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FIELD GUIDE TO INVASIVE ALIEN PLANT PESTS IN THE CARIBBEAN UK OVERSEAS TERRITORIES

PART 6 – INVERTEBRATES (Except insects) and References

Chris Malumphy, Sharon Reid, Rachel Down, Jackie Dunn and Debbie Collins

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Frontispiece

Top row: Giant African land snail *Lissachatina fulica* © C. Malumphy; Mediterranean fruit fly *Ceratitis capitata* © Crown copyright; Sri Lankan weevil, *Myllocerus undecimpustulatus undatus* adult © Gary R. McClellan. Second row: Cactus moth *Cactoblastis cactorum* caterpillar © C. Malumphy; Cottony cushion scale *Icerya purcashi* © Crown copyright; Red palm mite *Raoiella indica* adults © USDA. Third row: Tomato potato psyllid *Bactericera cockerelli* © Fera; Cotton bollworm *Helicoverpa armiger*a © Crown copyright; Croton scale *Phalacrococcus howertoni* © C. Malumphy. Bottom row: Red palm weevil *Rhynchophorus ferrugineus* © Fera; Tobacco whitefly *Bemisia tabaci* © Crown copyright; Brown marmorated stink bug *Halyomorpha halys* © David R. Lance, USDA APHIS PPQ, Bugwood.org.

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PART 3 – INSECTS (except Hemiptera)

6.48 Giant African Land Snail

Class:	Gastropoda
Order:	Stylommatophora
Family:	Achatinidae
Species:	*Lissachatina fulica* (Bowdich)

	Present I Absent ¡	Threat		
		Bio	HIth	Econ
Ang	I			
Ber	¡	ü	ü	ü
BVI	¡	ü	ü	ü
Cay	¡	ü	ü	ü
Mon	¡	ü	ü	ü
TCI	¡	ü	ü	ü

Figure 6.48.1 Giant African Land Snails *Lissachatina fulica*, Mauritius © C. Malumphy

Background

Giant African land snail *Lissachatina fulica* is a major plant pest, native to East Africa, that has been introduced accidentally to many parts of the world with trade and/or intentionally as a food source, for scientific research and education, and as a novelty pet (CABI, 2017; Global Invasive Species Database, 2017). It is readily transportable over considerable distances as it can go into a state of aestivation in cooler or unfavourable conditions. It has established in many tropical regions where it has had a major negative impact due to its broad polyphagy and prodigious reproductive capacity. As a result, *L. fulica* has been classified as one of the world's top 100 invasive species by The World Conservation Union, IUCN (ISSG, 2003). The snail can be found in agricultural areas, coastland, natural forest, planted forests, riparian zones, shrublands, urban areas, and wetlands.

Lissachatina fulica presents a potentially serious plant health threat to all the UKOTs with tropical climates, particularly to those located in the Caribbean where the snail is currently expanding its geographical range.

Geographical Distribution

Lissachatina fulica is native to the coastal regions of East Africa but has become widely distributed by the activities of man in humid tropical areas of sub-Saharan Africa, the Indian Ocean, Asia, Pacific, South America and parts of the Caribbean (Anguilla, Barbados, Guadeloupe, Martinique and Saint Lucia) (Fig. 6.48.2). Incursions in Florida, USA, are under eradication (CABI, 2017; Global Invasive Species Database, 2017).

Figure 6.48.2 *Lissachatina fulica* distribution map © CABI

Host Plants

Lissachatina fulica is broadly polyphagous feeding on hundreds of plant species (Raut & Ghose, 1984). In its native range its preferred food is decayed vegetation and animal matter, lichens, algae and fungi. It was only recognised as a major plant pest after having been introduced into new environments and has since been recorded feeding on many plants including ornamentals, vegetable and fruit crops. It shows a preference for brassicas, breadfruit (*Artocarpus altilis*), cassava (*Manihot esculenta*), cocoa (*Theobroma cacao*), papaya (*Carica papaya*), peanut (*Arachis hypogaea*), rubber (*Hevea brasiliensis*) and most species of legumes and cucurbits. It can also feed on the bark of relatively large trees such as citrus, papaya, rubber and cacao. The snail needs a source of calcium to build its shell and is recorded eating sand, very small stones, bones from carcasses and even concrete (CABI, 2017; Global Invasive Species Database, 2017).

Description

Mature *L. fulica* are distinctive in appearance and are readily identified by their large size and relatively long, narrow, conical shell (Figs 6.48.1, 6.48.3-4 and 6.48.6-8). The shell is usually in the size range 5 to 10 cm but may reach a length of 20 cm or more. The colour is variable but is most commonly light brown, with alternating brown and cream bands on young snails and the upper whorls of larger specimens. The coloration becomes lighter towards the tip of the shell, which is almost white. There are from six to nine spirally striate whorls with moderately impressed sutures. The shell aperture is ovate-lunate to round-lunate with a sharp, un-reflected outer lip (Fig. 6.48.8). The mantle is dark brown with rubbery skin. There are two pairs of tentacles on the head: a short lower pair and a large upper pair with round eyes situated at the apex. The mouth has a horned mandible containing some 80,000 teeth. Eggs (Fig. 6.48.5) are spherical to ellipsoidal in shape (4.5-5.5 mm diameter) and are cream to yellow in colour.

There are several species of large land snail distributed across sub-Saharan Africa, though three are most frequently encountered: *L. fulica* from East Africa is somewhat smaller than its similar counterpart in West Africa, *Achatina marginata*, and has a more pointed apex to its shell. Another similar species, *Achatina achatina*, also from West Africa, is the world's largest snail with a maximum recorded shell length of 27 cm and a weight of almost 1 kg. *Lissachatina fulica* could also be confused with Giant South American Snails (*Megalobulimus* spp.) which are also invasive in parts of the Caribbean. *Megalobulimus* shells are elongate-oval, apex conical, thick, calcareous and generally cream coloured. Mature *Megalobulimus* shells are generally smaller than those of *L. fulica* and usually lack the brown and cream banding found in the latter species (CABI, 2017; Global Invasive Species Database, 2017).

Figure 6.48.3 *Lissachatina fulica* fully extended body searching for food, Brazil © C. Malumphy

Figure 6.48.4 *Lissachatina fulica*, ribbon-like excrement is indicated by the arrow, Singapore © C. Malumphy

Figure 6.48.5 *Lissachatina fulica* eggs hidden under a stone in a National Park, Saint Lucia © C. Malumphy

Figure 6.48.6 Group of *Lissachatina fulica* snails in a small park in an urban area, Saint Lucia © C. Malumphy

Figure 6.48.7 *Lissachatina fulica* shell, dorsal view © Fera

Figure 6.48.8 *Lissachatina fulica* shell, ventral view © Fera

Biology

Lissachatina fulica is hermaphroditic and after a single mating can produce five or six batches of fertile eggs a year. Each batch contains 100 to 400 eggs (average around 200), with up to 1200 being laid in a year. They are laid on the ground, often at the base of plants. These hatch after about 8-21 days under tropical conditions. The reproductive rate of *L. fulica* is remarkable. For example, 20

tonnes of snails were collected on one day in Fiji just 4 years after its introduction. Adults have an average life span of 5-6 years but may live up to 9 years. Although *L. fulica* is a tropical snail, it can survive cold conditions, even snow, by aestivating for up to three years. It is normally nocturnal and crepuscular in its habits, though it will become active in the daytime during rainy or overcast periods (CABI, 2017; Global Invasive Species Database, 2017).

Dispersal and Detection

The snails can move over short distances between host plants (Fig. 6.48.3) but long-distance dispersal is due to anthropogenic activities. They have been moved internationally accidentally with trade and intentionally as a commercial food source, for scientific research, educational purposes, and as a novelty pet. All developmental stages may become attached to plant and non-plant materials, such as agricultural machinery and vehicles. Eggs and juvenile snails are also readily transported in garden waste.

Mature snails are large and conspicuous, and hide during the day, coming out at dusk to feed (Fig. 6.48.1). Surveys are therefore best carried out at night using a flashlight. Mature snails are easily detected, and attacked plants exhibit extensive rasping and defoliation. The sheer weight of numbers can break the stems of some host plant. Its presence can also be detected by signs of ribbon-like excrement (Fig. 6.48.4), and large slime trails on plants and buildings.

The eggs and juvenile snails can be difficult to detect during phytosanitary inspections of imported plants and other cargo.

Economic and other Impacts

Lissachatina fulica can have an economic, environmental and social impact when introduced to new areas (CABI, 2017; Global Invasive Species Database, 2017). The snail has a voracious appetite and has been recorded attacking a wide range of crops. It is considered by most authorities to be the most damaging land snail in the world. Indirectly, *L. fulica* may damage plants by vectoring plant diseases, for example, it has been implicated in the transmission of the fungus *Phytophthora palmivora*.

Snail populations can reach very high densities and invade native ecosystems. It can therefore pose a serious environmental and conservation threat by eating native plants, modifying habitats, and out-competing native species of snail.

High densities of snails in urban areas can be a major nuisance and have a significant social impact. Not only are they unsightly but cadavers smell and make a mess, especially where they are run over by traffic, which invariably happens during population explosions. *Lissachatina fulica* can act as a vector of the human disease, eosinophilic meningitis, which is caused by the rat lungworm parasite, *Angiostrongylus cantonensis*. The parasite is passed to humans through eating raw or improperly cooked snails. In sub-Saharan Africa, *L. fulica* is an important source of protein and large numbers of snails are regularly imported into the UK for human consumption. They can also be used to make fertilizer, chicken feed and fish feed. The snails are used for scientific research and educational purposes, and in Europe and parts of North America (where it is lawful), they are kept as a novelty pet.

6.49 Bumblebee Millipede

Class: Diplopoda
Order: Spirobolida
Family: Rhinocricidae
Species: *Anadenobolus monilicornis* (von Porat)

	Present l Absent ¡	Threat		
		Bio	Hlth	Econ
Ang	¡		ü	ü
Ber	¡		ü	ü
BVI	¡		ü	ü
Cay	l		ü	ü
Mon	¡		ü	ü
TCI	l		ü	ü

Figure 6.49.1 Bumblebee millipedes *Anadenobolus monilicornis* collected at a tourist resort in the Turks and Caicos Islands (TCI) © C. Malumphy

Background

Anadenobolus monilicornis is a millipede native to the southern Antilles that is now widespread in the Caribbean and has been introduced to South and North America (Shelly, 2014). It has several common names including yellow-banded millipede, bumblebee millipede or Jamaican bumblebee millipede. Populations can explode after rain and it can become a nuisance when hundreds of millipedes invade houses and tourist resorts. If threatened it has the potential to release a toxic irritant that can cause a dark chemical burn to the skin (Fig. 6.49.7). It is not a primary plant pest but can have a social impact. It has the potential to establish in all the UKOTs in the Caribbean. Shelly (2014) has published a detailed and comprehensive review of *A. monilicornis* and much of the information presented in this factsheet comes from this source.

Geographical Distribution

Anadenobolus monilicornis is native to the southern Antilles, but has been spread by anthropogenic activities in the Caribbean, South Eastern USA and Bermuda. In the Caribbean it has been recorded from Antigua, Barbados, Cayman Islands, Dominica, Dominican Republic, Grenada, Grenadines, Guadeloupe, Haiti, Jamaica, Saint Kitts, Saint Lucia, Saint Vincent, Trinidad and Tobago, Saint Maarten, Martinique, Puerto Rico and the US Virgin Islands.

Figure 6.49.2 Adult bumblebee millipede *Anadenobolus monilicornis* © Totodu74

Figure 6.49.3 *Anadenobolus monilicornis* in a tourist resort in TCI © C. Malumphy

Figure 6.49.4 Cleaning away *Anadenobolus monilicornis* in the TCI © C. Malumphy

Figure 6.49.5 *Anadenobolus monilicornis* invading buildings in the TCI © C. Malumphy

Figure 6.49.6 *Anadenobolus monilicornis* curled up in defensive position © Totodu74

Figure 6.49.7 Skin damage caused by toxins from *Anadenobolus monilicornis* © Marc Manfredi

Host Plants

Anadenobolus monilicornis feeds primarily on decaying plant material, as well as higher-quality foods, such as fallen fruits, seeds, mushrooms, faeces and dead invertebrates. It feeds opportunistically on whichever is most available at the soil surface. It does not normally feed on healthy plants but is commonly found in mulch used to fertilize garden plants.

Description

Anadenobolus monilicornis are elongate, cylindrical, with many body segments, most bearing two pairs of legs; they are dark brown to black with distinctive yellow bands, and measure 2.5–10 cm in length (Figs 6.49.1-2 and 6.49.6). The legs and antennae are red. Young millipedes resemble the adults.

Biology

This species inhabits leaf litter and eggs are laid in soil or moist organic matter. Birds and captive monkeys have been observed crushing these millipedes and rubbing their secretions on their wings or fur, probably to repel insects. This millipede might sometimes crawl on an unwary person at night while sleeping. If it finds itself pressed up against the skin, or crushed, it will release a toxic irritant that will cause a dark chemical burn to the skin (Fig. 6.49.7). These darkened areas may take more than 4 months to completely return to normal.

Dispersal and Detection

Anadenobolus monilicornis have a limited natural dispersal potential and can only crawl over relatively short distances but they may be dispersed over long distances with plant trade, for example, eggs and immatures are easily overlooked when hidden in the soil of potted plants. The adults are relatively easy to detect due to their conspicuous colour pattern and hundreds of millipedes may be found entering buildings after rain.

