred by Bhatti (1990) to a new genus *Arorathrips* Bhatti, 1990 which is closely related to *Chirothrips* and differs by the absence of multiple setae on the mesonota, metanota and ventral surface of the head. According to Mound & Marullo (1996), the genus comprises 13 species, all originating from the Americas. The distribution of *A. fulvus* in the Nearctic and Neotropical regions includes the USA (Tennessee and Texas), Argentina, Brazil, Colombia, Uruguay, and Panama (Schuber *et al*., 2008; Goldarazena *et al*., 2012; Nakahara & Foottit, 2012, Ebratt-Ravelo *et al*., 2019). Like the *Chirothrips* species, they all probably feed on Poaceae flowers (grasses and sedges).

In Madeira, only females have been collected, mainly from water-pan traps, except for a single specimen collected on flowers of the endemic *Argyranthemum pinnatifidum* (L. f.) Lowe s. str. (Asteraceae). This genus and species are new records for both Madeira and Macaronesia.

Material studied: Madeira: ICLAM-T539, 2♀♀, ex Moericke type water-pan trap, Jardim da Serra near Eira do Ribeiro, 1292 m, 32.710659, -16.991950, 23 Oct. 2005, F. Aguiar leg.; ICLAM-T588, 1♀, ex Moericke type water-pan trap, Pinheiro, Serra de Água, 400 m, 32.721272, -17.034679, 12 Sep. 2006, Celestina Brazão leg.; ICLAM-T608, 1♀, ex Moericke type water-pan trap, Pinheiro, Serra de Água, 400 m, 32.721272, -17.034679, 3 Oct. 2006, José Jesus leg.; ICLAM-T609, 2♀♀, ex Moericke type water-pan trap, Jardim da Serra near Eira do Ribeiro, 1292 m, 32.710659, -16.991950, 12 Sep. 2006, Celestina Brazão leg.; ICLAM-T625, 3♀♀, ex Moericke type water-pan trap, Pinheiro, Serra de Água, 400 m, 32.721272, -17.034679, 10 Oct. 2006, José Jesus leg.; ICLAM-T633, 1♀, ex Moericke type water-pan trap, Jardim da Serra near Eira do Ribeiro, 1292 m, 32.710659, -16.991950, 1 May 2006, José Jesus leg.; ICLAM-T635, 1♀, ex Moericke type water-pan trap, Pinheiro, Serra de Água, 400 m, 32.721272, -17.034679, 23 Nov. 2006, José Jesus leg.; ICLAM-T692, 1♀, ex *Argyranthemum pinnatifidum* (L. f.) Lowe (Asteraceae), Pico do Galo, Igreja, Câmara de Lobos, 612 m, 32.660025, -17.004279, 16 Aug. 2007, José Jesus leg.; ICLAM-T832, 1♀, ex Moericke type water-pan trap, Jardim da Serra near Eira do Ribeiro, 1292 m, 32.710659, -16.991950, 10 Oct. 2006, F. Aguiar leg.

Echinothrips americanus Morgan, 1913

Echinothrips Moulton, 1911 is a characteristic genus from the New World with seven species that have a reticulate sculpture on the head, pronotum and metanotum, which could be related to the Panchaetothripinae. Nevertheless, they differ from these in that the mesofurcal spinula is well developed. Other morphological distinguishing features include a row of long capitate setae on the fore wing first vein, none on the second, the median setae of the tergites are close together, tergite VIII with the comb complete and the males have small sternal pore plates (Mound & Marullo, 1996). The poinsettia or impatiens thrips is the only *Echinothrips* species that has spread worldwide through the trade in ornamental plants (Mound *et al*., 2016). Its original distribution area includes the eastern part of the USA, from Florida in the South to New York and Iowa in the North, Southern Canada, Mexico, Panama, Bermudas and Guadeloupe (Marullo & Pollini, 1999; Goldarazena *et al*., 2012; Etienne *et al*., 2015). It was introduced in England in 1989 and has since spread rapidly to at least 19 European countries between 1995 and 2004 (Varga *et al*., 2010). It has also been reported from the Oriental, Australasian, Neotropical (Brazil), and Eastern Palaearctic (China) regions (Mirab-Balou *et al*., 2011; Mound *et al*., 2016; Cavalleri & Gonçalves, 2022). In its native range in the south-east of the United States, it lives and overwinters outdoors, preferably on forest weeds (Varga & Fedor, 2008; Pijnakker *et al*., 2017). In Europe, it is essentially a greenhouse pest that overwinters in heated places and has a high degree of polyphagy and invasion potential due to characteristics such as thelytokous parthenogenesis reproduction, short life cycle and polyvoltinism (Marullo & Pollini, 1999; Vierbergen, 2002). It has been spread through international trade, especially on ornamental plants from the Araceae and Balsaminaceae families (Vierbergen *et al*., 2006). Varga *et al*. (2010) refer to its occurrence on 106 plant species from 48 families.

This species is a new record for Madeira and the entire biogeographic region of Macaronesia.

Material studied: Madeira: ICLAM-T317, 1♀, 1♂, ex unidentified ornamental plant, Quinta da Torrinha, Funchal, 85 m, 32.794460, -16.910196, 21 Nov. 1197, Dorita Camacho leg.

Frankliniella musaeperda Hood, 1952
as *Frankliniella bispinosa* (Morgan, 1913)
in Carvalho & Aguiar, 1997: 309

The genus *Frankliniella* Karny, 1910 is one of the most diverse among the Thysanoptera with more than 230 species, most of which originate from the Americas and are mostly restricted to the Neotropics (Cavalleri & Mound, 2012). Species identification in *Frankliniella* is particularly difficult, but *F. musaeperda* belongs to an even more complex group of species that have developed a swelling on the pedicel of the third antennal segment (Mound & Marullo, 1996). *F. musaeperda* was previously misidentified by Carvalho & Aguiar (1997) as *Frankliniella bispinosa* (Morgan). In *F. musaeperda* the antennal segment III (Fig. 1) (see end of article) has the pedicel with a very broad and sharp-edged basal ring, which is about 2 times as broad as the basal stem, and thus larger than in all other species of the genus. In addition, the pedicel immediately above the ring is smoothly concave in *musaeperda* and angled inwards in *bispinosa*. The specimens collected in Madeira agree with the morphological characters of *F. musaeperda* in both keys of Mound & Marullo (1996) and Cavalleri & Mound (2012).

Described by Hood (1952) from Haiti, it also occurs in the Dominican Republic (Mound & Marullo, 1996), Colombia (Ebratt-Ravelo, 2019) and Brazil (Cavalleri & Mound, 2012), where, according to Mound *et al*. (2022), it is native and of minor importance as a pest. *F. musaeperda* is not known to occur in any other of the Macaronesian archipelagos and on Madeira Island, the only colonised island to date, where it has spread along the south coast between the municipalities of Ponta do Sol and Santa Cruz up to an altitude of 350 metres. The available data from native countries in Central and South America indicate that *F. musaeperda* is a polyphagous species that feeds on plants of different families such as Anacardiaceae, Apocynaceae, Asteraceae, Euphorbiaceae, Lauraceae, Malpighiaceae, Musaceae, Passifloraceae, Rosaceae, Rutaceae, Verbenaceae and Vitaceae, including important crops such as bananas, grapes, avocado, oranges, mango, cassava, passion fruit and roses (Cavalleri & Mound, 2012; Lima & Miyasato, 2017; Ebratt-Ravelo *et al*., 2019). The feeding activity of the adults and larvae damages the surface of leaves and fruits as well as the flower tissue (Hood, 1952; Cardoso *et al*., 2016).

Material studied: Madeira: ICLAM-T40, 3♀♀, 1♂, ex *Rosa* sp. (Rosaceae), Lombo da Boa Vista, Funchal, 175 m, 32.652139, -16.889956, 8 Dec. 1992, F. Aguiar leg.; ICLAM-T58,

2♀♀, 3♂♂, ex *Rosa* sp. (Rosaceae), Salão, Gaula, Santa Cruz, 132 m, 32.677872, -16.806208, 10 Dec. 1993, José Ferreira leg.; ICLAM-T190, 2♀♀, ex *Citrus sinensis* (L.) Osbeck (Rutaceae), Preces, Câmara de Lobos, 190 m, 32.656399, -16.976775, 19 Jul. 1995, F. Aguiar leg.; ICLAM-T213, 1♀, 1♂, ex *Fuchsia* sp. (Onagraceae), Rua da Torrinha, Funchal, 85 m, 32.652790, -16.907177, 17 Mar. 1995, José Jesus leg.; ICLAM-T343, 2♀, ex *Echium nervosum* W. T. Aiton (Boraginaceae), Cancela, São Gonçalo, Funchal, 340 m, 32.643082, -16.858996, 3 Feb. 2000, José Jesus leg.; ICLAM-T357, 3♀♀, 1♂, ex *Echium nervosum* W. T. Aiton (Boraginaceae), Praia Formosa, Funchal, 10 m, 32.639426, -16.947645, 10 Feb. 2000, José Jesus leg.; ICLAM-T363c, 2♀♀, *Echium nervosum* W. T. Aiton (Boraginaceae), Miradouro da Ribeira Brava, 95 m, 32.669402, -17.063177, 10 Feb. 2000, José Jesus leg.; ICLAM-T420-421, 3♀♀, *Passiflora* sp. (Passifloraceae), Lugar de Baixo, Ponta do Sol, 40 m, 32.677924, -17.088495, 11 Jun. 2001, Jordan Andrade leg.; ICLAM-T431, 6♀♀, 1♂, ex *Rosa* sp. (Rosaceae), Livramento, Funchal, 350 m, 32.665038, -16.902145, 26 Jan. 2002, Sara Camacho leg.; ICLAM-T433b, 4♀♀, 3♂♂, ex *Rosa* sp. (Rosaceae), Livramento, Funchal, 350 m, 32.665038, -16.902145, 8 Jan. 2002, Sara Camacho leg.; ICLAM-T465, 3♀♀, ex *Erythrina crista-galli* L. (Fabaceae), Quinta Magnólia, Funchal, 73 m, 32.641061, -16.921117, 5 Aug. 2003, Natacha Silva leg.; ICLAM-T600, 1♀, *Passiflora* sp. (Passifloraceae), Travessa do Pilar, Funchal, 200 m, 32.657482, -16.931686, 11 Oct. 2006, José Jesus leg.; ICLAM-T881a, 1♀, 2♂♂, ex *Euphorbia pulcherrima* Willd. ex Klotzsch (Euphorbiaceae), Lugar de Baixo, Ponta do Sol, 19 m, 32.679920, -17.086645, 21 May 2018, Celestina Brazão leg.

Frankliniella schultzei (Trybom, 1910)

This is the third species of *Frankliniella* Karny, 1910 species of identified on Madeira Island, all are introduced species. *F. schultzei* is a polymorphic species with dark and pale-coloured forms, the dark form being mainly distributed south of the equator and the pale form in the North (Sakimura, 1969). The species itself is considered pantropical worldwide, is quite common in the international flower trade and is native to Europe, Asia, Africa, Australia, the Pacific Islands, North, Central and South America (Vierbergen & Mantel, 1991). The typical dark-coloured form of this species, like the females collected in Madeira (see below), is distributed from Africa to Australia and is common in South America, according to Mound & Marullo (1996). This dark form is also able to colonise greenhouses, increasing the risk of the spread of Tomato spotted wilt virus (TSWV) (Vierbergen & Mantel, 1991).

It is polyphagous and feeds mainly on flowers and leaves of many different plant species, including many ornamental and crop plants. At least 83 plant species from 35 families have been identified (Monteiro *et al*., 1999; Milne & Walter, 2000). Plant hosts can be damaged by direct feeding or indirectly by infection with tospovirus, as the dark form is known to be an effective vector of four tospoviruses, namely Tomato spotted wilt virus (TSWV), Tomato chlorotic spot virus (TCSV), Groundnut ringspot virus (GRSV) and Chrysanthemum stem necrosis virus (CSNV) (Sakurai, 2004). Interestingly, *F. schultzei* is also an important predator of eggs and adult mite pests on cotton in Brazil (Monteiro *et al*., 1999).

This species is already known in Macaronesia from the Canary Islands and Cape Verde Archipelago (Berzosa & Oromí, 2004; Berzosa *et al*., 2005).

Material studied: Madeira: ICLAM-T686, 1♀, ex flowers of *Helianthus annuus* L. (Asteraceae), levada Campanário to Boa Morte, Ribeira Brava, 32.680580, -17.029463, 514 m, 16 Aug. 2007, José Jesus leg.; ICLAM-T720, 1♀, ex flowers of *Calendula maderensis* DC. (Asteraceae), near Prainha beach, north of the main road, Caniçal, 32.749166, -16.722728, 81 m, 24 Jan. 2008, Celestina Brazão leg.; ICLAM-T738, 2♀♀, 4♂♂, ex *Tagetes erecta* L. (Asteraceae), Rua Lombo da Boa Vista, Funchal, 32.655323, -16.893879, 175 m, 8 Nov. 2008, F. Aguiar leg. Selvagens Islands: ICLAM-T810, 3♀♀, ex *Solanum nigrum* L. (Solanaceae), near the cistern, Selvagem Grande, 35 m, 30.140984, -15.869283, 17 Oct. 2012, Mahnaz Khadem leg.

