CENTER FOR ECOLOGY, EVOLUTION AND ENVIRONMENTAL CHANGES
AZOREAN BIODIVERSITY GROUP
GRUPO DA BIODIVERSIDADE DOS AçORES (ABG/CE3C)

2017 ANNUAL REPORT

Director: Paulo A.V. Borges

Vice-Director: Patrícia V. Garcia

Research Area: Biological Sciences

Home Institution: Universidade dos Açores

Angra do Heroísmo & Ponta Delgada, January 2018
EXECUTIVE SUMMARY

In 2015 the Azorean Biodiversity Group was recognized by the University of Azores as a regional Research Centre. At a national level, Azorean Biodiversity Group is a regional sub-group of the CENTRE FOR ECOLOGY, EVOLUTION AND ENVIRONMENTAL CHANGES (cE3c), based in Lisbon and awarded with the Classification of EXCELLENT by FCT in December of 2014. cE3c’s main objective is to perform research that addresses societal challenges in ecology, evolution and the environment, the three Es in the centre’s name, for the 2015-2020 period covering the EU 2020 Horizon. The Azorean Biodiversity Group is subdivided in two main groups with specific objectives, the “Island Biodiversity, Biogeography & Conservation - IBBC” and the “Island Environmental Risks & Society - IERS”.

In 2017, the main achievements of the 23 integrated members with Ph.D. of ABG-cE3c included 157 publications, 56 of which in International Indexed Journals with Impact Factor. The mean Impact Factor in 2017 in SCI Journals was 2.83 (max = 11.615; Biological Reviews); 28 publications are included in the first quartile, with a mean Impact Factor of 4.14 (49% of the SCI publications). Our 24 external collaborators published an additional 12 SCI publications with our affiliation.

Thirty-nine projects run in 2017, 10 of which were coordinated by integrated members (see detailed list in 6.1.): 18 received international funding, four were funded by National funds from FCT, eight by regional funds from DRCT and nine were funded by other Agencies. These 39 projects (some of them finishing in 2017) brought about 364,520.00 Euros to the research group members in 2017. In addition, in 2017 we secured a total of 280,720.00 Euros with Ph.D. Post Doc and other types of grants.

O GBA-cE3c tem por missão produzir, integrar e comunicar conhecimento científico sobre a biodiversidade em sistemas insulares, determinando efeitos das alterações globais, da fragmentação dos habitats e das espécies exóticas nos ecossistemas. Dar resposta aos desafios sociais implica avaliar esses impactos ao nível do ambiente, agricultura e saúde e conceber estratégias de os minimizar focadas na desconstrução de crenças e resistências das populações e na promoção de práticas pró-ambientais. O Grupo da Biodiversidade dos Açores está subdivididos em dois grupos principais com objectivos específicos, o “Island Biodiversity, Biogeography & Conservation - IBBC” e o “Island Environmental Risks & Society - IERS”.

Durante o ano de 2017 gostaríamos de realçar a publicação de 157 trabalhos científicos, 56 dos quais em revistas internacionais indexadas com Fator de Impacto. O Fator de Impacto médio em 2017 em SCI Journals foi de 2.83 (max = 11.615; Biological Reviews), sendo 28 as publicações no primeiro quartil, com Fator de Impacto médio 4.14 (49% das publicações SCI). Os nossos 24 colaboradores externos publicaram ainda um total de 12 artigos em revistas com IF com a nossa afiliação.

