

AZOREAN BIODIVERSITY GROUP NEWSLETTER. 2



Editors

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(Christmas Edition)

December 2008

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Cover picture



Plagiochila spinulosa, Algar do Carvão. (2006). Photograph of Pedro Cardoso.

This lovely liverwort – *Plagiochila spinulosa* – is considered a rare species in Europe, where the only region of occurrence is the Azores. It was once thought to be an endemic species – *P. allorgei* – but a world revision made by Grolle had it as a synonym of the Central American species. Even in the Azores this is a rare species appearing in dark, shaded and humid places, such as the cave entrances. More details in “Azorean Rare Bryophytes” (Homem & Gabriel, 2008).

Preamble

A happy and prosperous New Year to you all and welcome to the December edition of the Azorean Biodiversity Group Newsletter. The first Newsletter appeared in October and received good criticism from both members and non-members. We hope that this one will also have a nice impact and create discussion links among all members of the group.

This issue focuses on the WebPages managed by the members of the group. We are currently managing five WebPages on diverse themes:

i) the *Azorean Biodiversity Group Page* (www.angra.uac.pt/gba) is the main page of the group and is under the coordination of the Post-Doc Pedro Cardoso;

ii) the *Azorean Biodiversity Portal* (<http://www.azoresbioportal.angra.uac.pt/index.php?lang=en>) is a page made in a collaboration with members of the CIBIO-Azores; this initiative is growing in interest and impact;

iii) a new webpage on *Azorean Spiders* (see: <http://www.jorgenlissner.dk/azoreanspiders.aspx>), a collaboration with [Jørgen Lissner](#), Paulo A.V. Borges and Enésima Mendonça;

iv) a webpage on Environmental Education Discussion Group (<http://www.angra.uac.pt/Grupos/dea/index.htm>), coordinated by the Post-Doc Alison L. Neilson where you may access the news about the Cetacean Project (EDUMAR) and download some presentations and documents such as Alison's Thesis.

v) finally, a new webpage on *Azorean Termites* will be available soon (www.sostermitas.angra.uac.pt), under the coordination of Ana Moura Arroz and Paulo Borges.

This issue has also interesting news about the activities of the group members. The most relevant news are:

- i) We present the summary text of one of our papers that received a special **highlight** by the editors of the Journal of Biogeography (Borges, P.A.V. & Hortal, J. (2009). Time, area and isolation: Factors driving the diversification of Azorean arthropods. *Journal of Biogeography* **36**: 178-191).

- ii. Evaluation of CITA-A (2003-2006 activity) by FCT. The “Azorean Biodiversity Group” received a very positive evaluation (see more below).
- iii. New MSc students are now joining the group starting their thesis projects mainly in Environmental Education.
- iv. We make a review of the current activity of all Post-doc and PhD. students.
- v. The list of the 10 most relevant publications in 2008 is presented.

Pedro Cardoso, Enésima Mendonça and myself provided the photos of the species or landscapes that illustrate this Newsletter. Thanks Pedro and Enésima!

Best wishes for 2009!

Paulo A. V. Borges



1. SPECIAL WEBPAGES OF THE GROUP

1.1. *The Azorean Biodiversity Portal is growing in interest*

The Azorean Biodiversity Portal was developed under two projects financed by the European Community: INTERREG III B Project “Atlântico” (2003-2005) and INTERREG III B Project “BIONATURA” (2007-2008). The Azorean partners were respectively the “Direcção Regional do Ambiente e do Mar “ and the “Agência Regional da Energia e Ambiente - ARENA”. The coordinator of the project was the “Consejería de Medio Ambiente y Ordenacion Territorial” (Canary Islands).

One of the Azorean products was this website, which is coordinated by Paulo Borges and reflects the study and specific coordination of four different research teams of the University of the Azores:



i) Terrestrial arthropods – supervised by Paulo Borges (CITA-A; Azorean Biodiversity Group). Also in this research group: Enésima Mendonça, Francisco Dinis, Fernando Pereira and Sandra Jarroca;

ii) Terrestrial molluscs, coastal marine invertebrate- and terrestrial vertebrates – supervised by António Frias Martins, Ana Cristina Costa and Regina Cunha (Department of Biology; CIBIO-AZ). Also in this research group: Pedro Rodrigues e Paula Lourenço;



iii) Vascular plants – supervised by Luís Silva (Department of Biology; CIBIO-AZ). Also in this research group: Mónica Martins, Rodolfo Corvelo e Nuno Pinto;

iv.) Bryophytes and lichens – supervised by Rosalina Gabriel (CITA-A; Azorean Biodiversity Group). Also in this research group: Fernando Pereira, Sandra Câmara, Berta Martins, Nídia Homem e Eva Borges.



The number of visits is steadily growing (see Figure 1). This number is now reaching an average number of 400 (December). Last November more that 10,000 visitors had visited the portal (Figure 2) !

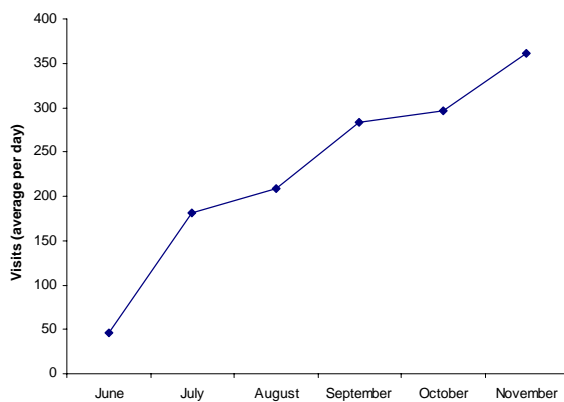


Figure 1. Average number of visits per day in the Azorean Biodiversity Portal in the last six months (June to December 2008).

