

## Darwin Initiative/Darwin Plus Projects Half Year Report (due 31<sup>st</sup> October 2021)

<b>Project reference</b>	DPLUS124
<b>Project title</b>	DPLUS124
<b>Country(ies)/territory(ies)</b>	Akrotiri and Dhekelia SBA
<b>Lead organisation</b>	Enalia Physis Environmental Research Centre
<b>Partner(s)</b>	Joint Services Health Unit, RAF Akrotiri UK Centre of Ecology and Hydrology
<b>Project leader</b>	Kelly Martinou
<b>Report date and number (e.g. HYR1)</b>	AR1
<b>Project website/blog/social media</b>	N/A

### 1. Outline progress over the last 6 months (April – Sept) against the agreed project implementation timetable (if your project has started less than 6 months ago, please report on the period since start up to end September).

(1) Raise awareness on INNS by initiating and promoting a citizen-science recording scheme for invasive non-native invertebrates:

Two citizen-science recording schemes have been constructed on the iNaturalist biodiversity recording platform. The first concerns all non-native species of Cyprus and is named after the Cyprus Database of Alien Species (CyDAS) (<https://www.inaturalist.org/projects/cydas>) while the second deals with the non-native insect fauna of the island (<https://www.inaturalist.org/projects/alien-to-cyprus-entomofauna>), a topic of particular research interest to the Fellow. These projects number 1157 and 100 citizen-science records, respectively. Utilizing the capability of constructing “Collection Projects” on iNaturalist, records of selected species (i.e. non-native species reported from Cyprus) are automatically pooled into the projects’ webpages and their metadata can be easily downloaded. In addition, by selecting species that have not been recorded on the island, we are constructing a first line of defence against these species and maintain an early-warning system regarding their arrival. These endeavours have been promoted during dissemination events and conferences such as (<https://martinoulab.weebly.com/events.html>):

- “Akrotiri BioBlitz 2022”. Organised by Dr Angeliki F Martinou and Dr Niki Chartosia, under COST Action CA 17122 “Increasing understanding of alien species through citizen (20-22 May 2022). Upon the completion of the event Akrotiri scored 4<sup>th</sup> among 12 European countries (<https://tinyurl.com/2p9ep7s2>; <https://www.inaturalist.org/projects/alien-csi-bioblitz>).
- “You can also become an entomologist through citizen science”. SCYence Fair 2022. Organised by the Cyprus Institute and Aglantzia municipality (14-15 Apr 2022).
- “Alien insects and citizen science”. Event held at the Akrotiri Environmental Education Centre. Organised by Dr. Angeliki F Martinou, Dr Maria Christou, Dr Elli Tzirkalli, Mr Evangelos Koutsoukos, Ms Joanna Angelidou, Ms Katerina Athanasiou, and Mr Jakovos Demetriou (03 Apr 2022).
- “More than just ruining a picnic: Ants as a human-health risk”. Speech held at the Akrotiri Environmental Education Centre under a program of Environmental Training of military personnel at the RAF Akrotiri SBA (14-17 Mar 2022).
- What is it like to be an Entomologist? Career Day at the Akrotiri Primary School (9-10 Mar 2022).
- Demetriou J, Radea C, Roy HE, Arianoutsou M, Martinou AF (2021) The alien to Cyprus entomofauna. HELECOS 10 - 10th Hellenic Conference of Ecology (oral presentation) (14-17 Oct 2021).
- Demetriou J, Martinou AF, Radea C, Roy HE, Arianoutsou M (2021) Non-native insect species associated with eucalypts in Cyprus. ENTO21’ - Royal Entomological Society (poster presentation) (23-27 Aug 2021).

The maintenance, constant updating and promotion of these online projects will be continued throughout the 2<sup>nd</sup> year of the Fellowship.

(2) Identify knowledge gaps regarding the impacts of non-native invertebrates on the island of Cyprus:

During the last year, an extensive literature review was carried out pooling available information on the biodiversity, alien status, origin, feeding habits, deliberate introductions, establishment status and impacts of non-native insects on the island. This review contains data till December 31<sup>st</sup> 2021. These data are being statistically analysed. The constructed database was named Alien to Cyprus Entomofauna (ACE). A scientific manuscript has been drafted and will be shortly sent to a scientific journal. In the upcoming publication, the impacts of non-native insects are briefly discussed. Although, more details on the subject can be made available after the publication of our article, it is currently known that around 60% of species are data-deficient i.e. no impacts have been recorded or investigated. This comes to show that there is a huge gap in our knowledge regarding the impacts of non-native invertebrates in Cyprus.

(3) Review the literature and other sources, including grey literature and social media, to update and create a public-facing interface for the Cyprus Database of Alien Species developed through DarwinPlus056:

The aforementioned literature review led to a substantial increase in the number of non-native species profiles on the CyDAS. In particular, the number of non-native insects has almost tripled from 123 to 349. The overall number of non-native species has climbed from 632 (<https://tinyurl.com/yp44maa4>) to 1,008 (<https://ris-ky.info/cydas>). These endeavours are still ongoing and although organismic groups such as vertebrates and insects have been reviewed and heavily supplemented we will be updating marine organisms and plants during the 2<sup>nd</sup> year of the Fellowship, throughout experts' consulting. Upon the preparation and submission of a scientific review article on the non-native species of Cyprus, a public-facing interface for the CyDAS will be created on social media in order to raise awareness about invasive non-native species as well as support and enhance public participation in scientific research through our projects on iNaturalist.