ABBREVIATIONS

ABG – Azorean Biodiversity Group /Grupo da Biodiversidade dos Açores

cE3c - Centre for Ecology, Evolution and Environmental Change /Centro de Ecologia, Evolução e Alterações Ambientais

FCAA-DCA – Faculdade de Ciências Agrárias e do Ambiente-Dep. de Ciências Agrárias

FCAA-DCEA – Faculdade de Ciências Agrárias e do Ambiente-Dep. de Ciências e Engenharia do Ambiente

FCSH-DP - Faculdade de Ciências Sociais e Humanas – Dep. de Psicologia

FCT – Portuguese Science Foundation / Fundação da Ciência e Tecnologia

FCT-DB- Faculdade de Ciências e Tecnologia-Dep. de Biologia

FCT-DCFQE- Faculdade de Ciências e Tecnologia-Dep. de Ciências da Física, Química e Engenharia

FRCT – Azorean Fund for Science and Technology / Fundo Regional da Ciência e Tecnologia

IF – Impact Factor / Factor de Impacto

LNEC – National Laboratory of Civil Engineering / Laboratório Nacional de Engenharia Civil

SCI – Science Citation Index

UAC – University of Azores/ Universidade dos Açores
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1. RESEARCH GROUP DESCRIPTION AND ACHIEVEMENTS FOR 2017

1.1. Introduction

Researchers that compose the Azorean Biodiversity Group (ABG-cE3c) have complementary expertise that allow to address research questions framed in the study of biodiversity patterns (taxonomic, functional and phylogenetic diversity), and its changes under the impact of climatic changes, land use alterations, and species invasions, which is key for guidelines of management and conservation. Emphasis is also given on the implementation of communication strategies and instruments to be used in participated risk appraisal, characterization and evaluation processes intended to facilitate the governance of the risk of environmental hazards, climate change and to increase social efficacy in the regions’ conservation of nature.

The ABG-cE3c has had a steady growth in the number of funded projects, publications and personnel over these last ten years (2008-2017), increasing from six integrated members in 2008 to the current 23. ABG-cE3c also included about 24 international and national collaborators as Associated Research Fellows that have been collaborating in several projects and publications.

The Group employed an integrated approach that combined multi-spatial and temporal scales (scale has a profound effect on detecting ecological and evolutionary patterns) with multi-metric measures of biodiversity (taxonomic, functional, phylogenetic) and their inter-relationships. It holds unique standardized databases for arthropods (BALA, ISLANDBIODIV and EDEN), bryophytes (MOVECLIM altitudinal gradients database), and vascular plants (ISLANDBIODIV).

Spreading its acquired knowledge both within the scientific community and to the general public has been important for the ABG-cE3c group in these last ten years. ABG-cE3c's interdisciplinary approach integrating science and education allowed the creation of eight web-based resources.

The research produced by the ABG-cE3c was crucial for wildlife conservation in Azorean natural terrestrial and marine habitats and the management of invasive species, some of which are useful for economic development. The Azorean government relied on ABG-cE3c for accurate information for the establishment of protected areas (Island Natural Parks).

In 2015 the Azorean Biodiversity Group was recognized by the University of Azores as a Regional Research Centre. Since 2015 the Azorean Biodiversity Group belongs to another FCT...
centre, the CENTRE FOR ECOLOGY, EVOLUTION AND ENVIRONMENTAL CHANGES (cE3c), based in Lisbon. cE3c’s main objective is to perform research that addresses societal challenges in ecology, evolution and the environment—the three Es in the centre’s name, for the 2015-2020 period. Our current 23 integrated members with Ph.D., plus Ph.D. students and collaborators are now part of a larger research centre, with 122 integrated members in which research questions will be addressed at both the mainland and insular scales. In December 2014 FCT awarded the Classification of EXCELLENT to the Centre for Ecology, Evolution and Environmental Changes (cE3C), an evaluation that included 19 researchers from the Azorean Biodiversity Group, which was a great achievement for all of us.

The current report lists all main activity of the Azorean Biodiversity Group for the year of 2017.

1.2. Members in 2017

The ABG has had a steady growth in the number of funded projects, publications and personnel over these last seven years, increasing from eight integrated members with Ph.D. in 2008 to the current 23.

