



*Organisers*



*Funding*



*International Symposium  
FloraMac2010*

*23-25 September 2010  
Ponta Delgada, Azores, Portugal*



*International Symposium  
FloraMac2010*

*23-25 September 2010  
Ponta Delgada, Azores, Portugal*



## *Organisers*

CCPA Centro de Conservação e Protecção do Ambiente  
CIBIO Centro de Investigação em Biodiversidade e Recursos Genéticos, Pólo Açores

## *Organizing Committee*

*Universidade dos Açores*

Luís Silva • Mónica Moura • Graciete Maciel • Ana Isabel Neto • Rosalina Gabriel

*Universidade da Madeira*

Miguel Sequeira

*Jardin Botánico Canario “Viera y Clavijo” – Unidad Asociada CSIC*

Juli Caujapé Castells

*Instituto Nacional de Investigação e Desenvolvimento Agrário*

Isildo Gomes • Samuel Gomes

*Natural History Museum*

Mark Carine • Fred Rumsey

*Harvard University, Department of Organismic and Evolutionary Biology*

Hanno Schäfer

*Instituto de Investigação Científica Tropical*

Maria Romeiras

## *Keynote speakers*

David Bramwell

José Luis Martín Esquível

José María Fernández-Palacios

Juli Caujapé Castells

Ricardo Haroun

Robert J Whittaker

## CONTENTS

SYMPOSIUM PRESENTATION	9
GENERAL PROGRAM	11
PROGRAM	13
PHYLOGENETICS & BIOGEOGRAPHY	13
ECOLOGY & CONSERVATION	17
ETHNOBOTANY & PLANT RESOURCES	21
ABSTRACTS	23
PHYLOGENETICS & BIOGEOGRAPHY	25
ORAL PRESENTATIONS	25
POSTER PRESENTATIONS	37
ECOLOGY & CONSERVATION	49
ORAL PRESENTATIONS	49
POSTER PRESENTATIONS	61
ETHNOBOTANY & PLANT RESOURCES	77
ORAL PRESENTATIONS	77
POSTER PRESENTATIONS	81
INDEX OF AUTHORS	89



## **General Program**

**23-09-2010**

### **Phylogenetics & Biogeography**

08:30 Registration	14:00 Session conference
09:30 Opening session	14:30 Oral presentations
10:00 Session conference	15:30 Poster Session / Coffee break
10:30 Coffee break	16:00 Oral presentations
11:00 Oral presentations	18:30 End of the day
13:00 Lunch	19:00 Reception of participants

**24-09-2010**

### **Ecology & Conservation**

09:00 Session conference	14:00 Session conference
09:30 Oral presentations	14:30 Oral presentations
10:30 Coffee break	15:30 Poster Session/Coffee break
11:00 Oral presentations	16:00 Oral presentations
13:00 Lunch	18:00 End of the day
	20:00 Symposium dinner

**25-09-2010**

### **Ethnobotany & Plant Resources**

09:00 Session conference	14:30 Workshops
09:30 Oral presentations	- DEMIURGO project meeting
10:30 Poster Session/Coffee break	- BIOCLIMAC project meeting
11:00 Session conference	- Macaronesian Herbaria
11:30 Conclusions of the symposium	- Conservation of Bryophytes in Macaronesia
12:00 Closing session	- Edition of a Flora of Macaronesia
12:45 Lunch	15:30 Coffee break

**26-09-2010**

**Post-symposium Tour**

- 08:30 Arrival of participants
- 09:00 Departure from the University Campus
- 09:30 Indigenous and non-indigenous species in the south coast
- 10:30 Lagoa do Fogo Nature Reserve – Indigenous and non-indigenous species
- 11:30 Porto Formoso tea plantations
- 12:30 Terra Nostra Gardens and swimming pool – Indigenous and non-indigenous species
- 13:30 Traditional Furnas Lunch
- 15:00 Visit to hotsprings
- 15:30 Lagoa das Furnas – Indigenous and non-indigenous species
- 17:00 Departure to Ponta Delgada

