

# Darwin Initiative: Half Year Report

(due 31 October 2007)

<b>Project Ref. No.</b>	Ref 14-059
<b>Project Title</b>	Certification to support conservation of endangered Mexican desert cacti
<b>Country(ies)</b>	Mexico
<b>UK Organisation</b>	University of Reading
<b>Collaborator(s)</b>	University of Querétaro
<b>Project Leader</b>	Dr Julie A Hawkins
<b>Report date</b>	September 2007
<b>Report No. (HYR 1/2/3/4)</b>	HYR 3
<b>Project website</b>	<a href="http://www.uaq.mx/naturales/biologia/ccma/index.html">http://www.uaq.mx/naturales/biologia/ccma/index.html</a>

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

The schedule of milestones for the last two quarters included:

- a two-week field-trip to the Tehuacan valley

As reported in our annual report, we have outstanding fieldwork from the previous year; this is due to time constraints on the Mexican PI, Dr Rolando Bárcenas, who has teaching and administrative duties at UAQ. In the last six months we were able to carry out fieldwork scheduled for the previous reporting year. In July the UK PI travelled to Mexico to carry for a two-week collecting trip to N. Baja with Dr Bárcenas. In August the UK PI and Dr Bárcenas were able to locate and visit a newly discovered population of *E. grusonii* (our target species for certification) in Querétaro; the Mexican Darwin technician and an assistant returned to the site to complete sampling later in August. Finally in this reporting period, collecting trips were carried out in San Luis Potosi and N Chihuahua. The outstanding trip to Sonora was planned for August, but postponed to December.

- SNP screens of for species sequenced to date

We have built a mega-alignment of the matK data and screened for SNPs which are diagnostic of species. Full sampling will be needed to determine the limitations of the data for species identification, since our current sampling does not include all species pairs, but we have good resolution with the sequences to date.

- additional sequencing to accumulate a total of 488 species sequences

We now have 750 collections of silica-dried leaf material for DNA barcoding. We have 332 species in our database of sequences. We have the resource of the PDRA, the Mexican exchange student and the Mexican Darwin technician to complete the sequencing in the next reporting period. Rates of sequencing in Mexico have been significantly enhanced following the visit of the UK PI this summer, and the adoption on new components for PCR.

In this period we have also been working on the *ssr* work for *E. grusonii*; screening all of the plants collected from the newly discovered population. This has added a further 33 plants to our *E. grusonii* screen. We have also been able to sub-culture the plants in tissue culture at UAQ so that we have three plants representing each of ten genotypes. One clone was destructively harvested and genotyped so we now have *ssr* profiles of all plants in cultivation.

Additional outputs in the reporting period included

- submission to a peer-reviewed journal

In this period we published a technical note on the development of the *ssr* primers and their

cross-species utility in the journal *Molecular Ecology*. Hardesty, BD, Hughes, SL, Rodriguez, VM and Hawkins, JA (2007) Characterization of microsatellite loci for the endangered cactus *Echinocactus grusonii*, and their cross-species utilization. *Molecular Ecology Notes*. doi:10.1111/j.1471-8286.2007.01913.x online early publication.

- reporting at an international conference

Dr Rolando Bárcenas Luna was an invited and funded delegate at an international scientific conference in Taiwan, the 2nd International Barcode of Life Conference (Taipei, Sept. 18-20). Dr Bárcenas presented a poster and gave a verbal report on the Darwin Initiative barcoding work.

**2. Give details of any notable problems or unexpected developments 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.**

One issue is noteworthy regarding the project management. The University of Reading PDRA has given her notice; she has found it difficult to combine her work and family commitments over the last months and this has impacted negatively on the project. I am presently seeking a replacement until the end of the project. Although I don't expect to be able to fill the position immediately (one candidate I was hoping to employ has found longer-term employment elsewhere) there are suitable candidates available in January. I am planning to use the funds allocated for the PDRA salary which are not spent in the gap period (November 16<sup>th</sup> to 2nd January) to employ technical support for the new PDRA. This will mean that funds that would be spent on salary in November and December will now be spent in January and February. Fortunately the project has reached a point where the essential SSR work is completed, and we can plan to make a huge push on the sequencing, training and writing in the new year. The main implications of the staffing changes are that work planned for November-December for the PDRA will be carried out in January and February. This includes the stakeholder workshop and training in Mexico. The staffing issue has also meant we are behind with the sequencing, but as noted in Q1 we expect to be on track for the Annual report in March.

**Have any of these issues been discussed with the Darwin Secretariat and if so, have changes been made to the original agreement?**

No.