In 2017 the group was composed by in average 23 senior researchers with Ph.D. thirteen of whom have academic positions at the University of Azores, one a position in a State Laboratory (LNEC), nine hold post-doctoral grants (three funded by Azorean Government FRCT, six funded by FCT). The group included in 2017 a total of 24 Ph.D. students, 5 of which with either FRCT (15) or FCT (4) grants; and six research grant holders. In addition, 24 Associated Research Fellows (External Collaborators) from several countries collaborate on different projects, creating a network of Island research investigators.

1.2.1. Integrated members with Ph.D.

1.2.1.1. Director

1. Paulo A.V. Borges (Univ. Azores, FCAA-DCEA) - IBBC

1.2.1.2. Vice-Director

2. Patrícia Ventura Garcia (Univ. Azores, FCT-DB) - IERS

1.2.1.3. Other Scientists with contract
3. Ana Isabel de Melo Azevedo Neto (Univ. Azores, FCT-DB)
4. Ana Moura Arroz (Univ. Azores, FCSH-DP)
5. Ana Maria Loureiro da Seca (Univ. Azores, FCT-DCFQE)
6. António Onofre Soares (Univ. Azores, FCT-DB)
7. David Horta Lopes (Univ. Azores, FCAA-DCEA)
8. João Pedro Barreiros (Univ. Azores, FCAA-DCA)
9. José Manuel Viegas de Oliveira Neto Azevedo (Univ. Azores, FCT-DB)
10. Maria do Carmo Barreto (Univ. Azores, FCT-DCFQE)
11. Lina Nunes (LNEC)
12. Rosalina Gabriel (Univ. Azores, FCAA-DCEA)
13. Rui Bento Elias (Univ. Azores, FCAA-DCA)
14. Virgílio Vieira (Univ. Azores, FCT-DB)

1.2.1.4. Post-Docs

15. Artur Gil (Univ. Azores, FCT-DB), Funded by FCT
16. Carla Rego (Univ. Azores, FCAA-DCEA), Funded by FCT
17. Eva Cacabelos Reys (Univ. Azores, FCT-DB), Funded by DRCT
18. Gustavo Oliveira de Meneses Martins (Univ. Azores, FCT-DB), Funded by FCT
19. Isabel Amorim (Univ. Azores, FCAA-DCEA), Funded by FCT
20. Mário Boieiro (Univ. Azores, FCAA-DCEA) (Starting in 2013), Funded by FCT
21. Olga Ameixa (Univ. Azores, FCT-DB & CESAM, Univ. of Aveiro), Funded by FCT
22. Reinaldo Pimentel (Univ. Azores, FCAA-DCEA) Funded by DRCT
23. Catarina Drumond Melo (Univ. Azores, FCAA-DCEA) Funded by DRCT

1.2.2. Other members

1.2.2.1. Ph.D. Students

24. Afonso Costa Lucas Prestes (Univ. Azores, FCT-DB) Funded by FRCT

26. Ana Rita Ferreira Patarra (Univ. FCAA-DCEA), Funded by FRCT (M3.1.2/F/024/2011)

27. Antonio Pérez Delgado (Univ. of La Laguna) Self-funded


29. Carolina Parelho (Univ. Azores, FCT-DB), Funded by FRCT (M3.1.2/F/048/2011) defended the doctoral thesis on October 2017

30. Débora Henriques (Univ. Azores, FCAA-DCEA), Funded by FRCT (M3.1.2/F/051/2011) waiting for the doctoral thesis defense

31. Emanuel Dias Xavier (Univ. Azores, FCT-DB), Funded by FRCT (M3.1.2/F/027/2011) waiting for the doctoral thesis defense

32. Filipe Miguel Teixeira de Sousa Bernardo (Univ. Azores, FCT-DB) Funded by FRCT

33. João Faria de Oliveira Santos (Univ. Azores, FCT-DB), Funded by FRCT (M3.1.2/F/021/2011) waiting for the doctoral thesis defense