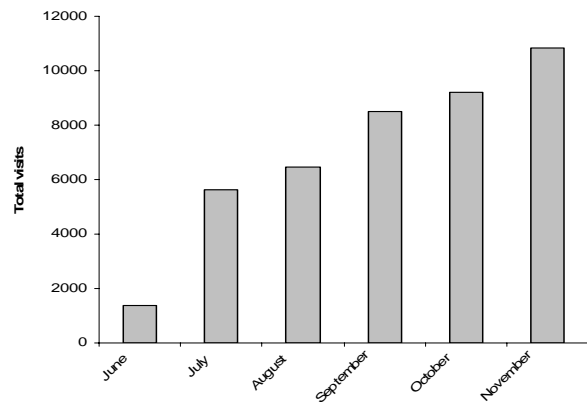


Figure 2. Total number of visits in each month to the Azorean Biodiversity Portal (June to December 2008).

It is expected that the number of visitors will increase, due to:

i) the divulgation of the Azorean Biodiversity Portal in Azorean schools, which is being made with the pamphlet beautifully designed by Nuno Farinha (Fig. 3);

ii) the inclusion of photographs, either gathered by the members of the team or given by many specialists who are cooperating with us, sending images from their personal collections or WebPages.

About **3,720** images are now available covering about **1,593** of the **5,000** terrestrial species of the Azores.

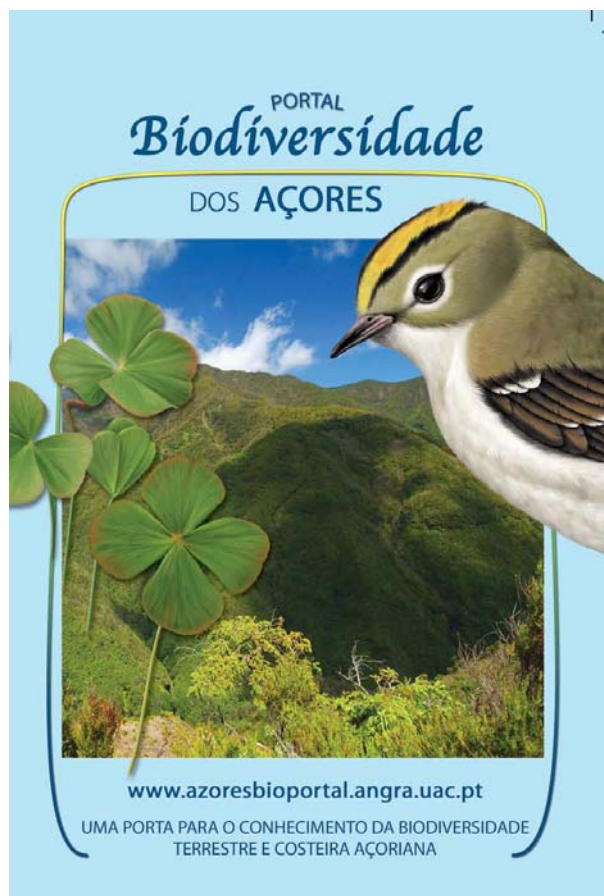


Figure 3. Pamphlet designed by Nuno Farinha (2008) to publicize the Azorean Biodiversity Portal.

Photography credits on the Azorean Biodiversity Portal

We are indebted to all the colleagues and friends who have sent us images of species. The names of the latest contributors are listed below, in alphabetical order of surname:

Ingrid **Altmann**, Isabel **Amorim**, Osvaldo **Borges**, Bruno **Brum**, Pedro **Cardoso**, Alain **Doornaert**, Martin **Gascoigne-Pees**, Nuno **Gonçalves**, Claus **Hense**, Nídia **Homem**, Jørgen **Lissner**, Fernando **Martins**, Enésima **Mendonça**, Walter **Müller**, Ed **Nieuwenhuys**, Sabine **Ortmann**, Fernando **Pereira**, Hubert **Polacek**, Francisco **Reis**, Jordi **Ribes**, Jean-Claude **Ringebach**, Pedro **Rodrigues**, Jacques **Rosès**, Ana **Simões**, Udo **Schmidt**, Paulo Henrique **Silva**, D´Almeida **Simões**, Stefan **Sollfors**, Xim **Sureda**, Alex **Wild**, Peter **Wirtz**.

We would like to highlight some specialists who are sending us large quantities of images (100 or more), many of them, that are already available to everybody, and many others to publish soon:

- John **Bridges** (<http://northeastwildlife.co.uk/>), images of several taxonomic groups.
- Tim **Faasen**, with images of several taxonomic groups (most of Arthropoda).
- Jan-Peter **Frahm**, with images of Bryophyta.
- Hanno **Schaefer**, with images of Spermatophyta.
- Felix **Schumm**, with images of Lichens.

We would also like to thank to all of the groups, that have allowed our use of their wonderful images:

- **Catalogue of the Lepidoptera of Belgium** (<http://webh01.ua.ac.be/vve/Checklists/Lepidoptera/LepMain.htm>), mainly to the leaders of this project, Willy De Prins and Chris Steeman
- “**Clube de Ambiente - Francisco Ornelas da Câmara**”, mainly to its leader Álvaro Areias;
- **National Museums Northern Ireland—Project Ground-Beetles of Ireland** (<http://www.habitas.org.uk/groundbeetles/index.html>) particularly to the leaders of the project and Roy Anderson .
- “**Projecto INTREFRUTA**”, mainly its leader David Horta Lopes;
- **UK Moths Webpage** (<http://ukmoths.org.uk/index.php>), particularly: Charles Baker, Tristan Bantock, George Davis, Tony Davison, Rob Edmunds, Shane Farrell, Graham Finch, Charles Fletcher, Martin Gray, Lee Gregory, David Grundy, Dave Hamilton, Paul Harris, Steve Hatch, Donald Hobern, Ian Kimber, Ingeborg M. M. van Leeuwen, Keith Naylor, Ben Smart, Ian Smith, Francis Solly, Brian Stone.

Thank you all!

1.2. Webpage on Azorean spiders by Jørgen Lissner, Paulo Borges & Enésima Mendonça

It was recently launched a website which aims to illustrate the diversity of spiders from the Azores in images

(see: <http://www.jorgenlissner.dk/azoreanspiders.aspx>)

This is an initiative led by Jørgen Lissner and with the collaboration of Paulo Borges and Enésima Mendonça (University of the Azores - DCA, CITA) who is photographing the Azorean endemic spiders with the help of the image system Syncroscopy (Fig. 4). Jørgen Lissner is coordinating a portal on spiders from Europe (<http://www.jorgenlissner.dk/default.aspx>) and now agreed to cooperate with the Azorean Biodiversity Portal in this initiative. The aim is to have pictures of live spiders and detailed illustration of their bodies, in order to help the identification of the Azorean species.



