Improving Biosecurity in the United Kingdom Overseas Territories

Identification service for invasive invertebrate plant pests

2024-2025

[redacted]

Figure 1 Varroa mite (*Varroa destructor*), one of the most damaging honeybee pests in the world, submitted by the British Virgin Islands Government © Fera Science

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Figure 2 White coconut scale *Pseudoparlatoria bennetti* damaging coconut in Anguilla. This is new for Anguilla and the Lesser and Greater Antilles. It is an economic pest of coconut and oil palm [redacted]

Figure 3 Phantasma scale *Fiorinia phantasma* is a pest of fruit crops, palms and ornamental plants. It was recorded for the first time from Anguilla, BVI and Montserrat [redacted]

Figure 4 Suspect *Amrasca biguttula*, two-spot cotton leafhopper, attacking eggplant in Montserrat. This is a recent introduction to the Caribbean from Asia [redacted]

Figure 5 A planthopper *Dikrella cedrelae* has been reported for the first time in the Cayman Islands. It has caused chlorosis of foliage of mahogany saplings. Nymph (top), Adult (bottom) © Fera Science

Figure 6 *Sogatella kolophon* is for new for Ascension it's a planthopper pest of cereals and grasses © Fera Science

Figure 7 Solanum whitefly, *Aleurotrachelus trachoides*, is reported from Anguilla for the first time. It is a pest of pepper, tomato and native solanaceous plants [redacted]

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Figure 15 A flatworm in the genus *Caenoplana* found in the British Virgin Islands © Fera Science

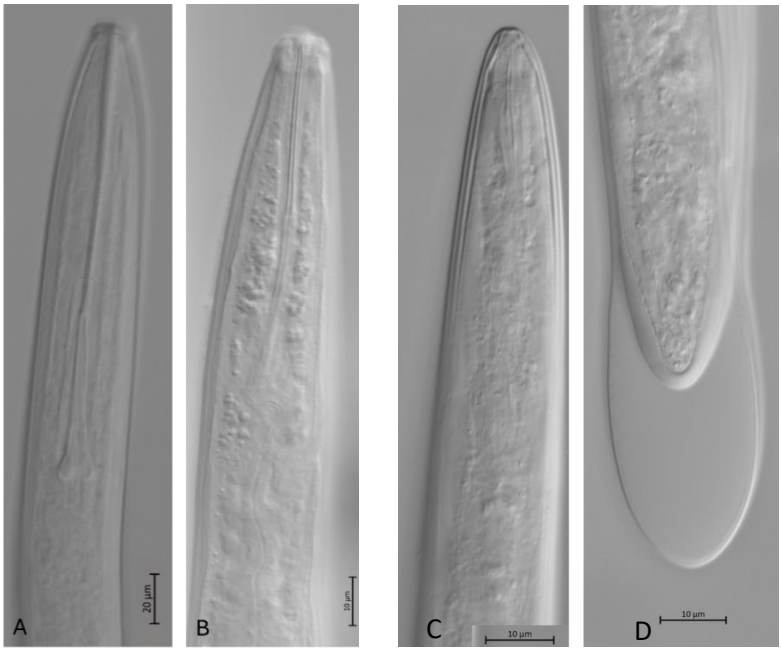

Figure 16 Nematode Dorylaimida biodiversity found in the soil of Montserrat Island. *Xiphinema* sp., belonging to the *X. americanum* group which contains virus vector nematodes (A). *Longidorella* sp. considered to be root-hair feeding nematodes (B). *Belondira* sp. considered a root-hair feeding nematode, head (C) and tail (D). Scale bar A = 20µm; B-D = 10µm © Fera Science

Figure 17 [redacted] pest talk at a meeting in Tortola, British Virgin Island on 20-23 January 2025 [redacted]

Figure 18 [redacted] morphological characters for identifying fire ants and presenting the different methods for controlling populations of invasive ant species [redacted]

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Contents

Executive summary

Biodiversity in the UK Overseas Territories (UKOTs) is globally significant and is recognised as being under threat from invasive alien species. [redacted] Rapid and accurate identification of potential invasive alien species is the essential first step. The Plants Programme at Fera Science Ltd. provides statutory diagnostic and training services for the England and Wales Plant Health Service and has a wealth of experience and expertise in the identification of all plant-feeding insects, mites and nematodes, as well as plant pathogens. The Invertebrate Identification Team has led a Defra-funded project to provide an identification service for invasive invertebrate plant pests for the UKOTs since November 2009. During 2024/25, representatives from nine territories (Ascension Island, Anguilla, Bermuda, British Virgin Islands, Cayman Islands, Montserrat, Saint Helena, Tristan da Cunha and Turks and Caicos Islands) used the service for identifications and biosecurity advice. During the reporting period, a total of 723 samples (including more than 100 photographs) were submitted to Fera for diagnosis.

The pest records accumulated through sample submissions and surveys feed into checklists and provide essential baseline data by which future faunistic changes can be monitored and accurately assessed. Early detection of invasive pests increases the chance of effective and efficient eradication, therefore lessening the impact on the environment, biodiversity, and local economy. The data is also useful in terms of monitoring the spread of invasive species and identify potential future threats to the other UKOTs. Measures can be put in place to reduce the risk of pest entry, and to develop contingency plans to determine appropriate management actions should the pest be detected.

Key achievements of the 2024/2025 project include:

- Across all the work packages 723 samples and photographs were received during 2024/25 from nine UKOTs: Anguilla (90), Ascension Island (81), Bermuda (37), British Virgin Islands (97), Cayman Islands (33), Montserrat (242), Saint Helena (138), Tristan da Cunha (1) and Turks and Caicos Islands (4). The Government of Bermuda submitted samples for the first since the commencement of this identification service.
- At least 266 invertebrate taxa were identified through a combination of morphological study and molecular study in WPs 1 and 2.
- Approximately 18, 000 individual specimens and photographs were examined, this figure is predominantly made up of nematodes and ants.
- Five insect species were recorded from Ascension Island for the first time, *Orius thripoborus* (Hesse) (Hemiptera: Anthocoridae) (Fig. 13); species of *Franklinothrips* (Thysanoptera: Aeolothripidae), suspected to be *F. vespiformis* (Crawford) (Fig. 12); the planthopper *Sogatella kolophon* (Kirkaldy) (Fig. 6) (Hemiptera: Delphacidae) and Jack Beardsley mealybug, *Pseudococcus jackbeardsleyi* Gimpel & Miller (Hemiptera: Pseudococcidae).

A number of pest species of significance were provisionally identified from photographs submitted from Montserrat. One of those organisms was Erythrina gall wasp, *Quadrastichus erythrinae* (Hymenoptera: Eulophidae) (Figure 11) on *Erythrina variegata* plants, this is the first known finding of this serious pest in Montserrat. Another significant pest was *Cosmopolites sordidus* (Coleoptera:Curculionidae), 'banana root borer', recorded as one of the most serious insect pests of bananas, known from nearly all banana-growing areas of the world.

- [redacted] presented a talk in Tortola on the 22nd January to representatives from all the Caribbean UKOTs and Bermuda on new and emerging arthropod pests in the Caribbean region. This was at a workshop entitled 'Meeting the Challenge of New Biosecurity Threats in the Caribbean: Strengthening Biosecurity Against Invasive Reptiles and Managing Invasive Fire Ants'.
- Images a flatworm suspected to be New Guinea flatworm, *Platydemus manokwari*, a highly invasive predator of snails was submitted to Fera by the BVI National Parks trust. Urgent advice on management and surveillance were provided (Appendix 3 & 4) and a sample was requested. DNA barcoding of the specimens submitted determined that were fortunately not New Guinea flatworm.
- On the 6th December, photographs and a video of mites submitted by the British Virgin Islands Government to Fera, were identified as Varroa mite (*Varroa destructor*) (Fig. 1). This is one of the most damaging honeybee pests in the world.
- A suspected finding of the highly invasive Erythrina gall wasp, *Quadrastichus erythrinae* (Fig. 11), on an Endangered endemic plant in BVI was reported to us by RBG, Kew. We took urgent action, provided advice to BVI on sampling, and processed samples immediately upon receipt. Fortunately, the damage proved not to be caused by *Q. erythrinae.*
- Two species of *Amynthas* (Family: Megascolecidae) (Fig. 14), 'Asian jumping worms' are being studied from BVI. These invasive worms are a potential ecological threat to island ecosystems.
- Three species of root-knot nematode were identified in soil samples analysed from Montserrat, among them was *Meloidogyne javanica* (Treub) (Tylenchida: Heteroderidae), the most important root-knot nematode in the tropics. It can infect many economically important crops, including tea, tobacco, potato, grapevine, tomato, many legumes, vegetables, fruit trees, cereals, sugar cane, yam and ornamentals. It is also a parasite of many weeds, that can act as reservoirs of these nematodes in agricultural settings. This is the first record for Montserrat.
- Morphological and molecular studies are ongoing regarding the identity of *Xiphinema americanum sensu lato,* Cobb (dagger nematodes) specimens found, which could be a potential virus vector of plant viruses (Fig. 16A) on Montserrat.
- More than 80 specimens of invertebrates were DNA sequenced with the aim of uploading to public reference databases.
- A metabarcoding study of the gut content of *Vespula vulgaris* (L.) (Hymenoptera: Vespidae) collected on Saint Helena determined that these invasive wasps prey on the island's endemic invertebrates. Five endemic species of spider and four (possibly

five) endemic insects were detected within the wasp gut contents, including IUCN Red Listed species. This study supports Saint Helena National Trusts' (SHNT) Darwin Initiative funded 'Invasive Invertebrate Project' by contributing to the understanding of the biology of the wasp and in doing so assist with the management of invasive predators.