The three *Frankliniella* Karny species occurring in Madeira can be identified using the following dichotomous key:

1. Pedicel of the antennal segment III with a sharp-edged basal ring, wider than the base of the segment. .... ***F. musaeperda*** Hood.
- Pedicel of the antennal segment III without a basal ring. .. 2
2(1). Ocellar setae III very close together, 3 to 4 times as long as the distance between their bases and arising between the posterior ocelli; Metanotum without campaniform sensillae; Abdominal tergite VIII with a comb with microtrichia on broad bases, very short, sparse and undeveloped medially; Males with glandular areas on sternites III-VII narrow and transverse, occupying more than half of the sternites width. ..... ***F. schultzei*** (Trybom).
- Ocellar setae III further apart, about twice as long as the distance between their bases, arising in front of the

posterior ocelli; Metanotum with a pair of campaniform sensillae; Abdominal tergite VIII with a well-developed comb, complete, long and on broad bases; Males with glandular areas on sternites III-VII oval, small and transverse, occupying a fourth of the sternite width. .... ***F. occidentalis*** Pergande.

Pezothrips kellyanus (Bagnall, 1916)

The genus *Pezothrips* Karny, 1907 has 13 valid species, most of which originate from the Palaearctic and are distributed between Western Europe and Japan (GBIF Secretariat, 2023). The exception is *P. kellyanus*, which is thought to have originated in eastern Australia, where it was described, and is now widespread in this region and also in New Zealand, New Caledonia and Hawaii, from where it was probably introduced to southern Europe in Greece in 1981 (Vierbergen *et al*., 2006; Mound *et al*., 2016). Regarding the geographical origin, Reynaud (2010) classifies it as cryptogenic, considering that the morphological similarity of *P. kellyanus* with all other *Pezothrips* species suggests that *P. kellyanus* originates from the same region. However, it is not known to breed on endemic plants here, but it has been found on *Myoporum insulare* R.Br. (Myoporaceae), which is endemic to Australia (Webster *et al*., 2006). In Europe, after its introduction to Greece, it spread to southern Italy, Sicily, France, Spain, Portugal, Cyprus, the Netherlands (in greenhouses) and Türkiye (Mound & Tree, 2020). *P. kellyanus* was recently found in Macaronesia in the Canary Islands, Tenerife (Siverio-Nuñez & Sobrino-Vesperinas, 2018).

The adults of Kelly's citrus thrips, as it is commonly called, are attracted to white, strongly scented flowers of various plants (Vassiliou, 2010), especially citrus species and varieties, where they feed and reproduce. It is considered a serious pest of *Citrus* spp. in South Australia (Mound & Tree, 2020), is the most common thrips on citrus flowers in southern Italy (Marullo, 2002), a key pest, mainly on lemons in Sicilian orchards (Conti *et al*., 2002), the dominant species on lemon trees in the western region of Portugal (Costa *et al*., 2006), and lemon and navel orange are the main hosts in Tenerife, Canary Islands (Siverio-Nuñez & Sobrino-Vesperinas, 2018). Other flowering plants can be selected as secondary hosts, such as those belonging to *Brassica*, *Brugmansia*, *Helianthus*, *Jasminus*, *Lycopersicon* and *Pittosporum* (Marullo, 1998; Marullo & De Grazia, 2013; Siverio-Nuñez & Sobrino-Vesperinas, 2018).

Material studied: Madeira: ICLAM-T517, 1♂, ex *Vitis vinifera* L. (Vitaceae), Calçada do Pico, Funchal, 32.649250, -16.912426, 90 m, 18 May 2005, Graça Freitas leg.; ICLAM-T566, 1♀, ex *Tipuana tipu* (Benth.) O. Kuntze (Fabaceae), Promenade do Lido, Funchal, 32.634486, -16.941425, 10 m, 29 Jun. 2006, José Jesus leg.; ICLAM-T567, 1♀, ex *Punica granatum* L. (Lythraceae), same data as previous; ICLAM-T568, 1♂, ex *Myrica faya* Ait. (Myricaceae), same data as previous; ICLAM-T584, 2♀♀, ex *Jacaranda mimosifoliae* D. Don (Bignoniaceae), Quinta das Cruzes, Funchal, 32.650744, -16.913875, 44 m, 1 Aug. 2006, Délia Cravo leg.; ICLAM-T599, 1♀, ex *Passiflora edulis* Sims (Passifloraceae), Travessa do Pilar, Funchal, 32.657482, -16.931686, 200 m, 11 Oct. 2006, José Jesus leg.; ICLAM-T710, 2♀♀, ex *Citrus reticulata* Blanco (Rutaceae), Quinta do Arieiro, Funchal, 32.645957, -16.957898, 142 m, 31 Jan. 2008, Paula Rocha leg.; ICLAM-T756, 1♀, ex undet. sp. (Orchidaceae), Jardim Orquídea, Funchal, 32.660448, -16.897847, 232 m, 12 May 2010, Maria L. Cortezão leg.; ICLAM-T758, 12♀♀, 1♂, ex *Citrus sinensis* (L.) Osbeck (Rutaceae), Lazareto, Funchal, 32.646524, -16.876206, 197 m, 5 May 2010, Maria L. Cortezão leg.; ICLAM-T759, 3♂♂, ex *Citrus* sp. (Rutaceae), Rua D. Mécia, Santa Cruz, 32.696605, -16.798547, 284 m, 19 May 2010, Maria L. Cortezão leg.; ICLAM-T778, 4♂♂, ex *Metrosideros excelsa* Sol. ex Gaertn. (Myrtaceae), Jardim do Mar, Calheta, 32.735852, -17.210188, 8 m, 28 Jul. 2011, José Jesus leg.; ICLAM-T795, 1♀, 3♂♂, ex *Vitis vinifera* L. (Vitaceae), Campo Exp. de Vinhas, Estreito da Calheta, 32.734955, -17.187060, 336 m, 7 May 2012, Rita Freitas leg.; ICLAM-T796, 1♂, same data as previous; ICLAM-T856, 1♂, ex *Jasminum azoricum* L. (Oleaceae), Lugar de Baixo, Ponta do Sol, 32.680834, -17.092154, 38 m, 3 Feb. 2016, Maria J. Dragovic leg.; ICLAM-T859, 1♀, ex *Citrus limon* (L.) Burm. fil. (Rutaceae), Quinta das Vinhas, Estreito de Câmara de Lobos, 32.669122, -16.979098, 433 m, 5 Aug. 2016, Celestina Brazão leg.; ICLAM-T862, 1♂, ex *Citrus reticulata* Blanco (Rutaceae), Lazareto, Funchal, 32.646524, -16.876206, 197 m, 10 Aug. 2016, Celestina Brazão leg.; ICLAM-T904, 1♀, ex *Euphorbia pulcherrima* Willd. ex Klotzch (Euphorbiaceae), Est. João Gonçalves Zarco, Estreito de Câmara de Lobos, 32.659148, -16.975413, 199 m, 18 Jun. 2020, Celestina Brazão leg.; ICLAM-T912, 1♀, ex *Citrus limon* (L.) Burm. fil. (Rutaceae), Maloeira, Calheta, 32.765792, -17.207825, 633 m, 27 Aug. 2020, José Jesus leg.; ICLAM-T913, 2♀♀, ex *Citrus limon* (L.) Burm. fil. (Rutaceae), Achada do Marques, Ilha, Santana, 32.799616, -16.908134, 398 m, 27 Aug. 2020, José Jesus leg.; ICLAM-T918, 1♂, ex *Carica papaya* L. (Caricaceae), Ponta Delgada, São Vicente,

32.828275, -16.986559, 41 m, 31 May 2021, Celestina Brazão leg.; ICLAM-T924, 1♀, ex *Persea americana* Mill. (Lauraceae), Quebradas, Funchal, 32.647848, -16.962601, 117 m, 2 Jun. 2022, Andreia Fernandes leg.; ICLAM-T939, 1♀, ex *Citrus limon* (L.) Burm. fil. (Rutaceae), Achada do Marques, Ilha, Santana, 32.798075, -16.909827, 433 m, 7 Sep. 2023, Graça Freitas leg.; ICLAM-T948, 1♂, ex *Citrus limon* (L.) Burm. fil. (Rutaceae), Faial, Santana, 32.786227, -16.853658, 52 m, 7 Mar. 2024, Graça Freitas leg.; ICLAM-T951, 2♀♀, ex *Citrus sinensis* (L.) Osbeck (Rutaceae), Serra de Água, Ribeira Brava, 32.715971, -17.033103, 207 m, 15 Mar. 2024, Graça Freitas leg.; ICLAM-T957, 1♂, ex *Citrus limon* (L.) Burm. fil. (Rutaceae), Faial, Santana, 32.786227, -16.853658, 52 m, 16 May 2024, Graça Freitas leg.; ICLAM-T960, 1♀, ex *Citrus reticulata* Blanco (Rutaceae), Santo António, Funchal, 32.671362, -16.948250, 459 m, 27 May 2024, Micaela Martins leg.

Psydrothrips luteolus Nakahara & Tsuda, 1994

One of the distinguishing features of the genus *Psydrothrips* Palmer & Mound, 1985 is the presence of nine-segmented antennae, a rarity in the family Thripidae, according to Mound *et al*. (2016). Besides *P. luteolus*, the genus contains only one other species, *P. kewi* Palmer & Mound, 1985 (Mound & Hastenpflug-Vesmanis, 2021).

Although *P. luteolus* was described from material collected by Nakahara & Tsuda (1994) in Honolulu, O'ahu (Hawaii), the species and the genus *Psydrothrips* are of Neotropical origin (Mound *et al*., 2016). The currently known distribution includes Florida (USA), where it was certainly introduced, and Brazil, where it is probably native (Edwards, 1995).

Psydrothrips spp. have been shown to feed exclusively on plants belonging to the Araceae, most of which are native to the tropical rainforests of Central and South America (Cavalleri *et al*., 2014), such as *Dieffenbachia* sp., *Epipremnum aureum* (Linden & André) Bunt, *E. pinnatum* (L.) Engl., *Philodendron scandens* ssp. *oxycardium* (Schott) Bunt, *Spathiphyllum floribundum* (Linden & André) N.E.Br., and *Syngonium podophyllum* Schott (Nakahara & Tsuda, 1994; Edwards, 1995). Araceae include many ornamental plants on which both the larvae and adults of *Psydrothrips* species cause considerable damage to the developing unfolded young leaves, which become stunted, malformed and necrotic (Nakahara & Tsuda, 1994).

P. luteolus is a new record for the archipelago of Madeira, but so far it has only been discovered on Madeira Island and is also a new record for Macaronesia.

Material studied: Madeira: ICLAM-T416, 3♀♀, 3♂♂, ex *Dieffenbachia* sp. (Araceae) indoors, São Pedro, Funchal, 88 m, 32.646695, -16.922449, 4 May 2001, Luís Domingues leg.

Scirtothrips aurantii Faure, 1929

In the 1920's Faure (1929) described this species after it became commercially important in South African citrus fruits (EFSA, 2018). It is an Afrotropical species whose distribution area extends throughout Africa between the Cape Province (South Africa), Zimbabwe, Angola, Malawi, Tanzania, Uganda, Kenya, Ethiopia, Nigeria, Ghana, Sudan and Egypt and is also found in Yemen, Mauritius and Réunion (Mound, 1981; EFSA, 2018; EPPO, 2024). It was introduced in Australia in 2002 (Hoddle & Mound, 2003), Spain in 2020 and Portugal in 2022 (EPPO, 2024). In Macaronesia, *S. aurantii* is reported for the Cape Verde archipelago, although this is currently considered doubtful (EPPO, 2024).

Scirtothrips Shull, 1909 is a large genus with currently 106 described species (Mound & Hastenpflug-Vesmanis, 2021). They are small, yellow and very active, often in large populations. Their feeding activity deforms young fruit and leaves through toxic saliva and the introduction of viruses (Mound, 1981). Most *Scirtothrips* spp. can be considered potential pests and are easily transported worldwide on infested host plants. *S. aurantii* is highly polyphagous and EFSA (2018) lists 22 different plant species in 13 families, including important crops such as *Citrus* spp. and *Mangifera indica* (Grové *et al*., 2000). On Madeira Island, it has been detected on strawberries and thornless blackberries. The introduction must have been recent. It may have originated from mainland Portugal or Spain, where it has also been found on strawberries (*Fragaria* x *ananassa* Duchesne) (NPPO of Spain, 2021; NPPO of Portugal, 2022).

Two other species of *Scirtothrips* Shull occur in the archipelago (zur Strassen, 1977), *S. inermis* Priesner, 1933 and *S. longipennis* (Bagnall, 1909). The former, originally described from the Canary Islands, is a native species that occurs in all Macaronesian archipelagos and some Mediterranean countries, the latter is possibly introduced and has also been recorded in Cape Verde (Berzosa *et al*., 2005). These species and the newcomer *S. aurantii* can be distinguished morphologically using the following dichotomous key:

1. Abdominal sternites IV-VI with microtrichia extending fully across; Forewing posteromarginal cilia undulating; Ocellar triangle with regular lines of sculpture between posterior ocelli closely striate; Tergite VIII with discal microtrichia present anteromedially; Tergite IX discal microtrichia absent; Male hind femora with a comb of stout dark setae, and tergite IX with drepanae. ..... ***S. aurantii*** Faure.

- Abdominal sternites IV-VI with microtrichia not extending across median area; Forewing posteromarginal cilia straight or undulating; Ocellar triangle with regular lines of sculpture between posterior ocelli, either transversely striate or transversely reticulate; Tergite VIII with or without discal microtrichia medially; Tergite IX with discal microtrichia present or absent; Male hind femora without a comb of dark stout setae, and tergite IX with or without drepanae. 2

2(1). Forewing posterior margin with all cilia straight without any undulations; Ocellar setae III long, about twice as long as median length of one posterior ocellus; Abdominal tergites with 4 to 6 discal setae on each lateral microtrichial field; Tergite VIII with microtrichia medially near anterior margin; Tergite IX without discal microtrichia; Male tergite IX without paired drepanae. ..... ***S. inermis*** Priesner.