Besides the habitus images we will try to provide images of female epigynes and male palps to enhance the ability to successfully identify spiders collected on the archipelago. Images shown on this page may not all be based on Azorean specimens but include spiders collected or observed elsewhere in their distributional range.

Figure 4. The endemic canopy spider *Savigniorhipis_azurensis*, a species that occurs mainly in the endemic tree *Juniperus brevifolia* (Photograph by Enésima Mendonça, 2008).

1.3. Webpage on Azorean termite control – SOS TERMITES

The project TERMIPAR (CITIZEN PARTICIPATION IN THE CONTROL OF TERMITE INFESTATION IN THE AZORES) financed by the Azorean Government and under the coordination of Paulo Borges, Ana Moura Arroz and Cristina Palos is about to launch a website (expected for January 2009), in Portuguese, in which the results of the project will be presented and many resources for the general public will be made available. The link will be the following (www.sostermitas.angra.uac.pt).



Figure 5. *Cryptotermis brevis* alate termite, one of the species that are present in the Azores (3D Creation of Paulo Cristóvão, May of 2008).

The site SOS—Termites pretends to attend to the needs of the people who have just discovered that have a termite infestation in their homes!

In this website will there will also be available four episodes of a film about the Azorean termites made by Paulo Cristovão (Instituto Politécnico de Viseu). This amazing 3D film includes also live interviews with specialists. We hope that this film will also appear in the Regional TV channel (RTP - Açores).

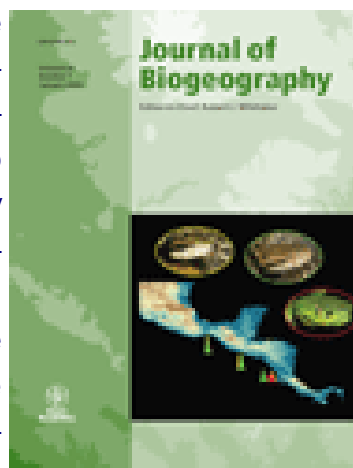
2. *Highlights from the literature*

Borges, P.A.V. & Hortal, J. (2009). Time, area and isolation: Factors driving the diversification of Azorean arthropods. *Journal of Biogeography* **36**: 178-191.

This article has recently been highlighted under the caption:

Azorean arthropods do it fast in dark caves

Azorean arthropods have diversified according to the age, area and relative isolation of each island within the archipelago. However, each group experiences these factors differently; hence their patterns of diversification differ according to their particular life histories. This is the main finding of a study conducted by Joaquín Hortal from the NERC Centre of Population Biology of the Imperial College, and Paulo Borges from the Azorean Biodiversity Group (CITA-A) of the University of the Azores, recently published in the *Journal of Biogeography*. The authors show that although the shape of the relationship between diversification and time is in general the same, different groups show different rhythms of evolution. They reach these conclusions within the first independent evaluation of the General Dynamic Model of Oceanic Island Biogeography, recently proposed by Robert J. Whittaker and colleagues, which merges the geological evolution of islands with the biological evolution happening on them. Borges and Hortal used the framework provided by this new model to study the relationship between the number of species that are single island endemics (i.e., exclusive of each island) and the age, area and isolation of each island.



Within the Azores, cave species appear to have evolved quite quickly, producing a number of species during the initial stages of development of the islands, when cave systems formed by lava tubes and volcanic pits were abundant and pristine due to the high volcanic activity. When the islands settle, cave systems start to collapse, diminishing the area available for cavernicolous species, which eventually end up either facing extinction or surviving in the small crevices of the soil under the forest.

This rapid pace of diversification and early decline is exclusive to cave arthropods and does not appear to be evident for the other arthropod groups studied.

In most islands some lineages are still evolving into new species, so older islands show more exclusive species than younger ones, except for the older island, Santa Maria, where some groups show some decrease in the pace of diversification. Such differences between groups are caused by the opposing roles of the two components of diversification. When speciation is predominant, diversification is positive and the number of endemic species on an island increases. This pace slows down as extinction takes the lead, and diversification gets slower and eventually negative when the islands age and erode and they start to lose species numbers. While for most arthropods the Azores is a land full of opportunities, those inhabiting caves already feel the pressure of living in aging islands.

Other factors, such as dispersal capacity, also affect the pace of diversification within the Azores, suggesting that the diversity of evolutionary responses in different kinds of organisms is so wide that no general model, like the one proposed by Whittaker and colleagues is able to predict the pattern and process of diversification of all living groups. What this model does, however, is to allow integration of deviations from the general pattern into a common theoretical framework. By relating these deviations with the particular characteristics of each group, we might be able to ascertain how and why evolutionary processes happen on the isolated archipelagos that constitute some of the few long-term experiments provided by nature.

If you want to comment on this article go to [http:// biogeography.blogspot.com/2008/10/azorean-arthropods-doit-fast-in-dark.html](http://biogeography.blogspot.com/2008/10/azorean-arthropods-doit-fast-in-dark.html)



Paulo A.V. Borges

3. CITA-A Evaluation

Our research centre— *Centro de Investigação de Tecnologias Agrárias dos Açores* (CITA-A) received the mention of GOOD on the last international evaluation.

The CITA-A was evaluated in February 2008 by a Panel of nine European scientists. The result was GOOD which keeps CITA-A with the same classification obtained in the previous evaluation.

The four research groups of CITA-A received independent evaluations.



I transcribe below the evaluation of Azorean Biodiversity Group. In general the evaluation was very positive. The evaluators refer that “*Productivity (Quant. & Qual.) seems to be high, (relatively high IP´s in Journals) and meeting international standards*” which gives justice to our work. **Good job everyone!**

Two suggestions from the evaluators:

i) the number of members should increase, which is already being achieved with the new Post-Docs, András and Kostas .

ii) to move to “climate change research”. Well we are already having some cooperation with the “Study Centre for Climate, Meteorology and Global Changes” of CITA-A, but probably we will have to study a more strategic cooperation with these and other colleagues .