Economic and other Impacts

Anadenobolus monilicornis is not a primary plant pest but is often associated with urban gardens. They can have an economic and social impact as staff in tourist complexes may have to sweep up the millipedes from outside and inside buildings because there is a risk that tourists could receive a chemical burn from the millipedes (Figs 6.49.3-5). They often enter buildings and houses through wall holes, around service lines, around loose-fitting windows or doors, or through roof vents. Once in a building they usually dry out and die relatively quickly unless they find a humid area such as a shower or bathroom. They may also emit an odour when disturbed.

6.50 Red Palm Mite

	Present l Absent ¡	Threat		
		Bio	Hlth	Econ
Ang	¡			ü
Ber	¡			ü
BVI	¡			ü
Cay	l			ü
Mon	¡			ü
TCI	l			ü

Class: Arachnida
Order: Trombidiformes
Sub order: Prostigmata
Family: Tenuipalpidae
Species: *Raoiella indica* (Hirst)

Figure 6.50.1 Red palm mite *Raoiella indica* adults © USDA

Background

Red palm mite, *Raoiella indica*, is a pest of several important ornamental and fruit-producing palm species in the Middle East and South-East Asia. It has invaded the Western Hemisphere and is in the process of colonizing islands in the Caribbean, as well as other areas on the mainland. The invasion of this species is the biggest mite explosion ever observed in the Americas.

Geographical Distribution

The red palm mite originated in India, Egypt, Israel, Mauritius, Reunion, Sudan, Iran, Oman, Pakistan and the United Arab Emirates. *Raoiella indica* was first reported in the New World in Martinique (Flechtmann & Étienne, 2004) and has since spread rapidly throughout the Caribbean archipelago into Southern Florida and South America, and has now spread further into Mexico, Brazil and Colombia (CABI, 2017). It has become of interest as an invasive in these countries due to the high population numbers and diverse range of host plants that the mite has been recorded on. It is spreading rapidly and is expected to establish in other subtropical regions of the Western Hemisphere.

Host Plants

The red palm mite is a pest of several ornamental and fruit-producing palm species such as coconut (*Cocos nucifera*) and areca palms (*Areca* spp.); it has also been found attacking bananas (*Musa* spp.) and plantains (*Musa paradisiaca*) in the Caribbean. Ornamental palms, including hurricane or princess palm (*Dictyosperma album*) and Christmas palm (*Veitchia merrillii*) have also been damaged. Palms are important components of our tropical landscapes, both indoors and out, and in many countries coconut palms (*C. nucifera*) and date palms (*Phoenix dactylifera*) are important food crops.

Figure 6.50.2 A colony of *Raoiella indica* on a coconut leaf © Bryony Taylor

Figure 6.50.3 Close-up of the different life stages of *Raoiella indica* © SENASICA

Figure 6.50.4 Male and female adult *Raoiella indica* ©USDA

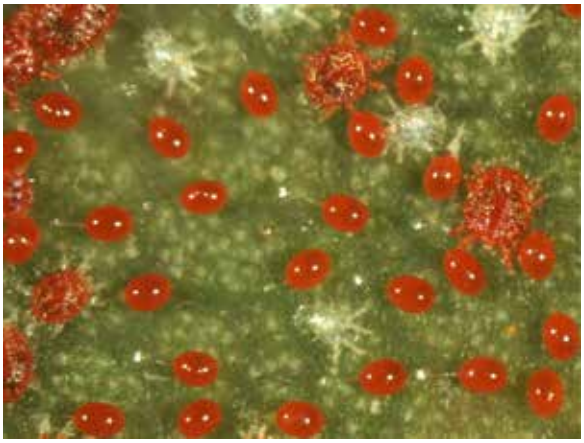

Figure 6.50.5 *Raoiella indica* eggs with immatures and moulted skins (left) and adults (right) © USDA

The red palm mite has been collected from ornamental plants other than palms such as *Heliconia* spp., bird of paradise (*Strelitzia* spp.,) and gingers (*Zingiber* spp.) in the Caribbean islands where it has invaded, but it is not clear whether these are valid host plants or whether the enormous mite populations on coconuts and other palms have temporarily moved on to sub-story plants under the palms.

Description

Raoiella indica is a tiny red mite, which is characterized by the presence of long spatulate setae on its dorsum, often with a drop of liquid on the end (Fig. 6.50.1 and 6.50.4). The body shape is oval and flattened and the male can be distinguished from the female by the distinct triangular abdomen (Kane & Ochoa, 2006; Welbourn, 2006). All stages of the mite are red; however, the adult females often have darkened areas on their abdomen (Fig. 6.50.4). There are five distinct life stages: egg, larva, protonymph, deutonymph and adult (Figs 6.50.3-5). The length of the adult female is between 267-300 µm and the width between 178 and 215 µm (Sadana, 1997). The eggs (Fig. 6.50.5) are laid in groups and are approximately 117 µm long, red/orange and smooth and shiny in appearance, and are found attached to the leaf by a stipe that is roughly twice as long as the egg (Kane & Ochoa, 2006).

Biology

Mites in the family Tenuipalpidae are commonly called "false spider mites" and are all plant feeders. However, only a few species of tenuipalpids are of economic importance. The tenuipalpids have stylet-like mouthparts (a stylophore) similar to those processed by spider mites (Tetranychidae). The mouthparts are long, U-shaped, with whiplike chelicerae that are used for piercing plant tissues. Tenuipalpids feed by inserting their chelicerae into plant tissue and removing the cell contents. These mites are small and flat, and usually feed on the under surface of leaves. They are slow moving and do not produce silk, unlike many of the tetranychid (spider mite) species, which do produce silk.

The number of eggs laid varies from individual to individual; however, on average, 28.1 eggs are laid during the average adult female life span of 27 days. As the larvae and nymphs pass through each stage, they enter a quiescent stage for 36-48 hours, whereby they enter ecdysis and withdraw posteriorly from the exuviae (Zaher *et al.*, 1969). The duration of each stage on coconut at 24.2°C in Mauritius was egg: 4-6 days; larva: 6-8 days; protonymph: 4-7 days; deutonymph: 4-5 days; however, the duration of stages increases with lower average temperatures (Moutia, 1958).

Dispersal and Detection

This mite is easily distributed by wind currents, which are the most likely method of natural dispersal, for example, the presence of mites on older palms on islands adjacent to Martinique within a year of introduction indicate that wind dispersal was the primary dispersal method. However, it is believed that *R. indica* was first accidentally introduced to the Caribbean on infested material imported via shipping lanes from the Old World. No research to date has identified whether this was a single or multiple introduction. Accidental spread to new areas is via the introduction of infested plants or plant material or on palm handicrafts infested with mites or eggs, which are common tourist souvenirs and readily transported. Quarantine measures are in place to prevent the transfer of mites via palm handicrafts, cut flower and leaf arrangements from host plants, and coconut seed.

Inspection of the underside of leaflets of host plants using a hand lens, or removal of material and inspection under a dissecting microscope can confirm the presence of mites. Colonies often contain mites of all stages as well as exuvial remains (white cast skins) and can have up to 300 individuals. Affected host plants will generally display symptoms under heavy infestations. Typical damage symptoms include localized yellowing of the leaf, which can spread into larger chlorotic patches. Heavy infestations may be found along the midrib of coconut leaflets and damage may progress from localized yellowing to necrosis. Infestations on banana and plantain often cause yellowing along the margins of the leaf. If there are heavy infestations, persons inspecting the host plant may find they pick up red on their fingers from the mites on the underside of leaves.

Economic and other Impacts

Raoiella indica is expected to cause economic damage to tropical and subtropical agriculture and to urban and indoor environments where palms are grown. Palm nurseries, landscape palms, and horticultural gardens could also be affected. Coconut growers have reported a 70% drop in coconut production since the introduction of the mite and FAO figures have shown a reduction in coconut production from Caribbean countries since 2004, when the mite was first identified in the region, to the present date. Empirical studies are required to confirm these figures/correlations; however, officials are concerned that a reduction in coconut production may lead to job losses and major socio-economic problems. In Florida, it was feared possible that economic impacts could come from quarantine restrictions if *R. indica* was detected in palm nurseries.

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8. References

Abrahams, P., Beale, T., Cock, M., Corniani, N., Day, R., Godwin J., Murphy S., Richards G. & Vos J. 2017. Fall Armyworm Status. Impacts and control options in Africa: Preliminary Evidence Note (April 2017). http://www.invasive-species.org/Uploads/InvasiveSpecies/FAW-inception-report.pdf.

Abraham Verghese & Nagaraju, D. K. 2004. Does stone weevil (*Sternochets mangiferae* (Fabricius) infestation affect fruit size of mangoes? *Insect Environment*, 10 (2): 61-62.

Abud Antun, A. J. 1991. Presence of the avocado lace bug, *Pseudacysta perseae* (Heidemann) (Hemiptera: Tingidae) in Dominican Republic. *Primera Jornado de Proteccion Vegetal, University of Santo Domingo, Santo Domingo, Dominican Republic* (Abstract, p. 4).

Agriculture Victoria 2017. Cypress decline Factsheet. http://agriculture.vic.gov.au/agriculture/pests-diseases-and-weeds/plant-diseases/shrubs-and-trees/cypress-decline.

Amarasekare, K. G. & Mannion, C. M. 2011. Life History of an Exotic Soft Scale Insect {*Phalacrococcus howertoni*} (Hemiptera: Coccidae} Found in Florida. *Florida Entomologist*, **94** (3): 588-593.

Andreazza, F., Bernardi, D., Dos Santos, R. S. S., Garcia, F. R. M., Oliveira, E.E., Botton, M., Nava, D.E. 2017. *Drosophila suzukii* in Southern *Neotropical* Region: Current Status and Future Perspectives. *Neotropical Entomology*, **46** (6):591-605.

Anonymous. 1999. Summary of activities associated with *Maconellicoccus hirsutus* in St Lucia. Paper presented at the Evaluation Workshop on Biological Control of Hibiscus Mealybug, *Maconellicoccus hirsutus* in the Caribbean sub region, 11-12 March 1999, Trinidad and Tobago.

Anon. 2018. Citrus statistics factsheet. Florida Citrus Mutual. www.flcitrusmutual.com/citrus-101/citrusstatistics.

Aristizabal, L. F., Mannion, C., Bergh, C. & Arthurs, S. 2012. Life history of pink hibiscus mealybug, *Maconellicoccus hirsutus* (Hemiptera: Pseudococcidae) on three *Hibiscus rosa-sinensis* cultivars. *Florida Entomologist*, **95**: 89-94.

Avery, P. B., Mannion, C. M., Powell, C. A., McKenzie, C. L. & Osborne L. S. 2011. Natural enemies managing the invasion of the fig whitefly, *Singhiella simplex* (Hemiptera: Aleyrodidae), infesting a *Ficus benjamina* Hedge. *Florida Entomologist*, **94** (3): 696-698.

Baker, R.T. & Cowley, J. M. 1991. A New Zealand view of quarantine security with special reference to fruit flies, In: Vijaysegaran, S. & Ibrahim, A.G., eds. First International Symposium on Fruit Flies in

the Tropics, Kuala Lumpur, 1988. Kuala Lumpur, Malaysia: Malaysian Agricultural Research and Development Institute, 396-408.

Balock, J. W. & Kozuma, T. T. 1964. Notes on the biology and economic importance of the mango weevil, *Sternochetus mangiferae* (Fabricius), in Hawaii (Coleoptera: Curculionidae). *Proceedings of the Hawaiian Entomological Society*, **18**: 353-364.

Bartlett, B.R. 1978. Margarodidae, *Icerya purchasi*. In: Clausen CP, ed. Introduced Parasites and Predators of Arthropod Pests and Weeds: a World Review. Agricultural Handbook. Washington DC, USA: Agricultural Research Service, United States Department of Agriculture, **480**: 132-135.

Bayles, B. R., Thomas, S. M., Simmons, G. S., Grafton-Cardwell, E. E. & Daugherty, M. P. 2017. Spatiotemporal dynamics of the Southern California Asian citrus psyllid (*Diaphorina citri*) invasion. https://doi.org/10.1371/journal.pone.0173226.

BCMA, 2013. Spotted Wing Drosophila (Fruit Fly) Pest Alert. British Columbia, Canada: Ministry of Agriculture. http://www.agf.gov.bc.ca/cropprot/swd.htm.

Beardsley, J. W. Jr. and R. H. Gonzalez. 1975. The biology and ecology of armored scales. Annual Review of Entomology. 20: 47-73.

Beltrà, A., Soto, A., Germain, J.-F., Matile-Ferrero, D., Mazzeo, G., Pellizzari, G., Russo, A., Franco, J.C. & Williams, D.J. 2010. The Bougainvillea mealybug *Phenacoccus peruvianus*, a rapid invader from South America to Europe. *Entomologia Hellenica*, **19**: 137-143.

Ben-Dov, Y. & German, V. 2003. ScaleNet, *Maconellicoccus hirsutus*. 27 November 2003. http://www.sel.barc.usda.gov/catalogs/pseudoco/Phenacoccusmanihoti.htm.

Benito, N. P., Lopes-da-Silva, M. & dos Santos, R. S. S. 2016. Potential spread and economic impact of invasive *Drosophila suzukii* in Brazil. *Pesquisa Agropecuária Brasileira*, **51**: 571–578. doi: 10.1590/S0100-204X2016000500018.

Bennett, F.D., Cock, M. J. W., Hughes, I. W., Simmonds, F. J. S., Yaseen, M. 1985. In: Cock MJW, ed. A review of biological control of pests in the Commonwealth Caribbean and Bermuda up to 1982. Commonwealth Institute of Biological Control Technical Committee 9. 218 pp.