- Forewing posterior margin with at least one or two cilia near basal half of wing not straight, sometimes with all cilia weakly to strongly undulating; Ocellar setae III wide apart, arising on or outside anterior margins of ocellar triangle; Abdominal tergites with 3 discal setae on each lateral microtrichial field; Tergite VIII without discal microtrichia medially; Tergite IX with discal microtrichia on posterior half; Male unknown. ..... ***S. longipennis*** (Bagnall).

Material studied: Madeira: ICLAM-T940, 1♀, ex *Rubus fruticosus* L. (Rosaceae), Largo das Levadas, Jardim da Serra, Câmara de Lobos, 29 Sep. 2023, Márcia Melim leg.; ICLAM-T941a, 13♀♀, 10♂♂, 1 larva, ex *Fragaria* x *ananassa* Duchesne (Rosaceae), Caldeira, Câmara de Lobos, 23 Jan. 2024, Luís Pestana leg.; ICLAM-T942, 1♀, 1♂, ex *Fragaria* x *ananassa* Duchesne (Rosaceae), Caldeira, Câmara de Lobos, 396 m, 32.66098, -16.99972, 31 Jan. 2024, Pedro Gonçalves leg.; ICLAM-T943, 1♀, 1♂, ex *Fragaria* x *ananassa* Duchesne (Rosaceae), Caldeira, Câmara de Lobos, 264 m, 32.65770, -16.99465, 31 Jan. 2024, Pedro Gonçalves leg.; ICLAM-T944, 1♀, ex *Fragaria* x *ananassa* Duchesne (Rosaceae), Caldeira, Câmara de Lobos, 248 m, 32.65303, -16.99191, 31 Jan. 2024, Pedro Gonçalves leg.; ICLAM-T945, 1♂, ex *Fragaria* x *ananassa* Duchesne (Rosaceae), Caldeira, Câmara de Lobos, 277 m, 32.65892, -16.99532, 16 Feb. 2024, Pedro Gonçalves leg.; ICLAM-T946, 8 larvae, ex *Fragaria* x *ananassa* Duchesne (Rosaceae), Chão da Ribeira, Seixal, 305 m, 32.81804, -17.10951, 28 Feb. 2024, Pedro Gonçalves leg.; ICLAM-T953, 1♂, 1 larva, ex *Fragaria* x *ananassa* Duchesne (Rosaceae), Caniço, Santa Cruz, 32.642005, -16.837836, 61 m, 22 Apr. 2024, João Nunes leg.

Scolothrips brevipilis Priesner, 1936

In the most recent revision of the genus *Scolothrips* Hinds, 1902 by Mound (2011), 14 species were recognised. Among the Thripidae, it is the only genus whose species are obligate predators (Wang *et al*., 2022). Most of them feed on mites (Bournier, 2000), although there is at least one report of a *Scolothrips* species that feeds on coccids (zur Strassen, 1995). *Scolothrips* are small pale-coloured thrips with a median body length of 1000 µm, 6 pairs of long, slightly barbed pronotal setae, a similar pair of interocellar setae and a series on the banded forewings (Bournier, 2000; Mound *et al*. 2010).

The morphological characteristics of the specimens collected on Madeira and Porto Santo correspond to those of *S. brevipilis* Priesner, as described in Mound (2011). They show a reticulate metanotum, the absence of a pronotal posteromesad pair of discal setae, a subbasal dark band on the fore wing completely including the costal margin, the fore wing clavus shaded only at the extreme base and a yellow body with brown lateral sclerites on the pterothorax.

The known distribution of *S. brevipilis* includes South Africa, Réunion, Congo, Togo, Chad, Sudan and Yemen (Bournier, 2000; Mound, 2011).

Material studied: Madeira: ICLAM-T145, 1♀, 4♂♂, ex *Sechium edule* (Jacq.) Swartz (Cucurbitaceae), Barreiros, Caniço, Santa Cruz, 32.654523, -16.837253, 240 m, 11 Oct. 1994, José Jesus leg. Porto Santo: ICLAM-T418, 2♀♀, 1♂, ex *Urtica* sp. (Urticaceae), preying on spider mites, *Tetranychus* sp. (Tetranychidae), Pico do Facho, 33.078302, -16.320195, 340 m, 24 Jul. 2001, F. Aguiar leg.

Thrips simplex (Morison, 1930)

Aguiar (1999a) had already cited this species as a new record for Madeira without details of the specimens examined or the collection in which they were deposited. Although *T. simplex* was first described by Morison from

specimens collected on flowers of *Dianthus caryophyllus* L. in South Australia (Denmark & Price, 2013; Masarovič *et al*., 2016), it probably originates from South Africa and the most closely related species belong to the African fauna according to Moritz *et al*. (2024).

As the name suggests, the gladiolus thrips, *T. simplex*, is a well-known pest, especially of *Gladiolus* L. cultivars, and has spread worldwide through the trade in these ornamental plants from Africa, South Asia and Japan, Australia, several Pacific islands, Europe and North and South America (Denmark & Price, 2013; Masarovič *et al*., 2016). Besides *Gladiolus*, other Iridaceae can also serve as hosts for *T. simplex*, such as *Crocosmia* Planch. and *Neomarica* Sprage, but also carnation, *Dianthus caryophyllus* L. and others that are not so common (Mound & Masumoto, 2005; Masarovič *et al*., 2016).

In Macaronesia, *T. simplex* has already been recorded in the Azores and Canary Islands (ABP, 2024; BIOTA, 2024).

Material studied: Madeira: ICLAM-T36, 18♀♀, 3♂♂, 5 nymphs, ex *Gladiolus italicus* Mill. (Iridaceae), Madalena, Funchal, 32.657190, -16.926060, 200 m, 21 Jun. 1992, F. Aguiar leg.; ICLAM-T37, 4♀♀, 1♂, 1 nymph, ex *Dianthus caryophyllus* L. (Caryophyllaceae), in a greenhouse, Barreiro, Santana, 32.807911, -16.880059, 367 m, 1 Oct. 1992, F. Aguiar leg.; ICLAM-T55, 1♂, ex *Brassica oleracea* L. (Brassicaceae), Lourencinhas, Estreito de Câmara de Lobos, 32.656185, -16.960770, 260 m, 24 Aug. 1993, F. Aguiar leg.; ICLAM-T212, 3♀♀, 2♂♂, ex *Fuchsia* sp. (Onagraceae), Quinta da Torrinha, Funchal, 32.652790, -16.907177, 85 m, 17 Mar. 1995, José Jesus leg.; ICLAM-T259, 4♀♀, ex *Dianthus caryophyllus* L. (Caryophyllaceae), in a greenhouse, Barreiro, Santana, 32.807911, -16.880059, 367 m, 9 May 1997, F. Aguiar leg.; ICLAM-T461a, 1♀, ex *Strelitzia reginae* Banks (Strelitziaceae), Murteira, Ribeira Brava, 32.683999, -17.052865, 70 m, 12 Jun. 2003, José Jesus leg.

With the addition of *T. simplex*, the current number of species of the genus *Thrips* Linnaeus, 1758 occurring in the Madeira Archipelago is 11. The species *T. australis* (Bagnall, 1915) and *T. florum* Schmutz, 1913 were mentioned in previous references under the synonyms *Isoneurothrips australis* Bagnall by zur Strassen (1977, 2008) and *Thrips exilicornis* Hood by Aguiar (2009) and Ribeiro *et al*. (2009). The females of these 11 species can be identified with the following dichotomous key:

1. Abdominal sternites without discal setae. 2
- Abdominal sternites with discal setae. 5
2(1). Ocellar setae pair III situated inside ocellar triangle. .. 3
- Ocellar setae pair III situated outside ocellar triangle. 4
3(2). Abdominal tergite II with 4 lateral setae; Metanotum with campaniform sensillae; Forewing first vein with 3 setae on its distal half; Tergite IX with two pairs of campaniform sensillae. ..... ***T. flavus*** Schrank.
- Abdominal tergite II with 3 lateral setae; Metanotum without campaniform sensillae; Forewing first vein with 4 (2-6) setae on its distal half; Tergite IX with only one pair of campaniform sensillae. ..... ***T. tabaci*** Lindemann.
4(2). Abdominal tergite VIII with posteromarginal comb with microtrichiae absent medially; Abdominal tergite IX with two pairs of campaniform sensillae. ..... ***T. major*** Uzel.
- Abdominal tergite VIII with posteromarginal comb complete with fine microtrichiae; Abdominal tergite IX lacking a pair of campaniform sensillae on the anterior half. ..... ***T. nigropilosus*** Uzel.
5(1). Ocellar setae pair III situated inside ocellar triangle. .. 6
- Ocellar setae pair III situated outside ocellar triangle. 8
6(5). Metanotum with reticulate sculpture and a pair of campaniform sensillae; Abdominal tergite II with 4 lateral setae; Abdominal tergite VIII with posteromarginal comb not developed medially; Pleurotergites with 6-10 discal setae; Sixth antennal segment "bullet-shaped"; Forewing setal row almost uninterrupted. ..... ***T. australis*** (Bagnall).
- Metanotum reticulate medially and without campaniform sensillae; Abdominal tergite II with 3 lateral setae. 7
7(6). Antennae with 7 segments; Forewing first vein with 3-4 setae on its distal half; Metanotum reticulate medially and reticles without any markings inside; Tergite VIII with posteromarginal comb complete with long and slender microtrichia; Tergite IX lacking a pair of campaniform sensillae on its anterior half. ..... ***T. origani*** Priesner.
- Antennae with 8 segments; Forewing first vein with 7 setae on its distal half; Metanotum reticulate medially and reticles with faint sculptured markings inside; Tergite VIII with posteromarginal comb complete with microtrichia slightly irregular and short; Tergite IX with two pairs of campaniform sensillae. ..... ***T. simplex*** (Morison).
8(5). Metanotum with the median pair of setae arising close or at the anterior margin and with a pair of campaniform sensillae. 9
- Metanotum with the median pair of setae arising behind the anterior margin and without campaniform sensillae. .. 10
9(8). Forewing first vein with 6-7 setae on its distal half; Tergite II with 3 lateral setae; Pleurotergites with 3-4 discal setae; Sternites III-VII with 15-20 discal setae. ..... ***T. atratus*** Haliday.
- Forewing first vein with 3 setae on its distal half; Tergite II with 4 lateral setae; Pleurotergites without discal setae;

Sternites III-VII with 6-14 discal setae. .... ***T. florum*** Schmutz.
10(8). Sternite II sometimes with 1 discal setae; Sternites III-VII with 10-15 discal setae. ..... ***T. angusticeps*** Uzel.
- Sternite II with 2 discal setae; Sternites III-VI with 12-14 irregular discal setae; Sternite VII with 14-17 discal setae in a double row. ..... ***T. pennatus*** zur Strassen.

Suborder **Tubulifera**

Family **Phlaeothripidae**
Subfamily **Phlaeothripinae**

Aleurodothrips fasciapennis (Franklin, 1908)

Besides the bicoloured body and the banded forewings, the genus *Aleurodothrips* Franklin, 1909 differs from other related genera by the absence of epimeral pronotal sutures, a tripartite pelta and the inflated fore femurs of the males with an inner, basal, curved, sharp tooth (Mirab-Balou & Chen, 2012). Although it was described from material collected in Belgium in 1908, its area of origin is uncertain and Reynaud (2010) classifies it as cryptogenic. It is currently found in tropical and subtropical regions of the world (Watson *et al*., 1998). Nearctic region (USA – Childers & Nakahara, 2006), Neotropical region (Barbados, Bermuda, Jamaica, Cuba, Puerto Rico, Bahamas, Guadeloupe, Trinidad, Panama, Brazil – Hoddle *et al*., 2002; Monteiro, 2002; Mirab-Balou *et al*., 2011; Goldarazena *et al*., 2012; Etienne *et al*., 2015), Palaearctic region (Belgium, Germany, Iran, China, Japan – Reynaud, 2010; Mirab-Balou *et al*., 2011), Afrotropical region (South Africa – Grové *et al*., 2001), Oriental and Australasian regions (India, Sri Lanka, Vietnam, Taiwan, Indonesia, Réunion Island, Fiji, Micronesia, Polynesia, Australia and Hawaii – Sakimura, 1937; Mirab-Balou *et al*., 2011). *A. fasciapennis* is a new record for Madeira and also for Macaronesia.

It is a generalist predator that favours armoured scales (Diaspididae), including *Aonidiella aurantii* (Maskell), *Aspidiotus nerii* Bouché, *Aspidiotus destructor* (Signoret), *Aulacaspis tubercularis* Newstead, *Chrysomphalus aonidum* (Linnaeus), *Ischnaspis longirostris* (Signoret), *Lepidosaphes beckii* (Newman), *Parlatoria pergandii* Comstock, *Unaspis citri* (Comstock), and other scale insects as *Palmaspis palmae* (Cockerell), *Cardiococcus umbonatus* Cockerell, mealybugs as *Planococcus citri* (Risso), whiteflies as *Aleurodicus dispersus* Russell, *Singhiella citrifolii* Morgan, *S. citri* Ashmead, and spider mites as *Eotetranychus sexmaculatus* (Riley), *Panonychus citri* (McGregor) and *Tetranychus kanzawai* Kishida (Childers & Beshear, 1992; Watson *et al*., 1998; Grové *et al*., 2001; Childers & Nakahara, 2006; Mirab-Balou & Chen, 2012; Etienne *et al*., 2015; Saengyot, 2016).

