Standardised arthropod (Arthropoda) inventory across natural and anthropogenic impacted habitats in the Azores archipelago

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Abstract

Background

In this paper, we present an extensive checklist of selected arthropods and their distribution in five Islands of the Azores (Santa Maria, São Miguel, Terceira, Flores and Pico). Habitat surveys included five herbaceous and four arboreal habitat types, scaling up from native to anthropogenic managed habitats. We aimed to contribute to the ongoing effort to document the terrestrial biodiversity of the world, in particular the Portuguese archipelago of the Azores, as islands harbour a significant portion of unique terrestrial biodiversity. Selection of Arthropoda groups for the current checklist was based on their known richness and abundance (Arachnida, Collembola, Hemiptera, Neuroptera, Coleoptera, Hymenoptera), in almost all terrestrial ecosystems, as well as their importance in current Integrated Pest Management and alternative Biocontrol protocols at large (i.e. hymenopteran parasitoids and beneficial Coleoptera). In addition, we include the list of

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Dermaptera, Orthoptera, Psocoptera and Thysanoptera species. These assembled groups represent part of the monitoring programme EDEN Azores (2008-2014), where all Arthropod fauna, at all strata, within nine representative habitats of the abovementioned five Islands of the Azores was recorded.

New information

In this study, a total of 116,523 specimens, belonging to 483 species and subspecies of selected groups of arthropods, are reported by order, family and, when possible, genus and species. Hymenopteran, mostly parasitoids, accounted for the most represented taxa across all the monitoring and sampling phase of EDEN Azores (193 species and mophospecies), followed by Coleoptera (95 species); Collembola (89 species); and Araneae (72 species).

A total of 37 non-native species are reported for the first time in the Azores. **Coleoptera:** Asaphidion flavipes (Linnaeus, 1761) (Carabidae); Tachyporus dispar (Paykull, 1789) (Staphylinidae). **Hemiptera:** Acrosternum heegeri Fieber, 1861 (Pentatomidae). **Collembola:** Entomobrya regularis Stach, 1963 (Entomobryidae); Lepidocyrtus lusitanicus piezoensis (Simón-Benito, 2007) (Entomobryidae); Jordanathrix articulata (Ellis, 1974) (Sminthuridae); Sminthurinus quadrimaculatus (Ryder, 1879) (Katiannidae); Himalanura sp. (Entomobryidae); Protophorura sp. (Onychiuridae). **Hymenoptera, parasitoids:** Aphidius colemani Viereck, 1912 (Braconidae); Aphidius ervi Haliday, 1834 (Braconidae); Aphidius matricariae Viereck, 1912 (Braconidae); Aphidius rhopalosiphi Stefani-Perez, 1902 (Braconidae); Aphidius rosae (Haliday, 1834) (Braconidae); Aphidius urticae Haliday, 1834 (Braconidae); Centistidea ectoedemiae Rohwer, 1914 (Braconidae); Meteorus unicolor (Wesmael, 1835) (Braconidae); Meteorus collaris (Spin.) Hal. – Ruschka, Fulmek, 1915 (Braconidae); Orthostigma cratospilum (Thomson, 1895) (Braconidae); Orthostigma lativentris Ratzeburg, 1844 (Braconidae); two other species of Orthostigma sp.; Pseudopezomachus bituberculatus (Marshall, 1905) (Braconidae); Tanycarpa punctata (van Achterberg, 1976) (Braconidae); Gonatopus clavipes (Thunberg, 1827) (Dryinidae).

New genera not previously recorded for the Azores include: Pycnetron sp. (Chalcidoidea: Pteromalidae); four species of Aspilota sp. (Braconidae: Alysiinae); Microgaster sp. (Braconidae: Microgastrinae); Homolobus sp. (Braconidae: Homolobinae); Lodbrokia sp. (Braconidae: Alysiinae).

These 37 taxa were found in several Islands and five are new species for Flores Island, 10 species are new for Pico Island, 12 species are new for Terceira Island, 19 species are new for S. Miguel Island and five species are new for S. Maria Island.

Additional species records for the Islands included: Flores (5 Collembola, 9 Araneae; 2 Hemiptera; 8 Coleoptera, 8 Hymenoptera), Pico (4 Collembola; 7 Araneae; 4 Hemiptera; 11 Coleoptera; 9 Hymenoptera), Terceira (4 Collembola; 1 Araneae; 3 Hymenoptera), S. Miguel (1 Araneae; 2 Coleoptera; 3 Hymenoptera), S. Maria (5 Collembola; 3 Araneae; 2 Hemiptera; 2 Hymenoptera).
Keywords
Arthropoda, Azores, São Miguel, Terceira, Flores, Santa Maria, Pico, Island, anthropogenic impact gradient, habitat types

Introduction
Biodiversity loss is accelerating at an unprecedented rate (Maxwell et al. 2016, Borges et al. 2019, Wagner et al. 2021), particularly in islands (Whittaker et al. 2017). Current drivers of biodiversity loss include habitat change (i.e. habitat loss, degradation and fragmentation), invasive species, pollution and contamination and climate change (Titeux et al. 2016, Sanchez-Bayo and Wyckhuys 2019). Land-use reconversion is a catalyst for major biodiversity changes in the world, namely in island ecosystems (Russell and Kueffer 2019). The inventory and monitoring of island biodiversity is critical for understanding current and future trends in biodiversity erosion (Borges et al. 2019) as remote archipelagoes enclose high endemism levels and a significant portion of terrestrial biodiversity.

In the current study, we focus in Azores Islands (Portugal) and on its arthropod diversity inventory. Arthropods are recognised as one of the most endangered taxa in the globe, vital for ecosystem stability and food security (Hochkirch 2016, Harvey et al. 2020, Raven and Wagner 2021, Wagner et al. 2021). Composed of nine Islands lying on the North Atlantic Ocean, (39°43'23'' N [Corvo] - 36°55'43'' N [Santa Maria]; 24°46'15'' WG [Formigas islets] - 31°16'24'' WG [Monchique Islet – Flores]), these Islands, when discovered, were completely covered by dense forests (Frutuoso 1978). These forests included Erica-Morella woodlands at levelled coastal areas and Picconia-Morella forests up to 300 m a.s.l. From 300 m to 600 a.s.l., the sub montane forests dominated (the Azorean Laurel forests, predominantly Laurus azorica), which probably covered more than two thirds of the Islands (Elias et al. 2016). Above the Laurus forests, between 600 m and 1000 a.s.l., Juniperus-Ilex forests and Juniperus woodlands would have covered most of the areas (Elias et al. 2016). At higher elevations, Calluna-Juniperus scrublands may have covered mountain ridges and Calluna-Erica scrublands and Calluna scrublands would have occupied Pico Mountain, above 1200 m a.s.l., as they still do today (Elias et al. 2016).

The topography of the Azores is characterised by the presence of numerous catchments, ravines and mainly seasonal water streams. Climate and hydrography, together with remote geographic isolation (i.e. central zone of the North Atlantic) and absence of any close continental masses (the nearest landmasses are Europe > 1300 km away and North America > 3200 km away), as well as the complex marine Current System (Caldeira and Reis 2017), contribute to a temperate climate and high humidity throughout the year. These environmental conditions and a nutrient-rich volcanic soil, still support an abundant flora in spite of intense anthropogenic influence and land reconversion to agriculture and forestry activities. Mixed and pristine forests [predominantly native evergreen Laurel forests (Laurisilva), a humid broadleaf Laurus azorica (Seub.) Franco forest] covers many islands’
hillsides (Cardoso et al. 2007, Hortal et al. 2006). Thirteen percent of their land surface is protected (World Heritage, Biosphere and Natura 2000 Networks).

The Azorean Islands have a long history of habitat loss and land-use changes, with only circa 5% of the native forest remaining intact (Borges et al. 2020). Deforestation has occurred extensively, initially at low elevations, but subsequently extended to mid- and higher elevations due to anthropogenic intervention and timber use as an energy source. Currently, six main habitats can be found in Azores, i.e. i) the original native forests, restricted to high elevations with some small pockets at mid-elevations and disturbed mixed vegetation at low elevation; ii) exotic fast-growing tree plantations, dominated by Cryptomeria japonica; iii) exotic mixed forests, dominated by the invasive tree Pittosporum undulatum; iv) several types of grasslands, including high elevation natural grasslands, although mostly dominated by intensive pastureland at low and mid-elevations and semi-natural pastures at mid- and high elevations; v) native bogs and fens at high elevations; and vi) several types of agro-ecosystems including vineyards, orchards and corn fields.

The Azorean arthropod fauna is well known and includes approximately 2332 species and subspecies, with less than 300 of these being endemic (Borges et al. 2010). Land-use changes had an impact on the composition of Azorean arthropod fauna, now dominated by exotic species, particularly in anthropogenic habitats (Borges et al. 2008), but also, to some extent, in native forest, such as in the case of soil arthropods, particularly Collembola (Cicconardi et al. 2017). Endemic arthropods are mostly restricted to native habitats (Borges et al. 2008, Rigal et al. 2018). However, endemic and native insect pollinators successfully adapted to new anthropogenic habitats and are providing essential ecosystem services in agro-ecosystems (Picanço et al. 2017). The impact of anthropogenic disturbance on vascular plants was also investigated in parallel with the arthropod distribution (Marcelino et al. 2013, Silva et al. 2017), observing that endemic and native plant species are not restricted only to natural habitats, but also occur in human-managed arborescent habitats. Invasive species dominate human-managed habitats, whilst also found at the edges of natural habitats.

General description

Purpose: This study intended to contribute to the current international directives concerning biodiversity, aiming to document and safeguard biological resources of the globe. Our objective was to present the most widely distributed and diverse taxa recorded during the sampling phase of the EDEN project (2008-2014) (Marcelino et al. 2013, Marcelino et al. 2020), specifically all arthropod fauna, at all strata, within eight representative habitats of five Islands of the Azores archipelago (Santa Maria, São Miguel, Terceira, Flores and Pico) (Fig. 1).

In the current study, we present an extensive checklist of Arthropoda for the following taxa: Araneae, Collembola, with emphasis on auxiliary predatory Coleoptera (Carabidae, Staphylinidae, Coccinellidae); Hymenopteran parasitoids (Aphelinidae, Bethylidae, Braconidae, Chalcididae, Chrysidae, Diapriidae, Dryinidae, Elasmidae, Encyrtidae,
Eupelmidae, Figitidae, Ichneumonidae, Megaspilidae, Mymaridae, Proctotrupidae, Pteromalidae, Scelionidae, Sphecidae, Tetracampidae). These groups are particularly relevant for the following reasons:

**Arachnida: Araneae** - i) ubiquitous presence across all terrestrial habitats; ii) recognised as indicators of ecological change due to their sensitivity to cryptic changes in their habitats (Pearce and Venier 2006); iii) important predators across trophic levels (e.g. pollinators, parasitoids, saprophytes etc.), thereby impacting ecosystems' community dynamics (Öberg and Ekbom 2006).

**Collembola** - i) the existence of a profuse diversity and abundance in a wide variety of soil systems from Islands to Continents to Antarctic habitats (Hawes et al. 2007); ii) their rapid response to changes in ecological and pedological patterns within a given ecosystem (Sousa et al. 2006).

**Hymenopteran parasitoids** - i) important role as regulators of host density (Henri and Van Veen 2011); ii) critical biological pest control agent, with circa $20 billion/year beneficial impact on US agriculture (Pennisi 2010).

**Beneficial Coleoptera** - i) the Coccinellidae groups ca. 6,000 species (Vandenberg 2002) with an ubiquitous distribution worldwide. The majority of species are predators providing relevant ecosystem and agricultural services, constituting one of the most studied groups of beneficial insects (Hodek et al. 2012, Ameixa et al. 2018 for a comprehensive revision). The rove-beetles (Staphylinidae) are one of the most diverse lineages of arthropods, inhabiting practically all terrestrial niches (Thayer 2005). They are also an ecologically-important component of soil fauna, reported to be potential bioindicators of environmental quality (Pohl et al. 2007) due to their sensitivity in detecting cryptic changes in the ecological dynamics of their ecosystems (Hodkinson and Jackson 2005)

In addition, we report widely-distributed species across sampling sites or new records for the Azores, in the orders Dermaptera, Heteroptera: Hemiptera, Neuroptera, Orthoptera, Psocoptera and Thysanoptera.

![Figure 1](image_url)
**Project description**

**Title:** Species inventory of Arthropoda across anthropogenically-impacted habitats in the Azores archipelago

**Personnel:** Plant identifications were performed by the botanist Luis Silva, from the University of the Azores. Arthropoda sampling was performed by José A. P. Marcelino, António O. Soares, Patricia V. Garcia and Roberto Resendes. Sorting, morphospecies IDs, image gallery stocks, digital data assembling and 96% EtOH-based collections, required a substantial number of technical staff (circa 15 people from 2010 to 2013). Species identifications were performed, initially, by José A. P. Marcelino, corroborated by Fernando Pereira and Paulo A. V. Borges using a reference collection (Dalberto Teixeira Pombo insect collection from the University of the Azores) and, subsequently, by reference taxonomists on the different Arthropoda groups, i.e. Collembola (Felipe Soto-Adames, Florida Dept. Agriculture and Consumer Services, USDA, Florida, USA), Araneae (Paulo Borges, University of the Azores), Hymenoptera (Kees van Achterberg, National History Museum Netherlands and Vladimir Žikić, University of Niš, Serbia), Coccinellidae (António O. Soares and Isabel Borges, University of the Azores), Staphylinidae (Volker Assing, Hannover, Germany) and one new record of Carabidae for the Azores by Bob Davidson at Carnegie Museum on Natural History, USA. Collembola were also genetically profiled (Marcelino et al. 2011), as well as Staphylinidae (Marcelino et al. 2016).