Binazzi, A. 1997. Further observations on the biology and ecology of the cypress aphid *Cinara (Cupressobium) cupressi* (Buckton) in Tuscany (I) (Lachninae). *Redia*, **80**: 45-52; 12

Biosecurity Australia. 2009. Final pest risk analysis report for "*Candidatus* Liberibacter psyllaurous" in fresh fruit, potato tubers, nursery stock and its vector the tomato-potato psyllid. Biosecurity Australia, Canberra. 110 pp.

Blackman, R.L & Eastop, V.F. 1984. Aphids on the World's Crops. An Identification and Information Guide. John Wiley, Chichester, UK.

Blackman, R. L. & Eastop, V. F. 2006. *Aphids on the world's herbaceous plants and shrubs.* Vols 1 & 2. J. Wiley & Sons, Chichester, UK.

Blackman, R.L. & V.F. Eastop. 2013. *Aphids* on the *World's Plants*: An *Online* Identification and Information Guide. http://www.aphidsonworldsplants.info/.

Blatchley, W. S. 1926. *Heteroptera or True Bugs of Eastern North America, with Especial Reference to the Faunas of Indiana and Florida*. Nature Publishing Company, Indianapolis. 1116 pp.

Bloem, K. & Bloem, S. 2012. *Cactoblastis cactorum* in the USA: a general overview and history. http://www.aphis.usda.gov/plant_health/plant_pest_info/cactoblastis/downloads/conference/abstracts/bloem-abstract_eng.pdf.

Bolda, M., Goodhue, R. E., Zalom, F. G. 2010. Spotted wing drosophila: potential economic impact of a newly established pest. *Agricultural and Resource Economics*, **13**(3): 5-8.

Bournier, A. 1993. Thysanoptéres de Martinique et Guadaloupe. *Zoology: Journal of Pure and Applied Zoology* **3**: 227-240.

Brown, S. H. & Cooprider, K. 2012. *Yucca aloifolia.* University of Florida Institute of Food and Agricultural Sciences, Lee County, Southwest Florida.

Brown, J. K., Dollet, M., Harrison, N. A., Jones, P. 2002. Investigations into the phylogeography and ecology of *Myndus crudus* (van Duzee) (Hemiptera, Fulgoromorpha, Cixiidae), the leafhopper vector of coconut lethal yellowing. In: 14th International Auchenorrhyncha Congress, Berlin, Germany, 8 August 2002. s.l. : s.n., 1.

*Buren, W. F. 1982. Red imported fire ant now in Puerto Rico. The Florida Entomologist, **65**: 188–189.* doi*:* 10.2307/3494163*.*

CABI. 2007. Crop Protection Compendium. Commonwealth Agricultural Bureau, International. http://www.cabicompendium.org/.

CABI. 2017. Invasive species Compendium. Various datasheets downloaded from http://www.cabi.org/isc. Accessed on 1st January 2018.

CABI/EPPO. 2011. *Diaphorina citri*. Distribution Maps of Plant Pests, Map 334 (2nd revision). Issued December. CABI, Wallingford, UK.

CABI/EPPO, 2016. *Rhynchophorus ferrugineus*. Distribution Maps of Plant Pests, Map 258 (4th revision). Issued December. CABI, Wallingford, UK.

Cabrera, I., Ramírez, A., Cruz, S., Vélez, A., Sáez, L. & Segarra, A. 2008. *Holopothrips tabebuia* sp.n. Cabrera & Segarra (Thysanoptera: Phlaeothripidae) en los robles *Tabebuia heterophylla* y *Tabebuia aurea* en Puerto Rico. *Journal of Agriculture of the University of Puerto Rico*, **92**: 225-229.

Cabrera, I. & Segarra, I. 2008. A New Gall-Inducing Species of *Holopothrips* (Thysanoptera: Phlaeothripinae) from *Tabebuia* Trumpet Trees in the Caribbean Region. *The Florida Entomologist*, **91** (2): 232-236.

Carver M. 1978. The black citrus aphids, *Toxoptera citricida* (Kirkaldy) and *T. aurantii* (Boyer de Fonscolombe) (Homoptera: Aphididae). *Journal of the Australian Entomological Society*, **17**(3): 263-270.

Casmuz, A., Juarez, M. L., Socıas, M.G., Murua, M. G., Prieto, S., Medina, S., Willink, E. & Gastaminza, G. 2010. Revision delos hospederos del gusano cogollero del maız, *Spodoptera frugiperda* (Lepidoptera: Noctuidae). *Revista de la Socie- dad Entomologica Argentina*, **69**: 209–231.

Chamorro, M. L, Persson, J., Torres-Santana, C. W., Keularts, J., Scheffer, S. J. & Lewis, M.L. 2016. Molecular and Morphological Tools to Distinguish *Scyphophorus acupunctatus* Gyllenhal, 1838 (Curculionidae: Dryophthorinae): A New Weevil Pest of the Endangered Century Plant, *Agave eggersiana* from St. Croix, U.S. Virgin Islands. *Proceedings of the Entomological Society of Washington*, **118**: 218-243.

Chong, J-H., Aristizabal, L. F. & Arthurs, S. P. 2015. Biology and management of *Maconelicoccus hirsutus* (Hemiptera: Pseudococcidae) on ornamental plants. *Journal of Integrated Pest Management*, **6**: 1-14.

Ciesla, W. M. 1991. Cypress aphids, *Cinara cupressi*, a new pest of conifers in eastern and southern Africa. *FAO Plant Protection Bulletin*, **39** (2-3): 82-93.

Clinton, P.K. & Peregrine, W.T. 1963. The zebra complex of sisal hybrid No. 11648. *East Africa Agricultural and Forestry Journal*, **29**(2): 110-113.

Cloyd, R.A. 2009. Western flower thrips (*Frankliniella occidentalis*) management on ornamental crops grown in greenhouses: Have we reached an impasse? *Pest Technology*, **3**:1-9.

Cluever, J. H., Smith, H. A., Funderburk, J. E. & Frantz, G. 2015. Western Flower Thrips (*Frankliniella occidentalis [Pergande]).* Entomology and Nematology Department, UF/IFAS Extension document ENY-883.

Coleman, T. W., Eskalen, A. & Stouthamer, R. 2013. New Pest Complex in California: The Polyphagous Shot Hole Borer, *Euwallacea* sp., and Fusarium Dieback, *Fusarium euwallaceae*. Available: https://cisr.ucr.edu/pdf/pest_alert_pshb_and_fd.pdf. Accessed on 23.06.2014.

Costa Lima, A. M. 1942. Insetos do Brasil: Homoptera. *Escola Nacional de Agronomia*, Rio de Janeiro, **3**: 141p.

Czepak, C., Albernaz, K. C., Vivan, L. M., Guimaraes, H.O. & Carvalhais, T. 2013. First reported occurrence of *Helicoverpa armigera* (Hübner) (Lepidoptera: Noctuidae) in Brazil. *Pesquisa Agropecuaria Tropical*, **43**: 110–113. doi: 10.1590/s1983-40632013000100015.

Dale, P. S. & Maddison, P. A. 1984. Transport services as an aid to insect dispersal in the South Pacific. In: Laird M, ed. *Commerce and the spread of pests and disease vectors*. Praeger Publishers, New York, USA: 225-256.

Dalton, R. 2005. Saving the Agave. *Nature* **438**: 1070-1071.

Danzig, E. M. & Pellizzari, G. 1998. Diaspididae. *Catalogue of Palaearctic Coccoidea.* Plant Protection Institute, Hungarian Academy of Sciences Budapest, Hungary, 526 pp.

Davidson, M. M., Teulon, D. A. J., Scott, I. A. W. & Workman, P. 2008. A review of the potato psyllid (*Bactericera cockerelli*); a new insect pest of potato in New Zealand. Crop and Food Research Confidential Report No 2231. 18 pp.

Davidson, J. A. & Miller, D. R. 1990. Ornamental plants. In: D. Rosen (ed.), *Armoured scale insects, their biology, natural enemies and control. [Series title: World Crop Pests, Vol. 4B].* Elsevier, Amsterdam, the Netherlands: 603-632.

Davis, L. R., Vander Meer, R. K., Porter, S. D. 2001. Red imported fire ants expand their range across the West Indies. *The Florida Entomologist, **84**(4): 735.* doi:10.2307/3496416.

De Meyer, M. (2000) Systematic revision of the subgenus Ceratitis MacLeay s.s. (Diptera, Tephritidae). Zoological Journal of the Linnean Society, **128**: 439–467.

Demirozer, O., Tyler-Julian, K., Funderburk, J., Leppla N. & Reitz, S. 2012. *Frankliniella occidentalis* (Pergande) integrated pest management programs for fruiting vegetables in Florida. *Pest Management Science*, **68**(12): 1537-1545.

Defra. 2017. Pest Alert: Zebra chip disease of potato. Defra Plant Health Portal https://planthealthportal.defra.gov.uk/assets/factsheets/pest-alert-zebra-chip.pdf.

D.E.N.R. (Unknown) Bermuda Cedar. *Department of Environment and Natural Resources Factsheet* www.environment.bm/bermuda-cedar. Accessed March 2018.

De Ros, G., Conci, S., Pantezzi, T. & Savini G. 2015. The economic impact of invasive pest *Drosophila suzukii* on berry production in the Province of Trento, Italy. *Journal of Berry Research*, **5**: 89–96. doi: 10.3233/JBR-150092.

Deyrup, M., Davis, L.& Buckner, S. 1998. Composition of the Ant Fauna of Three Bahamian Islands (PDF). San Salvador: Proceedings of the 7th Symposium on the Natural History of the Bahamas. p. 27. ISBN 978-0-935909-66-1.

Dominican Today July 7, 2017. www.dominicantoday.com/dr/economy/2017/07/07/dominican-territory-declared-med-fly-free/. Accessed 20.01.18.

Drees, B.M., Collins, H., Williams, D.F., Bhatkar A. 2002. Considerations for planning, implementing, and evaluating a spot-eradication program for imported fire ants. Fire Ant Plan Fact Sheet #30, http://fireant.tamu.edu/materials/index.html.

Drees, B. M. & Lard, C. F. 2006. Imported fire ant: economic impacts justifying integrated pest management programs. In: *Proceedings of the XV Congress of the International Union for the study of social insects*, Washington, DC, 30 July – 4 August 2006.

Edwards, S. 1999. Biological control of the pink mealybug (*Maconellicoccus hirsutus*) in St. Vincent and the Grenadines. Paper presented at the Evaluation Workshop on Biological Control of Hibiscus Mealybug, *Maconellicoccus hirsutus* in the Caribbean sub region, 11-12 March 1999, Trinidad and Tobago.

Ekesi, S., Billah, M.K., Nderitu, P.W., Lux, S.A. & Rwomushana, I. 2009. *Evidence* for *competitive displacement* of *Ceratitis cosyra* by the *invasive fruit fly Bactrocera invadens* (*Diptera*:

Tephritidae) on *mango* and *mechanisms contributing* to the *displacement*. Journal of Economic Entomology, **102**: 981–991.

EPPO, 1989. Data sheets on quarantine organisms, No. 175, *Thrips palmi*. *Bulletin OEPP/EPPO*, **19**: 717-720.

EPPO. 2006. Mini data sheet on *Scyphophorus acupunctatus.*

EPPO. 2008. Data sheets on quarantine pest, *Rhynchophorus ferrugineus*. *Bulletin OEPP/EPPO*, **38**: 55–59.

EPPO. 2013. EPPO Data Sheets on pests recommended for regulation '*Candidatus* Liberibacter solanacearum'. *OEPP/EPPO Bulletin*, **43**(2): 197–201.

EPPO. 2014. PQR database. Paris, France: European and Mediterranean Plant Protection Organization. http://www.eppo.int/DATABASES/pqr/pqr.htm.

EPPO. 2015a. *Aleurothrixus trachoides* (Hemiptera: Aleyrodidae). European and Mediterranean Plant Protection Organization. https://www.eppo.int/QUARANTINE/Alert_List/insects/Aleurotrachelus_trachoides.htm. Accessed on 1st January 2018.

EPPO. 2015b. PM 7/124 (1) *Spodoptera littoralis*, *Spodoptera litura*, *Spodoptera frugiperda*, *Spodoptera eridania*. *Bulletin OEPP/EPPO*, **45**: 410–444. https://doi.org/10.1111/epp.12258/epd.

EPPO. 2016. *Euwallacea* sp. and its symbiotic fungus *Fusarium euwallaceae.* https://www.eppo.int/QUARANTINE/Alert_List/insects/Euwallacea_Fusarium.htm

Evans, G. A. 2008*. The whiteflies* (*Hemiptera*: *Aleyrodidae) of the world and their host plants and natural enemies*. USDA/Animal Plant Health Inspection Service (APHIS). Last Revised: September 23, 2008, 703 pp.

Ezzat, Y. M. 1956. Studies on the "Kew Bug" *Orthezia insignis* Browne (Coccoidea – Ortheziidae). *Bulletin Société Entomologique d'Egypte*, **40**: 415-431.

Fengxin, M., Dazhuang, H. & Junjie, Y. (1997) [Occurrence characteristics and control countermeasures of *Apriona germari* in Xiling of Yixian County]. *Hebei Journal of Forestry and orchard Research*, **12**: 83–86.

Fetykó, K. & Kozár, F. 2012. Records of Ceroplastes Gray 1828 in Europe, with an identification key to species in the Palaearctic Region. *Bulletin of Insectology* **65** (2): 291-295.