Material studied: Madeira: ICLAM-T768, 1♀, ex *Aulacaspis tubercularis* Newstead on *Mangifera indica* L. (Anacardiaceae), Rua Dom João, Funchal, 32.656692, -16.915229, 104 m, 27 May 2011, Paula Rocha leg.; ICLAM-T933, 1♂, ex *Lepidosaphes beckii* (Newman) on *Citrus sinensis*

(L.) Osbeck (Rutaceae), São Pedro, Funchal, 32.656060, -16.919710, 137 m, 19 Jul 2023, Celestina Brazão leg.; ICLAM-T934, 3♀♀, 1♂, ex *Lepidosaphes gloverii* (Packard) on *Citrus sinensis* (L.) Osbeck (Rutaceae), remaining data as previous; ICLAM-T966, 4♀♀, ex *Lepidosaphes* spp. on *Citrus sinensis* (L.) Osbeck (Rutaceae), Rua dos Ilhéus, Funchal, 32.645611, -16.921577, 86 m, 30 Sep. 2024, Maria L. Cortezão leg.

Gynaikothrips uzeli (Zimmermann, 1900)

The genus *Gynaikothrips* Zimmermann, 1900 comprises 42 species, 16 of which occur on *Ficus* spp. (Moraceae) and both the insects and their hosts are native to Southeast Asia. Two species of *Gynaikothrips*, *G. ficorum* (Marchal) and *G. uzeli* (Zimmermann), are distributed worldwide through the trade of ornamental fig trees (Mound *et al*., 1995; Mound & Tree, 2021). In the present paper, we recognise that both species occur on the island of Madeira and that *G. uzeli* is a new record for the island of Porto Santo.

The first reference to the occurrence of a *Gynaikothrips* species in Madeira was made by Bagnall (1909) of *G. ficorum* (as *Leptothrips flavicornis* sp. n.), but without naming a host plant. However, Bagnall (1910) stated the following year that specimens labelled "*Anthothrips aculeatus*, Madeira" deposited in the collection of the British Museum were conspecific with his *L. flavicornis* and found on the young leaves of *Ficus carnosa*, a misprint of *F. comosa* Roxb., a synonym of *F. benjamina* L. Two years later Karny (1912) describes *Leptothrips* (?) *reticulatus* n. sp. (another synonym of *G. ficorum*), collected in Funchal, Madeira, also from "*Ficus carnosa*". Bagnall (1916) synonymises *L. flavicornis* with *G. uzeli* (Zimmermann) and recognises that both the Madeiran *L. flavicornis* and *L. longitubus* from Java are conspecific with *G. ficorum* from Algeria. At various times these two species *G. ficorum* and *G. uzeli* were considered to be the same species (Mound *et al*., 1995), so that in the last published Thysanoptera lists for the island of Madeira only *G. ficorum* was mentioned (zur Strassen, 1977, 2008). In contrast to this opinion, some authors consider *G. ficorum* and *G. uzeli* to be different species, such as Priesner (1939), Mound *et al*. (1995) and, more recently, Mound & Tree (2021). Based on the key provided in Mound & Tree (2021), *G. uzeli* and *G. ficorum* can be distinguished by the following morphological features (Table 3) (see end of article).

G. uzeli is native to Southeast Asia and was described by Zimmermann (1900) from Java (Indonesia). It is also known in Singapore, Vietnam, Timor Leste, Philippines, Laos, Cambodia, Thailand, Malaysia, Taiwan, China and India, and was introduced via the ornamental plant trade in Macaronesia (Madeira and the Canary Islands), North Africa (Algeria), Europe (Spain), Near East (Israel, Syria), Nearctic region (Southeast USA, Mexico), Neotropical region (Costa Rica, Cuba, Puerto Rico, Colombia, Peru, Brazil, Argentina), Hawaii, Galapagos Islands and Australia (Priesner, 1939; Mound *et al*., 1995; Held *et al*., 2005; Borbon & Agostini, 2011; Silva *et al*., 2011; Arthurs *et al*., 2016; Nagrare & Naikwadi, 2016; Mound & Tree, 2021). Both *G. ficorum* and *G. uzeli* cause the formation of leaf galls in their *Ficus* hosts. However, under experimental conditions (in greenhouses), *G. ficorum* can cause leaf galls on both *F. microcarpa* L. f. and *F. benjamina* L., whereas *G. uzeli* only causes leaf galls on *F. benjamina* and reproduces well (Tree *et al*., 2015; Arthurs *et al*., 2016).

Material studied: Madeira: ICLAM-T24, 2♀♀, 2♂♂, ex *Ficus benjamina* L. (Moraceae), Caniço de Baixo, Santa Cruz, 32.641521, -16.832870, 30 m, 8 Sep. 1991, F. Aguiar leg.; ICLAM-T499, 1♂, ex *Ipomoea batatas* (L.) Lam. (Convolvulaceae), Lamaceiros, Porto Moniz, 32.854111, -17.170496, 415 m, 25 Nov. 2004, Duarte Sardinha leg.; ICLAM-T500, 8♀♀, 4♂♂, ex *Ficus benjamina* L. (Moraceae), São Roque, Funchal, 32.668666, -16.926396, 290 m, 17 Aug. 2004, Leonor Figueira leg.; ICLAM-T501, 2♀♀, 3♂♂, ex *Ficus benjamina* L. (Moraceae), Rua Dr. Pita, Funchal, 32.647064, -16.932143, 168 m, 20 Aug. 2004, F. Aguiar leg.; ICLAM-T502, 4♀♀, 2♂♂, ex *Ficus benjamina* L. (Moraceae), Faial, Santana, 32.788998, -16.851425, 60 m, 12 Nov. 2004, Maria L. Cortezão leg.; ICLAM-T504, 2♀♀, 2♂♂, ex *Ficus benjamina* L. (Moraceae), Travessa Cruz de Carvalho, Funchal, 32.649702, -16.923896, 112 m, 19 Nov. 2004, Maria J. Mendonça leg.; ICLAM-T505, 2♀♀, 4♂♂, ex *Ficus benjamina* L. (Moraceae), Viveiros, Funchal, 32.666389, -16.920012, 221 m, 25 Nov. 2004, Duarte Sardinha leg.; ICLAM-T532, 1♂, ex *Monstera deliciosa* Liebm. (Araceae), Rua Velha da Ajuda, Funchal, 32.639107, -16.931254, 65 m, 6 Oct. 2005, José Jesus leg.; ICLAM-T533, 1♀, ex *Psidium guajava* L. (Myrtaceae), Rua Velha da Ajuda, Funchal, 32.639009, -16.931428, 63 m, 6 Oct. 2005, José Jesus leg.; ICLAM-T558a, 4♀♀, 1♂, ex *Ficus benjamina* L. (Moraceae), Santo António, Funchal, 32.666776, -16.938312, 289 m, 22 Feb. 2006, Helena Teixeira leg.; ICLAM-T580, 1♂, ex *Helianthus annuus* L. (Asteraceae), Rua Velha da Ajuda, Funchal, 32.639217, -16.930746, 64 m, 6 Jul. 2006, José Jesus leg.; ICLAM-T583, 1♀, ex *Jacaranda mimosifolia* D. Don (Bignoniaceae), Quinta das Cruzes, Funchal, 32.650744, -16.913875, 44 m, 1 Aug. 2006, Délia Cravo leg.; ICLAM-T601, 1♀, ex *Washingtonia filifera* (L. Linden) H. Wendl. (Arecaceae), Vargem, Madalena do

Mar, 32.700912, -17.133022, 16 m, 11 Oct. 2006, José Jesus leg.; ICLAM-T637, 1♀, ex *Jacaranda mimosifolia* D. Don (Bignoniaceae), Avenida do Infante, Funchal, 32.644201, -16.919326, 51 m, 27 Sep. 2006, F. Aguiar leg.; ICLAM-T732, 2♀♀, 1♂, ex *Ficus benjamina* L. (Moraceae), Rua Lombo da Boa Vista, Funchal, 32.655379, -16.893714, 181 m, 9 Aug. 2008, F. Aguiar leg.; ICLAM-T937, 1♀, ex *Citrus limon* (L.) Burm. fil. (Rutaceae), Faial, Santana, 32.786163, -16.853026, 44 m, 7 Sep. 2023, Graça Freitas leg. Porto Santo: ICLAM-T737, 3♀♀, 1♂, ex *Ficus benjamina* L. (Moraceae), Salões, Porto Santo, 33.065378, -16.334759, 20 m, 7 Nov. 2008, Natália Nunes leg.; ICLAM-T921, 3♀♀, 2♂♂, ex *Ficus benjamina* L. (Moraceae), Vila Baleira, Porto Santo, 33.059161, -16.333923, 13 m, 19 Oct. 2020, F. Aguiar leg.

A note on *Gynaikothrips uzeli* natural enemies detected in Madeira

Montandoniola moraguesi (Puton, 1896) [Heteroptera: Anthocoridae]

First recorded in Funchal, Madeira, by Lindberg (1961) associated with a *Ficus* species, where he collected 14 specimens. We have collected adult specimens and nymphs of this species feeding on *G. uzeli* inside leaf galls on *F. benjamina* (see the material anaysed below). *M. moraguesi* is a pantropical species with a wide distribution resulting from its use as a biocontrol agent against *Gynaikothrips* species (Péricart, 1972; Held *et al*., 2005). In Macaronesia, *M. moraguesi* is also found in the Canary Islands.

Material studied: Madeira: ICLAM01580, 2♀♀ preying on *G. uzeli* ex *Ficus benjamina* L. (Moraceae), Travessa Cruz de Carvalho, Funchal, 32.649702, -16.923896, 112 m, 19 Nov. 2004, Maria J. Mendonça leg.; ICLAM09341, 2♂♂, 1 nymph preying on *G. uzeli* ex *Ficus benjamina* L. (Moraceae), Travessa do Lombo da Quinta, São Gonçalo, 32.655373, -16.893725, 181 m, 13 Oct. 2022, Fátima Rocha leg.

Thripastichus gentilei (Del Guercio, 1931) [Hymenoptera: Eulophidae]

Thripastichus Graham, 1987 is a monotypic genus, and *T. gentilei* is the only species described and represents a new record for Madeira and Macaronesia. It is a parasitoid wasp of thrips belonging to several genera of Tubulifera, including *Gynaikothrips*, *Hoplothrips*, *Liothrips* and others (Boyd & Held, 2016). Its use as a biocontrol agent for *Gynaikothrips* spp. infesting ornamental ficus has contributed to its widespread dispersion in the Nearctic, Neotropical, Palaearctic, Oriental and Australasian regions (Noyes, 2019).

Material studied: Madeira: ICLAM-P757, 3♀♀ parasitising *G. uzeli* (Zimmermann) ex *Ficus benjamina* L. (Moraceae), Rua Lombo da Boa Vista, Funchal, 32.655379, -16.893714, 181 m, 9 Aug. 2008, F. Aguiar leg.

Liothrips (Liothrips) vaneeckei Priesner, 1920

With more than 270 described species worldwide, the genus *Liothrips* Uzel, 1895 is the second richest of the Thysanoptera, most of them from tropical areas and only

10 from the Palaearctic (Mound *et al*., 2023). *L. vaneeckei* was described by Hermann Priesner from specimens collected in the Netherlands, which developed between the bracts of *Lilium pardalinum* Kellog (Liliaceae) bulbs in a greenhouse. Due to the commercial trade in lily bulbs, lily thrips have become so widespread that they have become a cosmopolitan species (Vierbergen, 1995: Mound *et al*., 2023). Nearctic region (Canada, USA, Mexico – Malipatil *et al*., 2002), Palaearctic region (Norway, Denmark, Finland, Austria, Belgium, England, France, Italy, Netherlands, Poland, Russia, China, Japan – Kucharkzyk & Zawirska, 2002; Malipatil *et al*., 2002; Mirab-Balou *et al*., 2011; Gertson, 2015), Oriental and Australasian regions (India, Sri Lanka, Korea, Taiwan, Australia and New Zealand – Malipatil *et al*., 2002; Mirab-Balou *et al*., 2011). *L. vaneeckei* is a new record for Madeira and also for Macaronesia.

Published data suggest that *L. vaneeckei* feeds preferentially on bulbs and corms of Liliaceae and Orchidaceae in commercial plantations. Wilson (1938) and Malipatil *et al*. (2002) refers to at least 27 species of *Lilium* Tourn. ex L., and orchids of the genera *Dendrobium* Sw., *Paphiopedilum* Pfitzer and *Vanda* Jones ex R. Br. Mound *et al*. (2023) state that this thrips is rarely found in Australia outside of commercial plantings due to its subterranean ecology, although the fact that it is now widespread in eastern Australia suggests that it may live on the underground parts of native/wild plants, away from cultivated plants. Subagyo & Mardiningsih (2020) have identified *L. vaneeckei* as the causal agent of leaf galls on karuk plants, *Piper sarmentosum* Roxb. (Piperaceae) in Indonesia. We have compared their morphological description with pictures of mounted specimens of this host plant and are of the opinion that the species they collected on *P. sarmentosum* is not *L. vaneeckei*, but *L. pallipes* (Karny, 1913), which was described from specimens in a rolled leaf gall on *Piper* sp. in Java. In Subagyo & Mardiningsih (2020), Fig. 2, we can see that the tibiae of all legs are completely yellow (in *L. vaneeckei* they are brown with yellow distal apices); in Fig. 3a the antennomeres III-VI are yellow (in *L. vaneeckei* the distal half is brownish); in Fig. 3b, c the head is 0.8x as long as wide, the maxillary stylets reach almost to the postocular setae and are not close together medially (in *L. vaneeckeyi* the head is >1x as long as wide, the maxillary stylets extend beyond the postocular setae and are much closer together medially); in Fig. 4d the mesopresternum is boat-shaped and complete (in *L. vaneeckei* the mesopresternum is very narrow and almost absent medially). We can use the key to the *Liothrips* species of Australia in Mound *et al*. (2023) to easily distinguish *pallipes* from *vaneeckei* or the key to *Liothrips* species on *Piper* in Mound (2020) to separate pallipes from other *Piper*-feeding *Liothrips* species from Southeast Asia and Australia.