**Study area description:** We selected the Islands, based on the relative proportion of land used in agriculture and pristine areas (based on published data by Costa et al. 2014), taking into consideration all possible combinations, i.e. São Miguel (SMG), with a high proportion of land allocated to pastureland (61%) and a low proportion of scattered native and naturalised habitats (19.1%); (ii) Terceira (TER), with high proportion of pastureland (66.9%) and a similar proportion of native and naturalised habitats as SMG, but less fragmented (21.3%); (iii) Pico (PIC), with high proportion of pastureland (50.3%) and medium/high proportion of native habitats at higher elevation (35.5%); (iv) Flores (FLO), with scarce agricultural development (17.7%) and a high proportion of native and naturalised habitats (43%); and, (v) Santa Maria (SMR), with high proportion of agricultural land (56.7%) and a low proportion of native and naturalised habitats (17.3%) (Table 1).

| Island | Habitat     | Locality        | Elevation (m) | Latitude  | Longitude   |
|--------|-------------|-----------------|---------------|-----------|-------------|
| Flores | Corn Crop   | Fajã Grande     | 64            | 39.4572   | -31.2611    |
| Flores | Corn Crop   | Ponta Delgada   | 34            | 39.5187   | -31.2102    |
| Flores | Invasive Forest | Monte     | 190           | 39.4556   | -31.1441    |
| Flores | Invasive Forest | Saída das Lajes | 256         | 39.3879   | -31.1954    |

Table 1. Sampled Sites (n = 80).
| Island    | Habitat                     | Locality                             | Elevation (m) | Latitude   | Longitude   |
|-----------|-----------------------------|--------------------------------------|----------------|------------|-------------|
| Flores    | Meadows                    | Estrada para o Morro Alto            | 683            | 39.4536    | -31.2354    |
| Flores    | Meadows                    | Zona das Lagoas / Fundão             | 697            | 39.4079    | -31.1977    |
| Flores    | Natural Forest             | Estrada para Ponta Delgada           | 729            | 39.4739    | -31.2089    |
| Flores    | Natural Forest             | Estrada para Ponta Delgada / Lixeira | 579            | 39.4882    | -31.1858    |
| Flores    | Orchard                    | Lajes (SDA)                          | 109            | 39.3864    | -31.1672    |
| Flores    | Orchard                    | Vales                                | 186            | 39.4522    | -31.1464    |
| Flores    | Pasture                    | Cedros                               | 344            | 39.4808    | -31.1594    |
| Flores    | Pasture                    | Lajes                                | 205            | 39.3860    | -31.1842    |
| Flores    | Production forest          | Lajes Saída 1                        | 270            | 39.3914    | -31.2012    |
| Flores    | Production forest          | Ponta Ruiva                          | 494            | 39.4872    | -31.1778    |
| Flores    | Semi-natural Pasture       | Leste do Morro Alto                  | 619            | 39.4178    | -31.2013    |
| Pico      | Corn Crop                  | Madalena (Sete Cidades)             | 90             | 38.5337    | -28.5097    |
| Pico      | Corn Crop                  | Piedade                              | 115            | 38.4216    | -28.0513    |
| Pico      | Invasive Forest            | Cabeço do Chão                        | 443            | 38.5424    | -28.4829    |
| Pico      | Invasive Forest            | São Roque                            | 767            | 38.5170    | -28.3170    |
| Pico      | Meadows                   | Encosta da Prainha 2                 | 797            | 38.4406    | -28.1866    |
| Pico      | Meadows                   | Meia encosta da Prainha              | 765            | 38.4422    | -28.1919    |
| Pico      | Natural Forest            | Estrada para as Lagoas               | 715            | 38.4674    | -28.2967    |
| Pico      | Natural Forest            | Mistério da Prainha                  | 675            | 38.4822    | -28.2610    |
| Pico      | Orchard                   | Madalena (Sete Cidades)              | 79             | 38.5337    | -28.5097    |
| Pico      | Orchard                   | Prainha                              | 41             | 38.4686    | -28.2025    |
| Pico      | Pasture                   | Criação Velha                        | 214            | 38.5090    | -28.4914    |
| Pico      | Pasture                   | S. Miguel Arcanjo                    | 150            | 38.5036    | -28.2952    |
| Pico      | Production forest         | Candelária                           | 258            | 38.4705    | -28.4929    |
| Pico      | Production forest         | Prédio Mário Sequeira                | 419            | 38.4933    | -28.2952    |
| Pico      | Semi-natural Pasture      | Corre Água                           | 708            | 38.4768    | -28.2975    |
| Pico      | Semi-natural Pasture      | Longitudinal (Km 5)                  | 896            | 38.4454    | -28.3628    |
| Santa     | Corn Crop                 | Água de Alto / Caminho Florestal do  | 227            | 36.9925    | -25.1072    |
| Maria     |                            | Alto                                 |                |            |             |
| Island     | Habitat          | Locality                        | Elevation (m) | Latitude     | Longitude   |
|------------|------------------|---------------------------------|---------------|--------------|-------------|
| Santa Maria| Corn Crop        | Santa Bárbara                   | 201           | 36.9915      | -25.0698    |
| Santa Maria| Invasive Forest  | Anjos                           | 166           | 36.9922      | -25.1415    |
| Santa Maria| Invasive Forest  | Estrada para Santo Espírito     | 236           | 36.9590      | -25.0667    |
| Santa Maria| Natural Forest   | Estrada para o Pico Alto        | 491           | 36.9758      | -25.0866    |
| Santa Maria| Natural Forest   | Pico Alto                       | 580           | 36.9826      | -25.0909    |
| Santa Maria| Orchard          | Malbusca                        | 260           | 36.9471      | -25.0716    |
| Santa Maria| Orchard          | Trevina                         | 218           | 36.9874      | -25.1096    |
| Santa Maria| Pasture          | Calheta, Saida da Maia          | 266           | 36.9436      | -25.0302    |
| Santa Maria| Pasture          | Estrada para Santa Bárbara / Forno | 354     | 36.9661      | -25.0584    |
| Santa Maria| Production forest| Almagreira                      | 198           | 36.9715      | -25.1252    |
| Santa Maria| Production forest| Fontinhas / Parque Florestal     | 238           | 36.9595      | -25.0721    |
| Santa Maria| Semi-natural Pasture | Arrebetão                      | 453           | 36.9738      | -25.0782    |
| Santa Maria| Semi-natural Pasture | Loural / Estrada              | 428           | 36.9596      | -25.0691    |
| Santa Maria| Semi-natural Pasture Low Altitude | Aeroporto (100m) | 176 | 36.9715 | -25.1622 |
| Santa Maria| Semi-natural Pasture Low Altitude | Paúl / Estrada para o Anjo | 198 | 36.9918 | -25.1392 |
| São Miguel | Corn Crop        | Contentores da Unileite         | 38            | 37.7415      | -25.6850    |
| São Miguel | Corn Crop        | Rabo de Peixe                   | 34            | 37.8138      | -25.5479    |
| Island     | Habitat               | Locality                                      | Elevation (m) | Latitude  | Longitude |
|------------|-----------------------|-----------------------------------------------|---------------|-----------|-----------|
| São Miguel | Invasive Forest       | Pico das Camarinhas                           | 175           | 37.8583   | -25.8484  |
| São Miguel | Invasive Forest       | S. Pedro                                      | 378           | 37.8358   | -25.1826  |
| São Miguel | Meadows               | Encosta Sul para a Lagoa do Fogo             | 745           | 37.7650   | -25.5024  |
| São Miguel | Meadows               | Próximo do Monte Escuro / vertente virada a norte | 824           | 37.7827   | -25.4532  |
| São Miguel | Natural Forest        | Abelheira                                     | 490           | 37.7590   | -25.6416  |
| São Miguel | Natural Forest        | Tronqueira - Miradouro                        | 627           | 37.7874   | -25.2841  |
| São Miguel | Orchard               | Aflitos                                       | 104           | 37.8126   | -25.6396  |
| São Miguel | Orchard               | Malaca da Lagoa                               | 203           | 37.7583   | -25.5787  |
| São Miguel | Pasture               | Calhetas, Rabo de Peixe                       | 30            | 37.8213   | -25.6059  |
| São Miguel | Pasture               | Rocha da Relva                                | 101           | 37.7631   | -25.7345  |
| São Miguel | Production forest     | Lagoa das Empadadas                           | 775           | 37.8265   | -25.7506  |
| São Miguel | Production forest     | Sto António                                   | 190           | 37.8510   | -25.2013  |
| São Miguel | Semi-natural Pasture  | Altiprado                                     | 640           | 37.7706   | -25.3887  |
| São Miguel | Semi-natural Pasture  | Lagoa do Fogo / Vertente Sul                  | 660           | 37.7658   | -25.5100  |
| Terceira   | Corn Crop             | Etar                                          | 51            | 38.6543   | -27.2006  |
| Terceira   | Corn Crop             | S. Brás                                       | 159           | 38.7606   | -27.1367  |
| Terceira   | Invasive Forest       | Biscoitos/ Estrada para Sul                   | 315           | 38.7716   | -27.2636  |
| Terceira   | Invasive Forest       | Estrada para a Agualva                       | 409           | 38.7639   | -27.1923  |
| Terceira   | Natural Forest        | Caldeira Guilherme Muniz                     | 537           | 38.7060   | -27.2032  |
| Terceira   | Natural Forest        | Algar do Carvão - Terra Brava                 | 621           | 38.7399   | -27.2047  |
| Island   | Habitat                  | Locality                        | Elevation (m) | Latitude    | Longitude   |
|----------|--------------------------|---------------------------------|---------------|-------------|-------------|
| Terceira | Orchard                  | Biscoitos                       | 125           | 38.7882     | -27.2737    |
| Terceira | Orchard                  | Terra Chã                        | 72            | 38.6641     | -27.2524    |
| Terceira | Pasture                  | Agualva                          | 234           | 38.7608     | -27.1651    |
| Terceira | Pasture                  | Estrada de Porto Santo/ Angra    | 294           | 38.6789     | -27.2205    |
| Terceira | Production forest        | Lagoa das Papas                  | 545           | 38.7161     | -27.2894    |
| Terceira | Production forest        | Posto Santo/ Fim estrada         | 412           | 38.7003     | -27.2423    |
| Terceira | Semi-natural Pasture     | Furna do Enxofre                 | 554           | 38.7268     | -27.2322    |
| Terceira | Semi-natural Pasture     | Pico Gaspar                      | 461           | 38.7305     | -27.2743    |
| Terceira | Semi-natural Pasture Low Altitude | Biscoitos                  | 14            | 38.8000     | -27.2505    |
| Terceira | Semi-natural Pasture Low Altitude | Porto Martins                  | 5             | 38.6773     | -27.0622    |

The importance of incorporating ecological gradients, such as an anthropogenic impact gradient, in biodiversity and conservation projects, has been previously highlighted. They constitute valuable scenarios to infer possible causes for the distribution of species across the landscape (Ulrich et al. 2009). We therefore selected habitats that represented a gradient of increasing anthropogenic impact and management intensity. Nine habitat types, divided between herbaceous and arborescent habitats, were selected to represent a comprehensive range of the flora and fauna communities. We determined consistency, prevalence and fidelity of a given plant species across all habitats to define them, based on their flora. We used a metric called IndVal and developed another called SiteVal which can now be used to assign a location to a given habitat (and anthropogenic level of influence) (see more details in Marcelino et al. 2013, Marcelino et al. 2014, Silva et al. 2017). The herbaceous habitat gradient (Table 2) ranged from natural meadows (MED) to corn fields (COR). The arborescent habitat gradient (Table 2) ranged from natural pristine forests of *Laurus azorica* (NAT) to orchards of *Citrus* sp. (ORC). Pristine meadows were not present on Santa Maria and Terceira and semi-natural pastures at low altitude (SNPL) were used as a surrogate for MED on these Islands.

**Design description:** In order to obtain the maximum information on arthropod biodiversity, all strata present at a given habitat type were sampled, i.e. micro-epigean fauna (Berlese-Tullgren trapping), soil fauna (Pitfall trapping), aerial vagility fauna (Suction with an aspirator) and canopy fauna (sweeping nets).

One Island per week was sampled during the summer 2009 (July-August). This eliminated seasonal effects in the sampling. The total number of samples was 4800 [80 sampling sites x 4 different types of traps x 15 samples per site].
Increasing gradients of anthropogenic influence in herbaceous communities (1-5) and arborescent communities (1-4). Description and characteristic plant species communities. Note: * - Semi-natural pastures, at low altitude (SNPL), replaced Meadow habitats (MED) in Santa Maria and Terceira Islands due to the lack of sampling sites of the latter community type in these Islands.

| Gradient of HERBACEOUS communities | Composition | Plant species communities |
|-----------------------------------|-------------|---------------------------|
| 1. Natural meadows (MED)          | Indigenous taxa. Low management intensity and anthropogenic influence | Holcus rigidus, Festuca spp., Deschampsia foliosa, Leontodon spp., Tolpis azorica |
| 2. Semi-natural pastures at low altitude (SNPL)* | Annual populations of Daucus carota. Low management intensity and anthropogenic impact | Sporobolus indicus, Briza minor, Lotus subbiflorus |
| 3. Semi-natural pastures at high altitude (SNP) | Non-indigenous taxa with seldom indigenous taxa. Low management intensity and anthropogenic impact | Holcus lanatus, Agrostis castellana, Polytrichum commune, Ranunculus repens, Juncus effusus, Selaginella kraussiana, Stibthropia europeia, Eleocharis multicaulis, Sherardia arvensis, Anagallis arvensis |
| 4. Artificial pastures (PAS)      | Introduced taxa. High human-management intensity and anthropogenic influence | Lolium perenne, Bromus willdenowii, Trifolium repens, Poa spp., Holcus lanatus, Rumex obtusifolius, Plantago lanceolata, Dactylis glomerata, Sporobolus indicus |
| 5. Crops (COR)                    | Introduced taxa. High human-management intensity, high anthropogenic influence, as well as pesticide and fertiliser use | Zea mays, weeds and ruderal plants |

| Gradient of ARBORESCENT communities | Composition | Main species |
|------------------------------------|-------------|--------------|
| 1. Natural Forests (NAT)           | Indigenous taxa. Low management intensity and anthropogenic influence | Laurus azorica, Juniperus brevifolia, Erica azorica, Ilex perado subsp. azorica, Morella faya |
| 2. Exotic forests (INV)             | Non-indigenous invasive taxa. Low to medium management intensity and anthropogenic influence | Pittosporum undulatum, Acacia melanoxylon, Eucalyptus globulus, Pinus pinaster, Solanum mauritianum |
| 3. Production Forest (PRO)          | Human intentionally introduced taxa. High management intensity and anthropogenic influence | Cryptomeria japonica (monocultural stands) |
Gradient of HERBACEOUS communities | Composition | Plant species communities
--- | --- | ---
4. Orchards (ORC) | Introduced taxa. Medium management intensity and anthropogenic influence | *Citrus sinensis*, *Mallus domestica*, *Prunus* spp., other crops, weeds, ornamentals and rudereal species

The samples were subsequently processed in laboratory facilities and assigned to morphospecies groups, progressing to higher taxonomic degrees of identifications. Species richness and abundance were recorded. Species accumulation curves were performed for inventory completeness using EstimateS (using the ratio of observed to the estimated species richness with the non-parametric estimator Jackknife) (Colwell 2013). Inventory completeness was 70-75% for Staphylinidae and Collembola (Marcelino et al. 2011, Marcelino et al. 2016), reaching 80% for Araneae and Hymenoptera parasitoids (data not published).