Figueroa-Castro, P., López-Martínez, V., Hernández-Ruiz, A., Silva-García F. & Campos-Figueroa, M. 2016. Determining the best pheromone-baited traps for capturing *Scyphophorus acupunctatus* (Coleoptera: Dryophthoridae) in Mezcal Agave. *Florida Entomologist*, **99**(4): 790-792.

Flechtmann, C. H. W. & Étienne, J. 2004. The red palm mite *Raoiella indica* Hirst a threat to palms in the Americas (Acari: Prostigmata: Tenuipalpidae). *Systematic and Applied Acarology*, 9: 109-110.

Foldi, I. 2001. Liste des cochenilles de France (Hemiptera, Coccoidea). *Bulletin de la Société Entomologique de France*, **106** (3): 303-308.

Follet, P.A., 2002. Mango seed weevil (Coleoptera: Curcolinidae) and premature fruit drop in mangoes. *Journal of Economic Entomology*, **95**(2): 336-339.

Francis, A. 1999. Report on biological control activities (pink hibiscus mealybug), St. Kitts. Paper presented at the Evaluation Workshop on Biological Control of Hibiscus Mealybug, *Maconellicoccus hirsutus* in the Caribbean sub region, 11-12 March 1999, Trinidad and Tobago.

Francis, A., Bloem, K. A., Roda, A. L., Lapointe, S. L., Zhang, A. & Onokpise, O. 2007. Development of trapping methods with a synthetic sex pheromone of the pink hibiscus mealybug, *Maconellicoccus hirsutus* (Hemiptera: Pseudococcidae). *Florida Entomologist*, **90**: 440-446.

Francois, B. 1996. Measuring the impact of mealybug infestation. Proceeding of the first symposium on the Hibiscus mealbug in the Caribbean, 24-27 June 1996, Grenada.

Friedman, A. L. L., Rittner, O. & Chikatunov, V. I. 2008. Note: five new invasive species of longhorn beetles (Coleoptera: Cerambycidae) in Israel. *Phytoparasitica*, **36**(3): 242-246.

García Morales, M., Denno, B. D., Miller, D. R, Miller, G. L., Ben-Dov, Y. & Hardy, N.B. 2016. *ScaleNet: A literature-based model of scale insect biology and systematics*. Database. doi: 10.1093/database/bav118. http://scalenet.info.

Garland, J. A. 1998. Pest Risk Assessment of the Pink Mealybug *Maconellicoccus hirsutus* (Green), with particular reference to Canadian Greenhouses. PRA 96-21. Ontario, Canada: Canadian Food Inspection Agency.

Garnsey, S. M., Gottwald, T. R. & Yokomi, R. K. 1996. Control strategies for citrus tristeza virus. In: Hadidi A, Khetarpal RK Koganezawa H, eds. Plant Viral Disease Control: Principles and Practices. St. Paul, USA: APS Press

Garonna, A.P., Scarpato, S., Vicinanza, F. & Espinosa, B. 2015. First report of *Toumeyella parvicornis* (Cockerell) in Europe (Hemiptera: Coccidae). *Zootaxa*, **3949** (1): 142-6. doi: 10.11646/zootaxa.3949.1.9.

da Garta, J. V. & Maharaj, S. B. 1991. Citrus vein enation virus, a probable luteovirus. In: Brlansky RH, Lee RF, Timmer LW, eds. Proceedings of the 11th Conference of the International Organization of Citrus Virologists. Riverside, California, USA: IOCV, 391-394.

Gibney, E. 2004. *A Field Guide to Native Trees & Plants of East End, St. John, U.S. Virgin Islands*. Center for the Environment, East End.

Gill, R. J. 1997. *The Scale Insects of California: Part 3. The Armored Scales (Homoptera: Diaspididae).* California Department of Food & Agriculture Sacramento, CA, USA, 307 pp.

Girling D.J. (ed.) 1992. *Thrips palmi: a literature survey with an annotated bibliography*. International Institute of Biological Control, Ascot, UK. 37 pp.

Gitonga, L. M., Lohr, B., Overholt, W. A., Magambo, J. K. & Mueke, J. M. 2002. Temperature-dependent development of *Megalurothrips sjostedti* and *Frankliniella occidentalis* (Thysanoptera: Thripidae). *African Entomology*, **10**: 325-331.

Global Invasive Species Database. 2017. Various datasheets downloaded from http://www.iucngisd.org/gisd/. Accessed on 1st January 2018.

Goergen, G., Kumar, L. P., Sankung, S. B., Togola, A. & Tamò, M. 2016. First Report of Outbreaks of the Fall Armyworm *Spodoptera frugiperda* (J E Smith) (Lepidoptera, Noctuidae), a New Alien Invasive Pest in West and Central Africa. *PLOS ONE*, **11**(10): e0165632.

Goldbach, R. & Peters, D. 1994. *Possible causes of the emergence of tospovirus diseases. Seminars in Virology*, **5** (2): 113-120; 53 ref.

Gottwald, T. R., Garnsey, S. M., Cambra, M., Moreno, P., Irey, M., Borbon, J., Jean, A. S. & Solis, A.R. 1995. Rate of disease increase and patterns of spread of CTV when vectored by *Toxoptera citricida* vs. *Aphis gossypii*. p. 44-49. In: Lake Alfred FL, ed. Proceedings of the Third International Workshop on Citrus Tristeza Virus and Brown Citrus Aphid in the Caribbean Basin: Management Strategies. May 15-18, 1995. University of Florida, Institute of Food and Agricultural Sciences.

Gottwald, T. R., Da Graça, J. V. & Bassanezi, R. B. 2007.Citrus Huanglongbing: The pathogen and its impact. Plant Management Network. Plant Health Progress http://www.plantmanagementnetwork.org

Granara de Willink, M. C. & Szumik, C. 2007. Phenacoccinae de Centro y Sudamérica (Hemiptera: Coccoidea: Pseudococcidae): Sistemática y Filogenia. *Revista de la Sociedad Entomológica Argentina*, **66:** 29-129.

Green, E.E., 1922. *The Coccidae of Ceylon*. Part V. London, UK: Dulou & Co.

Gutrich, J.J., VanGelder, E., Loope, L. 2007. Potential economic impact of introduction and spread of the red imported fire ant, *Solenopsis invicta* in Hawaii. Environmental Science and Policy, doi:10.1016/jenvsci.2007.03.007.

Halbert, S. E. & Brown, G. 1996. *Toxoptera citricida* (Kirkaldy), brown citrus aphid - identification, biology and management strategies. Circulation No. 374. Division of Plant Industry, Entomology. Florida Department of Agriculture and Consumer Services.

Halbert, S. E. & Núñez, C. A. 2004. Distribution of the Asian citrus psyllid, *Diaphorina citri* Kuwayama (Rhynchota: Psyllidae) in the Caribbean basin. *Florida Entomologist,* **87**(3): 401-402.

Halbert, S. E., Wilson, S. W., Bextine, B. & Youngblood, S. B. 2014. Potential planthopper vectors of palm phytoplasmas in Florida with a description of a new species of the genus *Omolicna* (Hemiptera: Fulgoroidea). *Florida Entomologist*, **97**(1): 90-97. http://www.fcla.edu/FlaEnt/.

Hamby, K. A., Hernández, A., Boundy-Mills, K. & Zalom, F. G. 2012. Associations of yeasts with spotted-wing Drosophila (*Drosophila suzukii*; Diptera: Drosophilidae) in cherries and raspberries. *Applied and Environmental Microbiology*, **78**(14): 4869-4873. http://aem.asm.org/content/78/14/4869.full.

Hamon, A. B., Fasulo, T. R. & Buss, L. J. 2011. Cardin's Whitefly, *Metaleurodicus cardini* (Back) (Insecta: Hemiptera: Aleyrodidae: Aleurodicinae). University of Florida. IFAS Extension. EENY-153. Revised: April 2011. 4 pp.

Hamon, A. B. & Hodges, G. S. 2013. Pest Alert. Lobate lac scale, *Paratachardina pseudolobata* Kondo & Gullan (Hemiptera: Kerriidae). http://www.freshfromflorida.com/Divisions-Offices/Plant-Industry/Plant-Industry-Publications/Pest-Alerts. Accessed on 1st January 2018.

Hamon, A. B, & Fasulo, T. R. 2017. Cottony cushion scale factsheet. Florida Department of Agriculture and Consumer Services. Originally published as DPI Entomology Circular 352 http://entnemdept.ufl.edu/creatures/fruit/cottony_cushion_scale.htm.

Harris, W.V. 1936. The sisal weevil. *East Africa Agricultural and Forestry Journal*, **2**(2): 114-12.

Harrison, N. A & Elliott, M. L. 2015. Texas Phoenix Palm Decline Factsheet. USA: Plant Pathology Department, University of Florida (UF)/ Institute of Food and Agricultural Sciences (IFAS) Extension, PP-243.

Haviland, D. R., Beers, E. H. 2012. Chemical control programs for *Drosophila suzukii* that comply with international limitations on pesticide residues for exported sweet cherries. *Journal of Integrated Pest Management*, **3**(2): F1-F6.

Haynes, J. and Marler, T. 2005. Exotic invasive pest insect critically threatening Guam's vulnerable flora, fauna and island ecosystem.

Heidemann, O. 1908. Two new species of North American Tingidae. *Proceedings of the Entomological Society of Washington*, **10**: 103-108.

Heie, O. E. 1995. *The Aphidoidea, Hemiptera, of Fennoscandia and Denmark VI* (Fauna Entomologica Scandinavica). E.J. Brill, London.

Henderson, G. 2001. Practical considerations of the Formosan subterranean termite in Louisiana: A 50-year-old problem. *Sociobiology*, **37**:281-292.

Henderson, G. 2008. The termite menace in New Orleans: Did they cause the floodwalls to tumble? *American Entomologist*, **54**: 156-162.

Hernández, E. R., Magaña Alejandro, M. A., Ortiz García, C. F., Oropeza Salín, C., Lesher Gordillo, J. M. & Sánchez Soto, S. 2018. The coconut pathosystem: weed hosts of nymphs of the American palm Cixiid *Haplaxius crudus* (Hemiptera: Fulgoroidea). *Journal of Natural History*, **52**(5-6): 255-268, DOI: 10.1080/00222933.2017.1420832.

Hill, M. G. 1980. Wind dispersal of the coccid *Icerya seychellarum* (Margarodidae: Homoptera) on Aldabra Atoll. *Journal of Animal Ecology*, **49**: 939-957.

Hoddle, M. 2013. Biological Control of *Icerya purchasi* with *Rodolia cardinalis* in the Galapagos. University of California, Riverside. http://biocontrol.ucr.edu/rodolia/rodolia_icerya_biocontrol_galapagos.html.

Hodges, G.S. 2002. A new species of *Ceroplastes* from Florida (Hemiptera: Coccoidea: Coccidae). *Insecta Mundi* **16** (4): 205-208.

Hodges, G. 2007. The fig whitefly *Singhiella simplex* (Singh) (Hemiptera: Aleyrodidae): a new exotic whitefly found on *Ficus* species in south Florida. Division of Plant Industry, Florida Department of Agriculture and Consumer Services, http://www.freshfromflorida.com/pi/pest-alerts/singhiella-simplex.html. Accessed on 12/10/2014.

Hodges, G. S. 2008. *Icerya genistae* Hempel (Hemiptera: Margarodidae): an emerging pest in south Florida. *Proceedings of the XI International Symposium on Scale Insect Studies, Oeiras, Portugal, 24-27 September 2007.* ISA Press Lisbon, Portugal 322 pp.

Hodges, G. S. & Hodgson, C. J. 2010. *Phalacrococcus howertoni*, a new genus and species of soft scales (Hemiptera: Coccidae) from Florida. *Florida Entomologist*, **93** (1): 8-23.

Hodgson, C. J., Abbas, G. Arif, M. J., Saeed, S. & Karar, H. 2008. *Phenacoccus solenopsis* Tinsley (Sternorrhyncha: Coccoidea: Pseudococcidae), an invasive mealybug damaging cotton in Pakistan and India, with a discussion on seasonal morphological variation. *Zootaxa*, **1913**: 1-35.

Hodgson, C. J. & Peronti, A. L. B. G. 2012. A revision of the wax scale insects (Hemiptera: Sternorrhyncha: Coccoidea: Ceroplastinae) of the Afrotropical Region. *Zootaxa*, **3372**: 1–265.

Hodgson, C. J., Williams, D. J. & Giliomee, J. H. 2009. The identity of the wax scale insect, *Ceroplastes myricae* (Linnaeus) (Sternorrhyncha: Coccoidea: Coccidae), and a key to the wax scales recorded from South Africa. *African Entomology*, **17** (1): 95-105.

Hoebeke, E. R., Carter, M. E., 2003. *Halyomorpha halys* (Stal) (Heteroptera: Pentatomidae): a polyphagous plant pest from Asia newly detected in North America. *Proceedings of the Entomological Society of Washington*, **105** (1): 225-237.

Holway, D. A., Lach, L., Suarez, A. V., Tsutsui, N. D.& Case, T.J. 2002. The causes and consequences of ant invasions. *Annual Review of Ecology and Systematics*, **33**: 181-233.

Howard, F. W. 1981. Pigment migration in the eye of *Myndus crudus* (Homoptera: Cixiidae) and its relation to day and night activity. *Insect Science and its Application*, 2(3): 129-133.

Howard, F. W. 2015. American palm cixiid - *Myndus crudus* Van Duzee. Featured Creatures. USA: University of Florida. http://entnemdept.ufl.edu/creatures/orn/palms/palm_cixiid.htm.

