



*Organisers*



*International Symposium  
FloraMac2010*

*Funding*



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



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Rosalina Gabriel, moderator

09:00 Session conference

**Global warming threaten the biodiversity in Canary Islands**

Martín Esquivel JL

09:30 Oral presentations

**The nineteenth century and the botanical exploration of Madeira**

Gomes da Conceição AH & Menezes de Sequeira M

**Noxious invader or biomass resource? The case of *Pittosporum undulatum* in the Azores islands**

Lourenço P, Medeiros V, Gil A & Silva L

**Outdoor growth of *Haematococcus pluvialis* for astaxanthin production in the Azores**

Xavier ED, Furnas J, Azevedo JM, Mota G, Teves L & Neto AI

10:30 Poster Session / Coffee break

**57. Plant diversity in the city of La Laguna (Tenerife)**

García-Gallo A, Pérez-Vargas I & Wildpret W

**58. Essential oil chemical variability of *Myrtus communis* L collected in the mainland Portugal and Santa Maria (Azores)**

Lima AS, Bahcevandziev K, Barroso JG, Pedro LG & Figueiredo AC

**59. Triterpenes from the latex of *Euphorbia azorica***

Lima E & Medeiros J

**60. Triterpenoids from *Euphorbia stygiana***

Lima E & Medeiros J

**61. *Hypericum foliosum* Aiton. An Azorean endemic plant with anti-acetylcholinesterase properties**

Rainha N, Arruda M, Teixeira T, Rosa JS, Barreto M, Lima E & Baptista J

**62. Inhibition of acetylcholinesterase by *Hedychium gardnerianum* essential oils from S. Miguel (Azores)**

Arruda M, Rainha N, Medeiros J, Viana H, Rosa JS & Barreto MC

**63. Polyphenols and antioxidant activity in macroalgae from Azores**

Anjos MC, Medeiros J, Neto AI & Barreto MC

**64. Screening for acetylcholinesterase inhibitors in Azores Macroalgae**

Medeiros J, Arruda M, Anjos MC & Barreto MC

**65. Cytotoxicity of *Hedychium gardnerianum* extracts against HeLa tumour cell line**

Nunes R & Barreto MC

**66. Search for biological activities in plants from Macaronesia against *Pseudaletia unipuncta* (Lepidoptera: Noctuidae)**

Teixeira T, Rosa JS, Mascarenhas C, Oliveira L, Barreto MC & Medeiros J

**67. Search for insecticidal activity of *Hypericum undulatum* Schousb. Ex Willd. and *Hypericum foliosum* Aiton against *Aphis fabae* and *Myzus persicae* (Homoptera: Aphididae)**

Saraiva J, Teixeira T, Rainha N, Mendes R, Baptista J, Lima E, Garcia P, Soares AO & Rosa JS

**68. Ethnobotanical study of the Fajã da Ovelha (Madeira, Portugal)**

Ramos L, Frazão-Moreira A & Menezes de Sequeira M



## *Organisers*

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

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Maria Romeiras

## *Keynote speakers*

David Bramwell

José Luis Martín Esquível

José María Fernández-Palacios

Juli Caujapé Castells

Ricardo Haroun

Robert J Whittaker

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## Polyphenols and antioxidant activity in macroalgae from Azores

Anjos<sup>\*1,2</sup> MC, Medeiros<sup>3</sup> J, Neto<sup>2</sup> A & Barreto<sup>1,3</sup> MC

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Polyphenolic content and antioxidant activity of macroalgae *Osmundea pinnatifida*, *Fucus spiralis*, *Gelidium microdon*, *Ulva compressa*, and *Cystoseira abies-marina*, collected at the seacoast of the island of São Miguel Azores, were correlated. Their assessment was made respectively by the Folin-Ciocalteu and the ferric chloride and DPPH reducing power tests. The results indicated that methane extracts contained the higher values of polyphenols, highlighting *Fucus spiralis* and *Cystoseira abies-marina*. Dichloromethane extracts showed levels of polyphenols in general lower than the methanolics and higher than those of hexane. Regarding the ferric chloride test, the results of most methanol extracts followed the same pattern as the concentration of polyphenols, especially by the high reducing capacity of *Fucus spiralis* followed by *Cystoseira abies-marina*. For the DPPH test, these two extracts once again stood out, although the hexane extracts of these two algae also showed a significant reducing power. Thus, the polyphenols seem to be primarily responsible for the reducing power at least of the methanol extracts of these algae, however there are other less polar molecules with antioxidant activity, as can be inferred by the significant reducing power of hexane extracts of *Fucus spiralis*, *Cystoseira abies-marina* and those of dichloromethane of *Osmundea pinnatifida* and *Cystoseira abies-marina*.

**Keywords:** antioxidant activity, polyphenols, macroalgae.

## Screening for acetylcholinesterase inhibitors in Azores Macroalgae

Medeiros<sup>\*1</sup> J, Arruda<sup>2,3</sup> M, Anjos<sup>2,4</sup> MC & Barreto<sup>1,2</sup> MC

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The development of drugs for the treatment of the cognitive deficits of Alzheimer's disease (AD) has focused on agents which counteract loss in cholinergic activities. These symptoms of AD have been successfully treated with acetylcholinesterase (AChE) inhibitors. Ellman's microplate assay was used to screen five species of macroalgae collected along the coast of S. Miguel island (Azores) for their *in vitro* anti-AChE activity. Methanol (ME), hexane (HE) and dichloromethane (DCM) extracts were prepared from *Ulva compressa*, *Gelidium microdon*, *Osmundea pinnatifida*, *Fucus spiralis* and *Cystoseira abies-marina*. Overall, the best anti-AChE activity results were obtained for the HE extracts (except for *O. Pinnatifida* and *G. microdon*), followed by the DCM and ME extracts. Maximum anti-AChE activity, expressed as IC<sub>50</sub> (extract concentration needed to produce 50% of AChE inhibition) was found in *C. abies-marina* and *U. compressa* (HE) fractions, with the lowest IC<sub>50</sub> values (20 µg/mL and 100 µg/mL, respectively) which are comparable to the value for quercetin, a known AChE inhibitor (IC<sub>50</sub>=140 µg/mL). Some macroalgae are used as food since they are not poisonous and usually have soft tissues and as such have many indirect medicinal effects. To confirm this, further purification and identification of the active compound is needed.

**Keywords:** Alzheimer disease, cholinesterase inhibitors, algae.