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**Sampling methods**

**Study extent:** Five Islands of the Azores: Santa Maria, São Miguel, Terceira, Pico and Flores.

**Sampling description:** Suction (SU), sweeping (SW) and soil (BT) sampling were obtained in parallel with the pitfall traps (PF) in the sites previously listed (Table 1), in equal numbers of samples and distance.

SU and SW were done to record species at strata other than the epigeic stratum. SU was made with a hand-held aspirator (Stihl BG55), collecting the arthropods in shrubs, when available. SU was made individually for ca. 8 seconds, at each of four exposures (i.e. N, S, W, E) of the shrub or agro-culture plant. The specimens from all four cardinal exposures were transferred to a single cup for each SU and SW sampling spot, respectively. SW was made by gently sweeping with a 64 cm diameter sweeping net.

Berlese-Tullgreen sampling (BT) was made by collecting ca. 100 grams of soil litter per sampling unit (15 samples for each transect established at PF sampling spots). Samples were immediately stored in a cooler to avoid proliferation of saprophytic fungi and sent by air transportation to the Department of Biology, University of the Azores, Ponta Delgada where they were placed in a cooling chamber at 4°C for subsequent processing in BT traps. BT trap units consisted of two plastic darkened containers, assembled together to
provide an upper vented area (14 cm diameter x 11.5 cm high) with 4 openings (1 cm diameter covered with a 0.3 x 0.3 mm diameter mesh) and coupled with a 15 W lamp on top. The lower collecting area (13 cm diameter x 10 cm high) was partially filled with ca. 80 ml of the same mixture used in PF. Litter samples were placed on a 1.8 x 1.8 mm mesh, attached to a plastic funnel positioned in the assembling zone between the two halves of the device. In order to avoid heat and dryness, Collembola and other micro-arthropods crawled downwards to the litter sample and dropped through the funnel into the collecting mixture. Litter samples remained for 72 h in BT before specimen sorting at laboratory facilities.

Two parallel transects with fifteen pitfall traps (PF) were placed in 150 x 150 m geo-referenced plots. PF consisted of plastic cylinder cups 78 mm deep and 42 mm diameter filled with ca. 80 ml of a mixture of 96% Ethanol and 0.05% liquid detergent. PFs were buried in the soil so that the lid was flush with the surface and covered with a plastic plate at ca. 3 cm height, to avoid desiccation, flooding or insectivore predation. Traps remained in the soil for 7 days prior to collection. For each habitat type and Island, two replicate sites were monitored (with a minimum distance of 5 km apart), for a total of 80 sampling sites (i.e. 5 Islands x 8 habitat types per Island x 2 sites for each habitat type).

All specimens where stored in 96% EtOH in order to maintain viability for future genetic and/or taxonomic work, as well as voucher exchanges with other institutions.

Quality control: Identifications were conducted in a progressive higher degree of taxonomy resolution, i.e. 1) morphospecies were generated and, concomitantly, an ongoing web-based image gallery stock was created (at www.eden-azores.webs.com). This secured consistency in assigning specimens to morpho-species without duplications; 2) voucher specimens of all morphospecies were taxonomically assigned to a genus and, if possible, to species level; 3) species of Collembola and Staphylinidae were genetically profiled to match genetic and morphological IDs; 4) All voucher specimens where sent to taxonomist referees in the respective Order, family, genus or group (taxonomists listed in the Personnel section of this report), which corroborated identifications from steps 1, 2 and 3.

Geographic coverage

Description: Azores (Portugal). Islands of Santa Maria, São Miguel, Terceira, Pico and Flores

Coordinates: 36.906 and 39.589 Latitude; -31.311 and -24.961 Longitude.

Taxonomic coverage

Description: Widely distributed Arthropoda groups are reported, i.e. Araneae, Collembola, Hymenopteran parasitoids and beneficial Coleoptera (e.g. Carabidae, Coccinellidae, Staphylinidae). In addition, Dermaptera, Hemiptera, Neuroptera, Orthoptera, Psocoptera
and Thysanoptera. Information can be retrieved in the data resources below (Table of Species Occurrence).

**Taxa included:**

| Rank     | Scientific Name | Common Name           |
|----------|----------------|-----------------------|
| order    | Araneae        | Spiders               |
| order    | Collembola     | Springtails           |
| kingdom  | Dermaptera     | Earwigs               |
| order    | Orthoptera     | Grasshopper           |
| order    | Thysanoptera   | Thrips                |
| kingdom  | Hemiptera      | Tru bugs              |
| order    | Psocoptera     | Booklice              |
| order    | Coleoptera     | Beetles               |
| family   | Neuroptera     | Net-winged insects (lacewings) |
| order    | Hymenoptera    | Wasp, ants            |

**Temporal coverage**

**Notes:** Vegetation landcover and Arthropoda biodiversity were sampled during the summer of 2009 (July-August).

**Collection data**

**Collection name:** Arthropoteca of the University of the Azores at Ponta Delgada, São Miguel

**Collection identifier:** EDEN Azores

**Specimen preservation method:** All specimens were preserved in 96% ethanol.

**Curatorial unit:** EDEN Azores Arthropoteca at the University of the Azores

**Usage licence**

**Usage licence:** Creative Commons Public Domain Waiver (CC-Zero)

**Data resources**

**Data package title:** EDEN Arthropod Azores Database
Resource link: https://www.gbif.org/dataset/5cc85d78-4313-4959-b17d-cd3dc32cc155

Alternative identifiers: http://ipt.gbif.pt/ipt/resource?r=eden_arthropod_database_azores

Number of data sets: 1

Data set name: EDEN Arthropod Azores Database

Download URL: http://ipt.gbif.pt/ipt/resource?r=eden_arthropod_database_azores

Data format: Darwin Core Archive

Data format version: Version 1

Description: The following data table includes all the records for which a taxonomic identification of the species was possible. The dataset submitted to GBIF is structured as a sample event dataset, with two tables: event (as core) and occurrences. The data in this sampling event resource have been published as a Darwin Core Archive (DwCA), which is a standardised format for sharing biodiversity data as a set of one or more data tables. The core data file contains 3214 records (eventID) and the occurrences file 19555 records (occurrenceID). This IPT archives the data and thus serves as the data repository. The data and resource metadata are available for download from Marcelino et al. (2020).

| Column label          | Column description                                           |
|-----------------------|--------------------------------------------------------------|
| Table of Sampling Events | Table with sampling events data (beginning of table)       |
| eventID               | Identifier of the events, unique for the dataset             |
| stateProvince         | Name of the region of the sampling site                      |
| islandGroup           | Name of archipelago                                         |
| island                | Name of the Island                                          |
| country               | Country of the sampling site                                 |
| countryCode           | ISO code of the country of the sampling site                 |
| locationRemarks       | Details on the locality site                                 |
| decimalLatitude       | Approximate centre point decimal latitude of the field site in GPS coordinates |
| decimalLongitude      | Approximate centre point decimal longitude of the field site in GPS coordinates |
| geodeticDatum         | The ellipsoid, geodetic datum or spatial reference system (SRS) upon which the geographic coordinates given in decimalLatitude and decimalLongitude are based |
| coordinateUncertaintyInMetres | Uncertainty of the coordinates of the centre of the sampling plot |
| coordinatePrecision   | A decimal representation of the precision of the coordinates given in the decimalLatitude and decimalLongitude |
| georeferenceSources | A list (concatenated and separated) of maps, gazetteers or other resources used to georeference the Location, described specifically enough to allow anyone in the future to use the same resources |
| verbatimElevation | Elevation in metres |
| fieldNumber | With a code for the sample |
| samplingProtocol | The sampling protocol used to capture the species |
| eventDate | Date or date range the record was collected |
| year | Year of the event |
| month | Month of the event |
| day | Day of the event |
| habitat | The surveyed habitat |
| eventRemarks | Comments or notes about the type of habitat |
| locationID | Identifier of the location |
| Table of Species Occurrence | Table with species abundance data |
| type | Type of the record, as defined by the Public Core standard |
| licence | Reference to the licence under which the record is published |
| institutionID | The identity of the institution publishing the data |
| collectionID | The identity of the collection publishing the data |
| institutionCode | The code of the institution publishing the data |
| collectionCode | The code of the collection where the specimens are conserved |
| datasetName | Name of the dataset |
| basisOfRecord | The nature of the data record |
| occurrenceID | Identifier of the record, coded as a global unique identifier |
| catalogNumber | Record number of the specimen in the collection |
| recordedBy | Name of the person who performed the sampling of the specimens |
| individualCount | Total number of individuals captured |
| establishmentMeans | The process of establishment of the species in the location, using a controlled vocabulary: 'native', 'introduced', 'endemic' |
| eventID | Identifier of the events, unique for the dataset |
| identifiedBy | The names of taxonomists who assigned the Taxon to the subject |
| dateIdentified | The date on which the subject was determined as representing the taxon |
| identificationRemarks | Comments or notes about the Identification |
We collected a total of 116,523 specimens belonging to 483 species and subspecies of selected groups of arthropods. Due to the unavailability of taxonomic expertise, these represent a sub-set of the Arthropoda recorded during the monitoring programme EDEN (2008-2014) carried out in the Azores archipelago. Hymenoptera, mostly parasitoids (193 species and morphospecies), Coleoptera (95 species); Collembola (89 species); and Araneae (72 species) are the most represented taxa (Table 3). A total of 28 species are endemic to the Azores archipelago (2511 specimens), 59 are native non-endemic (26,139 specimens) and 161 are introduced (54,601 specimens). For 238 taxa identified as morphospecies (mostly Collembola and Hymenoptera), the colonisation status is unknown (33,272 specimens) (see Table 3).

### Table 3.
List of species and morphospecies with information on the colonisation status (CS) and abundance (n). The taxa are listed following the alphabetical sequence of classes, orders within classes, families within orders and finally species within families. When a species is a new record for a given Island, we add that information (codes for Islands as follows: FLO - Flores; PIC - Pico; TER - Terceira; SMG - S. Miguel; SMR - S. Maria). The top ten most abundant species are marked with an *.