Howard, F.W., Hamon, A., McLaughlin, M., Weissling, T. and Yang, S-L. 1999. *Aulacaspis yasumatsui* (Hemiptera: Sternorrhyncha: Diaspididae), a scale insect pest of cycads recently introduced into Florida. Florida Entomologist. 82 (1): 14-27.

Howard, F. W. & Pemberton, R. W. 2003. The lobate lac scale, a new pest of trees and shrubs in Florida: implications for the Caribbean Region. *Proceedings of the Caribbean Food Crops Society*, **39**: 91-94.

Howard, F. W., Pemberton, R. W., Hodges, G. S., Steinberg, B., McLean, D. & Liu, H. 2006. The host plant range of lobate lac scale, *Paratachardina lobata*, in Florida. *Proceedings of the Florida State Horticultural Society*, **120**: 308-408.

Hua, F. M., Ni, L. C. & Jin, M. X. 1999. Pesticide effectiveness test of several insecticides to control *Icerya purchasi* endangering *Liquidambar formosana*. *Journal of Zhejiang Forestry Science and Technology*, **19**(6): 46-47.

Huang, F., Zhang, J. M., Zhang, P. J., & Lu, Y. B. 2013. Reproduction of the Solenopsis Mealybug, Phenacoccus Solenopsis: Males Play an Important Role. *Journal of Insect Science*, **13**: 137. http://doi.org/10.1673/031.013.13701

Humeres, E. C., Morse, J. G., Roltsch, W. & Hoddle, M. S. 2009. Detection surveys and population monitoring for *Pseudacysta perseae* on avocados in Southern California. *Florida Entomologist,* 92. http://www.fcla.edu/FlaEnt/fe92p382.pdf. Accessed 1st February 2017.

Hurd, M. P. 1946. Generic classification of North American Tingoidea (Hemiptera-Heteroptera). *Iowa State College Journal of Science*, **20**: 229-493.

Influential Points. 2018. *Cinara cupressi*: Cypress aphid factsheet. www.influentialpoints.com/Gallery/Cinara_cupressi_cypress_aphid.htm. Accessed March 2018.

Ioriatti, C., Frontuto, A., Grassi, A., Anfora, G. & Simoni, S. 2012. *Drosophila suzukii* (Matsumura), una nuova specie invasiva dannosa alle colture di piccoli frutti. *Atti dell'Accademia dei Georgofili*, **VIII**: 69–80. (In Italian)

IPPC. 2007. Glossary of phytosanitary terms. ISPM 5. Rome, IPPC, FAO.

ISSG. 2003. Global Invasive Species Database. Invasive Species Specialist Group, IUCN. Auckland, New Zealand: University of Auckland. www.issg.org. Accessed on 1st January 2018.

ISSG. 2014. Global Invasive Species Database (GISD). Invasive Species Specialist Group of the IUCN Species Survival Commission. http://www.issg.org/database/welcome/.

Jackson, G. 2017. Lesser snow scale. Pacific Pests and Pathogens - Fact Sheets. No. 346. http://www.pestnet.org/fact_sheets/lesser_snow_scale_346.htm

Jenkins, D. A. 2013. *Holopothrips tabebuiae*: A thrips from nowhere! http://entomologylabpr.blogspot.co.uk/2013/01/holopothrips-tabebuiae-thrips-from.html. Accessed 26th February 2017.

Kairo, M. T. K. 1997. Assessment of the biological control programme for the Hibiscus Mealybug, *Maconellicoccus hirsutus* (Green) in Grenada. Report on a consultancy mission to Grenada under TCP/RLA/6719: Assistance for Biological Control of the Pink Mealybug: Technical Report, 27pp. Trinidad and Tobago: CABI Bioscience.

Kairo, M. T. K., Pollard, G. V., Peterkin, D. D. & Lopez, V. F. 2000. Biological control of the hibiscus mealybug, *Maconellicoccus hirsutus* in the Caribbean. *Integrated Pest Management Reviews*, **5**: 241–254.

Kairo, M. T. & Murphy, S. T. 2005. Comparative studies on populations of *Pauesia juniperorum* (Hymenoptera: Braconidae), a biological control agent for *Cinara cupressivora* (Hemiptera: Aphididae). *Bulletin of Entomological Research*, **95**(6): 597-603.

Kane, E. C., Ochoa, R. 2006. Detection and identification of the red palm mite *Raoiella indica* Hirst (Acari: Tenuipalpidae). unpaginated. [USDA document] http://www.sel.barc.usda.gov/acari/PDF/indicaGuide.pdf.

Kanzawa, T. 1935. Research into the Fruit-fly *Drosophila suzukii* Matsumura (Preliminary Report). Yamanashi Prefecture Agricultural Experiment Station Report.

King, A. B. S. 1994. Heliothis/Helicoverpa (Lepidoptera: Noctuidae) In: Matthews GA & Tunstall JA, eds. *Insect Pests of Cotton*. Wallingford, UK: CAB International, 39-106.

Kirk, W. D. J. & Terry, L. I. 2003. The spread of the western flower thrips *Frankliniella occidentalis* (Pergande). *Agricultural and Forest Entomology*, **5**: 301-310.

Komazaki, S. 1982. Effects of constant temperatures on population growth of three aphid species, *Toxoptera citricidus* (Kirkaldy), *Aphis citricola* van der Goot and *Aphis gossypii* Glover (Homoptera: Aphididae) on citrus. *Applied Entomology and Zoology*, **17**(1):75-81.

Komazaki, S. 1988. Citrus aphid population studies. *Applied Entomology and Zoology Tokyo* **23**: 220-227.

Kondo, T. & Evans, G. A. 2013. *Singhiella simplex* (Singh) (Hemiptera: Aleyrodidae), a new aleyrodid invasive species for Colombia. *Boletín del Museo de Entomología de la Universidad del Valle*, **13**(2): 31-33.

Kondo, T. & Gullan, P. J. 2007. Taxonomic review of the lac insect genus *Paratachardina* Balachowsky (Hemiptera: Coccoidea), with a revised key to genera of Kerriidae and description of two new species. *Zootaxa*, **1617**: 1-41.

Kondo, T., Gullen, P. & Portilla, A. A. R. 2012. Report of new invasive scale insects (Hemiptera: Coccoidea), *Crypticerya multicicatrices* Kondo and Unruh (Monophlebidae) and *Maconellicoccus*

hirsutus (Green) (Pseudococcidae), on the islands of San Andres and Providencia, Colombia. Insecta Mundi 0265: 1-17.

Kondo, T., Peronti, A. L., Kozár, F. & Szita, E. 2013. The citrus orthezia, *Praelongorthezia praelonga* (Douglas) (Hemiptera: Ortheziidae), a potential invasive species. In: Peña, JE, ed. *Potential Invasive Pests*. Wallingford, UK: CAB International. pp. 301-319.

Kondo, T., Ramos-Portilla, A. A., Peronti, A. L. B. G. & Gullan, P. J. 2016. Known Distribution and Pest Status of Fluted Scale Insects (Hemiptera Momphlebidae Iceryini) in South America. Redia XCIX: 187-195.

Kondo, T. & Unruh, C.M. 2009 A new species of *Crypticerya* Cockerell (Hemiptera: Monophlebidae) from Colombia, with a key to species of the tribe iceryini found in South America. Neotropical Entomology 38(1): 92-100.

Kozár, F. 2004. *Ortheziidae of the World*. Plant Protection Institute, Hungarian Academy of Sciences, Budapest.

Kramer, J. P. 1979. Taxonomic study of the planthopper genus *Myndus* in the Americas (Homoptera: Fulgoroidea: Cixiidae). *Transactions of the American Entomological Society*, **105**(3): 301-389.

Kriticos, D. J., Ota, N., Hutchison, W. D., Beddow J., Walsh, T., Tay, W. T., Borchert, D. M., Paula-Moraes, S. V., Czepak, C. & Zalucki, M. P. 2015. The potential distribution of invading *Helicoverpa armigera* in North America: is it just a matter of time? *PLoS One*, 10(3) doi: 10.1371/journal.pone.0119618. eCollection 2015. Erratum in: PLoS One. 2015;10(7).

Kumar, V., Francis, A., Ahmed, M. Z., Mannion, C., Stocks, I., Rohrig, E., McKenzie, C. L. & Osborne, L. S. 2016. Solanum whitefly, Pepper whitefly. *Aleurotrachelus trachoides* Back (Insecta: Hemiptera: Aleyrodidae: Aleyrodinae) Featured Creatures. University of Florida. http://entnemdept.ufl.edu/creatures/veg/Aleurotrachelus_trachoides.htm. Accessed on 1st January 2018.

La Fage J. 1987. Practical considerations of the Formosan subterranean termite in Louisiana: a 30-year-old problem. In: Tamashiro M, Su NY, eds. *Biology and control of the Formosan subterranean termite*. Honolulu, USA: College of Tropical Agriculture Human Resources, University of Hawaii, 37-42.

Lai, P. Y., Tamashiro, M., Yates, J. R., Su, N. Y, Fujii, J. K. & Ebesu, R. H. 1983. Living plants in Hawaii attacked by *Coptotermes formosanus*. *Proceedings of the Hawaiian Entomological Society*, **24** (2/3): 283-286.

Lammers, J. W., Macleod, A. (2007) Report of a Pest Risk Analysis *Helicoverpa armigera* (Hübner, 1808). Plant Protection Service (NL) and Central Science Laboratory (UK) joint Pest Risk Analysis for *Helicoverpa armigera*.

Leathers, J. 2015. California Pest Rating Proposal. *Euwallacea* sp. nr. *fornicactus*: Polyphagous Shot Hole Borer (PSHB). California Department of Food and Agriculture. Available at http://blogs.cdfa.ca.gov/Section3162/?tag=polyphagous – shot hole borer

Ledford, H. 2017. Geneticists enlist engineered virus and CRISPR to battle Citrus Disease. https://www.scientificamerican.com/article/geneticists-enlist-engineered-virus-and-crispr-to-battle-citrus-disease/. *Scientific American*. 16.05.2017.

Legaspi, J. S., Mannion, C., Amalin, D. & Legaspi Jr., B. C. 2011. Life table analysis and development of *Singhiella simplex* (Hemiptera: Aleyrodidae) under different constant temperatures. *Annals of the Entomological Society of America*, **104** (3): 451-458.

Lemos, L. N., Adaime, R., Jesus-Barros, C. R. & Deus, E. G. **2014**. New Hosts of *Bactrocera carambolae* (Diptera: Tephritidae) in Brazil. *Florida Entomologist*, **97**: 841–847.

Levy, J. 1996. Banana Inspection Guidelines (Re: Pink Mealybug). Riverdale, Maryland, USA: United States Department of Agriculture, Animal and Plant Health Inspection Service.

Liefting, L. 2008. New *Candidatus* Liberibacter species infecting solanaceous crops. *Biosecurity*, **85**: 21.

Lima, C. C. A. & Barbosa, S. M. L. 1988. Aspectos biologicos de *Curinus* sp., um predador da cochonilha-da-palma forrageira. *Pesquisa Agropecuaria Brasileira*, **23**: 103-105.

Lowe, S. J., Browne, M. & Boudjelas, S. 2000. *100 of the World's Worst Invasive Alien Species.* IUCN/SSC Invasive Species Specialist Group (ISSG), Auckland, New Zealand.

Lu, Y., Zeng, L., Wang L; Xu, Y. & Chen K, 2008. Guard against a dangerous invasion of China *Phenacoccus*. Precaution of solenopsis mealybug *Phenacoccus solenopsis* Tinsley. *Journal of Environmental Insects*, **4**: 1.

Lublinkhof, J. & Foster D. E. 1977. Development and reproductive capacity of *Frankliniella occidentalis* (Thysanoptera: Thripidae) reared at three temperatures. *Journal of the Kansas Entomological Society*, **50** (3): 313-316.

McKenzie, H. L. 1967. *Mealybugs of California, with taxonomy, biology, and control of North American species (Homoptera: Coccoidea: Pseudococcidae).* University of California Press, Berkeley, California. viii+526 pp.

Malumphy, C. 2005. The Neotropical solanum whitefly, *Aleurotrachelus trachoides* (Back) (Hem., Aleyrodidae), intercepted in the UK on sweet potato leaves imported from Gambia. *Entomologist's Monthly Magazine*, **141**: 94.

Malumphy, C. 2011. First incursions of the bougainvillea mealybug *Phenacoccus peruvianus* in Britain. *Entomologist's Monthly Magazine*, **147**: 230-232.

Malumphy, C. 2014. An annotated checklist of scale insects (Hemiptera: Coccoidea) of Saint Lucia. *Zootaxa*, **3846** (1): 69-86. http://www.mapress.com/zootaxa/2014/f/zt03846p086.pdf.

Malumphy, C. 2017. Scale insects (Hemiptera: Coccoidea) intercepted in England on fresh soursop, *Annona muricata,* fruit imported from the Neotropical Region. *Entomologist's Gazette*, **68**: 263–271.

Malumphy, C. & Eyre, D. 2011. Bougainvillea Mealybug *Phenacoccus peruvianus*. Plant Fact Sheet. The Food and Environment Research Agency (FERA), 1-4.

Malumphy, C., Hamilton, M.A., Manco, B.N., Green, W.C., Sanchez, M.D., Corcoran, M. & Salamanca, E. 2012. *Toumeyella parvicornis* (Hemiptera: Coccidae) Causing Severe Declie of *Pinus caribaea* var. *bahamensis* in the Turks and Caicos Islands. *Florida Entomologist*, **95** (1): 113-119.