- Two invertebrates not known to occur in Saint Helena were detected in the gut content of *Vespula vulgaris*.
- One hundred and two species of ant were collected during the study from seven UKOTs. Eight new species were reported new for Ascension Island (*Cardiocondyla mauritanica, Monomorium pharaonic, M. cf. butteli, Nylanderia bourbonica, Pheidole indica, Solenopis cf. castor, S. cf. molesta* and *Tapinoma melanocephalum*); x species were reported new from Saint Helena (*Cardiocondyla mauritanica*, *Lepisiota incisa*, *Solenopis cf. castor, S. cf. molesta, Technomyrmex moorens* and *T. pallipes*). These reports included five highly invasive pests that may continue to spread in the UKOTs.
- A paper entitled "Non-native vegetation encroachment drives trophic turnover in island nematodes" was published in *Biodiversity and Conservation.*
- A paper entitled "Invasive big-headed ants and black rats are dominant arthropod predators across opposing habitats of a degraded oceanic island" is currently under review by the journal *Biotropica*.

Introduction and Aims

Biodiversity in the UKOTs is globally significant; the OTs support unique ecosystems and many rare and threatened species, many of which are found nowhere else in the world. This rich biodiversity is under threat from the introduction of alien species, a major cause of the loss of biodiversity globally, and island ecosystems are particularly vulnerable (Cheesman *et al*., 2003; Varnham, 2006).

[redacted]

[redacted] Effective conservation of biodiversity in the UKOTs is essential if the UK is to meet Biodiversity Targets, as well as commitments under other relevant Multilateral Environmental Agreements (MEAs).

[redacted] accurate and rapid species identification for suspect alien species is fundamental to the enforcement of eradication and quarantine measures.

The Plants Programme at Fera provides diagnostic and training services for the Plant Health and Seeds Inspectorate within the Animal and Plant Health Agency (APHA) and has a wealth of experience and expertise in the identification of all plant-feeding insect orders, plant-feeding mites, plant-parasitic nematodes, and plant pathogens.

Fera has over 50 scientists dedicated to providing fast and accurate identifications of plant pests and diagnosis of plant diseases to an international standard. This project was managed and largely delivered by the entomologists in the Invertebrate Identification Team.

The results of the project feed directly into the conservation work carried out by the Royal Botanic Garden's UK Overseas Territories programme and the project entitled 'Tackling Invasive Non-Native Species in the UK Overseas Territories' which forms part of the Conflict, Stability and Security Fund (CSSF).

This Defra-funded project was divided into three sections or work packages:

- Work Package 1 (WP1): *Identification Service for Invasive Invertebrate Plant Pests* made up the largest section and was conducted to provide an identification service for invasive invertebrate plant pests that may threaten biodiversity and agriculture in all of the UKOTs.
- Work Package 2 (WP2) *Identification of invasive ants (Hymenoptera: Formicidae) in the UKOTs* is a continuation of the initial 'proof of concept' study with a focus on the invasive ants of Ascension Island and Saint Helena (ODA) and identify potential future threats. In year two, expand the project to two territories within the Caribbean (Montserrat (ODA) and Cayman Islands). In year three, expand the study to two further territories (to be agreed).
- Work Package 3 (WP3): *Identification of Plant Pathogens on Endemic and Endangered plants in the UKOTs* was a pilot study to expand the identification service offered to UKOTs to include identification of pathogens on endangered and endemic plants.
- Work Package 4 (WP4): *Gut content analysis of invasive predatory invertebrates in Saint Helena*. Support Saint Helena National Trust's endemic invertebrate recovery project (Darwin Initiative) in determining whether two invasive species, the common wasp (*Vespula vulgaris)* and the springbok mantis (*Miomantis caffra*) are preying upon SH's endemic invertebrates, such as the spiky yellow woodlouse, *Pseudolaureola atlantica.*

The aims of the project were to strengthen biosecurity in the UK Overseas Territories by delivering the following objectives:

WP1: Identification Service for Invasive Invertebrate Plant Pests

- Provide an identification service for invasive invertebrate plant pests for all of the UKOTs; including invasive non-native invertebrate plant pests, which impact on biodiversity and commercial interests.
- Provide rapid advice, wherever possible, when bio-security threats are detected, in the form of guidance on appropriate measures.
- Provision of remote (e.g. online) basic training to colleagues in overseas territories so that local capacity is developed where resources permit this.

Work Package 2: Identification of invasive ants (Hymenoptera: Formicidae) in the UKOTs

- Provide a protocol for collection, preservation, and submission of ant samples to Fera.
- Provide training on ant collection, preservation methods and identification to UKOT biosecurity officers, increasing in territory capacity to identify non-native ants.
- Produce a written report detailing ant species identified and a field-guide to the ant species.

- Update checklists of invasive ants in the UKOTs to enable future potential threats to be identified.
- Pin, label, and photograph ants identified. Set up reference collections of validated specimens for the UKOTs.

Work Package 3: Identification of Plant Pathogens on Endemic and Endangered plants in the UKOTs

- Provide identifications of pathogens on endangered and endemic plants in the UKOTs. Photographs of plants with suspected disease symptoms will be submitted to Fera, from which pathology diagnosticians will determine whether submission of a sample is necessary.

Work Package 4: Gut content analysis of invasive predatory invertebrates in Saint Helena

- Provide a written report detailing:
  - Outcome of gut content metabarcoding analysis for each sample
  - Details of identifications of prey contents to species (for those represented on DNA databases) and to genus or family (for those not represented) and give approximate figures for the total number of species (identified and unidentified)

WP1: Identification Service for Invasive Invertebrate Plant Pests

1.0 Methods

1.1 Service launch and publicity

The main contacts within the UKOTs that have used the service previously were notified that the pest identification service would continue to be funded by Defra and encouraged to submit samples at points throughout the year. This contact list is reviewed regularly due to staff changes within the territories. The identification service is promoted on the GB non-native species secretariat website, through the UKOT Conservation Forum Newsletters and meetings and through other UKOT activities such as training courses.

[redacted] gave a brief talk on the Sternorrhyncha of Diego Garcia at UKCEH in March 2024. He also promoted the Fera diagnostic service for the UKOTs at a workshop on biosecurity in Tortola, BVI in January 2025; and at a workshop on biosecurity and plant health in botanic gardens at the Andromeda Botanic Gardens, Bathsheba, Barbados, between 4th and 6th February 2025, organized by the Caribbean and Central American Botanic Gardens Network (CCABGN), Botanic Gardens Conservation International (BGCI), and the International Plant Sentinel Network (IPSN).

1.1.2. Project delivery

All samples submitted by the UKOTs were scanned and triaged, and those representing plant-feeding groups that might pose the greatest economic or biodiversity threat were identified as a priority. Incidental invertebrates not thought to be of concern were not always identified beyond family rank. In addition, the reports were shortened, and pictures were not always included.

2.0 Results

2.1 The number of samples received, and identifications made

A total of 463 invertebrate samples, consisting of over 18000 invertebrate specimens and photos were received from eight territories between April 2024 and March 2025: Anguilla (54), Ascension Island (81), Bermuda (37), British Virgin Islands (21), Cayman Islands (15), Montserrat (232), Saint Helena (21), and Tristan da Cunha (1). Many of these samples were received between the end of February and late March 2025 and are currently being processed, many diagnoses resulting from these samples will be incorporated into the 2025/2026 final report.