Recently I sent a document to the Azorean Environment Director with the key biodiversity areas that need urgent research in the Azores. We need to continue to identify the key decision makers and make them understand the importance of our research agenda and why our priorities are in their and Azores interests.

“AZOREAN BIODIVERSITY GROUP EVALUATION

The research group has a very limited staff number (7 PhD!) while it has to deal with specific biodiversity aspects of Macaronesia. The archipelago is both remote, biologically distinct and internationally recognized as interesting and important for bio conservation. Logically, efforts should be divided over taxonomical aspects and conservation problems for which a staff like this is very small. To limit oneself is sensible but hard to do, choices made are realistic (key research areas, in which further narrowing down should be necessary).

The overall situation shows the necessity of reinforcement either by extending staff or by structural cooperation with research groups elsewhere in Portugal or other countries. Productivity (Quant. & Qual.) seems to be high (relatively high IP's in journals) and meeting international standards; the amount of PhD and Masters (delivered or underway) quite good. The research group seems well organized with good leadership and stimulating working environment; and has good international and national contacts. It is worthwhile to develop structural cooperation (nationally and internationally) further.

In view of my very positive comments above and considering the group's small size, I feel there is a need for either focusing the future work - or expanding the group. Are there any considerations in that direction?

Are there any strategic plans for this research area in Portugal, e.g. in view of climate change research?

Are there plans for closer cooperation with the other group on Climate, Meteorology and Global Changes - which also seems to be a rather small group?"

Evaluation Panel (I&D unit visited: 11-02-2008)

4. Past Events – Book launchings

The “TOP 100” book was officially launched in Funchal (Madeira Island)

The book *TOP 100* (Figure 7):

Martín, J.L, Arechavaleta, M., **Borges, P.A.V.** & Faria, B. (eds.) (2008) *TOP 100 - As cem espécies ameaçadas prioritárias em termos de gestão na região europeia biogeográfica da Macaronésia*. Consejería de Medio Ambiente y Ordenación Territorial, Gobierno de Canarias, 500 pp.

was officially presented in Madeira during the “Jornadas Técnicas do Projecto BIONATURA” (Funchal, November 2008) .

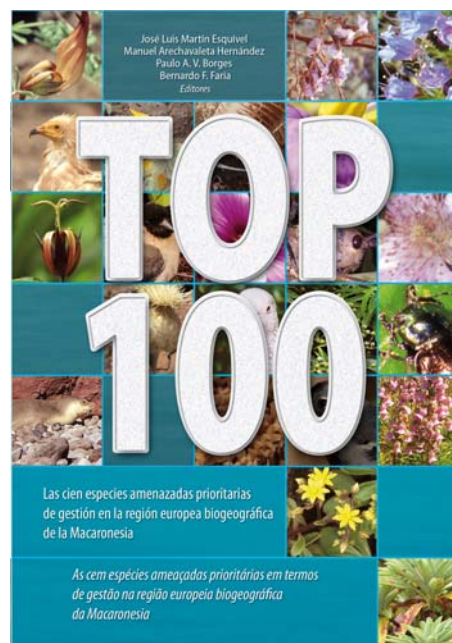


Figure 7. Cover of TOP 100 book. The PDFs in Portuguese and Spanish of this publication may be downloaded in the Azorean Biodiversity Portal.

5. Projects

The Short Courses open to the community have started.



The first Short Course on Floral Art under the Coordination of Ana Simões took place on the 25th October, with 35 enthusiastic participants (Figure 8).

The artist Beatriz Bigotte Chorão, from Lisbon, was the invited teacher, and the course was held at University of the Azores in the new building (Pico da Urze Campus).

Different types of floral ornaments were made using different techniques and materials. All the works are documented in images available upon request.

These program are going to be continued throughout the next year.



Figure 8. Floral Art rocks! The participants of the Short Course of the University of the Azores.

6. Future events—Oral and Poster Communications

The participation of members of the group in Congresses and meetings.

1. **Paulo A. V. Borges, Kostantinos Triantis** and **Ana Santos** will participate in January 2009 in the Fourth Biennial Meeting of the International Biogeography Society (8-12 January, Merida, Mexico). They will present the following Posters and talks:

- a) **Borges, P.A.V.**, Boieiro, M., **Cardoso, P.**, Aguiar, C., Rego, C., **Gaspar, C.**, **Amorim, I.**, **Ribeiro, S.P.**, Silva, I., Pereira, F. & Serrano, A.R.M. (2009). Comparing patterns of diversity and abundance of ground-beetles in the Laurisilva of Azores and Madeira archipelagos.
- b) **Borges, P.A.V.**, **Ribeiro, S.P.**, Uglund, K.I. & **Gaspar, C.** (2009). Insect and spider rarity in island tree canopies: true rare and pseudo-rare species
- c) **Santos, A.**, **Hortal, J.**, **Triantis, K.A.**, Jones, O.R., **Borges, P.A.V.** & Quicke, D.L.J. (2009). Global patterns in the niche width of island parasitoids.
- d) Sfenthourakis, S., **Triantis, K.A.**, Mylonas, M. (2009). Aegean biogeography: a land-bridge island perspective.

- e) Triantis, K.A., Borges, P.A.V., Ladle, R.J., Mendonça, E., Gaspar, C., Dinis, F., Melo, C., Santos, A.M.C., Amorim, I.R., Cardoso, P., Hortal, J., Gabriel, R., Ribeiro, S.P., Serrano, A.R.M., Quartau, J.A. & Whittaker, R.J. (2009). Catastrophic extinction debt on oceanic islands (oral presentation) .

