1. Content of the 'Topic Description' document

1.1. Topic area

F: Pest/Vector biology, epidemiology, taxonomy

1.2. Links to the Euphresco Strategic Research Agenda

The topic addresses the following objective(s) of the 2017-2022 Euphresco Strategic Research Agenda:
☒ Objective 2017-R-1.2: to support taxonomic research for the unambiguous identification of pests
☒ Objective 2017-R-5.2: to develop and validate high-throughput DNA extraction methods
☒ Objective 2017-I-1.1: to support knowledge exchange for efficient management and maintenance of collections
☒ Objective 2017-I-1.2: to improve access to collections of phytosanitary importance
☒ Objective 2017-I-1.3: to build a network of collections that fulfil minimum quality standards
☒ Objective 2017-I-2.1: to support data exchange, data use and re-use for the benefit of plant health research activities
☒ Objective 2017-I-2.2: to contribute to databases for plant pests identification and diagnostics

1.3. Topic title

ArthCollect - develop a database of DNA sequences for the reliable identification of arthropod species of plant health importance.

1.4. Description of the problem the research should solve

Classical insect/mite taxonomy is a highly specialised skill. Taxonomists generally operate within a few areas of expertise and rarely have the opportunity to pass on their knowledge to the next generation or colleagues in other countries. DNA sequencing is increasingly used to complement classical taxonomic methods for the rapid and accurate identification of arthropod species and is of particular use to researchers and diagnosticians involved in plant protection. However, this method relies heavily on the accuracy and availability of sequences on databases. EPPO-Q-bank is a trusted source of sequence data which currently holds a collection of 198 quarantine arthropod species and some of their closest relatives, with validated sequences, methodology and metadata including specimens available. There are, however, still many species to be added and many more non-quarantine species of concern to plant protection. As well as EPPO-Q-bank, a growing number of research institutes and plant protection authorities now house extensive personal databases holding validated sequences for (generally) non-quarantine plant pest species within their own areas of expertise, many of which are available on public databases but are not easily identified as being fully validated sequences.
The main activities of the project are:

- Consider EPPO-Q-bank as a repository for a more extensive database covering both native and non-native plant health pests and vector species.
- Interrogate individual institute collections and databases for validated sequences and metadata including methods, reference specimen availability and images.
- Collaborate on validation of sequences and reference material where required.
- Agree a list of sequences and metadata to be added in collaboration with the EPPO-Q-Bank coordination team.
- Add target species including (but not exclusively) – Tephritidae, Agromyzidae, Aphididae, Psylloidea, Cerambycidae, Buprestidae (group, family, order, genus)
- Identify a priority list of quarantine species or other arthropod groups still to be added to the database.

1.5. Description of the expected results

This project aims to gather the expertise and reference material held within participating groups, consolidating the information held into an accessible format including metadata, images and reference material.

1.6. Beneficiaries of this research product

Diagnosticians and researchers working in plant entomology, both in public organisations like NPPO's and inspection services, and in private companies, test kit producers, etc.

1.7. Research funders and research contribution/ distribution

Funding organisation	Research activity and researchers involved
1. Science and Advice for Scottish Agriculture, United Kingdom David Kenyon David.kenyon@sasa.gov.scot	-Project coordination; -All activities, as indicated in section 1.4; Contact person: Fiona Highet E-mail address: Fiona.Highet@sasa.gov.scot
2. Austrian Agency for Health and Food Safety, Austria Sylvia Bluemel sbluemel@ages.at	-All activities, as indicated in section 1.4; -Elaboration of guidelines for validation of sequences and reference material (arthropods) considering EN ISO 17034:2016; -Validation of sequences and reference material of the in-house collection; -Interlaboratory comparision of Sanger-sequence analysis for selected target species; Contact: Helga Reisenzein E-mail address: Helga.Reisenzein@ages.at Contact: Richard Gottsberger E-mail address: richard.gottsberger@ages.at Contact: Christa Lethmayer E-mail address: christa.lethmayer@ages.at
3. European and Mediterranean Plant Protection Organization, France Françoise Petter petter@eppo.int	-EPPO-Q-bank content and meta data for specimen; Contact person: Françoise Petter E-mail address: petter@eppo.int Contact person: Charlotte Trontin E-mail address: trontin@eppo.int
4. Department of Agriculture, Food and Marine, Ireland Maria Laura Destefanis Maria.Destefanis@agriculture.gov.ie	-Contribution to be detailed; Contact person: Maria Laura Destefanis E-mail address: Maria.Destefanis@agriculture.gov.ie
5. University of Guelph, Canada Robert Hanner rhanner@uoguelph.ca	-Contribution to be detailed; Contact person: Robert Hanner E-mail address: rhanner@uoguelph.ca

6. National University of Ireland Maynooth, Ireland James Carolan James.Carolan@mu.ie	-Contribution to be detailed; Contact person: James Carolan E-mail address: James.Carolan@mu.ie
7. University of Agronomic Sciences and Veterinary Medicine of Bucharest, Romania Roxana Ciceoi roxana.ciceoi@gmail.com	-Contribute with Institute own collection of DNA sequences for arthropods of economic importance from Romania (currently private data in BOLD, MCCRG code, sequences obtained at CBG Guelph); -Participate in interlaboratory tests for Sanger-sequence analysis for selected species; -Contribute with reference material and metadata from Romania, when sequencing is not possible to be performed by us, but pests might be of interest for the rest of Europe (only for non-quarantine pests allowed); -Develop the skills and necessary partnerships to be able to fill the gap of DNA barcodes in the area of plant pests;

1.8. Research project partnership outside Euphresco

Euphresco funding ensures a certain level of transnational collaboration among Euphresco member countries. It is possible, if the funding consortium is interested, to contact funding organisations or research groups outside the geographical area covered by Euphresco members. The Euphresco coordinator could advertise the research topic in order to have an enlarged collaboration. If funders are interested in this possibility, please check the case below:

☐ The funding consortium of the topic mentioned in section 1.2 requires that the topic is advertised outside the Euphresco network

Information to define the profile of sought partners could be useful (but not mandatory): country/region (if there are preferences), skills/expertise required, etc.

1.9. Any other relevant information on content

The consortium will explore the possibility to validate new primers for the barcoding of arthropods in order to support the revision of the EPPO Standard PM7/129 DNA barcoding as an identification tool for a number of regulated pests.

2. *Euphresco management aspects of the project*

2.1. Indication of the topic budget

Funding organisation [a]	Mechanism [b]	Total Budget [c]
1. SASA (GB)	NC	€
2. AGES (AT)	NC	€
3. EPPO (international)	NC	€
4. DAFM (IE)	NC	€
5. UoG (CA)	NC	€
6. MU (IE)	NC	€
7. USAMVB (RO)	NC	€
total		€

2.2. Expected duration of the project (only for non-competitive topics)

36 Months.

2.3. Identification of project coordinator

Has the research project coordinator been identified?

☒ Yes
☐ No

2.4. Any other relevant information on topic organisation and management

None.

[a] First member is project coordinator. A minimum of two partners are necessary for each proposal. Add lines as needed.
[b] Please indicate the preferred mechanism (e.g. real pot RP; virtual pot VP; non-competitive NC), or several mechanisms if there is flexibility.
[c] Optional, as this amount can still change in the next phase. In-kind contribution should also be indicated in this column.