**Discussed with the DI Secretariat:** no/yes, in..... (month/yr)

**Changes to the project schedule/workplan:** no/yes, in.....(month/yr)

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

No.

**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 or budget should not be discussed in this report but raised with the Darwin Secretariat directly.**

Please send your **completed form email** to Eilidh Young, Darwin Initiative M&E Programme at [Darwin-Projects@ectf-ed.org.uk](mailto:Darwin-Projects@ectf-ed.org.uk). The report should be between 1-2 pages maximum. **Please state your project reference number in the header of your email message eg Subject: 14-075 Darwin Half Year Report**

## **Response to this year's Annual Report.**

We report on three issues raised by the reviewer below.

### **How will the challenge of sequencing be addressed, and how will it impact on achieving the project's purpose?**

The challenge we referred in optimising sequencing across the whole of the molecule we have selected for our study, matK. We have been working hard to redesign primers and improve PCR chemistry and we are now getting sequence across the whole molecule in three PCR reactions and eight sequencing reactions using new primers and the ready-made PCR mix Biomix (Bioline Molecular Biology) for PCR. The short matK barcoding region recommended to the consortium for the Barcoding of Life (CBOL; <http://www.kew.org/barcoding/update.html>) is nested within this long-range region. Our plan is to use this region and to design primers for a second barcode region from the aligned complete matK sequences. The CBOL region amplifies and sequences routinely; we hope the second region we propose for cactus barcoding should be as tractable.

### **Can a project member from Reading accompany MEXU staff on collecting trips to ensure specimens are collected appropriately?**

We acted on this. Family commitments made it impossible for the UK PDRA to travel to Mexico in this half-year, but the UK PI was able to spend three and a half weeks in the field in Mexico in July and August. This facilitated the N Baja trip and further local fieldwork. It is planned that additional fieldwork with a UK-Mexican team can be appended to the stakeholder meeting (without incurring extra international travel costs).

### **It would be good if Table 9: Project Expenditure could be resubmitted.**

The output from the University of Reading's General Ledger Financial Reports is shown below. This is expenditure and budget for 1<sup>st</sup> April 2006 to 31<sup>st</sup> March 2007. There has been an overspend for the period of £3091.51.

The University's budget heading overlap with the headings used in the grant application, so that travel and subsistence in the University's system includes monies directed to Mexico for Mexican staffing and consumables costs.

	Budget	Actual
Staff costs	33,773.00	26,498.85
Overheads	500.00	500.00
Postage, telephone, stationary	1,200.00	4,042.69
Travel and subsistence	20,040.00	21,249.09
Printing	100.00	0.00
Conferences etc	0.00	0.00
Capital items	0.00	322.11
Others	19,650.00	25,741.77
	<u>75,263.00</u>	<u>78,354.51</u>

**How the project will face the challenge to implement a certification system can be reported in more detail in the next Half Year report.**

The reviewer made a number of comments and suggestions about the implementation of the certification scheme which are very valuable. In the last six months the UK and Mexican PIs have been discussing the scope and remit of the next stakeholders' meeting. Our plan is to address issues such as

- what is the demand in Mexico and outside of Mexico for certified plants?
- what should be the status of a body set up to "police" the certification?
- how should profits arising from the sale of certified plants be distributed to the appropriate beneficiaries?
- how and where will the cacti for trade be propagated to meet demand?

We expect that refining our agenda for the next stakeholder meeting will allow us to steer the discussions to address these questions. Dr Bárcenas is making appropriate contacts in Mexico to ensure we have the right input at the meeting. I have encouraged him to seek Mexican contributors to the FSC dialogue to engage with our discussions, as the reviewer suggests.

**Fieldwork**

The reviewer requested that progress on fieldwork be reported in the Half Year report. In the main report we detail the fieldwork carried out in this period. We also note (above) that the UK PI has played a more active role in the delivery of the fieldwork. The postponed trips are now one trip to Sonora and one trip to Tehuacan. Arrangements had been made to carry out the Sonora trip in August (Dr Bárcenas and assistants were available for fieldwork for the last two weeks in August). Although we need to carry out a collection trip in Sonora it was decided to use the field time available to carry out fieldwork in San Luis Potosi and N Chihuahua instead. This was because collecting conditions in Sonora in August are not conducive to safe work. In N Baja in August we experienced temperatures in the field of more than 43°C and flash-flooding following tropical storms which made working difficult. We decided that as conditions in Sonora could be as extreme, or worse with high fire risk, that it would be more effective to carry out this trip in December. Meantime the Mexican Darwin technician has been able to make collections of target species from Tehuacan and Sonora from MEXU. In this way we can focus on missing species in Tehuacan and Sonora, and work more efficiently.