2. **Rosalina Gabriel** and **Ana Moura Arroz** will participate in January 2009 in the “10º Congresso de Psicologia Ambiental: Comportamento humano e alterações globais” (Lisbon, Fundação Calouste Gulbenkian, 28-30 January 2009). They will present the following **oral presentations**:

- a) Ávila, S., **Arroz, A. M.** & Gabriel, R.. Em defesa do ambiente! – uma análise de conteúdo de medidas propostas por alunos do 2º Ciclo do Ensino Básico .
- b) **Gabriel, R.**, Silva, A. C., **Borges, P. A. V.** & **Arroz, A. M.** Conservação da biodiversidade: atitudes das crianças acerca dos invertebrados no âmbito de um projecto do 1º CEB
- c) **Gabriel, R.**, **Arroz, A. M.**, **Neilson, A. L.** & Rodrigues, L. C. O Ambiente não é qualquer coisa!: diversidade de perspectivas das crianças.
- d) Rodrigues, L. C., **Arroz, A. M.**, & **Gabriel, R.** O ambiente no futuro: Representações e preocupações de crianças terceirenses.

3. **Kostantinos Triantis**, **Joaquin Hortal** and **Ana Santos** will participate in February 2009 in the Conference on Island Evolution “Island Evolution 150 years after Darwin” (12-13 February, Leiden, The Netherlands). They will present the following papers:

- a) **Hortal, J.**, **Triantis, K.A.**, Meiri, S., Thébault, E., Sfenthourakis, S., Island species richness does increase with habitat diversity
- b) **Santos, A.M.C.**, **Triantis, K.A.**, **Borges, P.A.V.**, Jones, O.R., Quicke, D., Whittaker, R.J. & **Hortal, J.**. Are species-area relationships from entire archipelagos congruent with those of their constituent islands.
- c) **Triantis, K.A.** Evolutionary species-area curves (Invited talk)

4. **Alison L. Neilson** will participate in the December 15-16 meeting of the UN Regional Centres for Expertise in Education for Sustainable Development hosted by RCE-Ireland in Limerick. She will lead a workshop on power and identity in education for sustainable development .

5. **Alison L. Neilson** will participate in March 2009 in the conference of the European Cetacean Society (Feb 28 – Mar 4, 2009, Istanbul, Turkey). She will lead a workshop entitled *Reconciling diverse perspectives for cetaceans*.

7. The members whereabouts and their activities

Lots of comings and goings during this period!

Isabel Amorim (Post-Doc FCT – under the co-supervision of Paulo Borges and Brent Emerson) spent part of November actively sampling *Tarphius* specimens in mainland Portugal, successfully sampling the only species occurring at Portugal (North Portugal). This was quite an achievement since these samples could be really important to trace the colonization paths to Macaronesian islands from mainland. Brent Emerson commented: “*That really is GREAT news. Well done Isabel, fantastic stuff!*”



During the last months she was doing Laboratory Work in Lisbon, isolating DNA, and will start to work at Brent Emerson’s laboratory (University of East Anglia, U.K.) in January. There she will sequence DNA, analyse data and discuss lots of ideas with other evolutionists (January-May 2009). We hope to have her here at Terceira again in the Summer of 2009.



Pedro Cardoso (Post-Doc DRCT – under the co-supervision of Paulo Borges, Rosalina Gabriel and Jorge Lobo), delivered recently his first year report to DRCT. He submitted two manuscripts recently:

Cardoso, P., Borges, P.A.V. & Veech, J.A. (subm.). The robustness to under sampling for beta diversity measures based on presence-absence data. *Diversity and Distributions*.

Cardoso, P., Lobo, J.M., Calvo, S., Dinis, F., Gaspar, C. & Borges, P.A.V. (subm.). A spatial scale assessment of habitat effects on arthropod communities of an oceanic island. *Diversity and Distributions*.

Alison L. Neilson (Post-Doc DRCT – under the co-supervision of Rosalina Gabriel and Ana Moura Arroz), delivered her first year report to DRCT. She is actively preparing a paper to be submitted to a Conservation journal. She is also working on a project that will explore the perspectives about sea, whales and whale-watching in the Azores and in Canada and it involves several research groups in different parts of the world.



Kostantinos Triantis (Post-Doc FCT – under the co-supervision of Paulo Borges and Robert Whittaker) received a Visitors Research Grant and visited Joaquín Hortal and Ana Santos at NERC Centre for Population Biology, Imperial College London (Silwood Park, U.K.) during November-December 2008.



András Baselga (Post-Doc FCT – under the co-supervision of Paulo Borges and Alfried Vogler) is still working in Madrid. We hope he could start his project here at Terceira in January.

Ana Santos (Ph.D. student at Imperial College under the co-supervision of Donald Quicke and Paulo Borges) is currently finishing the paper “Are species-area relationships from entire archipelagos congruent with those of their constituent islands?”. This work will probably be submitted to *Global Ecology and Biogeography*. She is also doing laboratory work at Silwood Park (Imperial College, London University), isolating DNA from specimens collected in the Canary Islands.



Catarina Melo (Ph.D. in Ecology by the University of Coimbra under supervision of Helena de Freitas and Paulo Borges) is currently finalising her experimental work and starting the writing of her thesis. She is now performing the last experiment: Interactions between arbuscular mycorrhizal fungi and foliar-feeding insects (*Pseudaletia unipuncta*, Lepidoptera: Noctuidae) in *Holcus lanatus*.

Francisco Dinis (Ph.D. student in Ecology by University of Azores under the co-supervision of Paulo Borges, Miguel Araújo and Henrique M. Pereira) is currently writing his thesis entitled “Incorporating economics into sound reserve selection for biodiversity”.



Maria Teresa Ferreira (Ph.D. student in Entomology at the University of Florida under the co-supervision of Rudolf Scheffrahn and Paulo Borges) just completed her Masters degree at the University of Florida on “Dispersal flight, post flight behaviour, and early colony development of the West Indian drywood termite *Cryptotermes brevis* (Walker) (Isoptera: Kalotermitidae)”. She is now preparing some experiments to be conducted both in Florida and in the Azores during the next year. She expects to be at Terceira between May and September next year.

Sílvia Bettencourt (Ph.D. student in Entomology by University of Azores under the co-supervision of Ana Simões and Ana M. Nazaré Pereira) is currently doing the morphometrics of the species of scale insects that attack vines in Azores.