Malumphy, C., Hamilton, M.A., Sanchez, M.D. & Green, P.W.C. 2016. Trapping confirms aerial recruitment of pine tortoise scale (*Toumeyella parvicornis* (Cockerell)) (Hemiptera: Coccidae) in the Turks and Caicos Islands. *Entomologist's Monthly Magazine*, **152** (3): 193-200.

Malumphy, C. & Marquart, C. 2012 Queen Sago Palm (*Cycas circinalis* L.) Killed by Asian Cycal Scale *Aulacaspis yasumatsui* Takagi (Hemiptera: Diaspididae) in Britain. *Entomologist's Monthly Magazine*, **148**: 147-154.

Malumphy, C. Sanchez, M. D Hamilton, M. A. 2015. First report of lesser snow scale *Pinnaspis strachani* (Cooley) (Hemiptera: Diaspididae) killing *Varronia rupicola* (Urb.) Britton in the British Virgin Islands. *Entomologist's Monthly Magazine*, **151**: 285-288.

Mani, M. 1989. A review of the pink mealybug - *Maconellicoccus hirsutus* (Green). *Insect Science and its Application*, **10**(2): 157-167.

Mann, R. S. & Stelinski, L. L. 2017. Spotted-Wing Drosophila *Drosophila suzukii* (Matsumura) (Insecta: Diptera: Drosophilidae). Department of Entomology and Nematology, UF/IFAS Extension Factsheet. http://edis.ifas.ufl.edu/in887.

Mannion, C. 2010. Whiteflies in the landscape. University of Florida, IFAS Extension Bulletin, Nov., 2010. http://trec.ifas.ufl.edu/mannion/pdfs/Whitefly%20in%20the%20Landscape%20%20Nov2010.pdf. Accessed on 12/10/2014.

Mannion, C., Hunsberger, A., Gabel, K., Buss, E. & Buss, L. 2006. Sri Lanka weevil (*Myllocerus undatus*). University of Florida/IFAS, Tropical Research and Education Center, Homestead. August 2006: pp. 1-2. http://trec.ifas.ufl.edu/mannion/pdfs/SriLankaWeevil.pdf. Accessed 1st January 2018.

Mannion, C., Osborne, L., Hunsberger, A., Mayer H. & Hodges G. 2008. Ficus whitefly: A new pest in South Florida. University of Florida, IFAS Extension Bulletin, August 2008. http://miami-dade.ifas.ufl.edu/Pests_HT.shtml. Accessed on 12/10/2014.

Marchioro, C. A. 2016. Global Potential Distribution of *Bactrocera carambolae* and the Risks for Fruit Production in Brazil. *PLoS ONE*, **11**(11): e0166142.

Marohasy, J. 1994. October-December; The pest status of *Phenacoccus parvus* Morrison (Homoptera: Pseudococcidae). *International Journal of Pest Management*, **40**: 337-340.

Marohasy, J. 1997. Acceptability and suitability of seven plant species for the mealybug *Phenacoccus parvus*. *Entomologia Experimentalis et Applicata*, **84:** 239-246.

Martin, N. A. 2008. Host plants of the potato/tomato psyllid: a cautionary tale. *The Weta*, **35**(1): 12-16.

Martin, N. A. 2016. Tomato potato psyllid - *Bactericera cockerelli*. Interesting Insects and other Invertebrates. New Zealand Arthropod Factsheet Series Number 60. http://nzacfactsheets.landcareresearch.co.nz/Index.html. ISSN 1179-643X.

Martin, K. W., Hodges, A.C. & Leppla, N.C. 2012. Asian citrus psyllid factsheet. IDTools.org. http://idtools.org/id/citrus/pests/factsheet.php?name=Asian%20citrus%20psyllid.

Martin, J. H. & Mound, L. A. 2007. An annotated check list of the world's whiteflies (Insecta: Hemiptera: Aleyrodidae). *Zootaxa*, **1492**: 1-84.

Martini, X., Hoyte, A & Stelinski, L. L. 2014. Abdominal color of the Asian citrus psyllid (Hemiptera: Liviidae) is associated with flight capabilities. *Annals of the Entomological Society of America*, **107**: 842–847.

Matsumoto, K., Samosat, S. & Irianto-Ragil, S.B. 1996. Biology of the Green Lined Albizzia Longicorn, *Xystrocera globosa* Oliver (Coleoptera:Cerambycidae), from Sumatra, Based on Laboratory Breeding. *Tropics*, **6**(1-2): 79-89.

Matsumoto, K., Irianto-Ragil, S.B. & Kitajima, H. 2000. Biology of the Japanese green-lined albizzia longicorn, *Xystrocera globosa* (Coleoptera: Cerambycidae). *Entomological Science*, **3**(1): 33-42.

Mazzi, D., Bravin, E., Meraner, M., Finger, R., & Kuske, S. 2017. Economic Impact of the Introduction and Establishment of *Drosophila suzukii* on Sweet Cherry Production in Switzerland. *Insects*, **8**(1): 18. http://doi.org/10.3390/insects8010018.

Mead, F. W. 1994. Entomology Section, *Tri-ology*, **33**(5): 9 pp.

Mendel, Z., Protasov, A., Sharon, M., Zveibil, A., Yehuda, S. B., O'Donnell, K., et al. 2012. An Asian ambrosia beetle *Euwallacea fornicates* and its novel symbiotic fungus *Fusarium* sp. pose a serious threat to the Israeli avocado industry. *Phytoparasitica*, **40**(3): 235-238.

Michaud, J. P. 1998. A Review of the Literature on *Toxoptera citricida* (Kirkaldy) (Homoptera: Aphididae). *The Florida Entomologist*, 81:1.

Michel, B., Étienne, J. & Ovarbury, T. 2008. A new invasive Thrips in the French Antilles: *Holopothrips tabebuia* (Thys., Phlaeothripidae). *Bulletin de la Société Entomologique de France*, **113**(4): 419-420.

Miller, D. R. 2005. Selected scale insect groups (Hemiptera: Coccoidea) in the Southern Region of the United States. *Florida Entomologist*, **88** (4): 482-501.

Miller, D. R. & Davidson, J. A. 1990. A List of the Armored Scale Insect Pests. In: D. Rosen (ed.), *Armored Scale Insects, Their Biology, Natural Enemies and Control [Series title: World Crop Pests, Vol. 4B].* Elsevier, Amsterdam, the Netherlands, 688 pp.

Miller, D. R. Davidson, J.A. 2005. *Armored Scale Insect Pests of Trees and Shrubs.* Cornell Univ. Press Ithaca, NY 442 pp.

Mohammad, Z.K. & Moharum, F.A. 2013. Key to the species of family Coccidae in Egypt (Hemiptera: Coccoidea: Coccidae). *Egyptian Academic Journal of Biological Science*, **6** (2): 145–158.

Montalva, C., Rojas, E., Ruiz Gouet, C. & Lanfranco, D. 2010. The cypress aphid in chile: A review of the current situation and preliminary data of the biological control. *Bosque*, **31**: 81-88.

Morse, J.G. & Hoddle, M. S. 2006. Invasion biology of thrips. *Annual Review of Entomology*, **51**: 67-89. http://www.annualreviews.org.

Morrison L. W., Porteer, S. D., Daniels E., Korzukhin, M. D. 2004. Potential global range expansion of the invasive fire ant, *Solenopsis invicta*. *Biological Invasions*, **6**: 183-191.

Morton, J. F. & Dowling, C. F. 1991. The Spineless Yucca Deserves More Attention as an Ornamental and Food Plant. *Proceedings of the Florida State Horticultural Society*, **104**: 341-345.

Mound, L. A. 2007. Thysanoptera (Thrips) of the World – a checklist. http://www.ento.csiro.au/thysanoptera/worldthrips.php. Assessed 1st February 2017.

Mound L. A. & Halsey S. H. 1978. *Whiteflies of the World*. Chichester, UK: British Museum (Natural History) / John Wiley & Sons, 340 pp.

Mound, L. A. & Marullo, R. 1996. The Thrips of Central and South America: An Introduction (Insect: Thysanoptera). *Memoirs on Entomology International*, **6**: 1-487.

Moutia, L.A. 1958. Contribution to the study of some phytophagous Acarina and their predators in Mauritius. *Bulletin of Entomological Research*, **49**: 59-75.

Moznette, G. F. 1922. The avocado, its insect enemies and how to combat them. U.S. Department of Agriculture, *Farmers' Bulletin*, **1261**. 31 pp.

MSU Extension, 2016.

Munyaneza, J. E. 2012. Zebra chip disease of potato: biology, epidemiology, and management. *American Journal of Potato Research*, **89**(5): 329-350.

Murphy, S. T. *et al.* 1996. Status and impact of invasive conifer pests in Africa. pp. 289-297. In Nair, KSS *et al.*, eds. *Impact of diseases and insect pests in tropical forests. Proceedings of the IUFRO Symposium,* Peechi, India, 23-26 November 1993.

Murúa, M. G., Scalora, F. S., Navarro, F. R., Cazado, L. E., Casmuz, A., Villagrán, M. E, et al. 2014. First record of *Helicoverpa armigera* (Lepidoptera: Noctuidae) in Argentina. *Florida Entomologist*, **97**: 854–856. doi: 10.1896/054.097.0279.

NAPPO. 2014. Phytosanitary Alert System: Old world bollworm, *Helicoverpa armigera* (Lepidoptera: Noctuidae), detected in Puerto Rico. NAPPO. http://www.pestalert.org/oprDetail.cfm?oprID=600&keyword=helicoverpa%20armigera.

Neal, A. 2013. Sri Lankan weevil, *Myllocerus undecimpustulatus undatus* Marshall (Coleoptera: Curculionidae, Entiminae). University of Florida/IFAS extension. Publication number: EENY-579 http://entnemdept.ufl.edu/creatures/orn/sri_lankan_weevil.htm. Accessed 1st January 2018.

Ness, J. H., Bronstein, J. L. 2004. The effects of invasive ants on prospective ant mutualists. *Biological Invasions*, **6**: 445-461.

Netherlands Plant Protection Service. 2009. Short PRA *Scyphophorus acupunctatus,* Sisal Weevil. Wageningen, The Netherlands.

O'Boyle, B., Green, P. & Malumphy, C. 2017. Pest Risk Analysis (PRA) for: *Scyphophorus acupunctatus*. Fera Science Ltd., 37pp.

O'Brien, C. W., Haseeb, M. & Thomas, M. C. 2006. *Myllocerus undecimpustulatus undatus* Marshall (Coleoptera: Curculionidae), a recent discovered pest weevil from the Indian subcontinent. *Florida Department of Agriculture and Consumer Services, Entomology Circular*, **412**: 1-4. (http://www.freshfromflorida.com/content/download/36460/840137/ento412.pdf. Accessed 1st January 2018.

OEPP/EPPO. 2005. *Maconellicoccus hirsutus*. *Bulletin OEPP/EPPO Bulletin*, **35**: 413–415.

OEPP/EPPO. 2011. *Sternochetus mangiferae Bulletin OEPP/EPPO Bulletin*, **41**: 352–356.

Oetting, R. D. 1984. Biology of the cactus scale, *Diaspis echinocacti* (Bouché) (Homoptera: Diaspididae). *Annals of the Entomological Society of America*, **77**: 88-92.

Osborne, J. 2002. Century plant devastation. *The BVI Beacon* **19** (22): 1, 24.

Owolabi, T. A., Taiwo, M. A., Thottappilly, G. A., Shoyinka, S. A., Proll, E. & Rabenstein, F. 1998. Properties of a virus causing mosaic and leaf curl disease of *Celosia argentea* L. in Nigeria. *Acta Virologica*, **42** (3):133-139; 27 ref.

Paap, T., De Beer, Z. W., Migliorini, D., Nel, W. J. & Wingfield, M. J. 2018. The Polyphagous shot hole borer (PSHB) and its fungal symbiont *Fusarium euwallaceae*: a new invasion in South Africa. *Australasian Plant Pathology*, https://doi.org/10.1007/s13313-018-0545-0.

Pascoe, A. 2001. Turning up the heat on fire ants. *Biosecurity*, **32**: 6.

Pemberton, R. W. 2003. Invasion of *Paratachardina lobata lobata* (Hemiptera: Kerriidae) in South Florida: a snapshot sample of an infestation in a residential yard. *Florida Entomologist*, **86**: 373-377.

Peña, J. E., Sundhari, S., Hunsberger, A., Duncan, R., & Schaffer, B. 1998. Monitoring, damage, natural enemies and control of the avocado lace bug, *Pseudacysta perseae* (Hemiptera: Tingidae). *Proceeding of the Florida State Horticultural Society*, **111**: 330–334.

Peña, J. E., Duncan, R. E., Roltsch, W. J. & Carrillo, D. 2012. Mortality Factors of the Avocado Lace Bug, *Pseudacysta Perseae* (Heteroptera: Tingidae), in Florida. *Florida Entomologist*, **95**(1): 179-182.

Perry, G. 2004. Why did the Beetle Cross the Sea? The Search for Invasives in the BVIs. *ISSG Aliens*, 2004: 19-20.

Peters, T. 1999. The pink mealybug (*Maconellicoccus hirsutus*) in Grenada. Paper presented at the Evaluation Workshop on Biological Control of Hibiscus Mealybug, *Maconellicoccus hirsutus* in the Caribbean sub region, 11-12 March 1999, Trinidad and Tobago.

Peters T. & Watson G.W. 1999. The biological control of Hibiscus mealybug in Grenada. In: Bell K, ed. *Paths to prosperity: science and technology in the Commonwealth 1999/2000*. London, UK: Kensington Publications, 130-132.