Juli Caujapé-Castells, moderator

09:00 Session conference

**Dynamic oceanic island biogeography: a general model and its application to Macaronesia**

Whittaker RJ

09:30 Oral presentations

**The allozyme genetic diversity of the Canarian flora: relationships with reproductive, biotic and abiotic factors**

Pérez de Paz J & Caujapé-Castells J

**Genetic diversity and conservation of two threatened Canarian endemic species of *Crambe* (*Brassicaceae*)**

Soto M, Roca-Salinas A, Caujapé-Castells J & Bramwell D

**Genetic diversity of *Bryum argenteum* Hedw coming from high Mediterranean mountains in Tenerife Island and the Iberian Peninsula**

S Pisa, Werner, O & Ros RM

**Assessing different sources of threat to endemic species at Madeira Island**

Figueiredo A & Menezes de Sequeira M

10:30 Coffee break

11:00 Oral presentations

**Flirting with extinction? *Orthotrichum handiense*, a Canarian endemic bryophyte under multiple threats**

Patiño J, Medina R, Werner O, Ros RM, Lara F & González-Mancebo JM

**Riparian galleries of Azorean streams**

Cruz AM, Cunha A, Ramos J, Raposeiro P, Dodkins I, Costa AC & Gonçalves V

**Application of Macrophytes' indexes to water quality evaluation in Azores**

Cunha A, Cruz AM, Ramos J, Raposeiro P, Dodkins I, Costa AC & Gonçalves V

**Ecological quality of Azorean coastal waters: Macrophytes and Phytoplankton evaluation**

Patarra RF, Brotas V, Álvaro NV, Gameiro C, Silva A, Diniz T, Prestes ACL, Azevedo JMN, Medeiros MC, Pacheco DM, Gaspar JL & Neto AI

**Metal concentrations and structural changes in coralline algae from hydrothermal vents**

Couto RP, Neto AI & Rodrigues AS

**Madeiran landscape: one hundred years of change assessed by RLPT (Repeat Landscape Photography Technique)**

Pupo-Correia A, Aranha JT & Menezes de Sequeira M

**Evaluation of Azorean endemic plants according to IUCN**

Corvelo R, Silva L & Schäfer H

**Control of invasive alien flora species in Azores sensible areas**

Pimentel P, Bettencourt M, Veríssimo E & Costa M

13:00 Lunch

## Ecological quality of Azorean coastal waters: Macrophytes and Phytoplankton evaluation

Patarra\*<sup>1,2,3</sup> RF, Brotas<sup>4</sup> V, Álvaro<sup>1,2,3</sup> NV, Gameiro<sup>4</sup> C, Silva<sup>4</sup> A, Diniz<sup>4</sup> T, Prestes<sup>1,2,3</sup> ACL, Azevedo<sup>1,3</sup> JMN, Medeiros<sup>5</sup> MC, Pacheco<sup>5</sup> DM, Gaspar<sup>5</sup> JL & Neto AI<sup>1,2,3</sup>

<sup>1</sup> Grupo de Biologia Marinha, Departamento de Biologia da Universidade dos Açores, Apartado 1422, 9501-801 Ponta Delgada, Portugal, (\* E-mail: rpatarra@uac.pt)

<sup>2</sup> CIIMAR, Centro Interdisciplinar de Investigação Marinha e Ambiental, Rua dos Bragas 289, 4050-123 Porto, Portugal

<sup>3</sup> CIRN (Centro de Investigação de Recursos Naturais), Universidade dos Açores, Apartado 1422, 9501-801 Ponta Delgada, Portugal.