Sílvia Calvo (Ph.D. student in Plant Ecology at the University of the Azores under the co-supervision of Rosalina Gabriel, Jorge Lobo and Paulo Borges) is currently in the Museo Nacional de Madrid, where she would like to carry out her own ideas of data analyses. The field work performed in Terceira during the last months under the supervision of Rosalina Gabriel and Paulo Borges resulted in many samples that are now in a process of identification.

Enésima Mendonça was awarded a grant from CITA-A to work another four months (January-April 2009) with us. She is leading the project of photographing arthropods with the Syncroscopy Software to post them in the Azorean Biodiversity portal www.azoresbiportal.angra.uac.pt. She is also managing all the images offered by many people to be posted in the Azorean Biodiversity Portal.



João Moniz, who was awarded a grant from CITA-A to work four months (October 2008-January 2009) on the Entomoteca “Arruda Furtado”, is sorting and identifying morphospecies of arthropods of Pitfall and Canopy samples taken in several Azorean islands (Terceira, Flores, Corvo). He is also preparing two chapters on non-target insects occurring on fruit orchards at Terceira, for the books in preparation under Project INTER-FRUTA.

Lúcia Silveira, working under the supervision of Rosalina Gabriel and Ana Moura Arroz, is working on an interesting project that aims to put in a GIS system the land-use changes promoted during the Human colonization of the Azores during the last 500 years. She is investigating all the historical literature available.

Nídia Homem, working under the supervision of Rosalina Gabriel, received a CITA-A grant in order to continue the identification of Azorean bryophytes, recently collected in Flores and Terceira islands and write some papers on the distribution of the species on the archipelago.





Clara Gaspar, a past PhD student of the group who studied arthropod diversity and conservation planning, is currently managing the Science Centre of Angra do Heroísmo in Terceira (DRCT) is now interested in the area of science communication to the general public. She is at the moment writing and giving guidance to co-authors contributing for the book “Azores - a natural portrait” by Cardoso P., Gaspar C., Borges P.A.V., Gabriel R. et al.), a photographic book meant for the general public about the natural heritage of the Azores (mainly supported by CITA-A and a Grant of DRCT, to be printed at March/April of next year).

Joaquín Hortal (past Post-Doc of the group and currently at the NERC Centre for Population Biology, Imperial College London) has been appointed for a 5-year postdoctoral position on ‘Macroecology and Biodiversity’ at the “Centro de Biologia Ambiental” of the University of Lisbon, under the Portuguese FCT Ciência2008 scheme. He will probably move from the Imperial College on the coming autumn. **Congratulations to him!**



Alberto Jimenez Valverde, our Research Associate working in Kansas University under supervision of A. Peterson submitted recently the following papers:

Jiménez-Valverde, A., Nakazawa, Y., Lira-Noriega, A., Peterson, A. T. & Soberón, J. Environmental Correlation Structure and Ecological Niche Model Projections. *Biodiversity Informatics*, submitted

Peterson, A. T., Barve, N., Bini, L. M., Diniz-Filho, J. A., Jiménez-Valverde, A., Lira-Noriega, A., Lobo, J. M., Maher, S., De Marco Júnior, P., Martínez-Meyer, E., Nakazawa, Y. & Soberón, J. The climate envelope may not be empty. *PNAS*, submitted

Jiménez-Valverde, A., Lobo, J. M. & Hortal, J. The effect of prevalence and its interaction with sample size on the reliability of species distribution models. *Community Ecology*, submitted

Jiménez-Valverde, A., Baselga, A., Melic, A. & Txasko, N. Climate and regional beta-diversity gradients in spiders: dispersal capacity has nothing to say? *Ecography*, submitted

Fernando Pereira, our Field Technician keeps his enthusiasm and is coordinating the monitoring and sampling of arthropods in Algar do Carvão pit cave and sampling of *Sphagnum* spp. for heavy metal assessment (Terceira Island Geothermal Project).



8. New MSc. students and their projects

The PIs of the group have now new MSc. students to supervise mainly in the areas of Environmental Education and Nature Conservation.

In the last month several MSc. students started their thesis under the supervision of Paulo Borges, Ana Moura Arroz and Rosalina Gabriel, generally with co-supervisors either from the University of the Azores or from different Portuguese universities:

António Carlos Leal (Terceira, Azores), is a MSc Student in Environmental Education. His thesis is related with the management of coastal lagoons of Praia da Vitória (Terceira) (Supervisors: Rosalina Gabriel and António Frias Martins – Dep. Biologia UA – CIBIO Azores).

Berta Martins (Terceira, Azores), is a MSc Student in Environmental Education. Her thesis is related with the professional risk assessment of farmers in Terceira Island. (Supervisors: Ana Moura Arroz and Jorge Pinheiro – DCA - UA).

Carla S. G. M. da Silva (Pico, Azores), is a MSc student in Conservation Management. Her thesis is related with the "*Environmental perception about protected areas: contribution to the management of the Natural Park of Pico Island*" (Supervisors: Rosalina Gabriel and Paulo Borges).



Isabel Santos (Terceira, Azores), is a MSc Student in Environmental Education. Her thesis is related with the media interpretation of the environment (Supervisors: Ana Moura Arroz and Paula Castro - ISCTE).

Jacycarla Pinto (Pico, Azores), is a MSc Student in Conservation Management. Her thesis is related with the consumerism behaviour in the youth of Pico Island (Supervisors: Rosalina Gabriel and Ana Moura Arroz).

Helena Primo (São Miguel, Azores), is a MSc Student in Environmental Education. Her thesis is an experimental study comparing different ways to teach environmental concepts to children from the 5th and 6th grades (Supervisors: Rosalina Gabriel and Ana Moura Arroz).

Marcela Sobral (Terceira, Azores), is a MSc Student in Environmental Education. Her thesis is concerned about the public participation, namely the organic farmers of the Azores (Supervisors: Ana Moura Arroz and António Felix Rodrigues – DCA -UA).

Orjana Lara Risch (Terceira, Azores), is a MSc Student in Environmental Education. Her thesis intends to compare a number of teaching strategies (oral presentation by a specialist, *in situ* visits, regular teaching) in the youths perception of the natural pools of Terceira Island and their ecological importance for the biodiversity conservation (Supervisors: Rosalina Gabriel and João Pedro Barreiros – DCA -UA).