Jn Pierre, L. 2008. *Mitigating the Threat of Invasive Alien Species in the Insular Caribbean (Saint Lucia).* Report to CABI. 56 pp.

Pio-Ribeiro, G., Pappu, S. S., Pappu, H. R., Andrade, G. P. & Reddy, D. V. R. 2000. Occurrence of cowpea aphid-borne mosaic virus in peanut in Brazil. *Plant Disease*, **84**(7):760-766.

Plantwise. 2018. Plantwise Technical Factsheet. Cottony cushion scale (*Icerya purchasi*) www.plantwise.org/KnowledgeBank/Datasheet.aspx?dsid=28432. Accessed 27/03/2018.

Pollard, G. V. 1995. Pink or hibiscus mealybug in the Caribbean. *CARAPHIN News*, **12**: 1-2.

Porter, S. D. & Tschinkel, W. R. 1993. Fire ant thermal preferences: behavioural control of growth and metabolism. *Behavioural Ecology and Sociobiology*, **32**: 321–329.

Porter, S. D., Williams, D. F., Patterson, R. S. & Fowler, H. G. 1997. Inter-continental differences in the abundance of *Solenopsis* fire ants (Hymenoptera: Formicidae): an escape from natural enemies? *Environmental Entomology*, **26**: 373–384.

Pott, J. N. 1976. A yucca borer, *Scyphophorus acupunctatus*, in Florida. *Proceedings of the Florida State Horticultural Society*, **88**: 414-416.

Procter, D. & Fleming, L. V. 1999. Biodiversity: the UK Overseas Territories. Joint Nature Conservation Committee, Peterborough.

Purcell, A. H. 1985. The ecology of plant diseases spread by leafhoppers and planthoppers. In: Nault, LR, Rodriguez, JG, eds. *The leafhoppers and planthoppers*. pp. 351-380. New York, USA: Wiley

Qin, T.K., Gullan, P.J., Beattie, G.A.C., Trueman, J.W.H., Cranston, P.S., Fletcher, M.J. & Sands, D.P.A. 1994. The current distribution and geographical origin of the scale insect pest *Ceroplastes sinensis* (Hemiptera: Coccidae). *Bulletin of Entomological Research*, **84**: 541-549.

Ramirez Choza, J. L. 1984. Population dynamics and method to control the hemp weevil *Scyphophorus interstitialis* Gylh (Coleoptera: Curculionidae) in Yucatan. *Centro Agricola*, **11**(3):107-108.

Ramirez Garcia, L., Bravo Mojica H. & Llanderal Cazares C. 1987. Development of *Spodoptera frugiperda* (J.E. Smith) (Lepidoptera: Noctuidae) under different conditions of temperature and humidity. *Agrociencia*, **67**: 161-171.

Raut, S. K. & Ghose, K. C. 1984. Pestiferous land snails of India. *Technical Monograph, Zoological Survey of India*, No. 11: 151 pp.

Reboul, J. L. 1976. Principaux parasites et maladies des plantes cultivées en Polynesie Française. *Service de l'Economie Rurale. Recherche Agronomique, Pirae*. No. **129**/ER/RA. 58 pp.

Reitz, S. R. 2008. Comparative bionomics of Frankliniella occidentalis and Frankliniella tritici. *Florida Entomologist*, **91** (3): 474-476. http://www.fcla.edu/FlaEnt/.

Remaudière, G. & Binazzi, A. 2003. Les Cinara du Pakistan. II. Le sous-genre *Cupressobium* (Hemiptera, Aphidinae, Lachninae). *Revue francaise d'entomologie*, **25**(2): 85-96.

Ring, D. R, Henderson, G. & McCown, C. R. 2002. Evaluation of the Louisiana State program to treat trees infested with Formosan subterranean termites (Isoptera: Rhinotermidae). In: Jones, SC, Zhai, J & Robinson, WH, eds. *Proceedings of the 4th International Conference on Urban Pests, Charleston, South Carolina*. 259-266.

Roda, A., Kairo, M., Damian, T., Franken, F., Heidweiller, K., Johanns, C. & Mankin R. 2011. Red palm weevil (*Rhynchophorus ferrugineus*), an invasive pest recently found in the Caribbean that threatens the region. *Bulletin OEPP/EPPO Bulletin*, **41**(2): 116-121. http://onlinelibrary.wiley.com/journal/10.1111/(ISSN)1365-2338.

Ruitong, G., Guohong, L. & Guangwu, L. 1998 [Research and application on Bait of *Apriona germari*]. *Forest Science and Technology*, **30**: 376–380.

Ruiz-Montiel, C., Garcia-Coapio, G., Rojas, J. C., Malo, E. A., Cruz-Lopez, L., del Real, I. & Gonzalez-Hernandez, H. 2008. Aggregation pheromone of the agave weevil, *Scyphophorus acupunctatus*. *Entomologia Experimentalis et Applicata*, **127**(3): 207-217.

Russo, A. & Siscaro, G. 1994 *Diaspis echinocacti* fitomizo del fico d'India in Sicilia. *Informatore Agrario*, **50**: 37, 73-76.

Sadana, G. L. 1997. False spider mites infesting crops in India. New Delhi, India: Kalyani Publishers, 201 pp.

Sagarra, L. A. & Peterkin, D. D. 1999. Invasion of the Caribbean by the hibiscus mealybug, *Maconellicoccus hirstus* Green (Homoptera: Pseudococcidae. *Phytoprotection*, **80**: 103-113.

Sakamaki Y. 2005 Possible migration of the Asian citrus psyllid, *Diaphorina citri* Kuwayama (Homoptera: Psyllidae) between and within islands. *Occasional Papers, Kagoshima University Research Centre*, **42**: 121–125.

Sauers Muller, A. 2005. Host Plants of the Carambola Fruit Fly, *Bactrocera carambolae* Drew &Hancock (Diptera: Tephritidae), in Suriname, South America. *Neotropical Entomology*, **34**(2):203-214.

Seewooruthun, S. I., Permalloo, S., Sookar, P. & Soonnoo, A. R. 2000. The oriental fruit fly, *Bactrocera dorsalis* eradicated from Mauritius. In: Price NS, Seewooruthun I, eds. Proceedings of the Indian Ocean Commission, Regional Fruit Fly Symposium, Flic en Flac, Mauritius, 5th-9th June, 2000 Quatre Bornes, Mauritius: Indian Ocean Commission, 207-210.

Setliff, G. P. & Anderson, J. A. 2011. First Record of the Agave Snout Weevil, *Scyphophorus acupunctatus* Gyllenhal (Coleoptera: Curculionidae: Dryophthorinae), in Puerto Rico. *Insecta Mundi*, **152**: 1–3.

Seymour, P. R., Roberts, H. & Davis, M.E (Compilers). 1985. Insects and other invertebrates found in plant material imported into England and Wales, 1984. Reference Book, Ministry of Agriculture, Fisheries and Food, UK, 442/84.

Sforza, R., Bourgoin, T., Wilson, S.W. & Boudon-Padieu, E. 1999. Field observations, laboratory rearing and descriptions of immatures of the planthopper *Hyalesthes obsoletus* (Hemiptera: Cixiidae). *European Journal of Entomology*, **96**: 409-418, 1999.

Shelly, R. 2014. A consolidated account of the polymorphic Caribbean milliped, *Anadenobolus monilicornis* (Porat, 1876) (Spirobolida: Rhinocricidae), with illustrations of the holotype. *Insecta Mundi*, **0378**: 1-12.

Shimizu, K. & Fujisaki, K. 2002. Sexual differences in diapause induction of the cotton bollworm, *Helicoverpa armigera* (Hb.) (Lepidoptera: Noctuidae). *Applied Entomology and Zoology*, **37**: 527-533.

Shimwela, M. M., Narouei-Khandan, H. A., Halbert, S. E., Keremane, M. L., Minsavage, G. V., Timilsina, S., Protas Massawe, D., Jones, J.B. & van Bruggen, A.H.C. 2016. First occurrence of *Diaphorina citri* in East Africa, characterization of the *Ca*. Liberibacter species causing huanglongbing (HLB) in Tanzania, and potential further spread of *D. citri* and HLB in Africa and Europe. *European Journal of Plant Pathology*, **146**(2): 349–368.

Shukla, R. P. & Tandon, P.L., 1985. Bio-ecology and management of the mango weevil, *Sternochetus mangiferae* (Fabricius) (Coleoptera: Curculionidae). *Current Science*, **53**: 593-594.

Simonson, S. E., Stohlgren, T. J., Tyler, L., Gregg, W.P., Muir, R., & Garrett, L.J. 2005. Preliminary assessment of the potential impacts and risks of the invasive cactus moth, *Cactoblastis cactorum* Berg, in the U.S. and Mexico. *Final Report to the International Atomic Energy Agency*, April 25, 2005.

Singh, K. 1931. A contribution towards our knowledge of the Aleyrodidae (Whiteflies) of India. *Memoirs of the Department of Agriculture in India*, **12**: 1-98.

Singh, R. 1999. Socio-economic impact and evaluation of the HMB control programme. Paper presented at the Evaluation Workshop on Biological Control of Hibiscus Mealybug, *Maconellicoccus hirsutus* in the Caribbean sub region, 11-12 March 1999, Trinidad and Tobago.

Smith, I. M., McNamara, D. G., Scott, P. R. & Holderness, M. 1997. Palm lethal yellowing phytoplasma. Quarantine Pests for Europe, second edition. Wallingford, UK: CABI, 6 pp. https://www.eppo.int/QUARANTINE/data_sheets/bacteria/PHYP56_ds.pdf.

Smith, I.M., McNamara, D. G., Scott, P. R . & Holderness, M. 1997. Spodoptera frugiperda. In: Quarantine Pests for Europe, 2nd Edn., CABI/EPPO, Wallingford, 1425pp.

Solis, M. A., Stemphen, D. H. & Gordon D. R. 2004. Tracking the Cactus Moth, *Cactoblastis cactorum* Berg., as it flies and eats its way westward in the U.S. News of the Lepidopterists' Society.

Steck, G. J, Ekesi, S. 2015. Description of third instar larvae of *Ceratitis fasciventris*, *C. anonae*, *C. rosa* (FAR complex) and *C. capitata* (Diptera, Tephritidae). *ZooKeys*, **540**:443-466. doi:10.3897/zookeys.540.10061.

Stewart, J. S. & Vinson, S. B. 1991. Red imported fire ant damage to commercial cucumber and sunflower plants. *Southwestern Entomologist*, **16**: 168-170.

Stiling, P. 2002. Potential non-target effects of a biological control agent, prickly pear moth, *Cactoblastis cactorum* (Berg) (Lepidoptera: Pyralidae), in North America, and possible management actions. *Biological Invasions*, **4**: 273-281.

Stringer, L. D., Suckling, M. D., Baird, D., Vander Meer, R. K., Christian, S. J. & Lester, P. J. 2011. Sampling efficacy for the Red Imported Fire Ant *Solenopsis invicta* (Hymenoptera: Formicidae). *Environmental Entomology*, **40** (5): 1276-1284.

Suroshe, S. S., Gautam, R. D. & Fand, B. B. 2016. Biology of Mealybug, *Phenacoccus solenopsis* Tinsley on *Parthenium*. *Indian Journal of Entomology*, **78** (3): 264-267.

Suszkiw, J. 1998. The Formosan termite: A formidable foe. *Agricultural Research*, **46**: 4-9.

Suszkiw, J. 2000. Taking aim at Formosal subterranean termites. *Agricultural Research*, **48**: 12-15.

Swarbrick, J. T. & Donaldson, J. F. 1991. Host range studies with the lantana mealybug (*Phenacoccus parvus* Morrison). *Plant Protection Quarterly*, **6**: 68-69.

Symes, C. B. 1924. Notes on the black citrus aphis. *Rhodesia Agricultural Journal*, **11**: 612-626.

Szyniszewska, A. M. & Tatem, A. J. 2014. Global Assessment of Seasonal Potential Distribution of Mediterranean Fruit Fly, *Ceratitis capitata* (Diptera: Tephritidae). *PLoS ONE*, **9**(11): e111582. doi:10.1371/journal.pone.0111582.

Taber, S. W. 2000. Fire Ants. College Station, Texas: Texas A&M University Press, 308 pp.

Teerling, C. R., Pierce, H. D. Jr; Borden, J. H. & Gillespie, D. R. 1993. Identification and bioactivity of alarm pheromone in the western flower thrips, *Frankliniella occidentalis*. *Journal of Chemical Ecology*, **19** (4): 681-697.

Thomas, M. C. 2005. *Myllocerus undatus* Marshall, a weevil new to the Western Hemisphere. Florida Department of Agriculture and Consumer Services Pest Alert, DACSP-01635. http://freshfromflorida.s3.amazonaws.com/myllocerus-undatus.pdf. Accessed 1st January 2018.

Tsai, J. H & Kirsch, O. H. 1978. Bionomics of *Haplaxius crudus* (Homoptera: Cixiidae). *Environmental Entomology*, **7**(2): 305-308.

Tsai, J. H., Lee, R.F., Liu, Y.H. & Niblett C.L. 2009. Biology and Control of Brown Citrus Aphid (*Toxoptera citricida* Kirkaldy) and Citrus Tristeza. In Radcliffe's IPM World Textbook. (http://ipmworld.umn.edu/chapters/tsaietal.htm).

Tschinkel, W. R. 1993. Resource allocation, brood production and cannibalism during colony founding in the fire ant, *Solenopsis invicta*. *Behavioral Ecology and Sociobiology, 33: 209-223.*

Unruh, C.M. Gullan, P.J. 2008 Identification guide to species in the scale insect tribe Iceryini (Coccoidea: Monophlebidae).. Zootaxa 1803: 1-106.