The results are included in the summary below and detailed in Appendix 1 (Arthropods) and Appendix 2 (Nematodes)

2.2 Summary of findings

Approximately 236 distinct taxa of invertebrates were identified at Fera during 2024-25, of which more than 170 were identified to at least generic level. Samples of Thysanoptera and

Coleoptera from Cayman Islands, and Nematoda from Montserrat that were received prior to April 2024 but not fully processed at the time of compiling the 2023-2024 are reported here.

Table 1. The organisms identified so far belonged to the following classes and orders:

Taxonomic group	# Distinct taxa
Arachnida	
Mesostigmata	3 spp.
Trombidiformes	2 spp.
Amblypygi	1 sp.
Insecta	
Blattodea	2 spp.
Coleoptera	46 spp.
Dermaptera	2 spp.
Diptera	14 spp.
Embioptera	2 spp.
Hemiptera	71 spp.
Hymenoptera	12 spp.
Lepidoptera	13 spp.
Orthoptera	2 spp.
Psocoptera	2 spp.
Thysanoptera	7 spp.
Collembola	
Entomobryomorpha	2 spp.
Platyhelminthes	
Tricladida	3 spp.
Clitellata	
Tubificida	1 sp.
Opisthopora	2 spp.
Gastropoda	
Systellommatophora	1 sp.
Nematoda	
Chromadorina	1 sp.
Dorylaimida	18+ spp.
Enoplida	2 spp.
Monhysterida	1 sp.
Mononchida	1 sp.
Rhabditida	8 spp.
Triplonchida	2 spp.
Tylenchida	15 spp.

A full list of the taxa identified during the reporting period can be found in Appendix 1 'WP1: Summary of invertebrate identifications 2024-2025' and Appendix 2 'WP1: Summary of

Nematode identifications 2024-2025'. Some taxa are still being studied or are awaiting DNA sequencing results and have not been listed at species level. For certain invertebrate groups, world specialists were consulted when reliable keys or descriptions were not available. Further details regarding the individual samples, such as collector's name, location, date collected, has been recorded through Fera's Plant Health Information Warehouse Diagnosis Database and may be obtained by contacting the authors.

2.3 New geographical records and potential invasive threats

Published faunistic catalogues, regional checklists and taxonomic literature were examined to determine the validity of the new geographical records. For some groups, for example the scale insects and whiteflies (Hemiptera: Coccoidea and Aleyrodidae), there are accurate, up-to-date catalogues available online to check the distribution of species, whereas for some groups, the data is disparate and unreliable.

2.3.1. Anguilla

Two photographic samples were submitted to Fera from Anguilla biosecurity staff. One of these samples was of winged male termites from an infestation in a building. Unfortunately, they were not identifiable from the photograph and a sample was requested.

A further 52 samples were taken by [redacted] during a four-day invertebrate pest survey of Anguilla in February 2025. Due to the number of samples collected and therefore the considerable time required to produce slide preparations of specimens for study, results of these samples will be reported later and incorporated into the 2025-2026 end of year report.

One significant finding, white coconut scale (***Pseudoparlatoria benneţti***) (Hemiptera: Diaspididae) (Fig. 2), which is not only new for Anguilla, but appears to be new for the Lesser and Greater Antilles, was reported to the Anguilla government (see Appendix 5). This is an economic pest of coconut and oil palm, and has previously been recorded from Colombia, Honduras, Trinidad and Tobago, and Venezuela.

The solanum or tomato whitefly, ***Aleurotrachelus trachoides***, (Hemiptera: Aleyrodidae) (Fig. 3) is also reported from Anguilla for the first time. It is a pest of pepper, tomato and native solanaceous plants

2.3.2. Ascension Island

Eighty-one samples were received from Ascension Island for identification, submitted by the former Ascension Island Government Invertebrate Project Officer [redacted], and by Cabi researchers.
At least five species of insect were recorded from Ascension Island for the first time, including:

Pentalonia nigronervosa (Coquerel) (Hemiptera: Aphididae), commonly known as the 'banana aphid' was detected in malaise traps on the island. *Pentalonia nigronervosa* feeds almost entirely on plants in the family Musaceae, with a few records from Heliconiaceae and Zingiberaceae. It is an important vector of banana bunchy top and is widespread through all

tropical and subtropical parts of the world, and in glasshouses in Europe, Australia and North America.

Orius thripoborus (Hesse) (Hemiptera: Anthocoridae) (Fig. 13), a southern African species of flower bug was identified from numerous malaise trap samples. This species is reported from South Africa, Kenya and Saint Helena. They are omnivorous, feeding on an array of arthropod prey as well as on plant materials such as pollen and plant sap. *Orius* spp. are used worldwide for the control of different thrips (Thysanoptera: Thripidae) pests, *O. thripoborus* is reported as a natural enemy of two species of thrips damaging avocado in South Africa and it's potential as useful biological control agent was reported by Steyn et al. (1993).

A species of ***Franklinothrips*** (Thysanoptera: Aeolothripidae) (Fig. 12), suspected to be ***F. vespiformis*** (Crawford) were detected in a number of malaise trap samples. It is thought to be native to Central America and is now widely recorded in the tropics and subtropics, although there are no reports of it from the islands in the Atlantic and only one report from Africa (Kenya). *Franklinothrips vespiformis* are predacious on other thrips species and other invertebrates, including pest species such as spider mites, leafhoppers and whitefly. In Europe, *F. vespiformis* has been tested and marketed for use as a biocontrol agent against thrips in greenhouses, nurseries and botanical gardens. *Franklinothrips* have a highly constricted first abdominal segment, resembling an ant-like waist. They exhibit ant-mimicking behaviours, like ants they can run quickly and palpate their antennae on the ground.

The planthopper ***Sogatella kolophon*** (Kirkaldy) (Hemiptera: Delphacidae) (Fig. 6), was collected in malaise traps and appears to be a new record for the island. It is considered a pantropical species, reported from Australia, the Pacific Islands, S.E. Asia, the Americas, the Caribbean and West Africa. It has been present on Saint Helena since 1936 where it is known as the 'cream-backed planthopper' and considered very common (Key et al 2021). It is a pest of wheat, carrots, oats and various grasses and is a vector of viruses of corn and wheat, and transmits dry bud rot, an important disease of coconut palms.

A number of invertebrate pests were identified on critically endangered (IUCN Red List) endemic Ascension spurge, *Euphorbia origanoides*, including one for the first time. Jack Beardsley mealybug, ***Pseudococcus jackbeardsleyi*** Gimpel & Miller (Hemiptera: Pseudococcidae) was recorded for the first time on Ascension spurge and from Ascension Island. This pest mealybug was reported from Saint Helena in 2015 (specimens collected in 2006), so perhaps it is not surprising that it has been found in Ascension. It has a wide host range (55 plant families) and distribution (61 countries). Previously Fera identified and reported ten new invasive Hemiptera species found on wild populations of Ascension spurge (five species of mealybug, two whiteflies, two armoured scales and a monophlebid) (Fera, 2014).

2.3.3. Bermuda

Twenty-nine samples were received from Bermuda's Plant Protection in March 2025 and a further eight samples were received from [redacted] (UKOTCF) in late March. They are in the process of being studied, results from both are to be report after April 2025.

2.3.4. British Virgin Islands

Twenty-one samples were received from the British Virgin for identification, they were submitted by National Parks Trust of the Virgin Islands and Royal Botanical Gardens, Kew.
A further 120 samples were taken by [redacted] during a four-day invertebrate pest survey of Tortola and Anegada in February 2025. [redacted] visited BVI to provide training in fire ant identification and management to all Caribbean UKOTS, and to conduct invertebrate surveys (funded through the GB Non-native Species Secretariate project FR/003135). Due to the number of samples collected and therefore the considerable time required to produce slide preparations of specimens for study, results of these samples will be reported later and incorporated into the 2025-2026 end of year report.

A number of urgent queries were received from BVI contacts this reporting year:

In April 2024, National Parks Trust of the Virgin Islands contacted Fera urgently upon the finding of flatworms in the Botanical Gardens. Photos were submitted to Fera, and provisionally identified as the New Guinea flatworm. New Guinea flatworm*, Platydemus manokwari* de Beauchamp (Family: Geoplanidae) is a highly invasive predatory, terrestrial flatworm that has caused extinction of the native land snails on several Pacific islands in past decades, and therefore it has been listed among the top 100 of the world's worst invasive alien species. As well as snails, they feed upon a variety of other soil organisms such as earthworms, isopods and insects, and may cause economic or environmental harm. Additionally, they can harbour zoonotic pathogens which may possibly adversely affect human health. A document providing biosecurity and management advice for flatworms (Appendix 3) and a Pest Alert for *Platydemus manokwari* (Appendix 4) were written and provided to BVI National Parks Trust. Samples of the flatworms were requested flatworm specific primers were ordered in preparation for molecular study.