Material studied: Madeira: ICLAM-T787, 2♀♀, ex *Paphiopedilum insigne* (Wall. ex Lindl.) Pfitz. (Orchidaceae), Caminho do Amparo, Funchal, 32.644442, -16.943165, 157 m, 11 Oct. 2011, Elsa Alves leg.

Mesandrothrips inquilinus (Priesner, 1921)

Described by Priesner (1921) as *Haplothrips inquilinus*, Priesner (1933) later created the genus *Mesandrothrips*, which contains only this species. Pitkin (1976) transferred it to the genus *Xylaplothrips* Priesner, 1928 and Mound & Tree (2019) restored *Mesandrothrips* Priesner, 1933 from synonymy with *Xylaplothrips* and included *inquilinus* as one of 20 species (21, according to Mound & Hastenpflug-Vesmanis, 2021).

M. inquilinus is distributed in Southeast Asia, including southern India, Thailand, Cambodia, Vietnam, Malaysia, Singapore, Indonesia, Timor Leste and China (Sichuan) (Karny, 1922; Varatharajan *et al*., 2015; Mound & Tree, 2019; Dang *et al*., 2020). This is a new record for the Madeira archipelago and the Macaronesian region.

In this extensive area, *M. inquilinus* is known to invade galls of various thrips species, but there is no certainty about its biology. It may be a predator of gall-forming thrips species or simply a phytophagous kleptoparasite that feeds on the gall tissues (Mound & Tree, 2019; Wang *et al*., 2022). Examples of these associations are: leaf galls of *Ocnothrips cochinchinensis* Karny on *Hymenodictyon parvifolium* Oliv. (Rubiaceae); leaf galls of *Gynaikothrips leeuweni* Karny on *Pavetta indica* L. (Rubiaceae); galls of *Liothrips* sp. on *Mallotus philippinensis* (Lam.) Müll. Arg. (Euphorbiaceae) and *Schefflera octophylla* (Lour.) Harms (Araliaceae); galls of *Gynaikothrips uzeli* (Zimmermann) on *Ficus benjamina* L. (Moraceae); galls of *Liothrips brevitubus* Karny and *L. kuwayamai* (Moulton) on *Piper* L. spp. (Piperaceae), etc. (Karny, 1922; Ayyar, 1934; van Rijn, 2002; Dang *et al*., 2020).

Material studied: Madeira: ICLAM-T558b, 1♀, 2♂♂, ex leaf galls of *Gynaikothrips uzeli* (Zimmermann) on *Ficus benjamina* L. (Moraceae), Santo António, Funchal, 32.666776, -16.938312, 289 m, 22 Feb. 2006, Helena Teixeira leg.; ICLAM-T733, 5♀♀, 3♂♂, ex leaf galls of *Gynaikothrips uzeli* (Zimmermann) on *Ficus benjamina* L. (Moraceae), Rua Lombo da Boa Vista, Funchal, 32.655379, -16.893714, 181 m, 9 Aug. 2008, F. Aguiar leg.

Stephanothrips occidentalis Hood & Williams, 1925

According to Mound & Tree (2017), *Stephanothrips* Trybom, 1913 is one of 10 currently recognised genera of a distinct Phlaeothripine group of mostly apterous species with 4-7 segmented antennae, an abdominal segment IX longer than VIII, and terminal abdominal hairs much longer than the tube length. At least 32 species of *Stephanothrips* are currently recognised, 5 from North America, 2 from South Africa, 4 from Australia and 21 from Asia. *S. occidentalis* (Fig. 2) (see end of article) can be recognised by the following morphological features: dorsal surface of the head tuberculate with compound eyes with three large facets; median tubercles on vertex larger and more transverse than the lateral tubercles; terminal antennal segment broad at the base; antennal segments III-V fused and yellow in contrast to the brown apical segments VI-VII; fore tarsi with a hamus or hook on the outer margin; fore tibiae much paler than the brown femora; head and pronotum dark brown; mesonotum yellow; tergites I and II fused without suture (Mound & Tree, 2017).

S. occidentalis is the most widespread species of the group and has been recorded from many tropical and subtropical regions. Although it was described by Hood (1927) from material collected in Saint Croix (US Virgin Islands) and Trinidad, Mound & Tree (2017) suggest that tropical Asia is probably its area of origin, as males have only been found in southern Thailand. Its current distribution area includes the Nearctic region (Florida – Mound, 1972), Neotropical region (US Virgin Islands, Trinidad & Tobago, Jamaica, Caymans, Bermuda, Mexico, Costa Rica, Panama, Cuba, Puerto Rico – Mound, 1972; Mound & Marullo, 1996; Suris & Gonzalez, 2008), Afrotropical region (Angola, South Africa – Faure, 1953; Mound, 1972), Palaearctic (China – Wang & Tong, 2007), Oriental, Australasian and Pacific (India, Thailand, Malaysia, Indonesia, Philippines, Taiwan, Japan, Australia, New Caledonia, Norfolk Island and Hawaii – (Sakimura, 1937; Kudo, 1978; Bournier, 1997; Mound & Wells, 2015; Tong & Zhao, 2017). *S. occidentalis* is a new record for Madeira and also for Macaronesia.

In terms of biology, *S. occidentalis* is a fungivorous thrips that lives on dead branches, twigs, leaves, leaf litter and at the base of grass tussocks (Mound, 1972; Mound & Tree, 2017), although the wind can also drag them onto living parts, as has been observed in Florida within the canopy, in leaves and fruits of citrus (Childers & Nakahara 2006).

Material studied: Madeira: ICLAM-T956, 1♀, ex yellow sticky-trap on *Citrus sinensis* (L.) Osbeck (Rutaceae), São Pedro, Funchal, 32.645611, -16.921577, 86 m, 19 Apr. 2024, Pedro Gonçalves leg.

Urothrips paradoxus Bagnall, 1909

This and the previous species belong to a special group of the Phlaeothripinae, commonly known as "urothripines", which 23 formerly belonged to the tribe Urothripini (Mound, 1972). These species are fungivorous and live mainly in leaf litter. They are mostly wingless and have unusually long anal setae (Ulitzka & Mound, 2014). We used the following keys to the genera of Urothripini by Stannard (1970), Mound (1972) and Mound *et al*. (2023), which indicates that the only specimen we collected in Madeira belongs to the genus *Urothrips* Bagnall, 1909. This genus currently comprises 12 recognised species, almost half of which originate from the Afrotropical region, the others from the Eastern Palaearctic, Oriental and Australian regions (ThripsWiki, 2024).

According to the key for the *Urothrips* Bagnall species by Ulitzka & Mound (2014), our specimen belongs to the African *paradoxus*-group, which includes the species *U. paradoxus* Bagnall, 1909, *U. bagnalli* Trybom, 1913, and *U. minor* Faure, 1933. Their detailed original descriptions show that these three species can be distinguished by the observation of several morphological features, including the dorsal sculpture of the head, the length and shape of the VI and VII antennal segments, the tube length (10th abdominal segment) and the anal setae length. Our observations and measurements indicate that our specimen belongs to *U. paradoxus* (Fig. 3) (see end of article). The species of the *paradoxus*-group can be separated using the following key, which is partly based on Hood & Williams (1927) and extended to include *U. minor* Faure.

1 Median dorsal area of the head with reticulate sculpture. 2

- Median dorsal area of the head with 15 to 20 transverse, irregularly broken wavy thickenings. ..... ***U. minor*** Faure

2(1) Antennal segment VII almost twice as long as segment VI; tube (abdominal segment X) 0.33-0.40 times shorter than head length; anal setae 5 times as long as the tube. ..... ***U. bagnalli*** Trybom

- Antennal segments VI and VII subequal in length; tube (abdominal segment X) 0.85-0.91 times shorter than head length; anal setae 3 times as long as the tube. ..... ***U. paradoxus*** Bagnall

According to zur Strassen (1972), *U. paradoxus* is widespread in the Afrotropical region, in the east from Kenya to South Africa (Natal) and in the west from Angola to South Africa (Cape Town). The type material, a male and a female, deposited in the Hungarian National Museum in Budapest and used by Bagnall to describe this species, was collected in the old German colonial possessions of East Africa, which included present-day Burundi, Rwanda and Tanzania. More recently, Richard (2003) found a single specimen in association with *Vanilla planifolia* Andrews (Orchidaceae) on Reunion Island. As mentioned, *U. paradoxus* is a fungivorous species that lives in leaf litter and sometimes on dead branches (Mound *et al*., 2023). Urothrips paradoxus is a new record for the Madeira archipelago and Macaronesia.

Material studied: Madeira: ICLAM-T964, 1♀ ex *Citrus limon* (L.) Burm. fil. (Rutaceae), Caminho das Eiras, São Jorge, Santana, 32.81877, -16.93028, 557 m, 19 Sep. 2024, Maria L. Cortezão leg.

II – New records for a particular island

Suborder **Terebrantia**
Family **Aeolothripidae**

Franklinothrips vespiformis (D. L. Crawford, 1909)

This species was recorded as new for Madeira and Europe by zur Strassen (1996). It was based on a sample containing a single female taken on Caniço de Baixo, Santa Cruz by W. Dorrow in December 1995. The ICLAM collection currently has 15 additional samples containing 25 females of *F. vespiformis* collected between 1996 and 2024 in the following Municipalities: Santana, Funchal, Câmara de Lobos, Ribeira Brava and Ponta do Sol. *F. vespiformis* is here reported for the first time from the neighbouring island of Porto Santo.

Material studied: Porto Santo: ICLAM-T970, 4♀♀, ex yellow sticky-trap on Vitis vinifera L. (Vitaceae), Cancelas, Porto Santo, 33.065275, -16.347252, 71 m, 10 Oct. 2024, Carlos Mendonça leg.

Family **Thripidae**
Subfamily **Thripinae**

Thrips nigropilosus Uzel, 1895

Previously only mentioned by zur Strassen (1977) for Madeira. The species is widespread in the Holarctic region and is often found in association with grasses. This is a new record for Porto Santo.

Material studied: Porto Santo: ICLAM-T930, 2♀♀, ex *Ficus carica* L. (Moraceae), Campo de Cima, Porto Santo, 75 m, 18 Apr. 2023, Luís Dantas leg.

Thrips tabaci Lindeman, 1889

This cosmopolitan and polyphagous species, which was first cited for Madeira a long time ago by Priesner (1938) and is the most common species of the archipelago (zur Strassen, 1977), was previously only known from the inhabited main Islands of Madeira and Porto Santo and from Deserta Grande, the larger of the uninhabited Desertas. The following specimens are new records for Ilhéu Chão (also known as the northern Deserta) and for Selvagem Grande (Selvagens Islands). In Selvagem

Grande, the plant hosts were introduced by humans and so *T. tabaci* was certainly also introduced.

Material studied: Desertas Islands: ICLAM-T868, 1♀, ex unidentified species (Brassicaceae), southeast of the lighthouse, Ilhéu Chão, 85 m, 32.588723, -16.546806, 21 Jun. 2017, Cândida Ramos leg. Selvagens Islands: ICLAM-T572, 1♀, ex *Solanum nigrum* L. (Solanaceae), Selvagem Grande, 105 m, 30.144068, -15.870848, 18 May 2006, Rui Pereira leg.; ICLAM-T574, 2♀♀, ex *Lycopersicon esculentum* Miller (Solanaceae), valley center, Selvagem Grande, 110 m, 30.147836, -15.867179, 19 May 2006, Rui Pereira leg.

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Plate I – *Dendrothrips* sp. near *oleae* Faure.
a) Head with nine segmented antennae, bar = 0.1 mm; **b)** Pronotum shape, sculpture and setae, bar = 0.05 mm; **c)** Meso and metanotum, bar = 0.05 mm; **d)** Lyre shaped metanotal furca, bar = 0.1 mm; **e)** Abdominal tergite V sculpture, bar = 0.05 mm; **f)** Abdominal tergites VIII and IX, bar = 0.05 mm; **g)** Right fore and hind wings, bar = 0.2 mm.