| Class     | Order     | Family      | Species                           | CS           | n  |
|-----------|-----------|-------------|-----------------------------------|--------------|----|
| Arachnida | Araneae   | Agelenidae  | *Lycosoides coarctata* (Dufour, 1831) | Introduced   | 9  |
| Arachnida | Araneae   | Agelenidae  | *Malthonica* sp.                  | Introduced   | 3  |
| Class      | Order       | Family     | Species                                                  | CS                                | n   |
|------------|-------------|------------|----------------------------------------------------------|-----------------------------------|-----|
| Arachnida  | Araneae     | Agelenidae | *Tegenaria domestica* (Clerck, 1757)                      | Introduced (New to PIC)           | 7   |
| Arachnida  | Araneae     | Agelenidae | *Textrix caudata* L. Koch, 1872                         | Introduced                        | 3   |
| Arachnida  | Araneae     | Araneidae  | *Gibbaranea occidentalis* Wunderlich, 1989               | Endemic                           | 45  |
| Arachnida  | Araneae     | Araneidae  | *Mangora acalypha* (Walckenaer, 1802)                    | Introduced                        | 12  |
| Arachnida  | Araneae     | Cheiracanthiidae | *Cheiracanthium erraticum* (Walckenaer, 1802) | Introduced                      | 1   |
| Arachnida  | Araneae     | Cheiracanthiidae | *Cheiracanthium floresense* Wunderlich, 2008 | Endemic                          | 4   |
| Arachnida  | Araneae     | Clubionidae | *Clubiona terrestris* Westring, 1851                    | Introduced                        | 87  |
| Arachnida  | Araneae     | Clubionidae | *Porhoclubiona decora* (Blackwall, 1859)               | Native                            | 5   |
| Arachnida  | Araneae     | Clubionidae | *Porhoclubiona genevensis* (L. Koch, 1866)              | Introduced (New to FLO, SMG)      | 90  |
| Arachnida  | Araneae     | Dictynidae | *Emblyna acoreensis* Wunderlich, 1992                   | Endemic (New to SMG, SMR)         | 40  |
| Arachnida  | Araneae     | Dictynidae | *Lathys dentichelis* (Simon, 1883)                      | Native                            | 133 |
| Arachnida  | Araneae     | Dictynidae | *Nigma puella* (Simon, 1870)                            | Introduced                        | 59  |
| Arachnida  | Araneae     | Dysderidae | *Dysdera crocata* C.L. Koch, 1838                      | Introduced                        | 168 |
| Arachnida  | Araneae     | Gnaphosidae | *Haplodrassus signifer* (C.L. Koch, 1839)               | Introduced                        | 19  |
| Arachnida  | Araneae     | Gnaphosidae | *Marinarozelotes lyonneti* (Audouin, 1826)              | Introduced (New to FLO, PIC)      | 9   |
| Arachnida  | Araneae     | Gnaphosidae | *Zelotes tenuis* (L. Koch, 1866)                        | Introduced (New to FLO, PIC)      | 24  |
| Arachnida  | Araneae     | Linyphiidae | *Agyneta depigmentata* Wunderlich, 2008                 | Endemic                           | 12  |
| Arachnida  | Araneae     | Linyphiidae | *Agyneta fuscipalpa* (C.L. Koch, 1836)                 | Introduced                        | 642 |
| Arachnida  | Araneae     | Linyphiidae | *Agyneta sp.*                                       |                                   | 10  |
| Arachnida  | Araneae     | Linyphiidae | *Canariphantes acoreensis* (Wunderlich, 1992)         | Endemic                           | 27  |
| Class      | Order      | Family       | Species                                         | CS                  | n     |
|-----------|------------|--------------|------------------------------------------------|---------------------|-------|
| Arachnida | Araneae    | Linyphiidae  | Entelecara schmitzi Kulczynski, 1905            | Native              | 11    |
| Arachnida | Araneae    | Linyphiidae  | Erigone atra Blackwall, 1833                    | Introduced          | 348   |
| Arachnida | Araneae    | Linyphiidae  | Erigone autuminalis Emerton, 1882               | Introduced          | 882   |
| Arachnida | Araneae    | Linyphiidae  | Erigone dentipalpis (Wider, 1834)               | Introduced          | 257   |
| Arachnida | Araneae    | Linyphiidae  | Erigone sp.                                     |                     | 7     |
| Arachnida | Araneae    | Linyphiidae  | Mermessus bryantae (Ivie & Barrows, 1935)      | Introduced (New to FLO) | 49    |
| Arachnida | Araneae    | Linyphiidae  | Mermessus tradeorum (Berland, 1932)            | Introduced          | 190   |
| Arachnida | Araneae    | Linyphiidae  | Microctenonyx subitaneus (O. Pickard-Cambridge, 1875) | Introduced          | 1     |
| Arachnida | Araneae    | Linyphiidae  | Microlinyphia johnsoni (Blackwall, 1859)       | Native              | 33    |
| Arachnida | Araneae    | Linyphiidae  | Minicia floresensis Wunderlich, 1992            | Endemic (New to SMR) | 8     |
| Arachnida | Araneae    | Linyphiidae  | Neriene clathrata (Sundevall, 1830)            | Introduced          | 3     |
| Arachnida | Araneae    | Linyphiidae  | Oedothorax fuscus (Blackwall, 1834)            | Introduced *        | 1991  |
| Arachnida | Araneae    | Linyphiidae  | Ostearius melanopygius (O. Pickard-Cambridge, 1879) | Introduced          | 129   |
| Arachnida | Araneae    | Linyphiidae  | Palliduphantes schmitzi (Kulczynski, 1899)     | Native              | 174   |
| Arachnida | Araneae    | Linyphiidae  | Pelecopsis parallela (Wider, 1834)             | Introduced          | 74    |
| Arachnida | Araneae    | Linyphiidae  | Prinerigone vagans (Audouin, 1826)             | Introduced          | 221   |
| Arachnida | Araneae    | Linyphiidae  | Savigniorrhapis acoreensis Wunderlich, 1992     | Endemic             | 467   |
| Arachnida | Araneae    | Linyphiidae  | Tenuiphantes miguelensis (Wunderlich, 1992)     | Native              | 417   |
| Arachnida | Araneae    | Linyphiidae  | Tenuiphantes tenuis (Blackwall, 1852)          | Introduced          | 1234  |
| Class        | Order      | Family       | Species                                      | CS Description | n |
|--------------|------------|--------------|----------------------------------------------|----------------|---|
| Arachnida    | Araneae    | Linyphiidae  | Walckenaeria grandis (Wunderlich, 1992)      | Endemic        | 4 |
| Arachnida    | Araneae    | Lycosidae    | Arctosa perita (Latreille, 1799)            | Introduced (new PIC, SMR) | 27 |
| Arachnida    | Araneae    | Lycosidae    | Pardosa acorensis Simon, 1883                | Endemic        | 499 |
| Arachnida    | Araneae    | Mimetidae    | Ero furcata (Villers, 1789)                  | Introduced     | 3 |
| Arachnida    | Araneae    | Nesticidae   | Eidmannella pallida (Emerton, 1875)         | Introduced     | 1 |
| Arachnida    | Araneae    | Oecobiidae   | Oecobius similis Kulczynski, 1909            | Native (New to PIC) | 11 |
| Arachnida    | Araneae    | Phrurolithidae | Liophurillus flavitarsis (Lucas, 1846)     | Introduced     | 5 |
| Arachnida    | Araneae    | Phrurolithidae | Phrurolinillus lisboensis Wunderlich, 1995 | Introduced     | 4 |
| Arachnida    | Araneae    | Pisauridae   | Pisaura acoreensis Wunderlich, 1992          | Endemic        | 2 |
| Arachnida    | Araneae    | Salticidae   | Chalcocirtus infimus (Simon, 1868)          | Introduced     | 9 |
| Arachnida    | Araneae    | Salticidae   | Heliophanus kochii Simon, 1868               | Introduced     | 15 |
| Arachnida    | Araneae    | Salticidae   | Macaroeris cata (Blackwall, 1867)           | Native         | 61 |
| Arachnida    | Araneae    | Salticidae   | Macaroeris diligens (Blackwall, 1867)       | Native (New to FLO) | 13 |
| Arachnida    | Araneae    | Salticidae   | Neon acoreensis Wunderlich, 2008             | Endemic        | 6 |
| Arachnida    | Araneae    | Salticidae   | Pseudeuophrys vafra (Blackwall, 1867)       | Introduced     | 12 |
| Arachnida    | Araneae    | Salticidae   | Salticus mutabilis Lucas, 1846              | Introduced (New to PIC) | 29 |
| Arachnida    | Araneae    | Salticidae   | Synageles venator (Lucas, 1836)             | Introduced     | 2 |
| Arachnida    | Araneae    | Tetragnathida | Metellina meriana (Scopoli, 1763)           | Introduced     | 17 |
| Arachnida    | Araneae    | Tetragnathida | Pachygnatha degeeri Sundevall, 1830         | Introduced (New to FLO, PIC) | 31 |
| Arachnida    | Araneae    | Tetragnathida | Sancus acoreensis (Wunderlich, 1992)        | Endemic        | 7 |
| Class         | Order     | Family       | Species                                                                 | CS                          | n   |
|--------------|-----------|--------------|-------------------------------------------------------------------------|-----------------------------|-----|
| Arachnida    | Araneae   | Theridiidae  | Cryptachaea blattea (Urquhart, 1886)                                    | Introduced                  | 7   |
| Arachnida    | Araneae   | Theridiidae  | Lasaeola oceanica Simon, 1883                                          | Endemic                     | 90  |
| Arachnida    | Araneae   | Theridiidae  | Neottiura bimaculata (Linnaeus, 1767)                                   | Introduced (New to FLO)     | 14  |
| Arachnida    | Araneae   | Theridiidae  | Rugathodes acoreensis Wunderlich, 1992                                  | Endemic                     | 72  |
| Arachnida    | Araneae   | Theridiidae  | Steatoda grossa (C.L. Koch, 1838)                                       | Introduced                  | 63  |
| Arachnida    | Araneae   | Theridiidae  | Theridion melanurum Hahn, 1831                                          | Introduced (New to FLO, TER)| 19  |
| Arachnida    | Araneae   | Theridiidae  | Theridion musivivum Schmidt, 1956                                       | Native                      | 5   |
| Arachnida    | Araneae   | Thomisidae   | Xysticus cor Canestrini, 1873                                           | Native                      | 26  |
| Arachnida    | Araneae   | Thomisidae   | Xysticus nubilus Simon, 1875                                            | Introduced                  | 69  |
| Arachnida    | Araneae   | Zodariidae   | Zodorion atlanticum Pekár & Cardoso, 2005                               | Introduced (New to FLO)     | 130 |
| Arachnida    | Araneae   | Zoropsidae   | Zoropsis spinimana (Dufour, 1820)                                       | Introduced (New to PIC)     | 1   |
| Entognatha   | Collembola| Entomobryidae| Entomobrya albocincta (Templeton, 1835)                                 | Introduced (New to FLO)     | 602 |
| Entognatha   | Collembola| Entomobryidae| Entomobrya atrocincta Schött, 1897                                     | Introduced                  | 113 |
| Entognatha   | Collembola| Entomobryidae| Entomobrya multifasciata (Tullberg, 1871)                               | Introduced *                | 7162|
| Entognatha   | Collembola| Entomobryidae| Entomobrya rivalis (Linnaeus, 1758)                                     | Introduced                  | 1621|
| Entognatha   | Collembola| Entomobryidae| Entomobrya regularis Stach, 1963                                       | Introduced (New to Azores: SMG)| 5 |
| Entognatha   | Collembola| Entomobryidae| Entomobrya spp. (Potentially several species)                           | *                           | 1885|
| Entognatha   | Collembola| Entomobryidae| Entomobryidae sp. Nr. 1                                                 |                             | 105 |
| Entognatha   | Collembola| Entomobryidae| Entomobryidae sp. Nr. 2                                                 |                             | 397 |
| Entognatha   | Collembola| Entomobryidae| Entomobryidae sp. Nr. 3                                                 |                             | 91  |
| Entognatha   | Collembola| Entomobryidae| Entomobryidae sp. Nr. 4                                                 |                             | 1   |
| Class         | Order | Family       | Species                                                                 | CS       | n     |
|--------------|-------|--------------|--------------------------------------------------------------------------|----------|-------|
| Entognatha   | Collembola | Entomobryidae | Entomobryidae sp. Nr. 5                                                  |          | 19    |
| Entognatha   | Collembola | Entomobryidae | Entomobryidae sp. Nr. 6                                                  |          | 96    |
| Entognatha   | Collembola | Entomobryidae | Entomobryidae sp. Nr. 7                                                  |          | 41    |
| Entognatha   | Collembola | Entomobryidae | Entomobryidae sp. Nr. 8                                                  |          | 70    |
| Entognatha   | Collembola | Entomobryidae | Entomobryidae sp. Nr. 9                                                  |          | 4     |
| Entognatha   | Collembola | Entomobryidae | Entomobryidae sp. Nr. 10                                                 |          | 31    |
| Entognatha   | Collembola | Entomobryidae | Entomobryidae sp. Nr. 11                                                 |          | 60    |
| Entognatha   | Collembola | Entomobryidae | Entomobryidae sp. Nr. 12                                                 |          | 222   |
| Entognatha   | Collembola | Entomobryidae | Entomobryidae sp. Nr. 13                                                 |          | 723   |
| Entognatha   | Collembola | Entomobryidae | Entomobryidae sp. Nr. 14                                                 |          | 97    |
| Entognatha   | Collembola | Entomobryidae | Entomobryidae sp. Nr. 15                                                 |          | 12    |
| Entognatha   | Collembola | Entomobryidae | Entomobryidae sp. Nr. 16                                                 |          | 955   |
| Entognatha   | Collembola | Entomobryidae | * Heteromurus sp.                                                        |          | 8430  |
| Entognatha   | Collembola | Entomobryidae | Himalanura sp.                                                            | Introduced (New genus to Azores) | 45    |
| Entognatha   | Collembola | Entomobryidae | Lepidocyrtus curvicollosi Bourlet, 1839                                   | Introduced * | 2844 |
| Entognatha   | Collembola | Entomobryidae | Lepidocyrtus cyaneus Tullberg, 1871                                      | Introduced (New to FLO, PIC, TER) | 773   |
| Entognatha   | Collembola | Entomobryidae | Lepidocyrtus lusitanicus piezoensis (Simón-Benito, 2007)                  | Introduced (New to Azores: TER, SMG, SMR) | 237   |
| Entognatha   | Collembola | Entomobryidae | Lepidocyrtus sp.                                                          |          | 39    |
| Entognatha   | Collembola | Entomobryidae | Pogonognathellus longicornis (Müller, 1776)                              | Introduced (New to FLO, TER, SMR) * | 2007  |
| Entognatha   | Collembola | Hypogastruridae | Ceratophysella denticulata (Bagnall, 1941)                               | Introduced (New to SMR) * | 15403 |
| Entognatha   | Collembola | Isotomidae    | Desoria sp.                                                               | Introduced | 230   |
| Entognatha   | Collembola | Isotomidae    | Desoria trispinata (MacGillivray, 1896)                                  | Introduced (New to SMR) * | 4085  |
| Entognatha   | Collembola | Isotomidae    | Folsomia sp.                                                              |          | 780   |
| Entognatha   | Collembola | Isotomidae    | Folsomides sp.                                                            |          | 1170  |
| Entognatha   | Collembola | Isotomidae    | Isotoma sp.                                                               |          | 730   |
| Class      | Order     | Family    | Species                                                                 | CS                      | n     |
|------------|-----------|-----------|-------------------------------------------------------------------------|-------------------------|-------|
| Entognatha | Collembola| Isotomidae| Isotomidae sp. Nr. 1                                                    |                         | 291   |
| Entognatha | Collembola| Isotomidae| *Isotomurus palustris* (Müller, 1776)                                   | Introduced (New to SMR) | 113   |
| Entognatha | Collembola| Isotomidae| *Isotomurus spp.* (potentially several species)                        |                         | 1644  |
| Entognatha | Collembola| Isotomidae| *Folsomia* sp.                                                          |                         | 9     |
| Entognatha | Collembola| Katiannidae| *Sminthurinus aureus* (Lubbock, 1862)                                   | Introduced              | 16    |
| Entognatha | Collembola| Katiannidae| *Sminthurinus elegans* (Fitch, 1863)                                    | Introduced (New to FLO, PIC, SMR) | 256   |
| Entognatha | Collembola| Katiannidae| *Sminthurinus quadrimaculatus* (Ryder, 1879)                            | Introduced (New to Azores: TER, SMR) | 6     |
| Entognatha | Collembola| Neanuridae| Neanuridae sp. Nr. 1                                                    |                         | 20    |
| Entognatha | Collembola| Neanuridae| Neanuridae sp. Nr. 2                                                    |                         | 17    |
| Entognatha | Collembola| Onychiuridae| *Onychurus* spp. (potentially more than one species)                  | Introduced              | 1311  |
| Entognatha | Collembola| Onychiuridae| *Protophorura* sp.                                                      | Introduced (New genus to Azores) | 57    |
| Entognatha | Collembola| Poduridae  | *Neanura* sp.                                                           | Introduced              | 54    |
| Entognatha | Collembola| Sminthurida| *Bourletiella* sp.                                                      | Introduced              | 594   |
| Entognatha | Collembola| Sminthurida| *Dicyrtomina minuta* (O. Fabricius, 1783)                               | Introduced              | 208   |
| Entognatha | Collembola| Sminthurida| *Dicyrtomina ornata* (Nicolet, 1842)                                   | Introduced (New to FLO, PIC, TER, SMR) | 286   |
| Entognatha | Collembola| Sminthurida| *Dicyrtomina* sp.                                                       | Introduced              | 776   |
| Entognatha | Collembola| Sminthurida| *Jordanathrix articulata* (Ellis, 1974)                                 | Introduced (New to Azores: FLO, PIC, TER, SMG, SMR) | 1170  |
| Entognatha | Collembola| Sminthurida| *Jordanathrix* sp.                                                      |                         | 321   |
| Entognatha | Collembola| Sminthurida| *Lipothrix* sp.                                                          |                         | 136   |
| Entognatha | Collembola| Sminthurida| Sminthuridae sp. Nr. 1                                                  |                         | 46    |
| Entognatha | Collembola| Sminthurida| Sminthuridae sp. Nr. 2                                                  |                         | 249   |
| Entognatha | Collembola| Sminthurida| Sminthuridae sp. Nr. 3                                                  |                         | 374   |
| Entognatha | Collembola| Sminthurida| Sminthuridae sp. Nr. 4                                                  |                         | 49    |
| Class      | Order    | Family     | Species                        | CS | n  |
|------------|----------|------------|--------------------------------|----|----|
| Entognatha | Collembola| Sminthurida| Sminthuridae sp. Nr. 5         | 4  |    |
| Entognatha | Collembola| Sminthurida| Sminthuridae sp. Nr. 6         | 304|    |
| Entognatha | Collembola| Sminthurida| Sminthuridae sp. Nr. 7         | 994|    |
| Entognatha | Collembola| Sminthurida| Sminthuridae sp. Nr. 8         | 32 |    |
| Entognatha | Collembola| Sminthurida| Sminthuridae sp. Nr. 9         | 15 |    |
| Entognatha | Collembola| Sminthurida| Sminthuridae sp. Nr. 10        | 40 |    |
| Entognatha | Collembola| Sminthurida| Sminthuridae sp. Nr. 11        | 16 |    |
| Entognatha | Collembola| Sminthurida| Sminthuridae sp. Nr. 12        | 508|    |
| Entognatha | Collembola| Sminthurida| Sminthuridae sp. Nr. 13        | 134|    |
| Entognatha | Collembola| Sminthurida| Sminthuridae sp. Nr. 14        | 1  |    |
| Entognatha | Collembola| Sminthurida| Sminthuridae sp. Nr. 15        | 9  |    |
| Entognatha | Collembola| Sminthurida| Sminthuridae sp. Nr. 16        | 374|    |
| Entognatha | Collembola| Sminthurida| Sminthuridae sp. Nr. 17        | 23 |    |
| Entognatha | Collembola| Sminthurida| Sminthuridae sp. Nr. 18        | 12 |    |
| Entognatha | Collembola| Sminthurida| Sminthuridae sp. Nr. 19        | 109|    |
| Entognatha | Collembola| Sminthurida| Sminthuridae sp. Nr. 20        | 189|    |
| Entognatha | Collembola| Sminthurida| Sminthuridae sp. Nr. 21        | 31 |    |
| Entognatha | Collembola| Sminthurida| Sminthuridae sp. Nr. 22        | 11 |    |