A sample containing two specimens was received, morphologically they appeared to be different species. Both specimens were photographed, and the anal region dissected to determine whether contained nematodes, specifically *Angiostrongylus cantonensis* (Family: Angiostrongylidae), commonly known as rat lungworm. This parasite causes angiostrongyliasis, an infection that is the most common cause of eosinophilic meningitis in Southeast Asia, and New Guinea flatworm is a known host. No nematodes were observed.

Samples of the flatworms were DNA sequenced, using flatworm specifics primers and those to detect nematodes.

Two species of flatworm were detected, however neither specimen was a molecular match to the New Guinea flatworm *Platydemus manokwari,* for which reference sequences are available. One specimen was an undetermined species for which no matching sequences were available on the reference databases (BOLD, GenBank). Identification could only be taken to family level (Geoplanidae). The second specimen was an exact match to a sequence on GenBank from Italy that has been identified as *Caenoplana* sp. (Fig. 15), and from other sufficiently close matches on the databases Fera bioinformaticians came to the conclusion

that it is reasonably likely in the genus *Caenoplana.* The Italian researcher responsible for the matching sequence was not able to confirm the provenance of the specimen. *Caenoplana* are a genus of flatworms native to Australia and New Zealand, there are approximately 22 described species within the genus though there are likely to further undescribed species. A few species of *Caenoplana* have successfully established outside their native range, predominantly in Europe, and these introductions are most likely associated with movement of plants. No nematodes were detected via DNA sequencing of either specimen.

In June 2024 we received an urgent enquiry from a contact at Royal Botanical Gardens, Kew who was working on conservation project with the National Parks Trust. Plants of the Endangered (IUCN) *Eryhrina eggersii* Krukoff & Moldenke (Family: Fabaceae), were suspected to been attacked by the Erythrina gall wasp, an invasive species not recorded in BVI. Erythrina gall wasp (EGW), *Quadrastichus erythrinae* Kim (Hymenoptera: Eulophidae) is an invasive wasp that induces galls on new flushes of leaves, young stems and petioles of coral trees (*Erythrina*). Populations of the pest increase rapidly and result in severe galling and defoliation. Tree mortality has been observed within one to two years. Thought to be native to central Africa, this pest was first described from invasive populations on the islands of Singapore, Mauritius and Reunion and is considered an invasive pest in Asia, Pacific islands, South, Central and North America, and the Caribbean. EGW was first detected in the Caribbean in 2012, where it has been officially reported on the islands of Puerto Rico, Guadeloupe and Martinique. Given its rapid spread and the severe injury it causes, this pest poses a serious threat to the BVI endemic *Erythrina eggersii* and other *Erythrina* species in the UKOTS. *Erythrina* are tropical and sub-tropical trees which are used as ornamentals, shade trees, trellis support (e.g. to grow betel nut, black pepper, vanilla, yam), windbreaks, for soil and water conservation, as well as for traditional medicine. The neotropics are a centre of endemism for *Erythrina*, being home to 70 species, most of which are susceptible to EGW. EGW populations increase rapidly and result in severe galling and defoliation. Tree mortality has been observed within one to two years.
Photos of *Erythrina eggersii* plants exhibiting distorted growth on young shoots and leaf deformation were submitted to Fera. Fera entomologists suspected that EGW could be the cause and requested samples. Three samples of *E. eggersii* exhibiting severe stem and foliage distortion, collected in Tortola, BVI, arrived at the Fera laboratory at the end of November 2024. The cause of the distorted growth, based on photographs of the symptoms taken in the field, was suspected to be the erythrina gall wasp (*Quadrastichus erythrinae*). However, no evidence of the gall wasp was found in the samples.
11 species of arthropod were found including the following potentially invasive species:

- Pink hibiscus mealybug (*Maconellicoccus hirsutus*) – a major pest of crops and ornamentals. This species causes severe growth distortion and dieback of *Hibiscus*.
- Lesser snow scale (*Pinnaspis strachani*) – a major pest of crops and ornamentals that has been reported killing the critically endangered *Varronia rupicola* in BVI.
- Herculeana scale (*Clavaspis herculeana*) – an occasional pest but under-recorded as the scales usually feed hidden beneath the bark or epidermis of the host plant.
- Acacia whitefly (*Tetraleurodes acacia*) – usually only a minor pest of Fabaceae.

- Big-headed ant (*Pheidole megacephala*) – listed among the 100 worst invasive species in the world. It is likely to have a mutualistic relationship with the mealybugs and soft scales on the *E. eggersii*, providing protection to the insects and feeding on the egested honeydew.

In response to the suspected finding, a contingency plan for an incursion of *Quadrastichus erythrinae* was drafted.

On Friday the 6th December 2024 we received an urgent enquiry from Tessa Smith Claxton from the Ministry of Environment, Natural Resources and Climate Change, Government of the Virgin Islands of photos and video of mites found in honeybee hives in Virgin Gorda. They were rapidly identified as varroa mite (*Varroa destructor*) (Fig. 1) which is one of the most damaging honeybee pests in the world. This was confirmed by [redacted] (Senior Scientist Bee Health, Fera). Honey production has increased significantly in recent years in BVI. Consequently, a meeting was held on Monday 9th December with [redacted] and the Virgin Islands government to discuss emergency contingency and containment plans. Subsequent meetings included representatives from the honeybee industry and other stakeholders in BVI and the APHA Bee Inspectors. The UK National Bee Unit website was found to provide a huge amount of invaluable information on Varroa.

Six samples of earthworms and flatworms were received in March 2025 and are in the process of being studied. Thus far we studied the earthworms and suspect there are two species of *Amynthas* (Family: Megascolecidae) (Fig. 14), invasive 'Asian jumping worms', one species is possibly a new record for the island and possibly the Caribbean, however further morphological and molecular study is required for species confirmation. In the USA invasive *Amynthas* species are considered a potential ecological threat to native deciduous forest habitats, with concerns being raised concerning their potential effects on plant communities, native soil fauna, and soil carbon and nitrogen cycling (Chang et al., 2016).

2.3.5. Cayman Islands

Fifteen samples of invertebrates, including two photo samples, were submitted to Fera by Entomologist [redacted] (Queen Elizabeth II Botanical Park) and the Agricultural Health Inspection Services, Cayman Islands Government. The bulk of these samples were received in late February, and many require slide mounting and study therefore are only reported in part. A further forty-six samples of beetles and thrips received prior to April 2024 were reported this year.

2.3.4. Montserrat

One hundred and nine PowerPoint slides of invertebrate photos were submitted to Fera by the Montserrat Department of the Environment, and a further three photos submitted by [redacted] (UKOT Conservation Forum) many of them containing important pest species. A number of pests could not be diagnoses from photographs and samples were requested for study. In late March, 108 sample tubes of pests were submitted by Montserrat Department of Agriculture. They will be studied and reported after April 2025.

Pest species of significance identified from photographs but not yet confirmed:

- Photos of a leafhopper suspected to be the Indian cotton leafhopper, ***Amrasca biguttula*** (Ishida) (Hemiptera: Cicadellidae) were submitted. This pest was first detected in the Caribbean in Puerto Rico in 2023.
- Photos of pest damage suspected to be caused by the Erythrina gall wasp (EGW), ***Quadrastichus erythrinae*** Kim (Hymenoptera: Eulophidae) were received in February 2025.
- Images of a scale insect on Poaceae suspected to be ***Duplachionaspis divergens*** (Green) (Hemiptera: Diaspididae). This species is native to Asia but has spread to Australasia, Nearctic, Neotropical, and Palaearctic regions due to anthropogenic activities such as trade. It has previously been recorded from Saint Lucia (Malumphy 2014) and Antigua (Malumphy, 2018). It is polyphagous on grasses and is reported to be a minor pest of young sugarcane plants in Colombia and India, and a potential pest of a range of grasses in Florida (Hodges, 2004; Evans & Hodges 2007).

2.3.6 Saint Helena

Twenty-one samples were received from St Helena, they were predominantly submitted by [redacted] of the Species Recovery Trust and were collected by [redacted] in previous decades.

[redacted] directly submitted a few specimens of an undetermined shield-bug species that was first detected on Saint Helena as recently as 2017 and has become the commonest pentatomid on the island. In Key et al. (2021) it is listed a species possibly in the genus '*Boereas*', a misspelling of *Borerias*, a southern African genus. Molecular analysis at Fera determined it was a match to BOLD sequences of ***Dryadocoris apicalis*** (Herrich-Schäffer) (Hemiptera: Pentatomidae) (Fig. 10) from Corsica, with at 98.56% pairwise similarity. The morphological identification was confirmed by morphology, [redacted] (National Museum, Czech Republic), however he noted that due to the morphological and genetic variability of the species from different parts of the world a revision of the species is required. *Dryadocoris apicalis* is native to southern Europe where is reported from Albania, France, Italy, Portugal and Spain. It is also reported throughout sub-Saharan Africa and was first described from South Africa (van der Heyden, 2019).