Orlando Guerreiro (Terceira, Azores), is a MSc Student in Conservation Management. His thesis is almost concluded and is intended to be a "Contribution to the management of the drywood termite *Cyptotermes brevis* in the Azorean archipelago". He has made several experiments and modelled the dispersion data of the termite around the city of Angra do Heroísmo (Supervisors: Paulo Borges and Miguel Tavarela).

Teófilo Braga (São Miguel, Azores), is a MSc Student in Environmental Education. His thesis is related with "ONGs, social participation and environmental attitudes", and intends to explore the environmental attitudes of both the ONG's members and the general public in the Azores (Supervisors: Paulo Borges and Cristina Palos).

9. Publications

9.1. Recently Accepted or published papers

The following papers were accepted for publication or published during the last months:

- Borges, P.A.V.** (in press). Distribution and abundance of arthropod species in pasture communities of three Azorean islands (S. Maria, Terceira and Pico). *Arquipélago*.
- Borges, P.A.V. & Hortal, J.** (2009). Time, area and isolation: Factors driving the diversification of Azorean arthropods. *Journal of Biogeography* **36**: 178-191.
- Borges, P.A.V. & Wunderlich, J.** (2008). Spider biodiversity patterns and their conservation in the Azorean archipelago, with description of new taxa. *Systematics and Biodiversity* **6**: 249-282.
- Borges, P.A.V., Hortal, J., Gabriel, R. & Homem, N.** (in press). Would species richness estimators change the observed species area relationship? *Acta Oecologica* <http://dx.doi.org/10.1016/j.actao.2008.09.003>
- Gaspar, C., Borges, P.A.V. & Gaston, K.J.** (in press). Diversity and distribution of arthropods in native forests of the Azores archipelago. *Arquipélago*.
- Gonzalez-Mancebo, J., Patiño, J., Werner, O., **Gabriel, R.** & Rós, R. M. (in press). Distribution patterns of Leucodon species in Macaronesia, with special reference to the Canary Islands. *Cryptogamie*
- Neilson, A. L.** (in press). The power of nature and the nature of power. Special Issue: Inquiries into practice. *Canadian Journal of Environmental Education* **14** (2009)
- Serrano, AR.M., Aguiar, C.A.S., Boieiro, M., **Borges, P.A.V.**, Rego, C., **Amorim, I.R., Ribeiro, S.P. & Pereira, F.** (in press). A new species of *Orthomus* Chaudoir, 1838 (Coleoptera Carabidae) from Madeira Island (Macaronesia) and notes on related species. *Zootaxa*.
- Stech, M., Sim-Sim, M., Esquível, G., Fontinha, S., Tangney, R., Lobo, C., **Gabriel, R.** & Quandt, D. (2008). Explaining the "anomalous" distribution of *Echinodium* Jur. (Bryopsida): independent evolution in Macaronesia and Australasia. *Organisms Diversity and Evolution* **8**: 282-292.
- Triantis, K.A., Nogués-Bravo, D., Hortal, J., Borges, P.A.V., Adersen, H., Fernández-Palacios, J.M., Araújo, M.B. & Whittaker, R.J.** (2008). Measurements of area and the (island) species–area relationship: new directions for an old pattern. *Oikos* **117**: 1555-1559.
- Werner, O., Patiño, J., Gonzalez-Mancebo, J., **Gabriel, R.** & Rós, R. M. (in press). Macaronesian endemic moss *Fissidens luisieri* base don DNA sequence data. *The Bryologist*.

9.2. The ten most important publications from 2008

The scientific production of the group is increasing, **reaching 41 publications** in the current year. These include seven international peer reviewed papers (IN: *Systematics and Biodiversity*; *Acta Oecologica*; *Insect Conservation and Diversity*; *BioControl*; *Oikos* *Journal of Biogeography*, *Organisms Diversity and Evolution*), three Books, 24 Book Chapters, and seven other type of publications. Moreover, an additional total of 51 publications were submitted, 36 of which are *in press*, that is, will be published during 2009, or some even in the last weeks of 2008.

Here is the list our particular Top 10 in 2008:

Borges, P.A.V., Abreu, C., Aguiar, A.M.F., Carvalho, P., Jardim, R., Melo, I., Oliveira, P., Sérgio, C., Serrano, A.R.M. & Vieira, P. (eds.) (2008). ***A list of the terrestrial fungi, flora and fauna of Madeira and Selvagens archipelagos.*** Direcção Regional do Ambiente da Madeira and Universidade dos Açores, Funchal and Angra do Heroísmo. 438 pp.

Borges, P.A.V., Abreu, C., Aguiar, A.M.F., Carvalho, P., Fontinha, S., Jardim, R., Melo, I., Oliveira, P., Sequeira, M.M., Sérgio, C., Serrano, A.R.M., Sim-Sim, M. & Vieira, P. (2008). ***Description of the Madeira and Selvagens archipelagos terrestrial and freshwater biodiversity.*** In: Borges, P.A.V., Abreu, C., Aguiar, A.M.F., Carvalho, P., Jardim, R., Melo, I., Oliveira, P., Sérgio, C., Serrano, A.R.M. & Vieira, P. (eds.). *A list of the terrestrial fungi, flora and fauna of Madeira and Selvagens archipelagos.* pp. 13-26, Direcção Regional do Ambiente da Madeira and Universidade dos Açores, Funchal and Angra do Heroísmo

Borges, P.A.V. & Hortal, J. (2009). ***Time, area and isolation: Factors driving the diversification of Azorean arthropods.*** *Journal of Biogeography* **36**: 178-191.



Borges, P.A.V. & Wunderlich, J. (2008). ***Spider biodiversity patterns and their conservation in the Azorean archipelago, with description of new taxa.*** *Systematics and Biodiversity* **6**: 249-282.

Homem, N. & Gabriel, R. (2008). *Azorean Rare Bryophytes*. Principia, Oeiras. 96 pp.