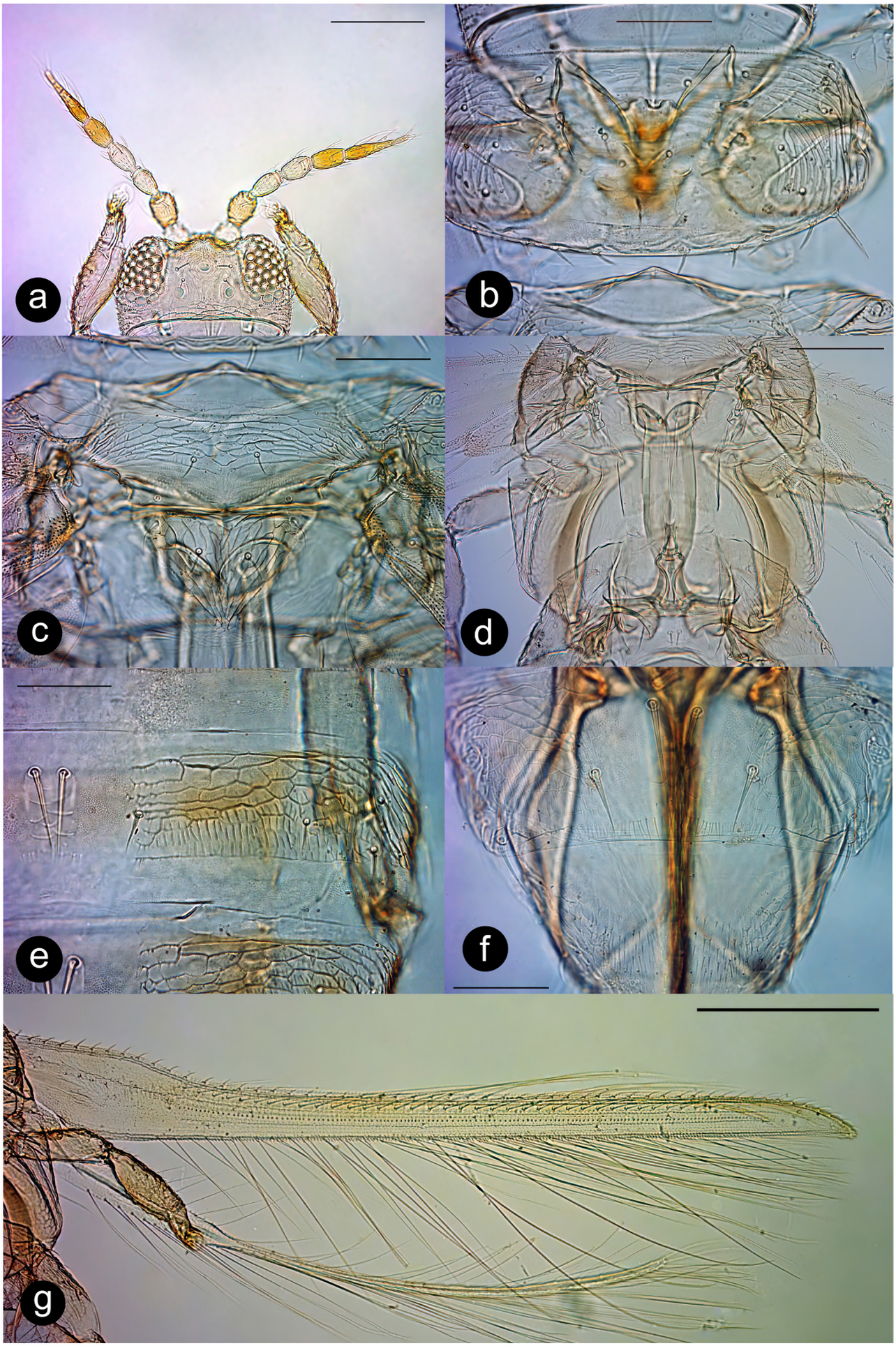
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Table 1 – Comparison of *Dendrothrips oleae* Faure and *Dendrothrips* sp. [T901] antennae; L – length, W – width. Measurements in micrometres (µm). Values between parenthesis are minimum values.v

	D. oleae			**T901**		
Antenomeres	**L**	**W**	**Color**	**L**	**W**	**Color**
A1	17 (14)	24 (23)	transparent	29	25	transparent
A2	31 (31)	24 (26)	transparent	37	27	pale brown
A3	30 (28)	17 (17)	grey	39	19	transparent
A4	28 (24)	19 (19)	grey	36	21	transparent
A5	30 (30)	17 (19)	grey	34	20	brown
A6	24 (26)	14 (16)	grey	33	15	brown
A7	10 (7)	9 (9)	grey	12	8	brown
A8	9 (10)	7 (7)	grey	10	6	brown
A9	12 (14)	3 (3)	grey	13	4	brown

Table 2 – Best morphological features to distinguish *Hercinothrips femoralis* (Reuter) from *H. bicinctus* (Bagnall).

	Hercinothrips bicinctus	***Hercinothrips femoralis***
Antennal segments VI-VIII	Yellow	Brown
Forewing	Median pale area 2 times as long as first dark cross-band	Median pale area small or absent
Metascutellum	Sensibly 3.5 times as wide as long	More than 3.5 times as wide as long

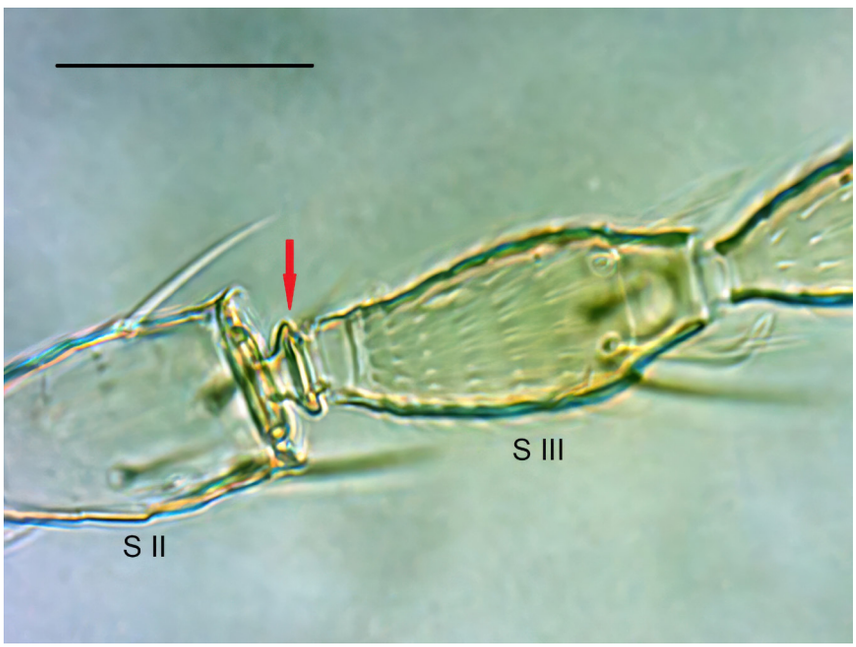

Fig. 1 – Antennal segment III of *Frankliniella musaeperda* Hood showing the sharp-edged ring on the segment's pedicel (indicated by a red arrow). S II – antennal segement II, S III – antennal segment III, bar = 0.03 mm.

Table 3 – Diagnostic characters to distinguish *Gynaikothrips uzeli* (Zimmermann) from *G. ficorum* (Marchal).

Species	Pronotal setae	Postocular setae	Host plant
Gynaikothrips uzeli	Posteroangular setae at least 60% as long as epimeral setae	Usually extending beyond the posterior margin of the compound eye	*Ficus benjamina* L.
Gynaikothrips ficorum	Posteroangular setae less than 20% as long as epimeral setae	Rarely extend to the posterior margin of the compound eye	*Ficus microcarpa* L. f.

Fig. 2 – Female *Stephanothrips occidentalis* Hood & Williams still glued to a yellow sticky-trap; bar = 0.3 mm.

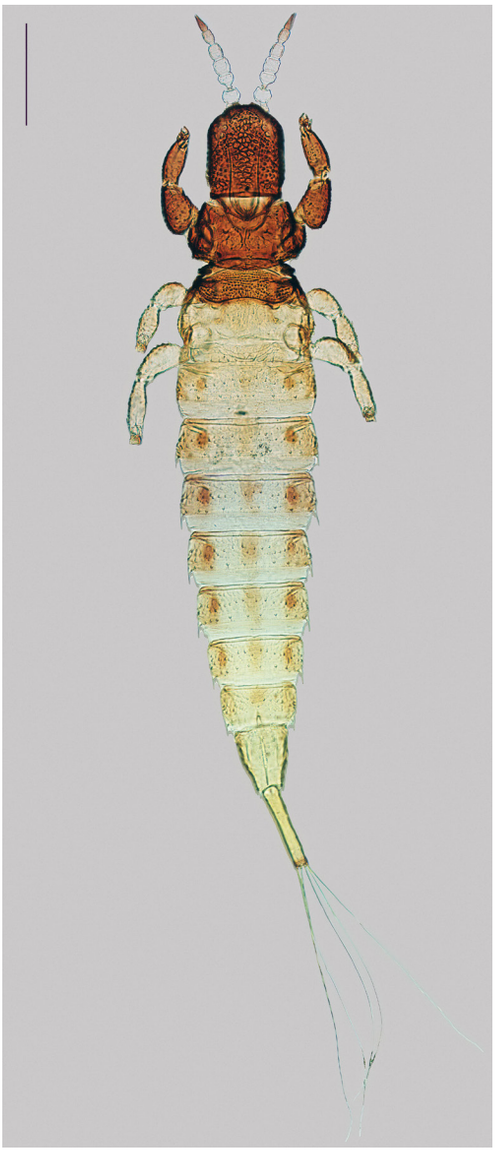

Fig. 3 – Female *Urothrips paradoxus* ; bar = 0.4 mm.

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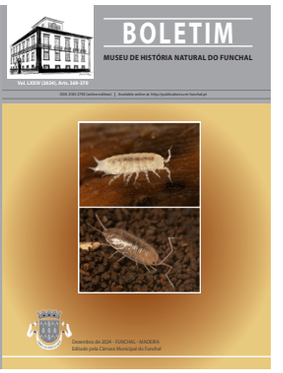

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A new terrestrial isopod species from Madeira (Isopoda, Oniscidea, Porcellionidae)

With 5 figures

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ABSTRACT: A new endemic species of terrestrial isopod, *Porcellio garciai* sp. n., (Oniscidea: Porcellionidae) is described from Machico, Madeira. The new species belongs to the "Atlantic-group" morphological complex, and has close affinities with *P. zarcoi* Vandel 1960 from the Madeiran archipelago and *P. eserensis* Rodríguez & Vincente, 1992 from the Canary islands. Its diagnostic characteristics, affinities, habitat and ecology are discussed and a key to the *Porcellio* species of the Madeiran archipelago is provided.

Keywords: Isopoda, Oniscidea, Porcellionidae, *Porcellio*, taxonomy, morphology, new species, Madeira, Portugal.

RESUMO: Uma espécie nova, endémica, de isópode terrestre, *Porcellio garciai* sp. n., (Oniscidea: Porcellionidae) é descrita para Machico, Madeira. A nova espécie pertence ao complexo morfológico do "grupo Atlântico" e tem estreitas afinidades com *P. zarcoi* Vandel 1960 do arquipélago madeirense e *P. eserensis* Rodríguez & Vincente, 1992 das ilhas Canárias. São discutidas as suas características de diagnóstico, afinidades, habitat e ecologia e é fornecida uma chave para as espécies do género *Porcellio* presentes no arquipélago da Madeira.

Palavras-chave: Isopoda, Oniscidea, Porcellionidae, *Porcellio*, taxonomia, morfologia, nova espécie, Madeira, Portugal.

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INTRODUCTION

The terrestrial isopod genus *Porcellio* Latreille, 1804 currently contains 185 species and is distributed across Macaronesia, Europe the Levant and north Africa (Schmalfuss, 2003). Several dubious species from other parts of the world are also included within the *Porcellio* but are likely alien introductions or are erroneously attributed to this genus (Ibid.). Within Europe, the greatest diversity is observed in the western Mediterranean and the Macaronesian archipelagos.

With the omission of a few widespread and cosmopolitan species, the majority of the approximately 35 species recorded from across Macaronesia are endemic and have close morphological and systematic relationships to one another, considered to be a result of them originating from a small number of pioneering species (Vandel, 1960; Rodriguez, 1990; Schmalfuss, 2003). Of these islands, the Madeiran archipelago has one of the richest and most ecologically varied range of species, which have diversified into an array of highly specific microhabitats and altitudinal preferences (Vandel, 1960). With such an unusual species diversity, it is surprising that very little attention has been focussed on the genus within the archipelago since the comprehensive works of Vandel over 60 years ago (Ibid.). Only one *Porcellio* species has been added to the list since then, but this was based on a single male specimen collected around 1899 and has not been recorded since (Hoese, 1978).

There are currently 12 species of *Porcellio* known from the Madeiran archipelago, of which 10 are endemic, including: *P. atlantidium* Paulian de Félice, 1939 from Madeira, *P. cataractae* Vandel, 1960 from Madeira, *P. ferroi* Paulian de Félice, 1939 from Porto Santo, *P. gruneri* Hoese, 1978 from Madeira, *P. lamellatus madeirae* Arcangeli, 1958 from Madeira and Porto Santo, *P. maculipes* Budde-Lund, 1885 from Madeira, *P. normani* (Dollfus, 1899) from Madeira and the Desertas Islands (Ilhéu Chão and Deserta Grande), *P. scitus* Budde-Lund, 1885 from Madeira, *P. xavieri* Arcangeli, 1958 from Madeira and the Desertas Islands (Deserta Grande), and *P. zarcoi* Vandel, 1960 from Madeira (Ilhéu do Desembarcadouro) (Vandel, 1960: Hoese, 1978). The remaining two species, *P. dilatatus* Brandt *in* Brandt & Ratzeburg, 1831 and *P. laevis* Latreille, 1804 are cosmopolitan with a western palaearctic origin (Schmalfuss, 2003). With the exclusion of *P. lamellatus madeirae* all of the remaining endemic *Porcellio* species fall under the informal morphological complex known as the "Atlantic-group" (previously the "*scaber*-group") which includes representatives from across Macaronesia, Iberia and the Baetic-Rifian region (Vandel, 1946, 1951, 1956, 1960). The "Madeiran-subgroup" was later proposed to accommodate 7 species within the "Atlantic-group" that are endemic to the Madeiran archipelago. This is due to them sharing a combination of two rare morphological characteristics, sexual dimorphism of the antennae and multiplicity of the glandular fields (Vandel, 1960).