(4) Create information sources to raise awareness and develop alert/rapid response schemes for invasive non-native insects likely to arrive and establish at SBAs (priority lists derived through DPLUS088) that have impacts on biodiversity, economy and human health such as *Halyomorpha halys*, *Vespa velutina*, *Aedes albopictus* and *Harmonia axyridis*:

This objective will be achieved through the construction and publication of educational posters under the thematic title "Alien Alert" raising awareness on invasive non-native species likely to arrive and establish at SBAs. These posters are currently being drafted and will provide information on more than 50 non-native species. This objective is expected to be completed by the end of year 2 of the Fellowship with the posters being published both in English and Greek to CyDAS, our iNaturalist projects and social-media.

(5) Create distribution maps for 10 invasive and non-native species present at the Peninsula:

This milestone has already been reached through the submission of scientific articles on the presence of three non-native psyllids on *Eucalyptus* spp. (Demetriou et al. *in press*), six Chalcid wasps (Demetriou et al. 2022), the discovery of the seed-beetle *Stator limbatus* (Demetriou et al. *in press*) and the bronze bug *Thaumastocoris peregrinus* in Akrotiri (Demetriou et al. *in press*). Nevertheless, more publications on non-native species are expected to be produced providing new records and updated distributions of non-native insects. Citizen-science data collected through the constructed projects on iNaturalist will be also utilized. By the end of year 2, maps for each species will be constructed and submitted with the final report.

- Demetriou J, Koutsoukos E, Davranoglou L-R, Roy H, Spodek M, Martinou A (*in press*) First records of the alien *Eucalyptus* psyllids *Blastopsylla occidentalis* (Hemiptera, Aphalaridae) from Cyprus and *Platyobria biemani* (Hemiptera, Aphalaridae) from Cyprus and continental Greece. *Travaux du Muséum National d'Histoire Naturelle "Grigore Antipa"* 65(1): xx-xx. (Accepted manuscript).
- Demetriou J, Kakiopoulou G, Háva J, Martinou A, Delobel A (*in press*) First record of the alien seed beetle *Stator limbatus* (Coleoptera, Chrysomelidae, Bruchinae) from Cyprus. *Travaux du Muséum National d'Histoire Naturelle "Grigore Antipa"* 65(1): xx-xx. (Accepted manuscript).
- Demetriou J, Koutsoukos E, Radea C, Roy HE, Arianoutsou M, Martinou AF (2022) Uninvited pests of an unwelcomed tree: A survey on alien chalcidoid wasps (Hymenoptera: Chalcidoidea) associated with *Eucalyptus* trees in Cyprus. *BioInvasions Records* 11(2): 390-400. <https://doi.org/10.3391/bir.2022.11.2.12>

(6) Explore impacts of alien plants on ecological networks using entomological and citizen-science data for the orders of Hymenoptera and Diptera:

Throughout this last year, material samplings on ornamental tree species such as *Eucalyptus* spp., *Acacia saligna*, *Schinus molle* and *Ficus microcarpa* have been performed. These have generated novel data on the presence and distribution of non-native insects previously unknown to Cyprus. Some of these species are mentioned in the aforementioned articles although, more articles will be published during the 2<sup>nd</sup> year of the Fellowship. Samplings in the upcoming year will target species widely distributed in neighbouring countries yet to be reported from Cyprus while, a review article on the alien insects associated with eucalypts is currently being drafted.

**2a. Give details of any notable problems or unexpected developments/lessons learnt that the project has encountered over the last 6 months (for COVID-19 specific delays/problems, please use 2b). Explain what impact these could have on the project and whether the changes will affect the budget and timetable of project activities.**

None.

**2b. Please outline any specific issues which your project has encountered as a result of COVID-19. Where you have adapted your project activities in response to the pandemic, please briefly outline how you have done so here. Explain what residual impact there may be on your project and whether the changes will affect the budget and timetable of project activities.**

Due to COVID-19 restrictions as well as health concerns of the Fellow, the trip to the UK was moved to the second year of the Fellowship. The necessary budget changes were formally made and the trip is planned for the financial year 2022-2023. Since the Fellow falls within a high risk category for COVID-19 (chronical lung disease - asthma) precautions are taken in order to secure the health of the Fellow. In particular, during periods when a high number of COVID-19 cases were reported in Cyprus or members of the Joint Services Health Unit had been infected, the Fellow proceeded with working from home. Despite minor set-backs, all restrictions regarding the workflow were swiftly overcome and the possible use of virtual meetings reduced travel costs and time. Such meetings are held up-to-date and should continue throughout the Darwin Fellowship.

**2c. Have any of these issues been discussed with LTS International and if so, have changes been made to the original agreement?**

Discussed with LTS: **Yes/No**

Formal change request submitted: **Yes/No**

Received confirmation of change acceptance **Yes/No**

**3a. Do you currently expect to have any significant (e.g. more than £5,000) underspend in your budget for this year?**

Yes  **No**  Estimated underspend: £

**3b. If yes, then you need to consider your project budget needs carefully.** Please remember that any funds agreed for this financial year are only available to the project in this financial year.

**If you anticipate a significant underspend because of justifiable changes within the project, please submit a rebudget Change Request as soon as possible. There is no guarantee that Defra will agree a rebudget so please ensure you have enough time to make appropriate changes if necessary. Please DO NOT send these in the same email as your report.**

**4. Are there any other issues you wish to raise relating to the project or to Darwin's management, monitoring, or financial procedures?**

None.

If you were asked to provide a response to this year's annual report review with your next half year report, please attach your response to this document.

Please note: Any planned modifications to your project schedule/workplan can be discussed in this report but **should also** be raised with LTS International through a Change Request. **Please DO NOT send these in the same email.**

Please send your **completed report by email** to [Darwin-Projects@ltsi.co.uk](mailto:Darwin-Projects@ltsi.co.uk). The report should be between 2-3 pages maximum. **Please state your project reference number in the header of your email message e.g. Subject: 25-001 Darwin Half Year Report**

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