| Entognatha | Collembola| Sminthurida| Sminthuridae sp. Nr. 23        | 4  |    |
| Entognatha | Collembola| Sminthurida| Sminthuridae sp. Nr. 24        | 2  |    |
| Entognatha | Collembola| Sminthurida| Sminthuridae sp. Nr. 25        | 7  |    |
| Entognatha | Collembola| Sminthurida| Sminthuridae sp. Nr. 26        | 1  |    |
| Entognatha | Collembola| Sminthurida| Sminthuridae sp. Nr. 27        | 521|    |
| Entognatha | Collembola| Sminthurida| Sminthuridae sp. Nr. 28        | 63 |    |
| Entognatha | Collembola| Sminthurida| Sminthuridae sp. Nr. 29        | 72 |    |
| Entognatha | Collembola| Sminthurida| Sminthuridae sp. Nr. 30        | 130|    |
| Entognatha | Collembola| Sminthurida| Sminthuridae sp. Nr. 31        | 13 |    |
| Entognatha | Collembola| Sminthurida| Sminthuridae sp. Nr. 32        | 9  |    |
| Entognatha | Collembola| Sminthurida| Sminthuridae sp. Nr. 33        | 1  |    |
| Entognatha | Collembola| Sminthurida| Sminthuridae sp. Nr. 34        | 3  |    |
| Class       | Order      | Family    | Species                                         | CS                                      | n     |
|------------|------------|-----------|------------------------------------------------|-----------------------------------------|-------|
| Entognatha | Collembola | Sminthuridae | *Sminthurus viridis* (Linnaeus, 1758)    | Introduced (New to FLO, PIC, TER)       | 775   |
| Insecta    | Coleoptera | Anobiidae | *Anobium punctatum* (De Geer, 1774)       | Introduced                             | 52    |
| Insecta    | Coleoptera | Anthicidae | *Hirticollis quadriguttatus* (Rossi, 1794) | Native (New to PIC)                    | 94    |
| Insecta    | Coleoptera | Anthicidae | *Hirticorus sp.*                              |                                        | 35    |
| Insecta    | Coleoptera | Carabidae  | *Agonum muelleri muelleri* (Herbst, 1784)   | Introduced                             | 2     |
| Insecta    | Coleoptera | Carabidae  | *Amara aenea* (De Geer, 1774)              | Introduced                             | 10    |
| Insecta    | Coleoptera | Carabidae  | *Anisodactylus binotatus* (Fabricius, 1787) | Introduced                             | 3     |
| Insecta    | Coleoptera | Carabidae  | *Asaphidion flavipes* (Linnaeus, 1761)      | Introduced (New to Azores: SMG)        | 1     |
| Insecta    | Coleoptera | Carabidae  | *Harpalus distinguendus distinguendus* (Duftschildt, 1812) | Introduced                             | 1     |
| Insecta    | Coleoptera | Carabidae  | *Harpalus sp.*                                | Introduced                             | 5     |
| Insecta    | Coleoptera | Carabidae  | *Microlestes negrita negrita* (Wollaston, 1854) | Native (New to FLO, PIC)            | 15    |
| Insecta    | Coleoptera | Carabidae  | *Notiophilus quadripunctatus* Dejean, 1826  | Native (New to FLO, PIC)              | 3     |
| Insecta    | Coleoptera | Carabidae  | *Ocys harsaloides* (Audinet-Serville, 1821) | Native                                 | 58    |
| Insecta    | Coleoptera | Carabidae  | *Pseudoophonus rufipes* (De Geer, 1774)     | Introduced                             | 138   |
| Insecta    | Coleoptera | Carabidae  | *Pterostichus vernalis* (Panzer, 1796)      | Introduced                             | 26    |
| Insecta    | Coleoptera | Carabidae  | *Stenolophus teutonus* (Schrank, 1781)      | Native                                 | 1     |
| Insecta    | Coleoptera | Chrysomelidae | *Chaetocnema hortensis* (Fourcroy, 1785) | Introduced                             | 41    |
| Insecta    | Coleoptera | Chrysomelidae | *Chrysolina bankii* (Fabricius, 1775)     | Native                                 | 81    |
| Insecta    | Coleoptera | Chrysomelidae | *Epitrix sp.*                                |                                        | 43    |
| Class     | Order       | Family          | Species                                           | CS                           | n   |
|-----------|-------------|-----------------|--------------------------------------------------|------------------------------|-----|
| Insecta   | Coleoptera  | Chrysomelidae   | *Longitarsus kutscherae* (Rye, 1872)              | Introduced (New to PIC)      | 38  |
| Insecta   | Coleoptera  | Chrysomelidae   | *Longitarsus lateripunctatus* lateripunctatus (Rosenhauer, 1856) | Introduced                  | 6   |
| Insecta   | Coleoptera  | Coccinellidae   | *Adalia decempunctata* (Linnaeus, 1758)          | Introduced                  | 1   |
| Insecta   | Coleoptera  | Coccinellidae   | *Clitostethus arcuatus* (Rossi, 1794)            | Introduced (New to PIC)      | 41  |
| Insecta   | Coleoptera  | Coccinellidae   | *Coccinella undecimpunctata* undecimpunctata Linnaeus, 1758 | Introduced                  | 4   |
| Insecta   | Coleoptera  | Coccinellidae   | *Nephus* sp.                                     |                              | 4   |
| Insecta   | Coleoptera  | Coccinellidae   | *Nephus voeltzkowi* (Weise, 1910)                | Introduced                  | 4   |
| Insecta   | Coleoptera  | Coccinellidae   | *Rodolia cardinalis* (Mulsant, 1850)             |Introduced                  | 14  |
| Insecta   | Coleoptera  | Coccinellidae   | *Scymnus interruptus* (Goeze, 1777)             | Native                      | 24  |
| Insecta   | Coleoptera  | Coccinellidae   | *Scymnus* sp.                                    |                              | 427 |
| Insecta   | Coleoptera  | Coccinellidae   | *Stethorus pusillus* (Herbst, 1979)              | Native (New to FLO, PIC)     | 71  |
| Insecta   | Coleoptera  | Corylophidae    | *Sericoderus lateralis* (Gyllenhal, 1827)        | Introduced                  | 903 |
| Insecta   | Coleoptera  | Curculionidae   | *Calacalles subcarinatus* (Israelson, 1984)      | Endemic                     | 21  |
| Insecta   | Coleoptera  | Curculionidae   | *Cocctryptes carpophagus* (Hornung, 1842)        | Introduced                  | 66  |
| Insecta   | Coleoptera  | Curculionidae   | *Drouetius* sp.                                  | Endemic                     | 51  |
| Insecta   | Coleoptera  | Curculionidae   | *Mecinus pascuorum* Gyllenhal, 1813              | Introduced (New to FLO, SMG) | 30  |
| Insecta   | Coleoptera  | Curculionidae   | *Orthochaetes insignis* (Aubé, 1863)             | Native                      | 7   |
| Insecta   | Coleoptera  | Curculionidae   | *Otiorynchus cribricollis* Gyllenhal, 1834       | Introduced                  | 109 |
| Class        | Order      | Family         | Species                                      | CS      | n  |
|--------------|------------|----------------|----------------------------------------------|---------|----|
| Insecta      | Coleoptera | Curculionidae  | *Pseudechinosoma nodosum* Hustache, 1936      | Endemic | 5  |
| Insecta      | Coleoptera | Curculionidae  | *Pseudocaulotrupis parvus* (Israelson, 1985)  | Endemic | 25 |
| Insecta      | Coleoptera | Curculionidae  | *Pseudocaulotrupis* sp.                      | Endemic | 15 |
| Insecta      | Coleoptera | Curculionidae  | *Xyleborus alni* Nijima, 1909                | Introduced | 14 |
| Insecta      | Coleoptera | Dryophthoridae | *Sitophilus* sp.                             | Introduced | 39 |
| Insecta      | Coleoptera | Elateridae     | *Heteroderes azoricus* (Tarnier, 1860)        | Endemic | 234|
| Insecta      | Coleoptera | Hydrophilidae  | *Cercyon haemorrhoidalis* (Fabricius, 1775)   | Introduced | 7  |
| Insecta      | Coleoptera | Latridiidae    | *Metophthalmus occidentalis* Israelson, 1984  | Endemic | 4  |
| Insecta      | Coleoptera | Mycetophagida  | *Typhaea stercorea* (Linnaeus, 1758)          | Introduced | 97 |
| Insecta      | Coleoptera | Nitidulidae    | *Brassicogthes aeneus* (Fabricius, 1775)      | Introduced | 5  |
| Insecta      | Coleoptera | Nitidulidae    | *Carpophilus fumatus* (Boheman, 1851)         | Introduced | 10 |
| Insecta      | Coleoptera | Nitidulidae    | *Carpophilus hemipterus* (Linnaeus, 1758)     | Introduced | 3  |
| Insecta      | Coleoptera | Nitidulidae    | *Carpophilus* spp. (possibly more than one species) | Introduced | 20 |
| Insecta      | Coleoptera | Nitidulidae    | *Eparaea biguttata* (Thunberg, 1784)          | Introduced | 703|
| Insecta      | Coleoptera | Nitidulidae    | *Eparaea* sp.                                | Introduced | 51 |
| Insecta      | Coleoptera | Nitidulidae    | *Stelidota geminata* (Say, 1825)             | Introduced | 35 |
| Insecta      | Coleoptera | Phalacridae    | *Stilbus testaceus* (Panzer, 1797)           | Native | 84 |
| Insecta      | Coleoptera | Ptiliidae      | *Ptenidium pusillum* (Gyllenhal, 1808)        | Introduced | 36 |
| Insecta      | Coleoptera | Ptinidae       | *Sphaericus* sp.                            | (blank) | 1  |
| Insecta      | Coleoptera | Scarabaeidae   | *Calamosternus granarius* (Linnaeus, 1767)    | Introduced | 19 |
| Insecta      | Coleoptera | Scarabaeidae   | *Onthophagus taurus* (Schreber, 1759)         | Introduced | 4  |
| Class       | Order       | Family               | Species                                                                 | CS                           | n     |
|------------|-------------|----------------------|--------------------------------------------------------------------------|------------------------------|-------|
| Insecta    | Coleoptera  | Scarabaeidae         | *Popillia japonica* Newman, 1838                                         | Introduced (New to PIC)      | 168   |
| Insecta    | Coleoptera  | Scraptiidae          | *Anaspis proteus* Wollaston, 1854                                        | Native                       | 46    |
| Insecta    | Coleoptera  | Scydmaenidae         | *Euconnus* sp.                                                           |                              | 18    |
| Insecta    | Coleoptera  | Silvanidae           | *Cryptamorpha desjardinsii* (Guérin-Méneville, 1844)                    | Introduced                   | 94    |
| Insecta    | Coleoptera  | Silvanidae           | *Silvanus* sp.                                                           |                              | 36    |
| Insecta    | Coleoptera  | Staphylinidae        | *Aleochara clavicornis* Redtenbacher, 1849                               | Introduced                   | 4     |
| Insecta    | Coleoptera  | Staphylinidae        | *Anotylus nitidifrons* (Wollaston, 1871)                                 | Introduced                   | 360   |
| Insecta    | Coleoptera  | Staphylinidae        | *Astenus lyonessius* (Joy, 1908)                                        | Native                       | 7     |
| Insecta    | Coleoptera  | Staphylinidae        | *Atheta atramentaria* (Gyllenhal, 1810)                                  | Introduced                   | 39    |
| Insecta    | Coleoptera  | Staphylinidae        | *Atheta fungi* (Gravenhorst, 1806)                                       | Introduced                   | 573   |
| Insecta    | Coleoptera  | Staphylinidae        | *Atheta* sp. (possibly more than one species)                           |                              | 77    |
| Insecta    | Coleoptera  | Staphylinidae        | *Carpelimus corticinus* (Gravenhorst, 1806)                              | Native                       | 2     |
| Insecta    | Coleoptera  | Staphylinidae        | *Coproporus pulchellus* (Erichson, 1839)                                 | Introduced                   | 7     |
| Insecta    | Coleoptera  | Staphylinidae        | *Cordalia obscura* (Gravenhorst, 1802)                                  | Introduced                   | 58    |
| Insecta    | Coleoptera  | Staphylinidae        | *Euplectus infirmus* (Raffray, 1910)                                     | Introduced (New to PIC, SMR) | 5     |
| Insecta    | Coleoptera  | Staphylinidae        | *Gabrius nigritulus* (Gravenhorst, 1802)                                | Introduced                   | 58    |
| Insecta    | Coleoptera  | Staphylinidae        | *Gyrohypnus fracticornis* (Müller, 1776)                                | Introduced                   | 7     |
| Insecta    | Coleoptera  | Staphylinidae        | *Medon* sp.                                                              |                              | 4     |
| Insecta    | Coleoptera  | Staphylinidae        | *Ocypus aethiops* (Waltl, 1835)                                         | Native                       | 15    |
| Insecta    | Coleoptera  | Staphylinidae        | *Ocypus olens* (Müller, 1764)                                           | Native                       | 11    |
| Insecta    | Coleoptera  | Staphylinidae        | *Oligota pumilio* Kiesenwetter, 1858                                     | Native (New to FLO, PIC)     | 42    |
| Class          | Order          | Family         | Species                                      | CS                        | n     |
|---------------|----------------|----------------|----------------------------------------------|---------------------------|-------|
| Insecta       | Coleoptera     | Staphylinidae  | Oligota sp.                                  |                           | 3     |
| Insecta       | Coleoptera     | Staphylinidae  | Oxytelus sculptus Gravenhorst, 1806           | Introduced (New to PIC)   | 29    |
| Insecta       | Coleoptera     | Staphylinidae  | Phlionthus sp.                               |                           | 8     |
| Insecta       | Coleoptera     | Staphylinidae  | Phloeonomus punctipennis Thomson, 1867        | Native                    | 1     |
| Insecta       | Coleoptera     | Staphylinidae  | Phloeonomus sp. (blank)                       |                           | 75    |
| Insecta       | Coleoptera     | Staphylinidae  | Proteinus atomarius Erichson, 1840           | Native                    | 45    |
| Insecta       | Coleoptera     | Staphylinidae  | Quedius curtipennis Bernhauer, 1908           | Native (New to PIC)       | 22    |
| Insecta       | Coleoptera     | Staphylinidae  | Quedius simplicifrons Fairmaire, 1862         | Native (New to FLO, SMG)  | 42    |
| Insecta       | Coleoptera     | Staphylinidae  | Rugillus orbiculatus (Paykull, 1789)          | Native                    | 113   |
| Insecta       | Coleoptera     | Staphylinidae  | Sepedophilus lusitanicus Hammond, 1973        | Native                    | 9     |
| Insecta       | Coleoptera     | Staphylinidae  | Tachyporus chrysomelinus (Linnaeus, 1758)     | Introduced                | 8     |
| Insecta       | Coleoptera     | Staphylinidae  | Tachyporus dispar (Paykull, 1789)             | Introduced (New to Azores: FLO, SMG) | 5     |
| Insecta       | Coleoptera     | Staphylinidae  | Tachyporus nitidulus (Fabricius, 1781)        | Introduced                | 6     |
| Insecta       | Coleoptera     | Staphylinidae  | Xantholinus longiventris Heer, 1839           | Introduced (New to FLO)   | 7     |
| Insecta       | Coleoptera     | Zopheridae     | Tarphius floresensis Borges & Serrano, 2017   | Endemic                   | 1     |
| Insecta       | Coleoptera     | Zopheridae     | Tarphius rufonodulosus Israelson, 1984        | Endemic                   | 1     |
| Insecta       | Dermaptera     | Anisolabidae   | Euborellia annulipes (Lucas, 1847)            | Introduced                | 540   |
| Insecta       | Dermaptera     | Forficulidae   | Forficula auricularia Linnaeus, 1758          | Introduced                | 32    |
| Insecta       | Hemiptera      | Aphididae      | Aphis fabae Scopoli, 1763                     | Introduced (New to PIC)   | 333   |
| Insecta       | Hemiptera      | Aphididae      | Aphis gossypii Glover, 1877                   | Native                    | 19    |
| Class | Order   | Family | Species                                                                 | CS                                      | n    |
|-------|---------|--------|-------------------------------------------------------------------------|-----------------------------------------|------|
| Insecta | Hemiptera | Aphididae | Aulacorthum solani (Kaltenbach, 1843)                                 | Native (New to PIC)                     | 1566 |
| Insecta | Hemiptera | Aphididae | Cinara juniperi (De Geer, 1773)                                         | Native *                                | 4261 |
| Insecta | Hemiptera | Cicadellidae | Anosocus albifrons (Linnaeus, 1758)                                   | Native                                  | 59   |
| Insecta | Hemiptera | Cicadellidae | Aphrodes hamiltoni Quartau & Borges, 2003                              | Endemic                                 | 100  |
| Insecta | Hemiptera | Cixiidae | Cixius spp. (several potential species and subspecies)                 | Endemic                                 | 674  |
| Insecta | Hemiptera | Coccidae | Protopulvinaria pyriformis (Cockerell, 1894)                            | Introduced                              | 361  |
| Insecta | Hemiptera | Cydnidae | Geotomus punctulatus (A. Costa, 1847)                                   | Native                                  | 32   |
| Insecta | Hemiptera | Delphacidae | Megamelodes quadrimaculatus (Signoret, 1865)                           | Native                                  | 220  |
| Insecta | Hemiptera | Diaspididae | Aspidiotus nerii Bouché, 1833                                          | Introduced                              | 2    |
| Insecta | Hemiptera | Diaspididae | Chrysomphalus pinnulifer (Maskell, 1891)                               | Native (New to PIC, SMR)                | 116  |
| Insecta | Hemiptera | Flatidae | Cyphopterum ascendentens (Herrich-Schaeffer, 1835)                      | Native                                  | 1219 |
| Insecta | Hemiptera | Lygaeidae | Kleidocerys ericae (Horváth, 1908)                                     | Native                                  | 18   |
| Insecta | Hemiptera | Margarodidae | Icerya purchasi Maskell, 1878                                          | Introduced (New to FLO, SMR)            | 609  |
| Insecta | Hemiptera | Miridae | Monalocoris filicis (Linnaeus, 1758)                                   | Native                                  | 254  |
| Insecta | Hemiptera | Miridae | Pinalitus oromii J. Ribes, 1992                                         | Endemic                                 | 88   |
| Insecta | Hemiptera | Pentatomidae | Acrosternum heegeri Fieber, 1861                                       | Introduced (New to Azores: FLO, TER)    | 6    |
| Insecta | Hemiptera | Reduviidae | Empicoris rubromaculatus (Blackburn, 1889)                            | Introduced (New to FLO)                | 27   |
| Insecta | Hemiptera | Stenocephalidae | Dicranoccephalus agilis (Scopoli, 1763)                         | Native (New to PIC)                      | 2    |
| Insecta | Hemiptera | Triozidae | Trioza laurisilvae Hodkinson, 1990                                     | Native                                  | 70   |
| Class     | Order            | Family            | Species                                      | CS                                      | n   |
|-----------|------------------|-------------------|----------------------------------------------|-----------------------------------------|-----|
| Insecta   | Hymenoptera      | Aphelinidae       | Aphelinidae sp. Nr. 1                        |                                        | 72  |
| Insecta   | Hymenoptera      | Aphelinidae       | Aphelinidae sp. Nr. 2                        |                                        | 4   |
| Insecta   | Hymenoptera      | Aphelinidae       | Aphelinidae sp. Nr. 3                        |                                        | 3   |
| Insecta   | Hymenoptera      | Aphelinidae       | Aphelinidae sp. Nr. 4                        |                                        | 44  |
| Insecta   | Hymenoptera      | Aphelinidae       | Aphelinidae sp. Nr. 5                        |                                        | 43  |
| Insecta   | Hymenoptera      | Aphelinidae       | *Encarsia citrina* (Crawford, 1891)          | Native (New to FLO, PIC)                | 5   |
| Insecta   | Hymenoptera      | Aphelinidae       | *Encarsia* sp.                              |                                        | 2   |
| Insecta   | Hymenoptera      | Apidae            | *Apis mellifera* Linnaeus, 1758              | Introduced                              | 9   |
| Insecta   | Hymenoptera      | Apidae            | *Bombus ruderatus* (Fabricius, 1775)        | Introduced                              | 6   |
| Insecta   | Hymenoptera      | Argidae           | Argidae sp.                                  |                                        | 3   |
| Insecta   | Hymenoptera      | Bethylidae        | Gen. sp.                                     |                                        | 2   |
| Insecta   | Hymenoptera      | Braconidae        | *Aphaereta difficilis* Nixon, 1939           | Native (New to FLO, PIC, TER, SMR)      | 615 |
| Insecta   | Hymenoptera      | Braconidae        | *Aphaereta* sp.1                            |                                        | 36  |