<sup>4</sup> Centro de Oceanografia, Faculdade de Ciências da Universidade de Lisboa, Campo Grande, 1749-016, Lisboa, Portugal

<sup>5</sup> DROTRH, Direcção Regional do Ordenamento do Território e dos Recursos Hídricos, Secretaria Regional do Ambiente e do Mar, Av. Antero de Quental, n.º 9C, 9500-160 Ponta Delgada, Portugal

EU Directive 2000/60/EC, commonly known as the Water Framework Directive (WFD), is a fundamental tool for the management of the European water resources and aimed at guarantying a good ecological quality by 2015. Its application requires the assessment of the ecological status of coastal waters in order to implement management plans that prevent their further deterioration. The geographical situation of the Azores places specific questions to the application of WFD. Due to the high dilution power of the open ocean surrounding these Atlantic islands, the impact of anthropogenic effects on coastal waters is likely to be localized. Water masses adjacent to urbanized areas have therefore been classified as “In Doubt”. In the present study, the ecological quality of the Azorean coastal water masses was evaluated in the islands of Terceira, São Miguel and Santa Maria, using the quality parameters: macrophytes and phytoplankton. Results indicate that the studied coastal waters have an excellent ecological quality when compared with mainland Europe. Differences within and among islands were detected only on the phytoplankton, with the highest concentrations recorded during Spring 2009 in Terceira, followed by São Miguel and Santa Maria. The coccolithophores were the most abundant group, followed by the diatoms and dinoflagellates.

**Keywords:** WFD, macrophytes, phytoplankton.

## Metal concentrations and structural changes in coralline algae from hydrothermal vents

Couto\*<sup>1,2,3</sup> RP, Neto<sup>1,2,3</sup> AI & Rodrigues<sup>1,3</sup> AS

<sup>1</sup> Department of Biology, University of the Azores, 9501-801 Ponta Delgada, Açores, Portugal (coutoruben@uac.pt ; aneto@uac.pt ; rodrigues@uac.pt).

<sup>2</sup> CIIMAR (Centro Interdisciplinar de Investigação Marinha e Ambiental), Rua dos Bragas 289, 4050-123, Porto, Portugal.

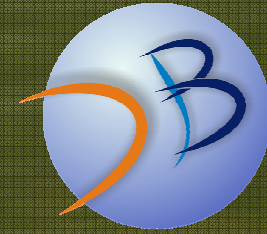
<sup>3</sup> CIRN (Centro de Investigação de Recursos Naturais), University of the Azores, 9501-801 Ponta Delgada, Portugal.

One of the striking features of the Azores is the presence of active shallow water hydrothermal activity. Organisms that live in such environments are chronically exposed to increased temperature and metal concentrations and reduced pH, therefore presenting great potential as sentinels of the effects derived from such exposure. The present study aimed at evaluating metal concentration in specimens of *Corallina elongata* J. Ellis & Solander collected at sites exposed and not exposed to shallow water hydrothermal activity and evaluating changes in its anatomical and calcareous structures. Specimens were collected at four sites, one with hydrothermal activity and three without. Concentrations of Ca, Mg, Zn, Rb, Mn and Cd in the collected specimens were determined and their calcium carbonated structure was morphometrically analysed by electron microscopy scan. Thicker cell walls and a bleached appearance were observed on *C. elongata* specimens collected at the hydrothermal location. Increased concentrations of elements associated to volcanic activity such as Zn, Rb and Mn were also observed in these specimens. This study reports on metal accumulation and changes in the carbonated structure of *C. elongata*, adding new data for further research on the influence of shallow water hydrothermal vents on communities living in such habitats. Results also provide an insight on how coralline algae might be affected by ocean acidification.

**Keywords:** Calcifiers; bioindicators; ocean acidification.



FloraMac 2010  
Ponta Delgada, Açores, Portugal  
September 23-25, 2010



# Metal concentration and structural changes in coralline algae from hydrothermal vents

Ruben P. Couto, Ana I. Neto & Armindo S. Rodrigues



Governo dos Açores



SECRETARIA REGIONAL DA CIÊNCIA, TECNOLOGIA E EQUIPAMENTOS