2.3.7 Tristan da Cunha

One photo sample was submitted by Tristan da Cunha in 2024, this was an adult moth in the family Lasiocampidae that was found in a box of imported bananas.

[redacted] (CABI) visited Tristan da Cunha in November and December 2023, as part of a Darwin funded project for the biological control of brown soft scale *Coccus hesperidum* L., to protect the *Phylica*-forest and associated endemic finches. The

opportunity was taken to collect approximately 50 samples, many of which were processed and identified the during 2024/25, the results of which were presented in the project report and will be reported in future publications.

2.4 Nematoda

The UK's National Biodiversity Strategy and Action Plan for 2030 outlines the UK's commitment to the Kunming-Montreal Global Biodiversity Framework (GBF), aiming to reverse global biodiversity loss by 2030. Recognizing the important role of the UK Overseas Territories (UKOTs) which hold a substantial portion of the UK's overall biodiversity, the strategy emphasizes their inclusion in national biodiversity goals. Implementing sustainable land management practices, including nature-friendly practices in agriculture, reducing environment impact, and enhance biodiversity are crucial in these territories. However, a significant knowledge gap exists regarding soil biodiversity in UKOTs which can delay effective conservation efforts and the reverse of biodiversity loss.

To address this gap, Fera Science initiated a study of soil nematodes in 2023. Nematode diverse feeding habits and different sensitivity to environmental change make them important microorganisms for assessing soil health and soil general condition, acting as bioindicators. Understanding the organisation of nematode communities can help with understanding soil processes, the food web, the health and stability of ecosystems, and the biodiversity of the soil.

2.4.1 Ascension Island

A first study of the Ascension Island nematode biodiversity was started in 2023 (see 2023/2024 Fera report for complete data). The survey in Ascension was carried out in collaboration with Adam Sharp (invertebrate ecologist and former Invertebrate Project Officer at Ascension Island Government Conservation and Fisheries Directorate).

The aim of the study was to assess nematode biodiversity in Ascension Island and with it to build knowledge of the species present in the island, in addition to discover/describe species new to science. Understanding nematode population dynamics and use it to obtain information regarding soil health and biodiversity. Part of this study was presented at the Plant Health and Seeds Inspectorate (APHA) AGM in January 2025. The feedback received was excellent and the response was incredibly positive. Inspectors seemed genuinely interested in nematodes, were highly impressed with using nematodes as bioindicators and expressed a strong willingness to help with collecting samples from the UK Overseas Territories.

All data from the samples collected are at the following UKOT published paper "Non-native vegetation encroachment drives trophic turnover in island nematodes"
https://link.springer.com/article/10.1007/s10531-025-03009-w

The paper outlines the spatial turnover of nematode communities on Ascension Island. The results showed that the moist and densely vegetated mountain top was dominated by plant-root parasites, less dense mid-elevations by omnivores, dry and sparsely vegetated lowlands by fungivores. Collated data predicts that plant-root parasitic nematodes on Ascension increased by 23% with spreading non-native vegetation over 24 years. With this study it was possible to infer that abundance of these nematodes in the soil could become an obstacle in

the restoration of invaded habitat, potentially requiring management long after non-native vegetation is removed.

2.4.2 Montserrat

In 2024, soil samples from six localities on Montserrat Island were collected to study the soil nematode community structure, the first such study from this area.

Soil samples were processed at Fera Science following the Whitehead tray technique (EPPO, 2013) for 24 hours to separate live, motile nematodes from the substrate. Motile nematodes were isolated by washing through three 53µm sieves, collected in boiling tubes, sealed using parafilm and stored at 5°C.

Nematode species were confirmed by morphological study and certain specimens sent for molecular analysis for species confirmation. Nematodes were quantified and identified to type using a Leica M50 stereomicroscope (Leica microsystems, Wetzlar, Germany). Ten adult specimens' representative of each type (plant-parasitic and non-parasitic nematodes) were picked out and further studied. Nematodes were identified to species or genus and separated according to the feeding habit, using a high-power compound microscope (Zeiss Axio Imager 2, ZEISS, Germany) utilizing differential interference phase contrast (DIC) and image analysis software.

Fifty-two nematode taxa, within different trophic groups, were obtained across: 15 bacterivores, 16 herbivores (plant-parasitic and root hair feeding nematodes), 3 fungivores, 11 omnivores and 7 predators in total. It was considered that at least two species new to science were identified from the samples, and these nematodes will be studied further by Fera nematologists (see Appendix 2 for details of results).

Root-knot nematodes juveniles were sent for molecular analysis after morphological confirmation. *Meloidogyne* spp. were identified as *M. javanica* (Banana Farm - Agricultural Land). This species is the most common and important root-knot nematode in tropical and subtropical regions of the world, with a vast range of hosts both monocotyledons and dicotyledons (over 770 host species) and it is considered a major agricultural pest. It can infect many of the economically important crops in the world, such as tea, tobacco, potato, grapevine, tomato, many legumes, vegetables, fruit trees, cereals, sugar cane, yam and also ornamentals. *M. javanica* also parasite many weeds, that can act as reservoirs of these nematodes in agricultural settings. *M. javanica* is widely distributed in warm and tropical climates where it is often the dominant root-knot nematode species. The geographic range includes Africa, Australia, South America, Asia, the Caribbean, the USA and greenhouses in Europe, and with this study Montserrat. *M. javanica* is considered particularly common in Central Africa and the savannah regions of West Africa (CABI/EPPO, 2002; CABI, 2021) and it is predominated in drier areas (less than 500 mm per year rainfall) (Sasser and Carter, 1985). *M. javanica* has also been recorded from areas of protected agriculture; for example, in soils in and around many temperate research stations and other areas of intensive horticulture. In some cases, the nematodes have been able to overwinter due to mild winters, and could be expanding geographic range into northern Europe (IIP, 1992) ((Subbotin et al. 2021)).

M. incognita was found and identified (Belham – volcanic). This species is considered to be one of the major *Meloidogyne* species due to its worldwide economic importance. It is common in tropical regions, however, can be found in temperate regions typically restricted

to glasshouses. This species is extremely polyphagous, infecting both monocotyledons and dicotyledons. Many vegetables, grasses and pasture legumes, cereals, ornamentals, shrubs, trees and crops such as potato, sweet potato, sugarcane, tobacco and turfgrasses are also infected and many weeds that can act as a reservatory in agricultural settings. Over 700 species and varieties have been listed as hosts (Subbotin et al. 2021).
M. incognita type 2 was also identified using molecular techniques (Forest - Soldier Ghaut). Type 2 refers to *M. ethiopica*, *M. luci*, *M. inornata* which cannot be distinguished by the molecular tests developed (Nad5).
Morphological and molecular studies are ongoing regarding the identity of a dagger nematode, *Xiphinema americanum sensu lato* specimens found, which could be a potential virus vector of plant viruses (Fig. 12A). This nematode was found in Lime kiln - Seasode Almond soil sample. Juvenile specimens of *Xiphinema* sp. were also found in the sample collected at Forest - Soldier Ghaut. Other interesting Dorylaimida were found such as *Longidorella* sp., a short and robust nematode under 1mm long (Fig. 12B) and *Belondira* sp., with a thickened cuticle and clavate tail, a species considered to be new to science (Fig. 12C and D).
We also found a root-lesion nematode *Pratylenchus brachyurus*. This nematode can be found throughout the tropical regions of the Earth and in countries such as the USA, South Africa, Australia, Japan, Turkey and others. It was found to cause severe damage in peanuts in the USA. Other known hosts are potato, pineapple, citrus, cotton, peach, soybean, tobacco, coffeae, rubber and several Poaceae (Loof, 1991).
A reniform nematode, *Rotylenchulus reniformis,* was found in the soil sample Banana Farm - Agricultural Land. This nematode has been found infecting over 140 species from 115 plant genera and it is widely distributed throughout tropical and subtropical countries causing damage in cultivated plants and fruit trees (Jatala, 2020) including banana plants.

2.4.3 British Virgin Islands

In February 2025, samples from six localities in the British Virgin Islands (see Appendix 2) were collected to study the soil nematode community structure, this would be the first study of its kind in the Virgin Islands. Two species of *Xiphinema* have been isolated from the rhizosphere of endemic Rhizoporaceae. Certain species of these migratory soil ecto-parasites can vector plant viruses. Sample extractions are currently ongoing, and nematodes are being quantified and identified.

