



Biodiversity Challenge Funds Projects Darwin Initiative, Illegal Wildlife Trade Challenge Fund, and Darwin Plus

Half Year Report

It is expected that this report will be a **maximum of 2-3 pages** in length.

If there is any confidential information within the report that you do not wish to be shared on our website, please ensure you clearly highlight this.

Submission Deadline: 31st October 2025

Please note all projects that were active before 1st October 2025 are required to complete a Half Year Report.

Submit to: BCF-Reports@niras.com including your project ref in the subject line.

Project reference	31-001
Project title	Quinoa-associated fungi and bacteria in Bolivia: conservation and sustainable use
Country(ies)/territory(ies)	Bolivia
Lead Organisation	CABI
Partner(s)	Permaculture Association, UK; PROINPA, Bolivia; Universidad Autónoma del Estado de Morelos [UAEM], Mexico; Universidad Mayor de San Simón [UMSS], Bolivia.
Project Leader	D.W. Minter
Report date and number (e.g. HYR1)	HYR2
Project website/blog/social media	www.permaculture.org.uk/articles/quinoa-associated-fungi-and-bacteria-bolivia

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

Although we are not looking for specific reporting against your indicators, please use this opportunity to consider the appropriateness of your monitoring, evaluation and learning (MEL) systems (are your indicators still relevant, can you report against any Standard Indicators, do your assumptions still hold true?). The guidance can be found on the resources page of the relevant fund website.

Over the six months of this reporting period, the following work was carried out.

Samples collected in March 2025 were examined microscopically, where possible identifying fungi present using classic morphology and developmental characters, and isolating fungi and bacteria using a range of culture media; approximately 500 strains have now been isolated at **UMSS**, 300 of them being bacteria; at **UAEM** a further 155 strains have been isolated (131 filamentous fungi, and 24 yeasts); so far, these have yielded 104 samples of genomic DNA for which the ITS regions have been amplified, purified and sequenced [1.1 (1), 1.1 (2)].

Physicochemical characteristics of plant and soil samples were assessed [1.1 (3)]. Isolated fungi and bacteria were identified using molecular techniques [1.1 (4)]. Metagenomic analysis of samples was carried out, shortlisting suitable strains / consortia [1.1 (5)]. Using in vitro techniques, shortlisted strains / consortia were evaluated for potential to enhance resilience (as biofertilizers, plant-growth promoters, protection against drought and salinity, etc.); on testing, 36 filamentous and three yeast strains have shown ability to solubilize phosphate; 16 strains confronted with the plant pathogen *Alternaria alternata* have shown antagonistic responses [1.2 (1)]. Field test baseline parameters, were established together with information about local quinoa crop yields (kg/ha) [1.3 (1)].

Steering committee meetings have been held, and teaching and other resources identified; the Project's Steering Committee now has 17 members (8 female, 9 male), and includes representatives from each of the following villages (Chacala, Chalguá, Chita, Keasa, Noel Mariaca, Puquí and Salinas), in addition to Genaro Aroni (Community Leader), Milton Villca (PROINPA's Liaison Officer) and Emma Zuazo (Head Teacher of Chita School), who are the Co-chairs. There is also input from the Club de Madres of Chita village. The Steering Committee came to Cochabamba and met at PROINPA on 7 July 2025. Project activities were reviewed. Attendees had hands-on experience of water capture and composting. They were also shown samples of microorganisms from Uyuni and learned how to make pelletized compost with the aim of replication in the villages of Chacala, Chita and Salinas. PROINPA has been provided by the local authority with a site at the Altiplano village of Chita for developing a new Permaculture centre for sustainable agriculture; a handbook for that centre has been prepared and distributed to the Steering Committee chairs and to project partners; its objectives and needs were reviewed with Milton Villca (PROINPA's Altiplano field officer) and Emma Zuazo (the head teacher of Chita school) during their visit to the UK in August/September [2.3 (1)].

Keyboarding work in Bolivia was supervised, ensuring quality and compatibility; the number of newly keyboarded records now exceeds 4500 [3.1 (2)].

Senior project staff member Ramón Batista and a biomathematician colleague, Yordanis Pérez Llano, also from UAEM, visited the Project Leader and Gihan Soliman in the UK in July 2025, using parallel leveraged funding, at no cost to the project. In addition to reviewing project work (Batista), and providing technical help with large datasets (Pérez Llano), they visited North Yorkshire Council's Yorwaste waste processing facility at Rufford, York (further details about this site below).