| Insecta   | Hymenoptera      | Braconidae        | *Aphaereta* sp.2                            |                                        | 30  |
| Insecta   | Hymenoptera      | Braconidae        | *Aphaereta* sp.3                            |                                        | 46  |
| Insecta   | Hymenoptera      | Braconidae        | *Aphidius colemani* Viereck, 1912            | Introduced (New to Azores: PIC, TER, SMG) | 13  |
| Insecta   | Hymenoptera      | Braconidae        | *Aphidius ervi* Haliday, 1834                | Introduced (New to Azores: PIC, TER)    | 33  |
| Insecta   | Hymenoptera      | Braconidae        | *Aphidius matricariae* Viereck, 1912         | Introduced (New to Azores: PIC, TER)    | 6   |
| Insecta   | Hymenoptera      | Braconidae        | *Aphidius rhopalosphi* Stefani-Perez, 1902   | Introduced (New to Azores: PIC, TER, SMG, SMR) | 18  |
| Insecta   | Hymenoptera      | Braconidae        | *Aphidius rosae* (Haliday, 1834)             | Introduced (New to Azores: PIC)         | 1   |
| Insecta   | Hymenoptera      | Braconidae        | *Aphidius sp.*                               |                                        | 21  |
| Insecta   | Hymenoptera      | Braconidae        | *Aphidius urticae* Haliday, 1834             | Introduced (New to Azores: FLO, PIC, TER, SMG) | 15  |
| Class   | Order      | Family     | Species                                                                 | CS                              | n  |
|---------|------------|------------|-------------------------------------------------------------------------|----------------------------------|----|
| Insecta | Hymenoptera| Braconidae | *Aspilota* spp. (potentially four species)                               | Introduced (New genus to Azores) | 49 |
| Insecta | Hymenoptera| Braconidae | *Bassus rugulosus* (Nees, 1834)                                         | Native (New to FLO, PIC)         | 10 |
| Insecta | Hymenoptera| Braconidae | *Bracon intercessor* Nees, 1834                                         | Native (New to PIC)              | 7  |
| Insecta | Hymenoptera| Braconidae | Braconidae sp. Nr. 1                                                    |                                  | 1  |
| Insecta | Hymenoptera| Braconidae | Braconidae sp. Nr. 2                                                    |                                  | 13 |
| Insecta | Hymenoptera| Braconidae | *Centistidea ectoedemiae* Rohwer, 1914                                  | Introduced (New to Azores: FLO, PIC, TER, SMR) | 10 |
| Insecta | Hymenoptera| Braconidae | *Chorebus* spp. (Potentially four species)                               | Introduced (New genus to Azores) | 175 |
| Insecta | Hymenoptera| Braconidae | *Dapsilarthra* sp.                                                      | Introduced                      | 1  |
| Insecta | Hymenoptera| Braconidae | *Dinotrema* sp.                                                          | Introduced                      | 29 |
| Insecta | Hymenoptera| Braconidae | Braconidae sp.                                                           |                                  | 5  |
| Insecta | Hymenoptera| Braconidae | *Homolobus* sp.                                                          | Introduced                      | 9  |
| Insecta | Hymenoptera| Braconidae | *Lodbrokia* sp.                                                          | Introduced (New genus to Azores) | 13 |
| Insecta | Hymenoptera| Braconidae | *Lysiphlebus fabarum* (Marshall, 1896)                                  | Native (New to FLO, PIC)         | 16 |
| Insecta | Hymenoptera| Braconidae | *Lysiphlebus testaceipes* (Cresson, 1880)                                | Native (New to FLO, PIC, SMG)    | 19 |
| Insecta | Hymenoptera| Braconidae | *Macrocentrus collaris* (Spinola, 1808)                                 | Native (New to PIC, TER)         | 5  |
| Insecta | Hymenoptera| Braconidae | *Meteorus collaris* (Spin.) Hal. – Ruschka, Fulmek, 1915                | Introduced (New to Azores: PIC, TER) | 3  |
| Insecta | Hymenoptera| Braconidae | *Meteorus unicolor* (Wesmael, 1835)                                     | Introduced (New to Azores: FLO, PIC, TER) | 18 |
| Insecta | Hymenoptera| Braconidae | *Microgaster* sp.                                                        | New genus to Azores              | 5  |
| Insecta | Hymenoptera| Braconidae | *Opium aster* sp.                                                        | Introduced                      | 109|
| Insecta | Hymenoptera| Braconidae | *Orthostigmceratoa cratospilum* (Thomson, 1895)                          | Introduced (New to Azores: PIC, TER, SMG) | 5  |
| Insecta | Hymenoptera| Braconidae | *Orthostigma latriventris* Ratzeburg, 1844                              | Introduced (New to Azores: PIC, TER, SMR) | 8  |
| Class      | Order               | Family            | Species                              | CS                                             | n     |
|-----------|---------------------|-------------------|--------------------------------------|------------------------------------------------|-------|
| Insecta   | Hymenoptera        | Braconidae        | Orthostigma spp.                     | Introduced (Potentially new records to Azores) | 179   |
| Insecta   | Hymenoptera        | Braconidae        | Pentapleura pumilio (Nees, 1812)     | Introduced (New to FLO, PIC; SMG)              | 295   |
| Insecta   | Hymenoptera        | Braconidae        | Pentapleura spp. (Potentially several species) | Introduced                                     | 39    |
| Insecta   | Hymenoptera        | Braconidae        | Pseudopezomachus bituberculatus (Marshall, 1905) | Introduced (New to Azores: PIC, SMG)         | 2     |
| Insecta   | Hymenoptera        | Braconidae        | Tanycarpa punctata (van Achterberg, 1976) | Introduced (New to Azores: SMG)              | 1     |
| Insecta   | Hymenoptera        | Chalcididae       | Gen. sp.                             |                                                 | 10    |
| Insecta   | Hymenoptera        | Chalcidoidea      | Chalcidoidea sp. Nr. 1               |                                                 | 273   |
| Insecta   | Hymenoptera        | Chalcidoidea      | Chalcidoidea sp. Nr. 10              |                                                 | 7     |
| Insecta   | Hymenoptera        | Chalcidoidea      | Chalcidoidea sp. Nr. 11              |                                                 | 6     |
| Insecta   | Hymenoptera        | Chalcidoidea      | Chalcidoidea sp. Nr. 12              |                                                 | 1     |
| Insecta   | Hymenoptera        | Chalcidoidea      | Chalcidoidea sp. Nr. 2               |                                                 | 112   |
| Insecta   | Hymenoptera        | Chalcidoidea      | Chalcidoidea sp. Nr. 3               |                                                 | 52    |
| Insecta   | Hymenoptera        | Chalcidoidea      | Chalcidoidea sp. Nr. 4               |                                                 | 38    |
| Insecta   | Hymenoptera        | Chalcidoidea      | Chalcidoidea sp. Nr. 5               |                                                 | 4     |
| Insecta   | Hymenoptera        | Chalcidoidea      | Chalcidoidea sp. Nr. 6               |                                                 | 2     |
| Insecta   | Hymenoptera        | Chalcidoidea      | Chalcidoidea sp. Nr. 7               |                                                 | 167   |
| Insecta   | Hymenoptera        | Chalcidoidea      | Chalcidoidea sp. Nr. 8               |                                                 | 26    |
| Insecta   | Hymenoptera        | Chalcidoidea      | Chalcidoidea sp. Nr. 9               |                                                 | 273   |
| Insecta   | Hymenoptera        | Chrysidae         | Chrysis ignita ignita (Linnaeus, 1758) | Native (New to FLO)                             | 1     |
| Insecta   | Hymenoptera        | Cynipidae         | Cynipidae sp. Nr. 2                  |                                                 | 25    |
| Insecta   | Hymenoptera        | Cynipidae         | Cynipidae sp. Nr. 3                  |                                                 | 86    |
| Insecta   | Hymenoptera        | Cynipidae         | Cynipidae ssp. Nr. 1                 |                                                 | 26    |
| Insecta   | Hymenoptera        | Diapriidae        | Diapriidae sp. Nr.                   |                                                 | 4     |
| Insecta   | Hymenoptera        | Diapriidae        | Diapriidae sp. Nr. 1                 |                                                 | 242   |
| Insecta   | Hymenoptera        | Diapriidae        | Diapriidae sp. Nr. 10                |                                                 | 25    |
| Insecta   | Hymenoptera        | Diapriidae        | Diapriidae sp. Nr. 2                 |                                                 | 57    |
| Class   | Order       | Family   | Species                  | CS  | n   |
|---------|-------------|----------|--------------------------|-----|-----|
| Insecta | Hymenoptera | Diapriidae | Diapriidae sp. Nr. 3     | 77  |     |
| Insecta | Hymenoptera | Diapriidae | Diapriidae sp. Nr. 4     | 144 |     |
| Insecta | Hymenoptera | Diapriidae | Diapriidae sp. Nr. 5     | 43  |     |
| Insecta | Hymenoptera | Diapriidae | Diapriidae sp. Nr. 6     | 34  |     |
| Insecta | Hymenoptera | Diapriidae | Diapriidae sp. Nr. 7     | 78  |     |
| Insecta | Hymenoptera | Diapriidae | Diapriidae sp. Nr. 8     | 97  |     |
| Insecta | Hymenoptera | Diapriidae | Diapriidae sp. Nr. 9     | 8   |     |
| Insecta | Hymenoptera | Dryinidae  | Gonatopus clavipes (Thunberg, 1827) | Introduced (New to Azores: SMG) | 1   |
| Insecta | Hymenoptera | Elasmidae  | Gen. sp.                 | 26  |     |
| Insecta | Hymenoptera | Encyrtidae | Encyrtidae sp. Nr. 1     | 13  |     |
| Insecta | Hymenoptera | Encyrtidae | Encyrtidae sp. Nr. 2     | 1411|     |
| Insecta | Hymenoptera | Encyrtidae | Encyrtidae sp. Nr. 3     | 11  |     |
| Insecta | Hymenoptera | Encyrtidae | Encyrtidae sp. Nr. 4     | 3   |     |
| Insecta | Hymenoptera | Encyrtidae | Encyrtidae sp. Nr. 5     | 5   |     |
| Insecta | Hymenoptera | Encyrtidae | Encyrtidae sp. Nr. 6     | 78  |     |
| Insecta | Hymenoptera | Encyrtidae | Encyrtidae sp. Nr. 7     | 18  |     |
| Insecta | Hymenoptera | Encyrtidae | Encyrtidae sp. Nr. 8     | 27  |     |
| Insecta | Hymenoptera | Encyrtidae | Encyrtidae sp. Nr. 9     | 159 |     |
| Insecta | Hymenoptera | Encyrtidae | Encyrtidae sp. Nr. 10    | 11  |     |
| Insecta | Hymenoptera | Encyrtidae | Encyrtidae sp. Nr. 11    | 161 |     |
| Insecta | Hymenoptera | Encyrtidae | Encyrtidae sp. Nr. 12    | 55  |     |
| Insecta | Hymenoptera | Encyrtidae | Encyrtidae sp. Nr. 13    | 41  |     |
| Insecta | Hymenoptera | Encyrtidae | Encyrtidae sp. Nr. 14    | 78  |     |
| Insecta | Hymenoptera | Encyrtidae | Encyrtidae sp. Nr. 15    | 209 |     |
| Insecta | Hymenoptera | Encyrtidae | Encyrtidae sp. Nr. 16    | 28  |     |
| Insecta | Hymenoptera | Encyrtidae | Encyrtidae sp. Nr. 17    | 20  |     |
| Insecta | Hymenoptera | Encyrtidae | Encyrtidae sp. Nr. 18    | 17  |     |
| Insecta | Hymenoptera | Encyrtidae | Encyrtidae sp. Nr. 19    | 9   |     |
| Insecta | Hymenoptera | Encyrtidae | Encyrtidae sp. Nr. 20    | 3   |     |
| Insecta | Hymenoptera | Encyrtidae | Encyrtidae sp. Nr. 21    | 18  |     |
| Class     | Order       | Family   | Species            | CS | n  |
|-----------|-------------|----------|--------------------|----|----|
| Insecta   | Hymenoptera | Encyrtida| Encyrtidae sp. Nr. 22 |    | 1  |
| Insecta   | Hymenoptera | Encyrtida| Encyrtidae sp. Nr. 23 |    | 62 |
| Insecta   | Hymenoptera | Encyrtida| Encyrtidae sp. Nr. 24 |    | 58 |
| Insecta   | Hymenoptera | Encyrtida| Encyrtidae sp. Nr. 25 |    |  3 |
| Insecta   | Hymenoptera | Encyrtida| Encyrtidae sp. Nr. 26 |    |298 |
| Insecta   | Hymenoptera | Encyrtida| Encyrtidae sp. Nr. 27 |    | 16 |
| Insecta   | Hymenoptera | Encyrtida| Encyrtidae sp. Nr. 28 |    |  5 |
| Insecta   | Hymenoptera | Encyrtida| Encyrtidae sp. Nr. 29 |    | 51 |
| Insecta   | Hymenoptera | Encyrtida| Encyrtidae sp. Nr. 30 |    |  9 |
| Insecta   | Hymenoptera | Encyrtida| Encyrtidae sp. Nr. 31 |    | 58 |
| Insecta   | Hymenoptera | Encyrtida| Encyrtidae sp. Nr. 32 |    |  8 |
| Insecta   | Hymenoptera | Encyrtida| Encyrtidae sp. Nr. 33 |    |  8 |
| Insecta   | Hymenoptera | Encyrtida| Encyrtidae sp. Nr. 34 |    |106 |
| Insecta   | Hymenoptera | Encyrtida| Encyrtidae sp. Nr. 35 |    |  1 |
| Insecta   | Hymenoptera | Encyrtida| Encyrtidae sp. Nr. 36 |    |  2 |
| Insecta   | Hymenoptera | Encyrtida| Encyrtidae sp. Nr. 37 |    |  9 |
| Insecta   | Hymenoptera | Encyrtida| Encyrtidae sp. Nr. 38 |    | 18 |
| Insecta   | Hymenoptera | Encyrtida| Encyrtidae sp. Nr. 39 |    | 46 |
| Insecta   | Hymenoptera | Encyrtida| Encyrtidae sp. Nr. 40 |    | 31 |
| Insecta   | Hymenoptera | Encyrtida| Encyrtidae sp. Nr. 41 |    | 60 |
| Insecta   | Hymenoptera | Encyrtida| Encyrtidae sp. Nr. 42 |    |387 |
| Insecta   | Hymenoptera | Encyrtida| Encyrtidae sp. Nr. 43 |    |  2 |
| Insecta   | Hymenoptera | Encyrtida| Encyrtidae sp. Nr. 44 |    |  5 |
| Insecta   | Hymenoptera | Encyrtida| Encyrtidae sp. Nr. 45 |    | 89 |
| Insecta   | Hymenoptera | Encyrtida| Encyrtidae sp. Nr. 46 |    | 13 |
| Insecta   | Hymenoptera | Encyrtida| Encyrtidae sp. Nr. 47 |    | 16 |
| Insecta   | Hymenoptera | Encyrtida| Encyrtidae sp. Nr. 48 |    |  2 |
| Insecta   | Hymenoptera | Encyrtida| Encyrtidae sp. Nr. 49 |    | 26 |
| Insecta   | Hymenoptera | Encyrtida| Encyrtidae sp. Nr. 50 |    |218 |
| Insecta   | Hymenoptera | Encyrtida| Eulophidae sp. Nr. 1  |    | 25 |
| Class     | Order       | Family         | Species                          | CS     | n    |
|-----------|-------------|----------------|----------------------------------|--------|------|
| Insecta   | Hymenoptera | Encyrtida      | Eulophidae sp. Nr. 2             |        | 7    |
| Insecta   | Hymenoptera | Encyrtida      | Eulophidae sp. Nr. 3             |        | 3    |
| Insecta   | Hymenoptera | Encyrtida      | Eulophidae sp. Nr. 4             |        | 11   |
| Insecta   | Hymenoptera | Eupelmidae     | Gen. sp.                         |        | 131  |
| Insecta   | Hymenoptera | Figitidae      | Gen. sp.                         |        | 70   |
| Insecta   | Hymenoptera | Formicidae     | Lasius grandis Forel, 1909       |        | 15469|
| Insecta   | Hymenoptera | Formicidae     | Temnothorax unifasciatus (Latreille, 1798) | Native * | 5 |
| Insecta   | Hymenoptera | Ichneumonidae  | Gen. sp.                         |        | 18   |
| Insecta   | Hymenoptera | Ichneumonidae  | Ichneumonidae sp. Nr. 1          |        | 94   |
| Insecta   | Hymenoptera | Ichneumonidae  | Ichneumonidae sp.Nr. 2           |        | 5    |
| Insecta   | Hymenoptera | Ichneumonidae  | Ichneumonidae sp. Nr. 3          |        | 10   |
| Insecta   | Hymenoptera | Ichneumonidae  | Ichneumonidae sp. Nr. 4          |        | 26   |
| Insecta   | Hymenoptera | Ichneumonidae  | Ichneumonidae sp. Nr. 5          |        | 24   |
| Insecta   | Hymenoptera | Ichneumonidae  | Ichneumonidae sp. Nr. 6          |        | 3    |
| Insecta   | Hymenoptera | Ichneumonidae  | Ichneumonidae sp. Nr. 7          |        | 6    |
| Insecta   | Hymenoptera | Ichneumonidae  | Ichneumonidae sp. Nr. 8          |        | 14   |
| Insecta   | Hymenoptera | Ichneumonoidea | Ichneumonoidea sp. Nr. 1         |        | 8    |
| Insecta   | Hymenoptera | Ichneumonoidea | Ichneumonoidea sp. Nr. 2         |        | 6    |
| Insecta   | Hymenoptera | Ichneumonoidea | Ichneumonoidea sp. Nr. 3         |        | 33   |
| Insecta   | Hymenoptera | Ichneumonoidea | Ichneumonoidea sp. Nr. 4         |        | 35   |
| Insecta   | Hymenoptera | Ichneumonoidea | Ichneumonoidea sp. Nr. 5         |        | 29   |
| Insecta   | Hymenoptera | Ichneumonoidea | Ichneumonoidea sp. Nr. 6         |        | 2    |
| Insecta   | Hymenoptera | Ichneumonoidea | Ichneumonoidea sp. Nr. 7         |        | 2    |
| Insecta   | Hymenoptera | Ichneumonoidea | Ichneumonoidea sp. Nr. 8         |        | 5    |
| Insecta   | Hymenoptera | Mymaridae      | Gen. sp.                         |        | 14   |
| Insecta   | Hymenoptera | Megachilidae   | Gen. sp.                         |        | 26   |
| Insecta   | Hymenoptera | Mymaridae      | Mymar taprobanicum Ward, 1875    | Native (New to FLO, PIC, TER, SMG, SMR) | 289 |
| Insecta   | Hymenoptera | Mymaridae      | Mymaridae sp. Nr. 1              |        | 1    |
| Insecta   | Hymenoptera | Mymaridae      | Mymaridae sp. Nr. 2              |        | 23   |
| Class       | Order       | Family       | Species                  | CS | n  |
|------------|-------------|--------------|--------------------------|----|----|
| Insecta    | Hymenoptera | Mymaridae    | Mymaridae sp. Nr. 3      | 4  |    |
| Insecta    | Hymenoptera | Mymaridae    | Mymaridae sp. Nr. 4      | 14 |    |
| Insecta    | Hymenoptera | Mymaridae    | Mymaridae sp. Nr. 5      | 6  |    |
| Insecta    | Hymenoptera | Mymaridae    | Mymaridae sp. Nr. 6      | 2  |    |
| Insecta    | Hymenoptera | Proctotrupidae | Proctotrupidae sp. Nr. 1 | 48 |    |
| Insecta    | Hymenoptera | Proctotrupidae | Proctotrupidae sp. Nr. 2 | 13 |    |
| Insecta    | Hymenoptera | Proctotrupidae | Proctotrupidae sp. Nr. 3 | 2  |    |
| Insecta    | Hymenoptera | Proctotrupidae | Proctotrupidae sp. Nr. 4 | 1  |    |
| Insecta    | Hymenoptera | Proctotrupidae | Proctotrupidae sp. Nr. 5 | 7  |    |
| Insecta    | Hymenoptera | Pteromalidae | Pycnetron sp.            | 25 |    |
| Insecta    | Hymenoptera | Scelionidae  | Scelionidae sp. Nr. 1    | 19 |    |
| Insecta    | Hymenoptera | Scelionidae  | Scelionidae sp. Nr. 2    | 29 |    |
| Insecta    | Hymenoptera | Scelionidae  | Scelionidae sp. Nr. 3    | 20 |    |
| Insecta    | Hymenoptera | Scelionidae  | Scelionidae sp. Nr. 4    | 3  |    |
| Insecta    | Hymenoptera | Scelionidae  | Scelionidae sp. Nr. 5    | 23 |    |
| Insecta    | Hymenoptera | Scelionidae  | Scelionidae sp. Nr. 6    | 10 |    |
| Insecta    | Hymenoptera | Scelionidae  | Scelionidae sp. Nr. 7    | 136|    |
| Insecta    | Hymenoptera | Scelionidae  | Scelionidae sp. Nr. 8    | 41 |    |
| Insecta    | Hymenoptera | Scelionidae  | Scelionidae sp. Nr. 9    | 5  |    |
| Insecta    | Hymenoptera | Scelionidae  | Scelionidae sp. Nr. 10   | 15 |    |
| Insecta    | Hymenoptera | Scelionidae  | Scelionidae sp. Nr. 11   | 27 |    |
| Insecta    | Hymenoptera | Scelionidae  | Scelionidae sp. Nr. 12   | 18 |    |
| Insecta    | Hymenoptera | Scelionidae  | Scelionidae sp. Nr. 13   | 6  |    |
| Insecta    | Hymenoptera | Scelionidae  | Scelionidae sp. Nr. 14   | 31 |    |
| Insecta    | Hymenoptera | Scelionidae  | Scelionidae sp. Nr. 15   | 160|    |
| Insecta    | Hymenoptera | Scelionidae  | Scelionidae sp. Nr. 16   | 2  |    |
| Insecta    | Hymenoptera | Scelionidae  | Scelionidae sp. Nr. 17   | 6  |    |
| Insecta    | Hymenoptera | Scelionidae  | Scelionidae sp. Nr. 18   | 30 |    |
| Insecta    | Hymenoptera | Scelionidae  | Scelionidae sp. Nr. 19   | 83 |    |
| Insecta    | Hymenoptera | Scelionidae  | Scelionidae sp. Nr. 20   | 72 |    |
| Class       | Order               | Family       | Species                                | CS     | n     |
|------------|---------------------|--------------|----------------------------------------|--------|-------|
| Insecta    | Hymenoptera         | Sphecidae    | Gen. sp.                               |        | 5     |
| Insecta    | Hymenoptera         | Tetracampidae| Gen. sp.                               |        | 178   |
| Insecta    | Neuroptera          | Chrysopidae  | *Chrysoperla lucasina* (Lacroix, 1912)  | Introduced | 9     |
| Insecta    | Neuroptera          | Hemerobiidae | *Hemerobius azoricus* Tjeder, 1948     | Endemic | 3     |
| Insecta    | Neuroptera          | Hemerobiidae | *Hemerobius humulinus* Linnaeus, 1758   | Native  | 55    |
| Insecta    | Orthoptera          | Gryllidae    | *Gryllus bimaculatus* De Geer, 1773    | Introduced | 5     |
| Insecta    | Orthoptera          | Gryllidae    | *Gryllus* sp.                          |        | 59    |
| Insecta    | Orthoptera          | Tettigoniidae| *Neoconocephalus* sp.                  |        | 16    |
| Insecta    | Pscoptera           | Caecliusidae | *Valenzuela flavida* (Stephens, 1836)   | Native  | 86    |
| Insecta    | Pscoptera           | Ectopsocidae | *Ectopsocus briggsii* McLachlan, 1899   | Introduced | 694   |
| Insecta    | Pscoptera           | Elipsocidae  | *Elipsocus brincki* Badonnel, 1963     | Endemic | 6     |
| Insecta    | Pscoptera           | Trichopsocidae| *Trichopsocus clarus* (Banks, 1908)    | Native  | 39    |
| Insecta    | Thysanoptera        | Phlaeothripidae| *Hoplothrips* sp.                      |        | 446   |
| Insecta    | Thysanoptera        | Thripidae    | *Heliothrips haemorrhoidalis* (Bouché, 1833) | Introduced | 564   |

