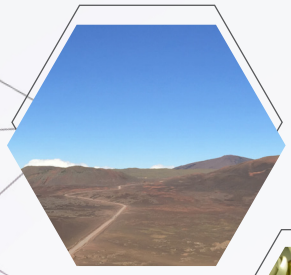
BOOK OF ABSTRACTS
TALKS

Island BIOLOGY



La Réunion
8-13 JULY
2019

Université de la Réunion
Campus du Moufia

UNIVERSITÉ DE LA RÉUNION · Région Réunion www.regionreunion.com · l'Europe s'engage à La Réunion avec le FEDER · Nexa · Préfet de la Région Réunion · Ville de Saint Denis · Parc national de La Réunion · Terres australes et antarctiques françaises · cnrs INEE institut écologie et environnement · IRD Institut de Recherche pour le Développement · cirad la recherche agronomique pour le développement · OSU-RÉUNION Observatoire des Sciences de l'Univers de La Réunion · METEO FRANCE

Island Biology

Book of Abstracts

Talks

Third International Conference on Island Ecology, Evolution and Conservation

8-13 July 2019
University of La Réunion
Saint Denis, France

Editors: Olivier Flores, Claudine Ah-Peng, Nicholas Wilding

Cloud water interception and resilience of tropical montane bryophytes to climate change in cloud forests of La Réunion

Claudine Ah-Peng *† [1], Louise Guérot [2], Laura Figenschou [3], Anna Doizy [4], Pierre Stamenoff [5], Terry A.j. Hedderson [3]

[1] Université de La Réunion (UMR PVBMT) – UMR PVBMT Université de La Réunion – Pôle de Protection des Plantes, 7 chemin de l'IRAT, 97410 Saint-Pierre, France
[2] Université de La Réunion (UMR PVBMT) – UMR PVBMT Université de La Réunion – 7 chemin de l'IRAT, 97410, Saint-Pierre, France
[3] University of Cape Town (Biological Sciences department) – Private Bag X3, Rondebosch 7701, South Africa, South Africa
[4] Cirad (UMR PVBMT) – UMR PVBMT Cirad – Pôle de protection des plantes, 7 Chemin de l'IRAT, 97410 Saint-Pierre, France
[5] Observatoire des Sciences de l'Univers de La Réunion (OSU-Réunion) – Institut national des sciences de lÚnivers, Université de la Réunion : UMS3365, Institut national des sciences de lÚnivers, Institut national des sciences de lÚnivers, Institut national des sciences de lÚnivers – OSU-R Bâtiment S4B, 15, avenue René Cassin CS 92003 97744 Saint-Denis Cedex 9, France

Tropical montane cloud forests (TMCFs) are characterized by frequent cloud immersion, host a high diversity of global biodiversity and provide vital ecosystem services to insular populations. Climate change on islands, is expected to both raise the cloud height base as a result of temperature increase and to increase the frequency of extreme events like drought. Bryophytes contribute a significant biomass in these systems yet the role of cloud water and the resilience of bryophytes to drought in island TMCFs is still poorly known. In La Réunion, we implemented a novel method to follow cloud water interception by bryophytes in the TMCF using *in situ*lysimeters. We showed that two abundant TMCF liverworts possess an excellent ability to intercept and store cloud water, and that stored water fluctuated according to climatic conditions. In order to better understand the ecophysiology of TMCF bryophytes, we examined chlorophyll fluorescence, under laboratory conditions, for 16 bryophyte species in response to dehydration and rehydration. This was accompanied by measurements of water retention capacity and relative water content of each species. Highest Water Retention Capacity and Relative Water Content were recorded for *Sphagnum*sp (2174 %: 91,37 %) and *Anthoceros*sp (1540 %; 7815 %). Dry down curves showed that species with high water storage capacity are favored by maintaining longer optimal photosynthetic activity. After one week of desiccation, half of the species could recover 50 % of their optimal photosynthetic activity within 24 h of rehydration. Most species, after 7 weeks of desiccation, could not recover their original photosynthetic activity after rehydration. These experiments highlight the presence of various strategies for managing desiccation by TMCF bryophytes at the microhabitat level. Bryophytes inhabiting the TMCF, exhibit a strong strategy in either tolerance or drought avoidance or a combination of both strategies, indicating a better adaptation to drought than expected. However, impact of repetitive drought on the physiology of the TMCF species remains unknown. The multiplicity of responses recorded for TMCF bryophytes regarding their physiology and life forms indicate that climate change will have distinct impacts on species.

Keywords: photosynthetic activity, ecohydrology, chlorophyll fluorescence, atmosphere/biosphere

*Speaker
†Corresponding author: claudine.ahpeng@univ-reunion.fr