Two members of the project's steering committee (Milton [REDACTED] PROINPA Altiplano Liaison Officer, and Emma [REDACTED] Head Teacher, Chita School) visited the UK in late August/early September 2025. During their time in Britain, they received training in permaculture principles and practice, with hands-on experience of constructing a water-harvesting system, and visited Rufford, York (the main waste-processing facility of North Yorkshire Council's Yorwaste, seeing a site which produces about 10,000 tons of compost annually, and now achieves zero landfill); Billsdale Country Show (Billsdale, North Yorkshire); The Hidden Mill Permaculture Association Centre (Castle Douglas, Dumfries & Galloway); Rhyze Mushrooms Co-operative, Edinburgh (seeing and getting practical experience of vermicomposting); Bothwell Community Garden (Glasgow); Leadhills Village School. Visits by two further project participants (Valeria Castellanos and Valeria Foronda) were also organized, and at the time of writing this report their arrival in the UK is imminent.

Ten publications in the CABI Description Sheets series were prepared by the Project Leader jointly with UMSS staff and a postgraduate of that university. These sheets, based partly on the work of this project, reviewed knowledge of ten extremophile archaea species associated with hypersaline environments. They are the first archaea to be included in this series, and the

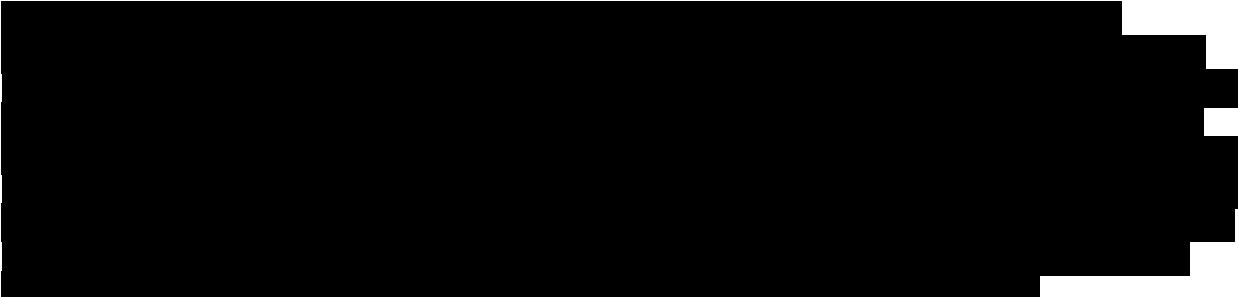
timing has been felicitous, since they each examined the difficult question of how to evaluate the conservation status of prokaryotes, just at the time the IUCN's Species Survival Commission has announced establishment of its first prokaryote specialist group. At the time of preparing this report, publication is imminent.

At this half-way point in the project, monitoring, evaluation and learning, reporting against standard indicators, and assumptions are all under review. For more, see 7 below.

2. Give details of any notable problems or unexpected developments/lessons learnt that the project has encountered over the last 6 months. Explain what impact these could have on the project and whether the changes will affect the budget and timetable of project activities.

The period covered by this report saw significant problems with visas.

The British Embassy in Bolivia's on-line application system for UK visas requires plastic card payments, but the sums involved are greater than permitted for international transactions by Bolivian citizens. All four participants so far invited to the UK under this project encountered that problem, which was only resolved by the UK-based senior project staff using their personal cards, and PROINPA in Bolivia using a company card to make the on-line payments.



3. Have any of these issues been discussed with NIRAS and if so, have changes been made to the original agreement?

Discussed with NIRAS:	No
Formal Change Request submitted:	No
Received confirmation of change acceptance:	No
Change Request reference if known: <i>If you submitted a financial Change Request, you can find the reference in the email from NIRAS confirming the outcome</i>	

Guidance for Section 4: The information you provide in this section will be used by Defra to review the financial status of projects. This review will identify projects at random for spot checks on financial management and will include requests for evidence of the actual spend information provided below. Please ensure the figures you provide are as accurate as possible and that you have the evidence to support it. You do not need to provide it now.

4a. Please confirm your actual spend in this financial year to date (i.e. from 1 April 2025 – 30 September 2025)

Actual spend: [REDACTED]

4b. Do you currently expect to have any significant (e.g. more than £5,000) underspend in your budget for this financial year (ending 31 March 2026)?

No

4c. If you expect an underspend, then you should 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 re-budget Change Request as soon as possible, and not later than 31st December. There is no guarantee that Defra will agree a re-budget so please ensure you have enough time to make appropriate changes to your project if necessary. **Please DO NOT send these in the same email as your report.**

NB: if you expect an underspend, do not claim anything more than you expect to spend this financial year.

5. Are there any other issues you wish to raise relating to the project or to BCFs management, monitoring, or financial procedures?

Suspicions or allegations related to fraud and error concerns should be reported to fraudanderror@Defra.gov.uk

No

6. Project risk management

6a. If your project has an Overseas Security and Justice assessment, please provide an update on any related risks, and any special conditions in your award paperwork if relevant for your project.

