



Tropentag, September 20-22, 2017, Bonn

“Future Agriculture:  
Socio-ecological transitions and bio-cultural shifts”

## Slow-Growth *in vitro* Conservation of *Ullucus tuberosus* (Loz.), an Andean Tuber Crop

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### Abstract

*Ullucus tuberosus* (Loz.) of the Basellaceae family is a perennial tuberous crop, originating from the Andean region where it is cultivated for its edible tubers. The species is vegetatively propagated, which causes standard conservation of its genetic material difficult to perform using conventional methods. An efficient tool for conservation of vegetatively propagated plants represents slow-growth *in vitro* method that ensures the genetic resources secure maintenance and availability for farmers and plant breeders. This study focuses on optimizing the slow-growth *in vitro* protocol for medium-term conservation of the species using MS storage culture media supplemented with three osmotic agents at different concentrations: sorbitol (1, 2 and 3%, w/v), mannitol (1, 2 and 3% w/v), and sucrose (1, 3, 6, 9 and 12% w/v); or abscisic acid (ABA) (1, 2 and 3 mg l<sup>-1</sup>). MS without osmotics and hormone was used as control. Forty plants per treatment including control was established, twenty were maintained at growing temperature of 5°C and twenty at 17°C. Plant height (cm), number of leaves, shoots and numbers of roots were evaluated for four consecutive months as a primary study within a longer period experiment. Results showed that the appropriate temperature for growth reduction while maintaining the vitality of plants for medium-term conservation of the species is 5°C, while temperature of 17°C is not appropriate as the plants grow at an exponentially higher rate. Mannitol 3%, sucrose 12 and 9% and ABA 3 mg l<sup>-1</sup> concentration yielded the best results in terms of growth reduction and maintenance of plant vitality during conservation when compared to the control and therefore appears to be the most effective for medium-term conservation of the species. However, further evaluation will be carried out over a 12 months period to determine what supplement is most effective in time and to have a fully optimised protocol. Conservation of this species is important, as it will ensure the constant availability of the species for both farmers and plant breeders.

**Keywords:** Abscisic acid, mannitol, medium-term conservation, osmotic agents, sucrose, *Ullucus tuberosus*