2.4.4 Saint Helena

One sample of a preserved nematode was submitted among insect samples from Saint Helena [redacted]. This was a predatory nematode in the genus *Prionchulus* (family Mononchidae), a beneficial nematode that preys upon plant-parasitic species. There are <40 spp. of *Prionchulus* described, none are known from Saint Helena.

2.5 Biosecurity and pest management advice provided

A summary of the distribution, host range, biology and economic importance is provided to the UKOTs when new pests are recorded. This information will assist the UKOTs to make a

rapid assessment of the potential risk posed by the organism. If available, photographs of the pest and symptoms are also provided to aid detection and identification.

A document providing biosecurity and management advice for flatworms (Appendix 3) and a Pest Alert for *Platydemus manokwari* (Appendix 4) were written and provided to BVI National Parks Trust.

2.6 New species to science

At least two species new to science were identified from the Montserrat nematode samples, and these nematodes will be studied further by Fera nematologists.

2.7 Scientific publications

Sharp, A., Correia, M., Gray, A. *et al.* Non-native vegetation encroachment drives trophic turnover in island nematodes. *Biodivers Conserv* **34**, 1071–1090 (2025). https://doi.org/10.1007/s10531-025-03009-w

Abstract

"Nematodes are important components of terrestrial ecosystems. There is currently limited understanding of how soil nematode communities are altered by non-native vegetation encroachment. The spatial turnover of nematode communities was studied on Ascension Island in the South Atlantic: an isolated and degraded volcanic island of sparse native vegetation. Many non-native plants were introduced in the mid-1800's, and non-native shrubs have more recently spread across the lowlands. Ascension's elevation gradient represented a unique space-for-time proxy for non-native vegetation colonisation of a relatively barren landscape. Nematodes were collected at 0, 200, 400, 600 and 800 m elevations along three transects and their community composition linked to Landsat-derived vegetation cover and moisture over the 2000–2023 period. Although taxonomic turnover was elevation independent, both nematode abundance and richness increased with elevation. The moist and densely-vegetated mountain top was dominated by plant-root parasites, less dense mid-elevations by omnivores, dry and sparsely-vegetated lowlands by fungivores, and the moist littoral habitat by predators. Landsat analysis predicted that the relative abundance of root parasitic nematodes on Ascension increased by 23% with spreading non-native vegetation over 24 years. While taxonomic turnover in nematode composition may be resultant solely of historic species introductions, trophic turnover is spatially structured and likely follows non-native vegetation encroachment closely. Root parasitic nematodes may be spreading rapidly with non-native vegetation, especially on oceanic islands. The abundance of such nematodes in soil could become an unanticipated hinderance in the restoration of invaded habitat – potentially requiring management long after non-native vegetation is cleared."

A number of other scientific papers are in the process of being prepared for submission.

2.7 Building diagnostic capacity in the UKOTs

As well samples and photos of invertebrates to diagnose we routinely receive other enquiries from our biosecurity contacts seeking diagnostic keys and descriptions of pests to assist them in making species determinations. We have provided advice to a few of the UKOTs on camera and microscope equipment to enable them to better study and image pests.

3.0 Conclusions

[redacted] Accurate and rapid species identification for suspect alien species is fundamental to the enforcement of eradication and quarantine measures to protect biodiversity and agriculture.

We have received a great number of enquiries and photographs of suspected biosecurity threats, which demonstrates that there continues to be a clear demand for an identification service for invasive invertebrate plant pests to improve biosecurity and support the preservation and conservation of biodiversity in the UKOTs. It has, however, always been required that if this service was to continue to be funded it should not only provide inventories of pests present in each territory, but demonstrate that the service has practical benefits. These benefits demonstrated during the 2024/25 reporting period include:

1. The service helped identify and evaluate immediate threats so that appropriate action could be taken.
2. The service helped identify potential threats and prioritise conservation efforts in some of the UKOTs.
3. More than ten new species records were reported for the UKOTs. New species of invertebrate are recorded from Montserrat, Ascension Island, British Virgin Islands and Anguilla. This figure is likely to be substantially higher once all of the samples that received in March are studied. These reports include some highly invasive pests that may continue to spread in the UKOTs.
4. In each case where a new pest is recorded, a summary of the distribution, host range, biology and economic importance is provided to assist with the UKOT making a rapid risk assessment and deciding upon appropriate action.
5. The presence of natural enemies in the samples have been recorded which over the longer term may be investigated and used to help suppress the numbers of invasive pests.
6. The service has provided data for the compilation of checklists of species for each Territory. Such checklists provide essential baseline data by which future faunistic changes, due to factors such as international trade, tourism, and climate change, can be monitored and accurately assessed. The early detection of exotic introductions improves the chances of eradication and can thus protect the environment, biodiversity and local economy.

Since the identification service was launched in February 2010, thirteen UKOTs have made use of the service and submitted more than 5000 samples. More than 150 of the invertebrate

species examined to date have never before been reported from the UKOTs. More than twenty-five species apparently new to science have been observed. One new species from the Cayman Islands has been described: *Scirtothrips cocolobae* Collins & Evans (Collins & Evans, 2013) and one new species from Montserrat: *Schoenlandella montserratensis* Kang, (Hymenoptera, Braconidae) Kang I, Sharkey MJ, Diaz R (2021).

In conclusion there is a continued high demand for the identification service and the project continues to fulfil its aims.

WP2: Identification of invasive ants (Hymenoptera: Formicidae) in the UKOTs

The introduction of some non-native ant species can be ecologically disastrous and economically damaging throughout the world, and island ecosystems are particularly vulnerable. Invasive ants in natural ecosystems can lead to the displacement and/or loss of native ant species. In addition, non-native ants may affect other organisms including the human population and alter ecosystem processes both directly and in-directly. The absence of their natural predators may result in an uncontrolled abundance in their introduced range, and they may outnumber native species. Moreover, invasive ants compete with and prey upon different organisms, including some vertebrates, and consequently disrupt mutualistic interactions with numerous plants and other organisms. The introduction of invasive ants may result in a change to the biogeographical pattern as well as a loss in biodiversity, especially in oceanic islands with few or no native ant species, such as many of the UKOTs. Mutualistic relationships between invasive ants and invasive honey-dew egesting hemipterans (aphids, psyllids, scale insects and whiteflies), can increase the population density and negative impact of both species.

1.0 Methods

1.1 Protocol for collection, preservation, and submission of ant samples

A protocol for the collection, preservation, and submission of ant samples was shared with and demonstrated to biosecurity officers who attended a training course in Montserrat in April 2023, it was then shared again with different government departments in the UKOTs individually. Different sampling methods were presented to sample ants across different habitats. The sampling methods within the protocol aim to provide information on the different native and non-native ant species as well as potentially monitoring the presence or potential entry of any invasive species that may impact the environment of the territories in question. The sampling methods are also useful in monitoring the effectiveness of treatments or control measures on the population density of target invasive ant species. Furthermore, the sampling protocols can also be used to address research objectives relating to the understanding of ant species diversity, functional diversity, population genetics, island of biogeography and conservation studies. See Appendix 8 for the details of the sampling protocol.

Specimens collected were examined and identified under a dissection microscope to generic level and then card-pointed to identify to species. Species were determined by using

published keys and descriptions, and by comparison of images through online resources such as www.antweb.org and www.antwiki.org. To determine the geographical distribution of each species, we compared the list to previous published literature (e.g. Wetterer 2007, 2012, 2013, 2017; Wetterer and Davis 2010) and online resources. Twenty-six specimens were sent for molecular sequencing to ascertain the species identification due to lack of adequate keys and descriptions.

Samples were preserved in 70% ethanol and individual specimens were mounted on card points. These have been deposited in the Fera collections and voucher specimens will be sent to Cayman Islands and Montserrat as reference material.

1.2 Training and advice

1.2.1 Fire ant management training in Caribbean

A regional training event titled "Meeting the Challenge of New Biosecurity Threats in the Caribbean: Strengthening Biosecurity Against Invasive Reptiles and Managing Invasive Fire Ants" was held in Tortola, British Virgin Island on 20-23 January 2025.

[redacted] gave a presentation on emerging pests that may have significant negative impact on agriculture and the environment. [redacted] delivered a two-day training course on managing and identifying invasive fire ants. He presented several control methods aimed at reducing the fire ant population and mitigating potential negative impacts on biodiversity, the economy and public health. [redacted] also surveyed other areas in the British Virgin Islands and Anguilla, such as farms, nurseries, botanical gardens and forest areas to determine if there were new introductions of non-native pests and further infestations of fire ants. This visit was funded by GB Non-native Species Secretariate project FR/003135.