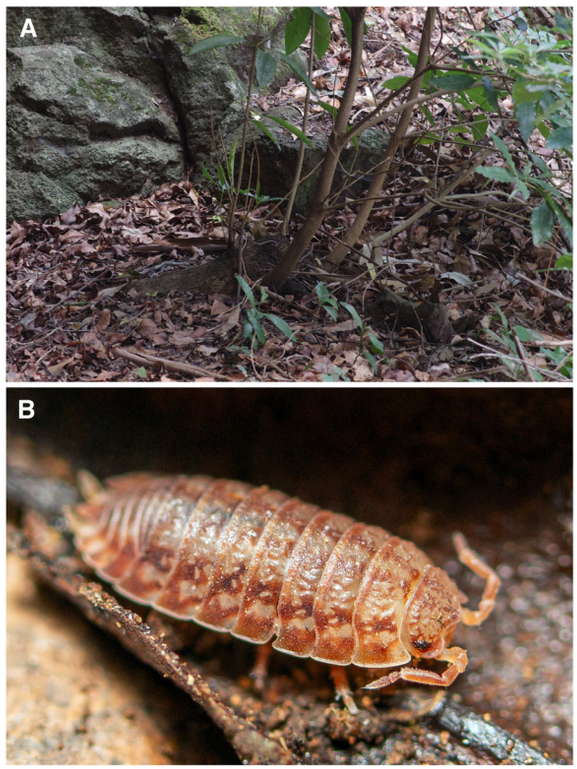

Fig. 1 – **A**. Habitat; **B**. *Porcellio garciai* sp. n. female habitus, *in-situ*.

In the present paper a new *Porcellio* species, *P. garciai* sp. n. is described and illustrated from the environs surrounding the Furnas do Cavalum cave system in Machico, Madeira. The new species is one of only three endemic *Porcellio* to the Madeiran archipelago that belongs to the "Atlantic-group" but cannot be included in the "Madeiran-subgroup".

MATERIALS AND METHODS

Specimens were collected by hand, immersed in 70% isopropanol and dissected under a stereo microscope (Wild M3). Body parts were prepared as permanent slide mounts using Euparal. Drawings were made using a

camera Lucida attached to a compound microscope (Wild M20), and the final illustrations were digitally drawn with the aid of a graphic tablet (XP-PEN Deco 01 V2) using Photoshop. The type material has been deposited in the Museu de Historia Natural do Funchal (MMF) and the Natural History Museum, London (NHM UK).

RESULTS

Porcellio garciai sp. n.

Figures 1B, 2, 3 & 4

Type material. **Holotype**: 1♂, Madeira – Portugal, Furnas do Cavalum, Cavalum IV entrance, Machico, 32° 43' 56.4132" N 16° 47' 4.7112" W, 9 Dec. 2023, leg. T. Hughes (MMF 50533). **Paratypes**: 1♂, 1♂ as 9 microscope slides, without corresponding specimen (MMF 50534, 50542), 7♀ (2 microscope slides), same data as holotype (MMF 50535-50541). 1♂, 4♀, same data as holotype (NHM UK 2024.144-145).

DESCRIPTION

Maximum body length: ♂ 4.5 mm, ♀ 5 mm. Body slightly convex, with outline as in Fig. 2A. Colour (example, Fig. 1B) variable, either grey, brown or red; pereon with dark central stripe, occasionally divided by a narrow paler internal stripe; cephalon completely pigmented with a continuation of the dark central stripe present on the vertex and with slight darkening below the eyes; pereonites 1-7 with a distal dark stripe delineating the upper edge of the epimera; epimera darker posteriorly, with a small white spot bearing the noduli laterales; pleon pigmentation as in the pereon, although the stripe pattern is poorly defined or absent; pleon epimera pigmented, except for anterior portion of pleonites 4-5 which bear a paler spot; antennae and pleotelson well pigmented, uropods notably paler. Dorsal surface of cephalon and pereon entirely granulated; pleon smooth. Glandular fields (Fig. 2B) semicircular, with 1-4 pores each, inserted anteriorly on the lateral margin. First glandular field located on the top margin of pereonite 1 then positioned either a quarter or a third down in subsequent pereonites. Integument covered in numerous short triangular scale-setae (length 0.0095mm) with a blunt apex (Fig. 2C). Noduli laterales (Fig. 2D & 2E) (length 0.044 mm) situated in an unpigmented disk; noduli 1-3 and 5-6 equidistant from the lateral margin, noduli 4 and 7 slightly more inset. Cephalon (Fig. 2F & 2G) lateral lobes sub-rounded with a regularly sinuous anterior margin; median lobe protruding slightly further than the lateral ones, narrowly rounded with a median indentation; eyes comprised of 7 ommatidia. Pereonites 1-3 with the posterior margin strongly concave at sides; pereonites 4-6 with a weakly sinuous posterior margin; pereonite 7 regularly sinuous. Posterior tips of epimera acutely angled becoming less so posteriorly. Pleon with continuous outline with pereon; posterior tips of pereon epimera directed backwards with acute angles. Pleopods 1 and 2 with indented tracheal fields. Telson (Fig. 2H) triangular, slightly wider than long with weakly concave sides and a broadly rounded apex. Uropods (Fig. 2I) without sexual dimorphism; protopodites reaching to two thirds the length of the telson; endopod slightly shorter than exopod. Antennula (Fig. 2K) 3 segmented with the basal article equal to 2 + 3; distal article with 6-8 aesthetascs and rounded lobe. Antenna (Fig. 2J) when extended backwards, reaching just behind the posterior border of pereonite 1; first flagellar article a third the length of the second. Mandibles (Fig. 3A & 3B) with molar penicils dichotomised; right mandible with 2 free penicils; left mandible with 4 free penicils; no penicils present on the pilose lobes. Maxillula (Fig. 3C) external branch with 4 + 6 teeth (2 moderately toothed), internal branch with 2 stout penicils with slightly indented apex and toothed posterior corner. Maxilla (Fig. 3D) inner lobe with setose apex; inner lobe slightly wider than inner. Maxilliped (Fig. 3E) first palp article with 1 small and 1 large seta; second article with 2 well developed setae; distal article elongate, with the apex bearing a tuft of short setae; endite with 2 + 1 anterior triangular teeth and 1 large sub-apical seta.

Male

Pereopod 1 (Fig. 4A & 4B) merus and carpus bearing abundant setae on the sternal margin, with 3 prominent palmatiform setae on carpus; antennal grooming brush also absent from carpus. Pereopod 7 (Fig. 4C) lacking distinct sexual modification, ischium sternal margin weakly concave. Pleopod 1 (Fig. 4D) exopod with projecting lobe on posterior tip, lacking spines along the medial margin and with an indented tracheal field; endopod broadly tapering, with 6 small setae at its apex. Pleopod 2 (Fig. 4E) exopod triangular, with weakly concave outer margin and indented tracheal field; distal process with chamfered apex bearing one small and one large spine; endopod flagelliform, a third longer than the exopod. Pleopods 3-5 as in Figures 4F, 4G & 4H.

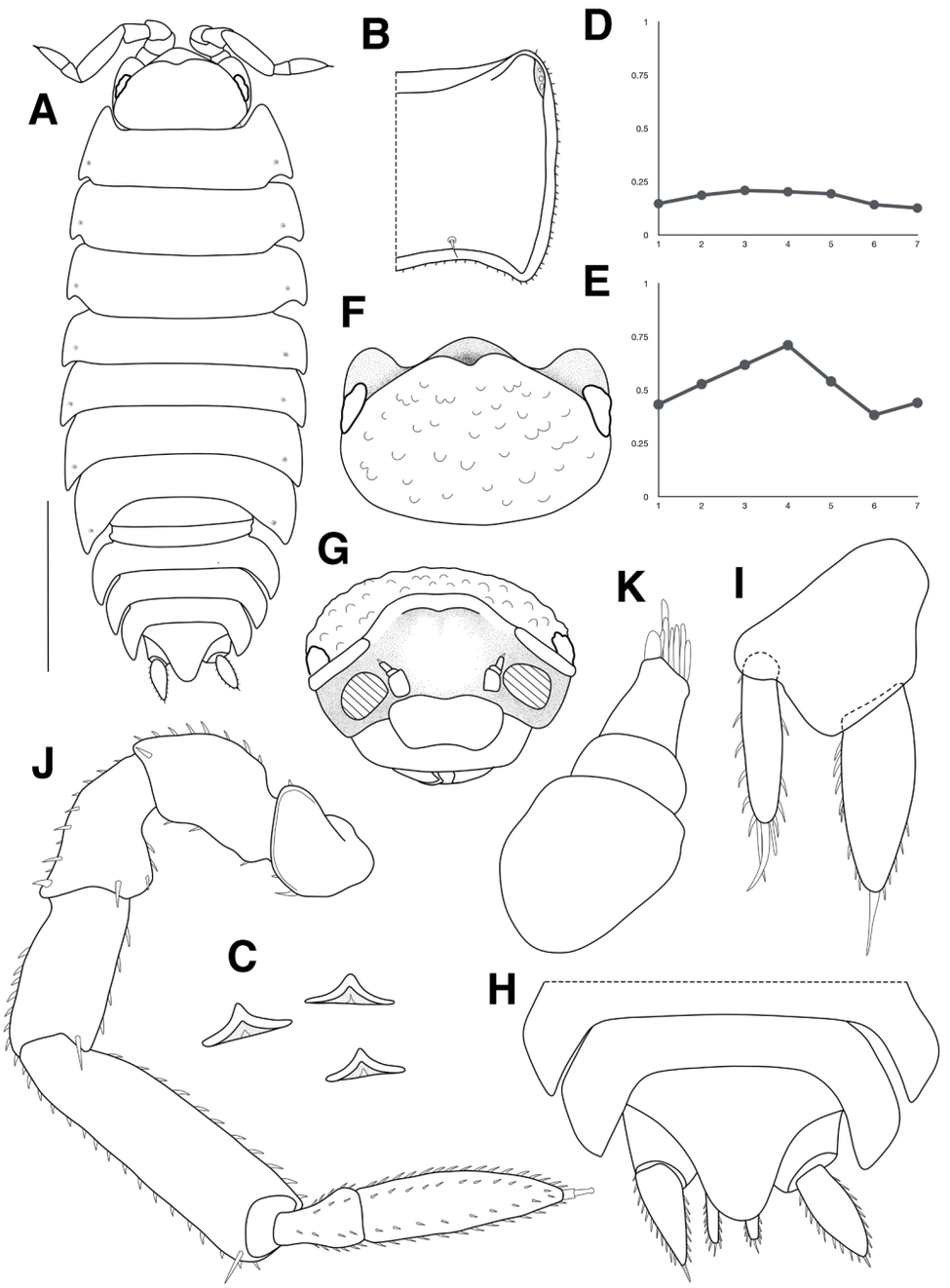

Fig. 2 – *Porcellio garciai* sp. n. female (A-I), male (J-K): **A**. Habitus, dorsal; **B**. Pereonite 1 showing disposition of glandular field and nodulus lateralis, dorsal; **C**. Scale-setae, dorsal; **D**. Noduli laterales b/c coordinates; **E**. Noduli laterales d/c coordinates; **F**. Cephalon, dorsal; **G**. Cephalon, frontal; **H**. Pleotelson, dorsal; **I**. Uropod, dorsal; **J**. Antenna; **K**. Antennula (scale bar 1 mm).

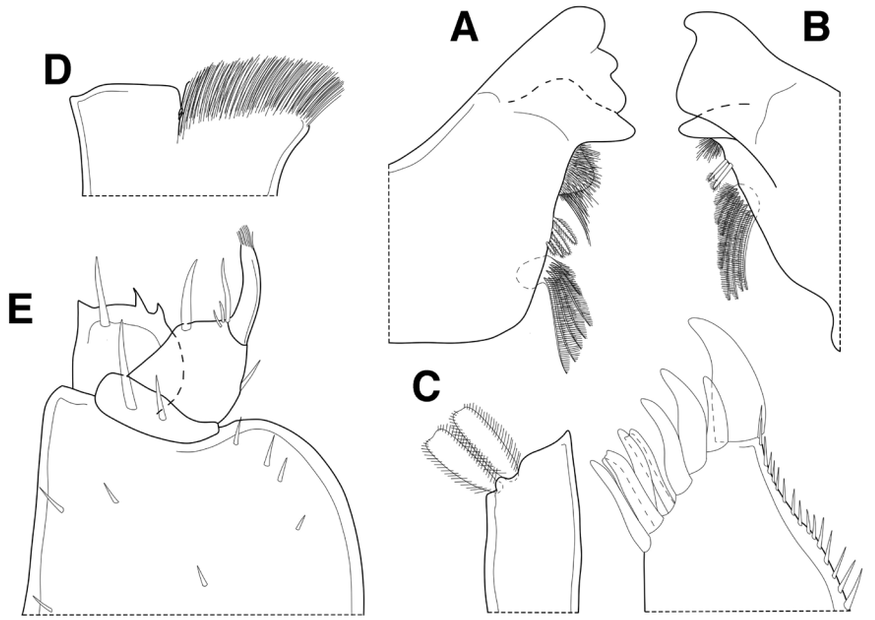

Fig. 3 – *Porcellio garciai* sp. n. male: **A**. Left mandible; **B**. Right mandible; **C**. Maxillula; **D**. Maxilla; **E**. Maxilliped.