34. João Manuel Medeiros da Silva (Univ. Azores, FCAA-DCEA), Self-funded

35. Lucas Lamelas López (Univ. Azores, DCA) Funded by FCT (SFRH/BD/115022/2016)

36. Manuel Fernandez Urrutia (Self-funded)

37. Marc Fernandez Morron (Univ. Azores, FCT-DB), Funded by FRCT (M3.1.2/F/028/2011) waiting for the doctoral thesis defense

38. Márcia Coelho (Univ. Azores, FCAA-DCEA), Funded by FRCT (M3.1.2/F/007/2012) waiting for the doctoral thesis defense


40. Mário Cesar Sedrez (Univ. Federal de São Carlos – UFSCAR) defended his doctoral thesis on February 2017

41. Orlando Guerreiro (Univ. Azores, FCAA-DCEA), Funded by FRCT (M3.1.5/F/003/2011)

42. Rita Godinho (Univ. Azores, FCAA-DCEA), Funded by FRCT (M3.1.2/F/030/2011)
43. Rui Miguel dos Santos Mendes Carvalho (Univ. Azores, FCAA-DCEA), Funded by FRCT Azores 2020

44. Rui Nunes (Univ. Azores, FCAA-DCEA), Funded by FRCT (M3.1.2/F/035/2011) waiting for the doctoral thesis defense

45. Sietze Johannes Norder (Univ. Lisbon, Faculty of Sciences) Funded by FCT - PD/BD/114380/2016

46. Sofia Terzopoulou (in collaboration with other research Center in Greece) defended her doctoral thesis on November 2017

47. Sónia Duarte (LNEC, Lisbon) Funded by FCT (FRH/BD/84920/2012) waiting for the doctoral thesis defense

1.2.2.2. Grant Students:


49. Enésima Mendonça (Univ. Azores, DCA) - IBBC (FCT)

50. Hugo Silva (Univ. Azores, DCA) - IERS (“Recuperar Progam - Azorean Government”) finished in May 2017

51. Joana Lourenço (Univ. Azores, DCA) - IERS (“Recuperar Progam - Azorean Government”) finished in May 2017

52. Luís Barcelos (Univ. Azores, DCA) – IBBC (“Recuperar Progam - Azorean Government”) finished in May 2017

53. Sílvia Silva (Univ. Azores, DCA) - IERS (“Recuperar Progam - Azorean Government”) finished in May 2017

1.2.2.3. Technicians:

54. Fernando Pereira (Univ. Azores, DCA) IBBC

1.2.2.4. Associate Research Fellows (External Collaborators):

55. Alain Vanderpoorten (University of Liege) – Collaboration in the Biogeography of Azorean Bryophytes
56. Ana Margarida Santos (Past Ph.D. Student), collaborator based in the University of Alcala (Spain)

57. Aristeidis Parmakelis (University of Athens)

58. Dinarte Nuno Freitas Teixeira (Instituto das Florestas e Conservação da Natureza, IP-RAM)

59. Fleur Visser (Behavioural Biology group of Leiden University) - Collaboration in the Island Marine Biology Sub-group led by J. Pedro Barreiros

60. François Rigal (Past Post-Doc) - Université de Pau et des Pays de l’Adour (France)

61. Gabor Lovei (Aarhus University)

62. Isabel Borges (Univ. Azores, FCT-DB)

63. Isadora Moniz (Univ. Azores, FCT-DB)

64. Jairo Patiño (University of Liege) – Collaboration in the Biogeography of Azorean Bryophytes

65. José A. P. Marcelino (Past Post-Doc) (Univ. Azores, FCT-DB)

66. José Carlos Carvalho, collaborator in Macroecology (Independent researcher)

67. Kostas Triantis (Past Post-Doc), collaborator in Island Biogeography and based in the University of Athens, Greece

68. Leila Bagaço (Univ. Azores, FCT-DB)

69. Margarita Patricia Florencio Diaz (Past Post-Doc) (Universidade Federal de Goiás, Brasil)

70. Maria Vale (Univ. Azores, FCT-DB)

71. Maria Teresa Bravo Ferreira (Past Ph.D. Student) (Univ. Azores, FCAA-DCEA)

72. Nídia Homem (Univ. Azores, FCAA-DCEA)

73. Pedro Cardoso (Past Post-Doc), collaborator in Macroecology and based in the Finish Museum of Natural History at Helsinki (Finland)