Cardoso, P., Borges, P.A.V., Costa, A. C., Cunha, R. T., Gabriel, R., Martins, A. M. F., Silva, L., Homem, N., Martins, M., Rodrigues, P., Martins, B. & Mendonça, E. (2008). *A perspectiva arquipelágica - Açores*. In: J. L Martín, M. Arechavaleta, P.A.V. Borges & B. Faria, (eds.) *TOP 100 - As cem espécies ameaçadas prioritárias em termos de gestão na região europeia biogeográfica da Macaronésia*. pp 421-449. Consejería de Medio Ambiente y Ordenación Territorial, Gobierno de Canarias.



Martín, J.L, Arechavaleta, M., Borges, P.A.V. & Faria, B. (eds.) (2008) *TOP 100 - As cem espécies ameaçadas prioritárias em termos de gestão na região europeia biogeográfica da Macaronésia*. Consejería de Medio Ambiente y Ordenación Territorial, Gobierno de Canarias, 500 pp.

Soares, A.O., Borges, I., Borges, P.A.V., Labrie, G. & Lucas. E. (2008). *Harmonia axyridis; What will stop the invader?* In Helen E. Roy & Eric Wajnberg, (Eds.). *From Biological Control to Invasion: the Ladybird Harmonia axyridis as a Model Species*. pp. 127-145. Springer Verlag, Germany

Stech, M., Sim-Sim, M., Esquível, G., Fontinha, S., Tangney, R., Lobo, C., Gabriel, R. & Quandt, D. (2008). *Explaining the "anomalous" distribution of Echinodium Jur. (Bryopsida): independent evolution in Macaronesia and Australasia*. *Organisms Diversity and Evolution* 8: 282-292.

Triantis, K.A., Nogués-Bravo, D., Hortal, J., Borges, P.A.V., Adersen, H., Fernández-Palacios, J.M., Araújo, M.B. & Whittaker, R.J. (2008). *Measurements of area and the (island) species–area relationship: new directions for an old pattern*. *Oikos* 117: 1555-1559.

10. Current Members (with their current location)

COORDINATOR: Paulo A. V. Borges (Azores)

Senior Research Scientists

- ⇒ Ana Maria Ávila Simões (Azores)
- ⇒ Ana Moura Arroz (Azores)
- ⇒ Rosalina Gabriel (Azores)

Post-Docs:

- ⇒ Alison L. Neilson (Azores)
- ⇒ Andrés Baselga (Spain)
- ⇒ Isabel Amorim (Lisbon)
- ⇒ Kostantinos Triantis (London)
- ⇒ Pedro Cardoso (Azores)

Associate Research Fellows:

- ⇒ Alberto Jimenez-Valverde (Kansas, USA)
- ⇒ Clara Gaspar (Azores)
- ⇒ Joaquín Hortal (London)
- ⇒ Sérgio Pontes Ribeiro (Ouro Preto, Brazil)

Ph.D. Students:

- ⇒ Ana Margarida Santos (London)
- ⇒ Catarina Melo (Azores)
- ⇒ Francisco Dinis (Azores)
- ⇒ Maria Teresa Ferreira (Florida, USA)
- ⇒ Sílvia Bettencourt (Azores)
- ⇒ Silvia Calvo Aranda (Madrid, Spain)

MSc. Students (Preparing Thesis):

- ⇒ António Carlos Leal (Terceira, Azores)
- ⇒ Berta Martins (Terceira, Azores)
- ⇒ Carla S. G. M. da Silva (Pico, Azores)
- ⇒ Isabel Santos (Terceira, Azores)
- ⇒ Jacycarla Pinto (Pico, Azores)
- ⇒ Helena Primo (São Miguel, Azores)
- ⇒ Marcela Sobral (Terceira, Azores)
- ⇒ Orjana Lara Risch (Terceira, Azores)
- ⇒ Orlando Guerreiro (Terceira, Azores)
- ⇒ Teófilo Braga (São Miguel, Azores)

Grant Students:

- ⇒ Enésima Mendonça (Azores)
- ⇒ João Moniz (Azores)
- ⇒ Lúcia Silveira
- ⇒ Nídia Homem (Azores)

Technicians:

- ⇒ Fernando Pereira (Azores)



Co-supervisors of PhD Students that are cooperating with the Group:

Ana M. Nazaré Pereira (Universidade de Trás-os-Montes e Alto Douro (UTAD))

Alfried Vogler (Imperial College, U.K)

Brent Emerson (University of East Anglia)

Donald Quicke (Imperial College, Univ. London)

Helena Freitas (Univ. of Coimbra)

Henrique M. Pereira (University Lisbon)

Jorge Lobo (Museo Nacional de Ciencias Naturales, Madrid)

Kevin Gaston (University of Sheffield)

Miguel Araújo (Museo Nacional de Ciencias Naturales, Madrid)

Robert Whittaker (University of Oxford)

Rudolph Scheffrahn (Ft. Lauderdale Research & Education Center University of Florida)

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Arturo Baz (Universidad de Alcalá, Spain)

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Erik Sjogren (Uppsala University, Sweden)

Fernando Albano Ilharco (Estação Agronómica Nacional,
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A little history...

The Azorean Biodiversity Group (ABG) is one of the four research groups of the Investigation Centre CITA-A (“Centro de Investigação em Tecnologias Agrárias dos Açores”). This centre is included in the University of Azores and is mainly sponsored by the Portuguese Foundation for Science and Technology (FCT) and the Regional Direction of Science and Technology (DRCT).

Although the Azorean Biodiversity group started officially in 2006, based on a reorganization of CITA-A, many investigators go back to 1999, when the BALA (Biodiversity of Arthropods from the Laurisilva of the Azores) project started. The number of people that is involved in the group has been steadily increasing since its creation and presently includes more than 20 members and four research associates, in several countries.

As the coordinator of the Azorean Biodiversity Group I thought that a “Newsletter” would be a good way to share news and promote the discussion among all the members of the group and their co-supervisors, especially those who do not live in Terceira Island.

Enjoy this space and feel free to use it at your will!

Paulo A. V. Borges



Newsletter details...

Write to Paulo Borges (pborges@uac.pt):

- ⇒ If you do not wish to receive any further editions of this Newsletter.*
- ⇒ If you want to announce anything or share some news of your activities*
- ⇒ If you would like to submit a picture, preferably with a small story or explanation, for the “Cover Picture” section.*