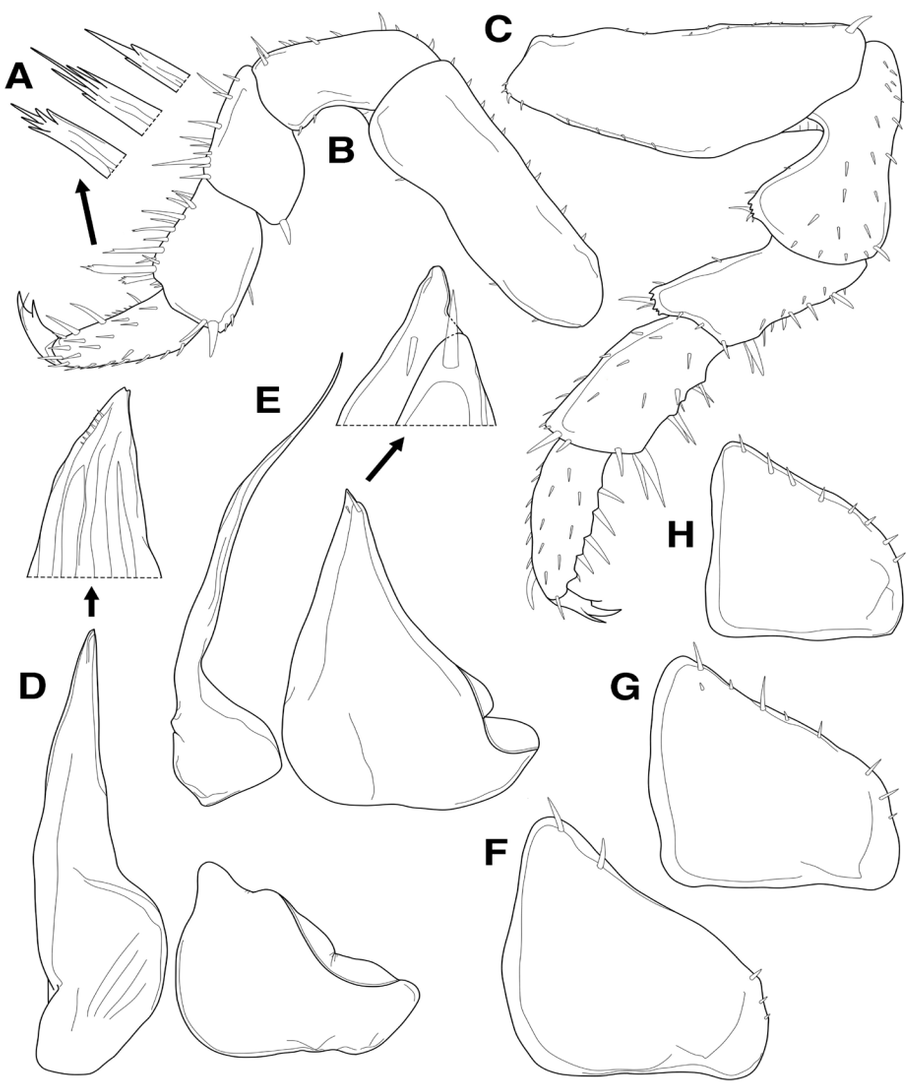

Fig. 4 – *Porcellio garciai* sp. n. male: **A**. Detail of carpal spines; **B**. Pereopod 1; **C**. Pereopod 7; **D**. Pleopod 1; **E**. Pleopod 2; **F**. Pleopod 3; **G**. Pleopod 4; **H**. Pleopod 5.

Etymology: Named after the Mallorcan carcinologist Lluc Garcia in recognition of his taxonomic contributions to the western Mediterranean terrestrial Isopod fauna. His detailed and carefully illustrated publications have been a great source of inspiration for the author.

REMARKS

P. garciai sp. n., belongs to the "Atlantic-group" morphological complex due to the glandular fields being semi-circular and attached to the lateral margin, the disposition of the tracheal field on the lateral margin of the 1st male exopod and the carpus being straight sided on the 7th male pereopod (Vandel, 1960). However, as the new species lacks sexual dimorphism of the antennae and multiplicity of the glandular fields it cannot be included within the "Madeiran-subgroup" (Ibid.). Only 2 other species endemic to the Madeiran archipelago fall into this category, these being *P. xavieri* and *P. zarcoi*. *P. garciai* sp. n. is morphologically closer to *P. zarcoi* but can be differentiated from it by the presence of dorsal granulations and by the first pleopod exopod having a more elongate posterior lobe and lacking spines. *P. garciai* sp. n. also has morphological affinity with *P. eserensis* Rodríguez & Vicente, 1992 from El Hierro, Canary Islands, but it can be differentiated from this species by the smaller number of ommatidia (7 compared to 20) and the shape and lack of spines on the first pleopod exopod.

DISCUSSION

At present, *P. garciai* sp. n. is only known from outside the entrance to Cavalum IV of the Furnas do Cavalum lava tube complex in Machico, Madeira. Specimens were collected, with difficulty, by sifting through the first few centimetres of frass-rich soil covered by a leaf layer of the invasive plant species *Pittosporum undulatum* Ventenat, 1802 (Fig. 1A). Sympatric terrestrial isopods found at the type location included the western palearctic species *Eluma caelata* (Miers, 1878) and *Porcellionides sexfasciatus* (Budde-Lund, 1885). Vandel (1960), also documents the cosmopolitan species *P. dilatatus* and *Oniscus asellus* Linnaeus, 1758, in addition to *Miktoniscus patiencei* Vandel, 1946 from the environs surrounding the cave system. Within the lava tubes, the Macaronesian endemic troglobitic species *Trichoniscus bassoti* Vandel, 1960 has been recorded from Cavalum I, II and III (Serrano & Borges, 2010) (Fig. 5A), in addition to a single observation of the Madeiran endemic *Soteriscus bremondi* Vandel, 1960 from within the entrance to Cavalum II (*pers. obs.*) (Fig. 5B).

During the micro-preparation of the type material of *P. garciai* sp. n., multiple secondary capilliconidia of *Basidiobolus* Eidam, 1886 (*Amphoromorpha*) fungi were found attached to the pereopods and antennae. This fungus has previously been cited as occurring on cave adapted terrestrial isopods by Racovitza (1907, 1908), but to our knowledge this has not been recorded from a *Porcellio* species before.

Due to *P. garciai* sp. n., currently being recorded from only a single locality, it remains unknown whether the species is restricted solely to, or has a strong specificity with, the microhabitat found around the cave entrance itself. Therefore, further soil faunal studies are strongly encouraged within the surrounding forests to understand the distribution and ecology of this new species. The Furnas do Cavalum lava tubes are listed in the Madeira Geological Heritage Inventory (M04), but lack any form of protection (Brum da Silveira *et al*., 2012; Baquero *et al*., 2023). As such, it is hoped that the addition of another new species, currently known only from the environs surrounding the lava tube complex, will further highlight the need to protect this important natural feature.

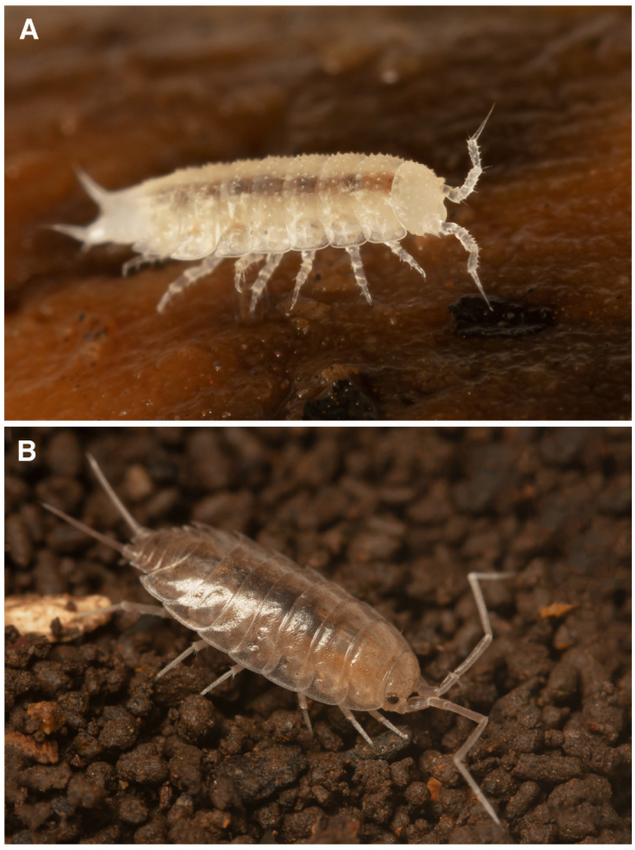

Fig. 5 – Madeiran endemic terrestrial Isopods found within the Furnas do Cavalum: **A**. *Trichoniscus bassoti*, **B**. *Soteriscus bremondi*.

Key to the *Porcellio* of the Madeiran Archipelago

The following key is a modification of the one provided by Vandel (1960), for the species belonging to the "Atlantic-group". It is expanded to incorporate all *Porcellio* recorded from the archipelago, including the cosmopolitan species and those described after Vandel's publication.

1. Glandular fields completely absent, dorsum strongly granulated and telson with a truncated apex (maximum size 21 mm) ..... ***Porcellio xavieri*** **Arcangeli, 1958**
1a. Glandular fields present, dorsum granulated or smooth **2**

2. Pereonites with a single glandular field **3**
2a. Pereonites with multiple glandular fields (at least on the first pereonite) attached to the lateral margin. Most species show clear sexual dimorphism of the antennae ... **9**

3. Pereonites with a single round or elliptical glandular field not attached to the lateral margin (with the exception of the first pereonite). Dorsum smooth to weakly granulated and the telson with a pointed apex (maximum size 20 m) ... . ***Porcellio laevis*** **Latreille, 1804**
3a. Pereonites with a single semicircular glandular field attached to the lateral margin **4**

4. Dorsum smooth without granulation (maximum size 5 mm) ..... ***Porcellio zarcoi*** **Vandel, 1960**
4a. Dorsum granulated **5**

5. Cephalon with a quadrangular, strongly projecting median lobe and telson with a pointed apex (maximum size 10 mm) .... ***Porcellio lamellatus madeirae*** **Arcangeli, 1958**
5a. Cephalon with a small rounded or pointed lobe. Telson trapezoidal or triangular with a rounded apex **6**

6. Body broad with expanded epimera. Telson parallel sided just before the apex. Male pleopod 1 exopod with a broadly rounded posterior lobe (maximum size 15 mm) .... ***Porcellio dilatatus*** **Brandt *in* Brandt & Ratzeburg, 1831**
6a. Body more elliptical. Telson triangular with regular curved edges before the apex. Male pleopod 1 exopod with either a triangular or clearly extended round posterior lobe **7**

7. Antennae not sexually dimorphic. Posterior margin of the male pleopod 1 exopod with an extended round lobe (maximum size 5 mm) ..... ***Porcellio garciai*** **Hughes sp. n.**
7a. Antennae sexually dimorphic. Posterior margin of the male pleopod 1 exopod with an evenly triangular lobe ... **8**

8. Granulation uniform across the entire dorsum (maximum size 13 mm) ... ***Porcellio normani*** **(Dollfus in Norman, 1899)**
8a. Granulation becoming more developed on the last 3 pereonites and pleonites, appearing spinescent on the posterior margin (maximum size 10 mm) .... ***Porcellio ferroi*** **Paulan de Félice, 1939**

9. Median cephalic lobe projecting further than the lateral lobes. The dorsum is entirely covered with coarse granules and the posterior margin of male pleopod 1 exopod with a concave lobe ..... ***Porcellio gruneri*** **Hoese, 1978**
9a. Median cephalic lobe projecting to the same extent as the lateral lobes, but if extending further then the dorsum granulation is much more pronounced in the posterior half. Posterior margin of male pleopod 1 exopod with an evenly triangular lobe or with a single projecting point **10**

10. Small. Body convex and narrow, with parallel sides. The dorsum Is entirely granulated and the antennae have pronounced sexual dimorphism (maximum size 6 mm) .... ***Porcellio scitus*** **(Budde-Lund, 1885)**
10a. Much larger (12-19 mm) **11**

11. Dorsum strongly granulated becoming well developed and spinescent in the posterior half (maximum size 19 mm) ..... ***Porcellio atlantidium*** **Paulian de Félice, 1939**
11a. Dorsum with weak granulation in the posterior half **12**

12. Sexual dimorphism of the antennae pronounced, teeth of peduncle articles 2, 3 and 4 very strongly developed in the males. Posterior margin of the male pleopod 1 exopod with an evenly triangular lobe (maximum size 18 mm) .... ***Porcellio cataractae*** **Vandel, 1960**
12a. Sexual dimorphism of the antennae weak, teeth of peduncle article 2, 3 and 4 weak or absent in the males. Posterior margin of the male pleopod 1 exopod with a single projecting point (maximum size 12 mm) .... ***Porcellio maculipes*** **Budde-Lund, 1885**

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