74. Pedro Miguel Reis Rodrigues (Universidad Austral de Chile) Collaboration in the Biogeography of Azorean Birds
75. Sérvio P. Ribeiro, collaborator in Canopy ecology and based in Universidade Federal de Ouro Preto (UFOP), Brasil

76. Simone Fattorini, collaborator in Island Biogeography (University of Aquila, Italy)

77. Tarso de Menezes Macedo Costa (Past Post-Doc) (Univ. Azores, FCT-DB)

78. Thomas Matthews (Past Ph.D. Student) (University of Birmingham, UK)

Further details may also be seen in the following web-pages:

Azorean Biodiversity Group ABG:

http://www.gba.uac.pt/

Island Biodiversity, Biogeography & Conservation – IBBC:

http://ce3c.ciencias.ulisboa.pt/team/IBBC

and

Island Environmental Risks & Society – IERS:

http://ce3c.ciencias.ulisboa.pt/team/IERS
2. PUBLICATIONS in 2017

2.1. By integrated members (Total = 157)

INTERNATIONAL PEER REVIEWED PAPERS (SCI Journals) = 56
BOOKS = 2
BOOK CHAPTERS = 9
OTHER PEER REVIEWED PAPERS = 19
PAPERS ON PROCEEDINGS OF SYMPOSIA = 4
EDUCATION & OUTREACH PUBLICATIONS = 7
OTHER TYPE OF PUBLICATIONS = 60
TECHNICAL REPORTS = 1

2.2. By Associate Research Fellows (Total = 16)

INTERNATIONAL PEER REVIEWED PAPERS (SCI Journals) = 12
OTHER PEER REVIEWED PAPERS = 1
OTHER TYPE OF PUBLICATIONS = 3

The main achievement performed by integrated members in 2017 was the publication of 157 works, 56 of which were published in International Indexed Journals with Impact Factor. In 2017, the mean Impact Factor of these publications was 2.83 (max = 11.615; Biological Reviews) with 28 of the publications included in the first quartile (49% of the SCI publications). Among the other publications, it is noteworthy to mention two Books as authors, nine book chapters, seven outreach publications, 19 papers in peer-reviewed journals with no impact factor (dominating the last edition of Arquipélagos, Life and Marine Sciences with five articles), four papers in Proceedings of Symposia and 59 other type of publications (mostly IUCN assessments) (Figure 1).
This makes an average of 6.82 publications and 2.43 SCI papers, per integrated member with a Ph.D. in 2017.

On top of those 157 publications we can add 16 more with the affiliation of the ABG (cE3c) published only by our Associate Research Fellows External Collaborators (namely 12 SCI papers). We must highlight the large contribution from our collaborators Simone Fattorini, François Rigal, Pedro Cardoso, Thomas Matthews, Jairo Patiño, Isabel Borges, Margarita Florencio, Kostas A. Triantis, Ana M.C. Santos, Marta Vale, Aris Parmakelis and Alain Vanderpoorten. The publications by collaborators are promoting the internationalization of the ABG (cE3c, University of Azores) and increasing the visibility of the group (Table 1). The detailed output of publications in 2017 for each member is given in Table 1. **Remarkably, 19 researchers had five or more indicators and a total of 29 researchers participated in at least two publications of the SCI (Table 1).**
<table>
<thead>
<tr>
<th>Authors</th>
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<th>Books</th>
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There was a steady increase in the number of publications in the last nine years in Journals with Impact Factor of the SCI (Figure 2), with a maximum value in 2017 (56 papers). The years of 2011, 2012 and 2014-2017 were particularly productive.

