

SCAR Fellowship report 2012/13

Participant:

Megumu Tsujimoto

National Institute of Polar Research (NIPR), Tokyo, Japan

Host:

Prof. Peter Convey

British Antarctic Survey (BAS), Cambridge, UK

Project title:

Is the reproductive strategy of Antarctic flowering plants changing in response to climate change?

Duration:

10th June 2013 - 9th September 2013.

3 month stay at BAS in Cambridge.

Work conducted during stay:

The aim of the project was to determine the reproductive response of the two native Antarctic flowering plants, *Deschampsia antarctica* and *Colobanthus quitensis*, to the temperature increase observed in the maritime and sub-Antarctic over the last several decades.

Fresh plant samples were obtained from three sites - sub-Antarctic South Georgia, Signy Island (northern maritime Antarctic), and Léonie Island (Marguerite Bay, southern maritime Antarctic) - in the 2012/13 season. Reproductive allocation and seed production were compared with (i) previously published data collected in the period 1994/95 and reported in earlier publications (Convey 1996), and (ii) data collected at two sites (La Serena and Punta Arenas) in southern South America in 2013 by Dr. Molina-Montenegro (CEAZA). For about 20 individuals from each location, vegetative and reproductive biomass, seed output and shoot morphology were measured. Mean air temperature data for each location were obtained from either SCAR Met READER (<https://legacy.bas.ac.uk/met/READER/>) or WeatherOnline UK (<http://www.weatheronline.co.uk/>).

Different investment patterns (reproduction vs. vegetative growth) of *C. quitensis* were observed at the different latitudes of the study locations.

Although the results of our study did not clearly demonstrate an overall reproductive response of *C. quitensis* to the recent temperature increase or to the latitudinal temperature gradient, greater development of reproductive structures and increased seed production were observed in the maritime Antarctic region where climate warming has been well documented. The results were presented at the XXXIII SCAR Open Science Conference in Auckland in 2014.

In addition to the core research of this project, I used the opportunity to obtain assistance in the identification of specimens of tardigrades collected from the Syowa Station area with the help and advice of Dr. Sandra McInness at BAS, with the findings being published in *Polar Biology* in 2014.

Expenditure Summary:

Travel	USD1920 (JPY188000) (Round trip airfares; Tokyo - Cambridge)
Living costs	USD6720 (GBP4480) (Accommodation, subsistence and other local costs in Cambridge)
Insurance	USD370 (JPY36000)

Total - US\$9010

*Following journeys for collaborative meetings or conferences were made during the visit and were separately funded by Grant-in-Aid for Scientific Research (A) No. 2347012 in Japan.

- SCAR Biology Symposium in Barcelona (13th - 21st July)
- Royal Botanic Gardens, Kew, Université Paris 5 (18th - 22nd August)
- National Botanic Garden of Belgium, Gent University (31st August - 4th September)

Conference presentation:

Tsujimoto, M., Molina-Montenegro, M. and Convey, P. Is the reproductive strategy of Antarctic flowering plants changing in response to climate change? XXXIII SCAR Open Science Conference, Auckland, New Zealand, August 2014

Publication:

Tsujimoto, M., McInnes, S.J., Convey, P., and Imura, S. Preliminary description of tardigrade species diversity and distribution pattern around coastal Syowa Station and inland Sør Rondane Mountains, Dronning Maud Land, East Antarctica. *Polar Biology*, 37, 1361-1367, 2014. doi: 10.1007/s00300-014-1516-8.

Acknowledgments:

I sincerely thank SCAR for this fellowship, which allowed me to gain new collaborations and further develop my research and new friendships.

I am grateful to my hosts at the British Antarctic Survey. I would like to thank Mairi Fenton and Marie Sabacka for sample collection, and Paul Geissler for assistance in lab work at BAS. Satoshi Imura gave me helpful advice and support for my work at BAS. Renuka Badhe and Mike Sparrow made my stay in Cambridge comfortable, exciting and fun.