1.2.2. Caribbean UKOTS

[redacted] has continued contact with the biosecurity officers in Montserrat and Cayman Islands during this past year and invited British Virgin Islands, Turks and Caicos Islands and Anguilla to take part in the ant study during 2024-2025. The sampling protocol was shared with these territories and advice provided on ant collection and sample submission.

1.2.3. Saint Helena and Ascension

[redacted] has continued contact with the biosecurity officers and invertebrate specialist at Saint Helena National Trust during this past year. Although no samples of ants were submitted from Ascension Island this year, due to staffing shortages, the biosecurity staff remained in contact with [redacted] and shared records of ants discovered.

1.2.4. Cyprus (incl. Sovereign Base Areas of Akrotiri and Dhekelia)

In October 2024, [redacted] (Department of Biology, National and Kapodistrian University of Athens, Greece) began corresponding with regards to the first report of little fire ant (*Wasmannia auropunctata*) in Cyprus. Rapid response including early management and assessment of the level of the infestation are currently being discussed, as well as possibilities of [redacted] visiting Cyprus to help manage the situation.

2.0 Results

2.1 The number of samples received, and identifications made

A total of 199 ant samples from six UKOTs were received during the reporting year of which 181 were processed (see Table 1).

Table 2. The number of ant samples processed for 2024-2025 from various UK Overseas Territories.

Number of samples	Date	Countries	Note
4	April 2024	Turks and Caicos	Received
38	May 2024	St. Helena Island	Received
15	December 2024	Montserrat	Received
18	February 2025	Cayman Islands	Received
48	January 2025	Anguilla	Collected by NT
76	January 2025	British Virgin Islands	Collected by NT
Total = 199			

Based on the samples processed this year, 36 species of ants belonging to 19 genera and five subfamilies were identified (See Appendix 5). Most of the samples processed were collected from Anguilla and British Virgin Islands in January 2025. The most noteworthy ant species collected was the Red Imported Fire Ant (*Solenopsis invicta*) a highly invasive species which were predominantly found in open and very disturbed areas in the Caribbean UKOTs. There are no comprehensive checklists of ants in the Caribbean UKOTs, and many of the ants collected during this study are considered new geographical records and will be published in the near future. On the islands of Ascension and St Helena, there are 14 new records (see Appendix 5).

Known invasive fire ant species such as the Tropical Fire Ant (*Solenopsis geminata*) and Little Fire Ant (*Wasmannia auropunctata*) were also collected this year in Cayman Islands, Ascension Island, St. Helena and Montserrat, but they are not considered to be as problematic as Red Imported Fire Ant. These two species are known to commonly occur in Central America and the Caribbean, but they only become a problem when they occur in urban or residential areas.
The results are included in the summary below and detailed in Appendix 5.

2.2 Summary of findings

2.2.1 Anguilla

A total of 48 samples were processed containing 329 individuals of 17 ant species. These samples were hand collected in various locations and from many different habits across Anguilla by [redacted] in February 2025 during a two-day island survey. Three highly invasive species were collected i.e. *Pheidole megacephala*, *Solenopsis invicta* and *Wasmannia auropunctata*. *Solenopsis geminata* was also collected but is not considered invasive in this region. Most of the species collected were either introduced or may have arrived naturally (as

they are within their native range) and so far, there are no published reports on the ant diversity of the island.

2.2.2 British Virgin Islands

A total of 76 samples were processed containing 425 individuals of 17 genera and 34 species. These samples were hand collected in various locations and from many different habits across the British Virgin Islands (Anegada and Tortola) by [redacted] in February 2025 during a four-day island survey, Similar with Anguilla's species composition, most of the species were introduced or typical of the region. However, there were three highly invasive species collected i.e. *Pheidole megacephala, Solenopsis invicta* and *Wasmannia auropunctata.* S. *geminata* was also present. The overall count of species gathered does not accurately represent the potentially greater species richness that could arise from the significant habitat variability present in the British Virgin Islands. A repeat sampling study using sampling protocols for at least two weeks will provide better data consistent with area sizes and habitat qualities. Details of the sampling protocol have been shared with BVI staff at the Department of Agriculture and Environmental Health Office.

2.2.5 Saint Helena

Thirty-eight ant samples were received in April 2024 which were collected by [redacted] in the early 1980's. No further specimens were received of the new species detected in 2023 i.e. *Lepisiota incisa*, *Technomyrmex moorens*, *Technomyrmex pallipes*, *Solenopsis* cf. *castor* and *Solenopsis* cf *molesta*. In 2023, a *Phytophthora* outbreak in the cloud forest was detected which has significantly impacted further ant collection within and surrounding the National Park. There were also changes on the staff St. Helena National Trust that limited the submission of ant samples.
Among the ants collected throughout this project, *P. megacephala* remains the dominant ant species and so continues to threaten the endemic invertebrates on the island.

2.2.4 Montserrat

To date, a total of 49 species from 24 genera belonging to five subfamilies have been identified from Montserrat.

A batch of 15 samples of ants collected in Montserrat by [redacted] were received in December 2024. A total of twenty-two ant species were identified from this batch. The ants were collected using a combination of baiting and hand collection.

Among the UKOTs that took part in this three-year invasive ant study, Montserrat is exhibiting the highest ant diversity (See Appendix 2), and this is potentially due to the following factors:

- Number of samples processed from sampling by [redacted].
- Diversity of sampling methods used
- A good representation of suitable ant habitats was surveyed.
- There is a very good forest cover in Montserrat that is ideal for the survival of ants leading to higher diversity and better species composition.

The aforementioned factors have led to the identification of ant species characteristic of the Caribbean Region, as well as the presence of notable invasive species, including *Pheidole megacephala*, *Solenopsis invicta, Trichomyrmex destructor* and *Wasmannia auropuntata*. *Solenopsis geminata* is also present in Montserrat but not considered an invasive species as it is within its native range. However, the presence of *S. geminata* in urban areas can facilitate the establishment and colonization of *S. invicta* by taking over their mounds and nests through their more aggressive manner.

The current list of ant species collected is expected to increase following the completion of this project because [redacted] will be collecting more samples in various habitats in Montserrat as part of the objectives of the Darwin Plus Local project DPL00113. [redacted] will be looking at the potential negative impact of fire ants on ant and invertebrate assemblages, assess any potential presence of natural predators and provide guidance in managing the population of Red Imported Fire Ant.

2.2.3 Cayman Islands

A total of 41 ant species have been identified from samples submitted from the Cayman Islands, including two fire ant species *S. invicta* and *S. geminata.* Several species were also introduced but most of the species were typical of the neotropical regions.

A suspected new species of *Temnothorax* was submitted for molecular sequencing and did not result in a match to any of the available genetic sequences in the public databases. The morphological study continues, we are currently awaiting a loan of specimens from the USA of closely related species (*T. subditivus* and *T. pollitus*) for molecular analysis and phylogenetic study of this group. Additional samples were received in late February 2025 and will be processed in April 2025.

2.2.4 Turks and Caicos Islands

Four sample vials containing ants were submitted by the Environmental Health Department. The samples were submitted to confirm if they were fire ant species due to complaints received by the members of the public regarding painful stings and bites.

2.3. Field-guide to the ant species in the UKOTs

An identification key to subfamilies and genera of Ants of UKOTs was developed (See Appendix 7). The key incorporates the different genera found across the UKOTs and some genera that may be encounter in the future due to their inclusion in the biogeographical region and potential introduction from nearby countries. A field guide to five highly invasive ant species was produced to facilitate the early detection and increase the awareness of the different species that may cause significant negative impact in the UKOTs. The species in the field guide were selected based on being listed as the top 100 World's Worst Invasive Species by the Invasive Species Specialist Group (ISSG).

2.4. Setting up of reference collections of validated specimens for the UKOTs

Specimens received from previous years were mounted, stored in tubes containing 70% ethanol and labelled accordingly. A total of 11 ant species from St. Helena were returned in October 2023 via [redacted] The Species Recovery Trust. An additional three species of high-risk ant (*Anoplolepis gracilipes*, *Solenopsis invicta* and *Wasmannia auropunctata*) that are not currently found in St. Helena were sent as reference material for biosecurity measures and enable staff to become familiar with their diagnostic features in case they arrive on the island.

In August 2023, an ant reference collection was set-up on Ascension Island for 12 species and three high-risk ants as above. The ant specimens were mounted dry on card points and stored in tubes with 70% ethanol.

