



Darwin Initiative/Darwin Plus Projects Half Year Report (due 31st October 2021)

Project reference	25-032
Project title	Biodiversity and agriculture: addressing scale insect threats in Kenya
Country(ies)/territory(ies)	Kenya
Lead organisation	Natural History Museum
Partner(s)	National Museums of Kenya; University of Nairobi; Kenya Agricultural and Livestock Research Organisation; Kenya Forestry Research Institute; Kenya Plant Health Inspectorate Service; CABI
Project leader	Dr Andrew Polaszek
Report date and number (e.g. HYR1)	HYR4
Project website/blog/social media	https://www.cabi.org/projects/addressing-scale-insect-threats-in-kenya/ https://www.researchgate.net/project/Biodiversity-and-Agriculture-addressing-scale-insect-threats-in-Kenya-Darwin-Initiative-project

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).

Output 1: *Increased informed perception by smallholder farmers/foresters and extension providers of the scale insect threats to agricultural production, and on the means to manage the pests without disturbing agro-ecosystems, leading to increased crop yield for affected farms.*

1.1 Preparation of the questionnaire for the final socio-economic survey is advanced.

1.3 Ant and ladybird samples were fully identified by 2 world experts. (Prof. M. Sharaf, Riyadh) revealed one species record new for Kenya; ladybird beetle identifications (Dr R. Booth, London) contained species already well-recorded from Kenya.

Output 2: *A publicly-available scale insect and natural enemies inventory for Kenya developed, with distributions maps for species recorded from the study area in three coastal counties of Kenya.*

2.5 Distribution maps of scale insects: see conference presentation in 4.3 below: W. Kinuthia (NMK).

2.6 Seventy new country species records for Kenya have been published, in:

Watson, G.W., Ouvrard, D., Kasina, M., Achieng, J.C., Githae, M.M., Mulwa, J., Kinuthia, W., Macharia, I., Heya, H.M. & Polaszek, A. (June 2021) New scale insect country records for Kenya (Hemiptera: Coccoomorpha) from old samples in insect collections. *African Phytosanitary Journal*, 2 (1), 72–104. [51 new country records]

<http://africa-cope.org/images/docs/African%20Phytosanitary%20Journal%20Volume%202.pdf>

Githae, M.M., Ong'amo, G.O., Nderitu, J., Watson, G.W. & Kinuthia, W. (June 2021) Diversity of scale insects (Hemiptera: Coccoomorpha) attacking citrus trees in Machakos, Makueni, Kilifi and Kwale Counties, Kenya. *Asian Journal of Agriculture and Biology*, 6 (3), 79–85. [2 new country records]

Macharia, I., Kibwage, P., Heya, H.M., Koome, F., Olubayo, D., Guantai, M., Kinuthia, W., Ouvrard, D. & Watson, G.W. (Sept. 2021) New records of scale insects and mealybugs (Hemiptera: Coccoomorpha) in Kenya. *EPPO Bulletin*, 00, 1-9. [early view; to be published as hard copy in the December issue] [17 new country records] <https://doi.org/10.1111/epp.12786>

An up-to-date checklist for Kenya is in press, which will enable KEPHIS to review the Kenyan plant quarantine pest lists: Watson, G.W. (In press) A checklist of the scale insects (Hemiptera: Coccoomorpha) of Kenya, with some new combinations. *Zootaxa* [14 families, 128 genera and 304 species]

Output 3: *Taxonomic researchers, parataxonomists and extension officers trained, and pest management decision chain implemented through identification capacity building among all stakeholders.*

3.1 Analysis of second Extension Officer training feedback prepared.

3.3 The first of a series of seven papers in the series “Towards the identification of the scale insects (Hemiptera: Coccoomorpha) of continental Africa” will be published imminently:

Watson, G.W. & Ouvrard, D. (In press) Towards the identification of the scale insects (Hemiptera: Coccoomorpha) of continental Africa: 1. Identification of the families. *Zootaxa*. [covers 23 families]

The next two manuscripts in the series (covering 9 families including mealybugs) are at an advanced stage of preparation.

Output 4: *Best practices for improving management of scale insect pests developed, disseminated to raise key stakeholder awareness and capacity, and adopted by them.*

4.2 A policy brief reviewed by stakeholders (NMK, KEPHI, KARLO, CABI and the Coastal County farmers and extension officers) has been forwarded to the Ministry of Agriculture. A document on best practices has been developed by KEPHIS but has yet to be reviewed by stakeholders

4.3 The following Darwin Initiative 25-032 project-related presentations were made at the 3rd Virtual Phytosanitary Conference, staged by KEPHIS, 13-16 September 2021:

13 Sept.: G. Watson (NHM) - Invasive scale insects (Hemiptera: Coccoomorpha): detection and identification in Africa

A. Polaszek (NHM) - Natural enemies and potential classical biological control of invasive scale insects (Hemiptera: Coccoomorpha) in sub-Saharan Africa

14 Sept.: A panel discussion on invasive species and pest incursions, with M. Kasina (KALRO), moderator; G. Watson and E. Mutitu (KEFRI) as panelists

P. Kibwage (KEPHIS) – Poster: Best practices for sustainable scale insect pest management in Kenya

M. Guantai (CABI) – Poster: Farmer perception, knowledge and management of scale insect pest complex infesting crops and trees in coastal Kenya

15 Sept.: W. Kinuthia (NMK) - Scale insects: distribution and threat to food security in Kenya

M. Guantai – Effects of changes in market requirements: a case study of current status of compliance of Kenyan produce in the international market and mitigation measures

4.4 Participation in the KEPHIS Virtual Phytosanitary Conference provided good exposure for the project (see 4.3 above)

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.

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.

There have been several prolonged COVID-19 lockdowns in both Kenya and the UK since March 2020. Taxonomic research, insect identifications and slide preparation in the UK have been severely slowed by prolonged home working, without access to Museum reference material or laboratory facilities, although this has eased now as the result of vaccination. The lack of funding is now restricting access to Museum facilities. In Kenya, without the benefit of vaccination, the second socio-economic survey continues to be slowed by COVID-19 social distancing requirements. These delays have been compensated for by two successive 6-month budget-neutral project extensions by Darwin Initiative, firstly 1 April 2021 to 30 September 2021, and now 1 October 2021 to 31 March 2022.

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.

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

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. 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**