USDA factsheet. 2014. *Helicoverpa armigera*. https://www.aphis.usda.gov/plant_health/plant_pest_info/owb/.../owb-factsheet.pdf.

USDA. 1988. List of Intercepted Plant Pests, Fiscal Year 1987. Hyattsville, Maryland, USA: United States Department of Agriculture, Animal and Plant Health Inspection Service PPQ.

Valdes-Estrada, M. E., Hernandez Reyes, M. C., Gutierrez-Ochoa, M. & Aldana-Llanos, L. 2010. Determination of the life cycle of *Scyphophorus acupunctatus* (Coleoptera: Curculionidae) under laboratory conditions. *Florida Entomologist*, **93**(3): 398–402.

Valentine, B. D. & Ivie, M. A. 2005. Beetles: Coleoptera. In Lazell, J, ed. *Island: Fact and Theory in Nature*, Berkeley: University of California Press. 274-282.

Vargas, R. I., Piñero, J. C. & Leblanc L. 2015. An overview of pest species of bactrocera fruit flies (Diptera: Tephritidae) and the integration of biopesticides with other biological approaches for their management with a focus on the Pacific region. *Insects*, **6**(2): 297-318. http://www.mdpi.com/2075-4450/6/2/297/htm/

Velasco, G. D. N., Moura, R.G., Berti Filho, E. & do Couto, H. T. Z. 2011. Avaliação da infestação por *Singhiella simplex* (Hemiptera: Aleyrodidae) em *Ficus benjamina* no município de São Paulo, SP, Brasil. *Revista de Agricultura*, **86** (2): 134-131.

Vinson, S. B. 1997. Invasion of the red imported fire ant: spread, biology and impact. *American Entomologist*, **43**: 23-39.

Walker, K. 2008a. Host Plants: Sisal weevil (*Scyphophorus acupunctatus*) Pest and Diseases Image Library. Updated on 10/13/2008 4:51:31 PM. Available online: http://www.padil.gov.au.

Walker, K. 2008b. Aleurotrachelus whitefly (*Aleurotrachelus trachoides*). Updated on 11/25/2011. Available online: PaDIL - http://www.padil.gov.au. Accessed on 1st January 2018.

Walker, K. 2008c. Cardin's whitefly (*Metaleurodicus cardini*). Updated on 11/25/2011. Available online: PaDIL - http://www.padil.gov.au. Accessed on 1st January 2018.

Wang, Y, Watson, G. W. & Zhang, R. 2010. The potential distribution of an invasive mealybug *Phenacoccus solenopsis* and its threat to cotton in Asia. *Agricultural and Forest Entomology*, **12**: 403–416. DOI: 10.1111/j.1461-9563.2010.00490.x

Wang, D.X., Zhi, L., Ping L. & ZhiHua G. 2002. The main diseases and pests of pomegranate in Huaiyuan area and their control. *China Fruits*, No.1: 36-38.

Waring, G. L. & Smith, R. L. 1986. Natural history and ecology of *Scyphophorus acupunctatus* (Coleoptera: Curculionidae) and its associated microbes in cultivated and native agaves. *Annals of the Entomological Society of America*, **79**(2): 334-340.

Watson, G. W. *et al.* 1999. Biogeography of the *Cinara cupressi* complex (Hemiptera: Aphididae) on Cupressaceae, with description of a pest species introduced into Africa. *Bulletin of Entomological Research*, **89**(3): 271-283.

Welbourn. C. 2006. Red palm mite, *Raoiella indica* Hirst (Acari: Tenuipalpidae). Red palm mite, *Raoiella indica* Hirst (Acari: Tenuipalpidae). unpaginated. [Pest alert] http://www.doacs.state.fl.us/pi/enpp/ento/r.indica.htm.

*Wetterer, J. K. 2013. Exotic spread of Solenopsis invicta (Hymenoptera: Formicidae) beyond North America. Sociobiology, **60**: 50–55.* https://www.google.co.uk/search?q=doi:10.13102/sociobiology.v60i1.50-55.

Wetterer, J. K., Snelling, R. R. 2006. The red imported fire ant, *Solenopsis invicta*, in the Virgin Islands (Hymenoptera: Formicidae). *The Florida Entomologist, **89**(4): 431–434.* http://www.bioone.org/doi/abs/10.1653/0015-4040%282006%2989%5B431%3ATRIFAS%5D2.0.CO%3B2.

White, I. M & Elson-Harris, M. M. 1994. *Fruit flies of economic significance: Their identification and bionomics*. Oxon, UKL: CAB International. 601 pp.

Williams, D. J. 1996. A brief account of the hibiscus mealybug *Maconellicoccus hirsutus* (Hemiptera: Pseudococcidae), a pest of agriculture and horticulture, with descriptions of two related species from southern Asia. *Bulletin of Entomological Research*, **86**(5): 617-628.

Williams, D. J. 2004. *Mealybugs of Southern Asia*. The Natural History Museum, Kuala Lumpur: Southdene SDN. BHD, 896 pp.

Williams, D. J. & Cox, J. M. 1984. Notes on the distribution of *Phenacoccus parvus* Morrison = *P. surinamensis* Green syn. n. (Hem., Pseudococcidae). *Entomologist's Monthly Magazine*, **120:** 139-140.

Williams, D.J. & Granara de Willink, M.C. 1992. *Mealybugs of Central and South America*. Wallingford, UK: CAB International, 635 pp.

Williams, D.J. and Watson, G.W. 1988. The Scale Insects of the Tropical South Pacific Region. Part 1. The Armoured Scales (Diaspididae) CAB International, Wallingford, 290 p.

Williams, D. J. & Watson, G. W. 1988. *The Scale Insects of the Tropical South Pacific Region*. Pt. 2: The Mealybugs (Pseudococcidae). CAB International Institute of Entomology, London. 260 pp.

Williams, D. J. & Watson, G. W. 1990. The scale insects of the tropical South Pacific region. Part 3: the soft scales (Coccidae) and other families. Wallingford, UK: CAB International, 267 pp.

Wilson, S.W. 2005. Keys to the families of Fulgoromorpha with emphasis on planthoppers of potential economic importance in the Southeastern United States (Hemiptera: Auchenorrhyncha). *Florida Entomologist*, **88**(4): 464-481.

Wilson, S. W. & Tsai, J. H. 1982 Descriptions of the immature stages of *Myndus crudus* (Homoptera: Fulgoroidea: Cixiidae). *Journal of the New York Entomological Society*, **90:** 166-175.

Woodiel, N. L. & Tsai, J. H. 1978. A rotary flight trap used for sampling *Haplaxius crudus* (Homoptera: Cixiidae) in coconut groves. *Journal of the New York Entomological Society*, **86**(1): 37-44.

Woodruff, R. E. & Fasulo, T. R. 2015 Mango Seed Weevil, *Sternochetus mangiferae* (Fabricius) Insecta: Coleoptera: Curculionidae). University of Florida IFAS extension EENY-371 *h*ttps://edis.ifas.ufl.edu/pdffiles/IN/IN66600.pdf.

Woodruff, R. E. & Pierce, W. H. 1973. *Scyphophorus acupunctatus*, a weevil pest of Yucca and Agave in Florida (Coleoptera: Curculionidae). Florida Department of Agriculture and Consumer Services, Entomology Circular No. 135. Gainesville.

Yen, A. L. & Burckhardt, D. 2012. Diagnostic Protocol for the detection of the Tomato Potato Psyllid, *Bactericera cockerelli* http://plantbiosecuritydiagnostics.net.au/resource-hub/priority-pest-diagnostic-resources/.

Yokomi, R. K., Lastra, R., Stoetzel, M. B., Lee, R. F., Garnsey, S. M., Gottwald, T. R., Rocha-Pena, M. A. & Niblett, C. L. 1994. Establishment of the brown citrus aphid (Homoptera: Aphididae) in Central America and the Caribbean basin and transmission of citrus tristeza virus. *Journal of Economic Entomology*, **87**: 1078-1085.

Zaher, M. A., Wafa, A. K. & Yousef, A. A. 1969. Biological studies on *Raoiella indica* Hirst and *Phyllotetranychus aegyptiacus* Sayed infesting date palms in U.A.R. (Acarina-Tenuipalpidae). *Zeitschrift fur Angewandte Entomologie*, **63** (4): 406-411.

Zimmermann, H., Bloem, S. & Klein, H. 2004. Biologia, Historia, Amenaza, Monitoreo y Control de la Palomilla del Nopal, *Cactoblastis cactorum*. Joint FAO/ International Atomic Energy Agency Programme Nuclear Techniques in Food and Agriculture. Mexico. 61 pp.

9. Appendices

9.1 Major sources of further information

The following list of websites provide a wealth of freely accessible information on invasive alien species that pose a potential pant health risk to the UKOTs in the Caribbean. They also provide links to further sources of information:

CABI. 2007. Crop Protection Compendium. http://www.cabicompendium.org/.

CABI. 2017. Invasive species Compendium. http://www.cabi.org/isc.

CABI. 2018. Plantwise. https://www.plantwise.org/

EPPO. 2018. European and Mediterranean Plant Protection Organization (EPPO) https://www.eppo.int/

FDACS 2018. Florida Department of Agriculture and Consumer Services https://www.freshfromflorida.com/

NNSS. 2018. GB Non-Native Species Secretariat – UK Overseas Territories Home – http://www.nonnativespecies.org/ots/otsMap.cfm

ISSG. 2014. Global Invasive Species Database. http://www.iucngisd.org/gisd/

9.2 Fera invertebrate plant pest identification Services for the UKOTs

Defra provide funding to Fera to deliver an identification service for suspected invasive alien invertebrate plant pests in the UKOTs. A submission form and instructions on how to submit a sample are given below.

UK Overseas Territories Sample Submission Form

To help us with our diagnosis, please try and fill in as much information as possible?

For Fera use only:

Your Details

Name:		Date:		
Department/Organisation:		Your Ref:		
Address:		Tel:		☐*
		Fax:		☐*
		Email:		☐*

* Tick preferred method of contact

The Sample

Type of sample:	Plant/Produce Import Interception ☐ Locally grown plant(s) ☐ Other (give details) ☐		
Type of pest:	Insect ☐ Mite ☐ Nematode ☐ Other (give details) ☐ Unknown ☐		
What do you suspect the pest to be?			
Approximate numbers of organisms found:		Life-stage(s) (if known):	
Sample preservation: (see over for recommended methods)	Live ☐ Dried/pinned ☐ Slide mounted ☐ Fluid preserved (please give details) ☐		

The Host

Plant genus, species:	
Description of host damage (if any):	
Country of origin:	
Other information:	

I hereby authorise Fera to carry out diagnostic work on this sample.	Signature:

Sending your sample for diagnosis

How to collect, package and send your sample

How a sample is preserved before posting is largely dependant on how long it will take to reach us. Please contact us for advice if you are unsure of how to collect and package a particular sample or if you wish to send photos of pests and/or pest damage before submitting a sample. Please email: ukot@fera.co.uk

Collecting and Packaging:

- Provide as many individual specimens of each suspected species as possible. Some species are highly variable, or there may be mixed populations of related species on a host.
- In some cases, adult life stages are necessary for species determination. Larval forms of most Diptera (flies) and Lepidoptera (butterflies and moths) should ideally be collected with their food source and reared on before sending.

Beetles, adult Lepidoptera, and other robust bodied invertebrates	Kill before sending, freezing is preferable. Carefully place the dead insect in a small tube or box and lightly wrap it with tissue (enough to stop it rattling around and becoming damaged). Avoid airtight containers due to possible mould formation. Prevent this by puncturing a few holes in the tube or box. Moths and butterflies can also placed in paper or glassine envelopes, but take care not to crush them. Pinning, carding and setting of organisms before posting is welcomed, please contact us if you require instructions.
Larval invertebrates	Place in a small plastic tube filled with ethanol (70%).
Scale insects, aphids, whitefly pupae and mites	Leave on the host where possible. Removing them can damage them making identification more difficult. Place the host leaf or stem in a plastic pot of 70% ethanol. With larger leaves or stems, or if the sample is going to take a while to reach us it is necessary to change the preservative after 4-5 days as the plant material will dilute the ethanol and the invertebrates will begin to rot. If you have to detach specimens from the host material this is best done with a fine paintbrush or fine forceps. Place them in a small plastic container filled with ethanol (70%). Do not send specimens in formalin or any other formaldehyde based preservative.
Soil samples	For nematode analysis. Place about 500g of soil in a strong plastic bag and seal.
Sticky traps	Label, bend round sticky side inwards, and secure in position with adhesive tape.

Labelling and Posting:

- Each sample must be clearly labelled indicating host association, date collected, locality, reference numbers and any other pertinent information. Pictures of associated host damage are also useful.
- All samples should be put in a strong cardboard box and packaged securely. Include your Sample Submission Form licence and permits seal the box. We will provide you with a copy of our licence 'Letter of Authority'.
- On the outside of the parcel a label should state "Dead Invertebrates for Scientific Study - No Commercial Value". Please also place a copy of the appropriate permits and licences in and envelope and secure to the outside of the parcel.
- If the parcel is being sent by courier, please send us the tracking reference if possible.

Send your sample to:

UKOT Project (Room 02FA04)
Fera Science Ltd
Sand Hutton
York
YO41 1LZ
United Kingdom

If you have any queries, contact:

Sharon Reid or Dr. Chris Malumphy
Tel: +44 (0)1904 462000
E-mail: ukot@fera.co.uK