The ten most abundant species account for 54% of all the sampled specimens. These ten species include only two native non-endemic taxa, the ant *Lasius grandis* Forel, 1990 (that ranks as second) and the aphid *Cinara juniperi* (De Geer, 1773) (that ranks as fifth), a specialist species associated with the Azorean endemic tree *Juniperus bervifolia*. All the other dominant species include six introduced species and two morphospecies of unknown status (see Table 3).

The most relevant data reported in this study are the new non-native species for the Azores, i.e. two beetles (Coleoptera), one Hemiptera-Heteroptera: Pentatomidae, six Collembola and 29 Hymenoptera micro-parasitoids (see Table 3 and Borges et al. 2010). These 37 taxa were found in several Islands (see below) and correspond to the addition of five new species for Flores Island, 10 species for Pico Island, 12 species for Terceira Island, 19 species for S. Miguel Island and five species for S. Maria Island.
Additional species records for the Islands included: Flores (5 Collembola; 9 Araneae; 2 Hemiptera; 8 Coleoptera; 8 Hymenoptera), Pico (4 Collembola; 7 Araneae; 4 Hemiptera; 11 Coleoptera; 9 Hymenoptera), Terceira (4 Collembola; 1 Araneae; 3 Hymenoptera), S. Miguel (1 Araneae; 2 Coleoptera; 3 Hymenoptera), S. Maria (5 Collembola; 3 Araneae; 2 Hemiptera; 2 Hymenoptera) (see Table 3).