N/A

7. Please use this section to respond to any feedback provided when your project was confirmed, or from your most recent Annual Report. As a reminder, all projects that were scored as 'Not Yet Sensitive' in the Gender Equality and Social Inclusion (GESI) assessment of their latest Annual Report should demonstrate how they are meeting the minimum GESI-Sensitive standard.

The reviewer is thanked for feedback. Every point is acknowledged, and is getting attention. A full response is impossible within the recommended number of pages for this report, but the following comments are provided.

4.1. Implementation of activities. Evidence provided in future reports will go beyond photos, with the intention of facilitating assessment of activity quality (Outputs 1 & 2).

4.2. Progress towards outputs. Output 3. About 12% of fungal records in the GBIF biodiversity database have information about associated organisms. In only a trace (<1%), is that information stored in the database's associated organism field. Almost all associated organism information is scattered in unstructured text, mostly in the fields for exact locality and ecosystem. It means, in practice, that GBIF does not handle information about associated organisms. With more than 3 billion records, this resource cannot tell the user what mycorrhizal fungi are found on, for example, pine trees, or what insect pollinates, for example, a rose. This serious defect is again drawn to the attention of the Darwin Initiative. Over the past decade, the Project Leader has sent several e-mails about the importance of fungi to, more or less, every CBD National Focus Point. The response rate has been less than 3%. Further e-mails would simply run the risk of alienating these busy people. This situation is, however, changing. In early November 2025, the Leaders of this project and the Darwin Initiative project on conservation of Sub-Saharan fungi jointly held a zoom meeting with National Focus Points of eight African countries, all of which expressed interest and enthusiasm for including fungi in their country's CBD documents.

4.3. Progress towards outcome. Para 1: these challenges were indeed considered at the outset. Para 2: an appropriate indicator has been added to the logframe. Para 3: the letter of support from Bolivia's CBD National Focus Point was included in the material accompanying the stage2 application for this project; if it has been mislaid, a new copy can be supplied on request.

4.4. Progress towards impact. Software to output the digitized components of the national assessments and conservation plans is being developed. Successful trials with the prototype suggest it will eventually be able to produce automated information about a given country's fungi at a level never previously achieved.

5. Project support to at least one of the Conventions... There ARE achievements and they were reported. The very existence of the COP16 Pledge on Fungi is evidence of the long-term impact of the Darwin Initiative's 2007 project establishing a movement for fungal conservation. Giuliana Furci, the prime mover of this Pledge, was supported by the Project Leader as far back as 2013, something she has always been kind enough to acknowledge. The leader of the present project wrote to every CBD National Focus Point urging them to support the COP16 Pledge and, as a direct result of those communications, two countries (Benin and Guinea) signed. The leader of the present project also personally paid for refreshments at Fundación Fungi's launch of the Pledge in Cali. Darwin projects are more than just the lists of activities of their logframes.

6. Project support to multidimensional poverty reduction. Locality-specific composting and water management are new contributions by this project which the Permaculture Association and PROINPA are taking forward.

8. Monitoring, evaluation and lessons learnt. The reviewer is thanked for these comments which are being studied, evaluated and implemented.

11. Scalability and durability. Basic infrastructure taken for granted in animal and plant conservation extends far beyond records of location, mapping and knowledge sharing. Donors funding projects involving fungal conservation, for example, should make sure there is a mycologist on the team developing the proposal. A PDF file of a blog on the subject of basic infrastructure for fungal conservation has been attached as an annex to this report.

12. Early indicators of transformational change. The present project may be at an early stage of implementation, but it is only the most recent of a series of Darwin Initiative project awarded over the past 30 years to the present Project Leader and relating to fungal conservation. Collectively, those projects have been a significant factor in taking fungal conservation to the point of transformational change. Where before there was nothing, there are now societies and NGOs for fungal conservation. The number of fungi in the IUCN red list has gone from two to well over 1000 over the past 15 years. Software has been developed to produce draft red list evaluations for fungi, and a recent trial evaluated over 1600 species (more than all the fungi in IUCN's red list) in under 6 hours [www.cybertruffle.org.uk/meliola]. IPBES has now started to include mycologists as authors of its reports. The COP16 Pledge and involvement by CBD National Focus Points in the recent Fourth International Congress on Fungal Conservation (Benin, West Africa, supported by Darwin Initiative projects) are further evidence that the movement has become mainstream. Transformational change has already arrived. This is a hugely exciting time for fungal conservation, and the **Darwin Initiative identity (13)** can be seen celebrating this all the way through.



Checklist for submission

Have you responded to feedback from your latest Annual Report Review ? You should respond in section 6, and annex other requested materials as appropriate.	YES
Have you reported against the most up to date information for your project ?	YES
Have you clearly highlighted any confidential information within the report that you do not wish to be shared on our website?	N/A
Include your project reference in the subject line of submission email.	YES
Submit to BCF-Reports@niras.com	YES
Please ensure claim forms and other communications for your project are not included with this report.	YES