Samples collected from the Cayman Islands and Montserrat were mounted and labelled so they can be incorporated in the reference collections of each territory. A few specimens of fire ants from Montserrat were posted in August 2024. With additional specimens to be collected through the Darwin Plus Local project DPL00113 in Montserrat, and completion of the description of the suspected new species from the Cayman Islands, reference material will be sent to these territories and all other UKOTs after the completion of the project.

2.5. Scientific publications

A manuscript titled "*Suppression of an invasive ant facilitates a rapid increase in island-endemic invertebrates through reduced predation pressure*" was submitted to Journal of Applied Ecology but was rejected in June 2024 due to incomparable sampling design in both islands. Taking the reviewer comments into consideration, part of the manuscript was rewritten and a new manuscript entitled *"Invasive big-headed ants and black rats are dominant arthropod predators across opposing habitats of a degraded oceanic island"* is currently under review by the journal Biotropica. [redacted]

Abstract:

"Invasive animals threaten island-native arthropods with predation. We found that introduced ants and rats conducted 77% of experimental arthropod live bait predations on Ascension Island. Predation was mostly by big-headed ants *Pheidole megacephala* inland and around non-native vegetation, and by black rats *Rattus rattus* in coastal lowland habitats and caves".

3.0 Conclusions

We have received a good level of participation from UKOTs (Government Departments and National Trusts) over the past three years of this study which demonstrates that there

continues to be a clear demand for support in invasive ant identification and related biosecurity advice.

The study has provided valuable data for the compilation of ant checklists for each territory. Such checklists provide essential baseline data by which future faunistic changes, due to factors such as international trade, tourism, and climate change, can be monitored and accurately assessed. Not all exotic ant introductions are invasive, and risk assessments will help identify species that may be harmful if introduced. Early detection of potentially harmful exotic ant introductions improves the chances of eradication, and may help protect the environment, biodiversity and local economy. One hundred and two species of ant were collected during the study from seven territories. Eight new species were reported new for Ascension Island (*Cardiocondyla mauritanica, Monomorium pharaonic, M. cf. butteli, Nylanderia bourbonica, Pheidole indica, Solenopis cf. castor, S. cf. molesta* and *Tapinoma melanocephalum*) and six species were reported new from Saint Helena (*Cardiocondyla mauritanica*, *Lepisiota incisa*, *Solenopis cf. castor, S. cf. molesta, Technomyrmex moorens* and *T. pallipes*). These reports included five highly invasive pests that may continue to spread in the UKOTs. The ant species identified in South Atlantic Ocean UKOTs were predominantly introduced to these islands as a result of human activities, particularly international trade. Species identified in the Caribbean region were typically within their natural range. Moreover, there are some highly invasive ant species present in both regions which may have a negative impact on biodiversity if not monitored and managed.

As well as updating species checklists this study has brought many practical benefits to the UKOTs:

- Training in ant survey methods and species identification was provided to staff in Saint Helena, Ascension Island and all Caribbean UKOTs between 2023 and 2025.
- An invasive ant field guide and a key to the genera of ants in the UKOTs was produced. The identification key will prove useful for biosecurity officers to provide early detection for any suspected invasive species.
- Support and training were provided in setting up ant reference collections.

Among the UKOTs studied during this project, Ascension Island, St. Helena and Montserrat are currently managing specific invasive ant species. Management of invasive ant species faces various challenges, such as funding, staff availability, training in species identification, monitoring capacities and support from the community. If these challenges remain unaddressed, the population of invasive ants may continue to grow, reducing the possibility of alleviating their detrimental effects.

This year's findings have demonstrated the importance of employing effective sampling techniques and maintaining an appropriate frequency of surveys. These practices are essential for the generation of reliable baseline species diversity data and determining potential impact of each species. The data also indicates that native forest and conservation areas should be protected to reduce the impact of invasive species, and restoring disturbed areas may also reduce the risk of colonization of invasive species, such as fire ants.

Results from the ant data on Ascension Island have identified the significant drivers on the colonization process of invasive ants and inferred conservation implications for oceanic

islands globally. A similar pattern may also be found in Anguilla, Cayman Island and St. Helena but this will depend on there being data collected using comparable sampling effort. For this reason, we emphasize that prevention of future species introductions will reduce the risk of negative impacts on native biodiversity, even on islands where many non-native ant species are already established.

4.0 Recommendations and Future outcomes

The data generated from previous years is serving as baseline data for ant diversity in the South Atlantic Islands and Caribbean, and may be useful in strengthening biosecurity measures, management of invasive species and engaging more ecological restoration. It would be advantageous if ant monitoring could be introduced at all ports of entry to detect high-risk species. Preventing their introduction and spread has a lower cost over time than controlling them once they have established. It is also recommended that annual ant surveys (or more frequently if resources are available) are undertaken and taxonomic capacity of the biosecurity staff is strengthened. This may require further training and upgrading equipment such as microscopes with higher magnification. Furthermore, contingency and rapid response plans should be developed for high-risk species, so appropriate action can be rapidly employed as soon as they are detected. This may involve training specific staff in ant management.

Measures on safeguarding island biodiversity against the threat of non-native ants is important especially in relation to climate change which may contribute to invasive species' distribution expansion, rate of spread and impact.

WP3: Identification of Plant Pathogens on Endemic and Endangered plants

1.0 Methods

1.1 Service launch and publicity

In April 2024 and again in November 2024 the main contacts within the UKOTs were notified that the Fera Plant Pathology teams were continuing to offering assistance in the identification of diseases on endemic and endangered plants.

1.1.2. Project delivery

All samples submitted by the UKOTs were initially submitted as photographs of disease symptoms. The territories that wished to submit samples were first issued with Fera's Pathogen Licence Letter of Authority (issued by Defra), this enabled them to submit plant samples exhibiting disease symptoms to Fera under licence. The samples were scanned and triaged, and sent to the most appropriate pathology team for analysis.

2.0 Results

2.1 The number of samples received, and identifications made

A total of five suspect pathogen samples and more than 20 photos were received from Montserrat Department of Agriculture. Photos of suspected diseased plants were also submitted from Cayman Islands, we are awaiting samples for testing.

2.2 Summary of findings

2.2.1 Montserrat

In July 2024 and February 2024, a series of photographs of apparently diseased plants were submitted to Fera for advice, we reported provisional results and requested samples for testing. Five samples were submitted in late March 2025 and are in the process of being tested.

2.3 Further samples

We have received queries from contacts in Ascension Island with regards to providing diagnosis of observed fungal pathogens on an endemic plant species. These samples arrived on the last day of March and will be processed and results submitted in due course.

3.0 Conclusions

Invasive non-native plant diseases are a significant threat to the biodiversity within the UK Overseas Territories. Early detection and identification of invasive alien species can enable effective and appropriate measures to be taken in a timely manner to eradicate, contain and/or manage the disease.

We have over the past seven years received an increasing number of enquiries from the UKOT governments, National Trusts, and the UKOT Conservation Science Team at RBG Kew for assistance with the diagnosis of suspected alien plant diseases on threatened endemic plant species.

Due to the remoteness and accessibility of some of the islands and the practicalities of transporting plant material, submission of samples for disease testing from the territories has it's difficulties. Despite this, we have received a number of enquiries and photographs of suspected biosecurity threats, which demonstrates that there continues to be a clear demand for an identification service for invasive plant pathogens to improve biosecurity and support the preservation and conservation of biodiversity in the UKOTs.

In conclusion there is a continued demand for the identification of invasive and the project continues to fulfil its aims.

WP4: Gut content analysis of invasive predatory invertebrates in Saint Helena.

See Appendix 9 for a full report on this section of the project. Supplementary tables and figures can be found in Appendix 10-11.

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Appendices

Appendix 1. WP1: Summary of invertebrate identifications made during 2024-2025

Appendix 2. WP1: Summary of Nematode identifications 2024-2025

Appendix 3. WP1: Biosecurity and management advice for flatworms

Appendix 4. WP1: Pest Alert for *Platydemus manokwari*

Appendix 5. WP1: Pest Factsheet for White coconut scale *Pseudoparlatoria benneti*

Appendix 6. WP2: Ant species list for the Atlantic and Caribbean UKOTs

Appendix 7. WP2: Protocol for collection, preservation, and submission of ant samples

Appendix 8. WP2: Keys to UKOT Ant Subfamilies & Genera

Appendix 9. WP2: UKOT Invasive Ant Field guide

Appendix 10. WP4: Gut content analysis of invasive predatory invertebrates in Saint Helena

Appendix 11. WP4: Supplementary Table 1

Appendix 12. WP4: Supplementary Table 2