The two species of beetles include a ground-beetle *Asaphidion flavipes* (Linnaeus, 1761) (Carabidae) found in an exotic forest (*Eucalyptus* spp. plantation) in S. Miguel Island and the rove-beetle *Tachyporus dispar* (Paykull, 1789) (Staphylinidae), found in Flores and S. Miguel Islands, in pasture land and also in *Cryptomeria japonica* plantations.

The bug *Acrosternum heegeri* Fieber, 1861 (Pentatomidae) was found in corn fields, pastures and orchards in the Islands of Flores and Terceira.

Concerning the Collembola, the new species, recorded to Azores, include: *Entomobrya regularis* Stach, 1963 (Entomobryidae) found in *Cryptomeria japonica* plantations from S. Miguel Island; *Lepidocyrtus lusitanicus piezoensis* (Simón-Benito, 2007) (Entomobryidae) found in pastures, corn fields and exotic forests in three Islands (Terceira, S. Miguel and S. Maria); *Sminthurinus quadrimaculatus* (Ryder, 1879) (Katiannidae) found in native forest and *Cryptomeria japonica* plantations in Terceira and S. Maria Islands and *Jordanathrix articulata* (Ellis, 1974) (Sminthuridae) found in all the studied Islands and in almost all sampled habitats, this being a very common species.

Two Collembola genera are also new records for Azores: *Himalanura* Baijal, 1958 (Entomobryidae) and *Protophorura* Absolon, 1901 (Onychiuridae). Further taxonomic resolution is needed to confirm their status and species assignation.

Concerning the Hymenoptera parasitoids, several species and genera are also new records for the Azores: *Gonatopus clavipes* (Thunberg, 1827) (Dryinidae), sampled in corn fields in S. Miguel Island.

*Aphidius colemani* Viereck, 1912 (Braconidae), sampled in pastures, corn fields and native forest in Pico, Terceira and S. Miguel Islands.

*Aphidius ervi* Haliday, 1834 (Braconidae), sampled in pastures and corn fields in Pico and Terceira Islands.

*Aphidius matricariae* Viereck, 1912 (Braconidae), sampled in pastures and native forest in Pico and Terceira Islands.

*Aphidius rhopalosiphi* Stefani-Perez, 1902 (Braconidae), sampled in all types of pastures (i.e. low and high altitude), corn fields, orchards and native forest in Pico, Terceira, S. Miguel and S. Maria Islands.

*Aphidius rosae* (Haliday, 1834) (Braconidae), sampled in semi-natural pastures in Pico Island.
Aphidius urticae Haliday, 1834 (Braconidae), sampled in all types of pastures and corn fields, in Flores, Pico, Terceira and S. Miguel Islands.

Centistidea ectoedemiae Rohwer, 1914 (Braconidae), sampled in pastures, orchards and Cryptomeria japonica plantations, in Flores, Pico, Terceira and S. Maria Islands.

Meteorus unicolor (Wesmael, 1835) (Braconidae), sampled in all types of pastures, orchards, exotic forest and native forest in Flores, Pico and Terceira Islands.

Meteorus collaris (Spin.) Hal. – Ruschka, Fulmek, 1915 (Braconidae), sampled in corn fields and exotic forest in Pico and Terceira Islands.

Orthostigma cratospilum (Thomson, 1895) (Braconidae), sampled in pastures, orchards, exotic forest and native forest in Pico, Terceira and S. Miguel Islands.

Orthostigma latriventris Ratzeburg, 1844 (Braconidae), sampled in pastures, corn fields and orchards in Pico, Terceira and S. Maria Islands. Two other morphospecies of Orthostigma sp. are recorded occurring in all the Islands and habitats, but for which further taxonomic resolution is needed to confirm their status and species assignation.

Pseudopezomachus bituberculatus (Marshall, 1905) (Braconidae), sampled in semi-natural pastures in Pico and S. Miguel Islands.

Tanycarpa punctata (van Achterberg, 1976) (Braconidae), sampled in Cryptomeria japonica plantations, on S. Miguel Island.

New genera, not previously recorded in the Azores, include: Pycnetron sp. (Chalcidoidea: Pteromalidae); four species of Aspilota sp. (Braconidae: Aphidiinae); four species of Chorebus sp. (Braconidae: Alysiinae); Microgaster sp. (Braconidae: Microgastrinae); Homolobus sp. (Braconidae: Homolobinae); Lodbrokia sp. (Braconidae: Alysiinae). Further taxonomic resolution is needed to confirm their status and species assignation.

We wish also to call attention to three species collected in our study for the first time in Azores, but reported in previous publications: two spiders species of the family (Phrurolithidae): Liophrurillus flavitarsis (Lucas, 1846) found in an exotic forest in S. Maria Island and Phrurolinillus lisboensis Wunderlich, 1995 found in pastures in Pico and Terceira Islands (see Borges et al. 2013); the ladybird Nephus voeltzkowi (Weise, 1910) (Coccinellidae) found in orchards and semi-natural pastures in Terceira Island (see Magro et al. 2020).

The staggering number of Hymenoptera, mostly parasitoids (193 species and morphospecies) concurs with reports of an increasingly unreported high number of species in this group, which, due to their size, makes capture and identification difficult and, therefore, underestimated (Lobo and Borges 2010). Their number might rival Coleoptera, commonly reported as the most speciose animals on Earth (Zhang et al. 2018). The number of Hymenoptera parasitoid species is thought to be 2.5-3.2-fold higher than the one of Coleoptera species (Forbes et al. 2018). We hypothesise that the same pattern for Collembola exists as identifications, based on morphological characters, is usually
insufficient to discriminate phenotypic identical species. This was the case for Collembola (Marcelino et al. 2011) and Staphylinidae (Marcelino et al. 2016), in which, after matching morphological identifications with genetic profiles, undetected cryptic species complexes were found.

Our results indicate that increasing anthropogenic impact is a major driver for species diversity in habitats ranging from pristine to highly human-influenced habitats. Our results support the mission statement of Borges et al. (2018) that there is the urgent need to inventory and monitor island biodiversity.

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