**Figure 2** Number of papers in Journals of the SCI in the period 2008-2017 by integrated members.
Particularly relevant is the fact that the summed values of Journals Impact Factor are increasing very fast (Figure 3), a demonstration that our researchers were successful in having their papers accepted in more prestigious Journals. In fact, the mean IF increased from 1.94 in 2014 to 2.7 in 2015, 2.6 in 2016 and now 2.8 in 2017.

![Figure 3 Summed Impact Factor in Journals of the SCI in the period 2008-2017 by integrated members.](image)

Considering the period in which we will be evaluated by FCT in 2018 (the 2013-2017 period), we also increased very fast the number of indicators (Table 2), with a particular relevance in an increase in papers in IF journals and a constant high number of papers in national and international journals without IF (in particular in Arquipélago, Life and Marine Sciences and Biodiversity Data Journal). In the period 2013-2017 a total of 486 publications were generated, with 214 (44%) being articles in IF journals.
Table 2 Number of publications of different types in the period 2008-2017 by integrated members.

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2.1. Selection of publications by thematics

In this period 2013-2017 we can highlight a group of 49 publications that made an important contribution to different thematics:

2.1.1. BIODIVERSITY AND TAXONOMY


Reason: First description of arthropod species for Azores using an Integrative taxonomic approach. This paper focus on biodiversity and diversification of a group of insects, which are among the most diverse group of terrestrial organisms in the Azores. Biodiversity assessments and investigating diversification on fragile island ecosystems generate crucial knowledge that will be used towards a capable next generation of scientists, a better-informed public and adequately advised policy, in order to promote change aiming to a more sustainable future.

Reason: Complete sampling of all dimensions of biodiversity is a formidable task, even for small areas. The framework now proposed combines estimation of taxonomic, phylogenetic and functional diversity into a single framework, offering a tool for future developments involving these different facets of biological diversity.


Reason: creation for the first time of a framework that allows partitioning beta taxonomic, phylogenetic and functional diversity into a single framework.


Reason: Creation of an innovative R-Package to measure and estimate alpha and beta taxon, phylogenetic and functional diversity.


Reason: Innovative exercise presenting the first model of Azorean natural zonal vegetation and its potential distribution in the nine Azorean Islands. This information may be used for landscape planning and management, selection of sites and species for ecological restoration and evaluation of climate change effects.

Reason: the taxonomic differentiation of several species of the genus CALENDULA existing in Portugal is supported by the analysis of the chemical profile of each one, that is to say, a work about biodiversity and taxonomy supported by the chemical point of view.


Reason: Innovative database was created for the first time for functional traits of Azorean bryophytes.


Reason: A comprehensive sampling of the epibiota living on the shells of the limpet Patella aspera across the nine islands of the Azores. The study highlights the exceptional diversity of this assemblage (190 taxa), identifies a positive relationship between basibiont size and diversity and how this varies among islands. The study further identifies 17 new algae not previously recorded in the Azores.

2.1.2. ISLAND BIOGEOGRAPHY


Reason: This review paper on island biogeography includes the contribution of many island biogeographers, including experts on Portuguese islands, namely the Azores and Madeira. The critical review of the most recent knowledge gathered on island biogeography will contribute to tackle challenges posed by global change. By November 2017 this paper has reached “highly cited” status on the web of knowledge, attesting its potential high impact on future research in this field.

Reason: For the first time, directional network models were constructed, representing putative connections among islands. Directional network models provide a way for evaluating the spatio-temporal signature of species dispersal. The method allows building scenarios against which hypotheses about dispersal within archipelagos may be tested. The new framework may help to uncover the pathways via which species have colonized the islands of a given archipelago and to understand the origins of insular biodiversity.


Reason: Biogeographic theory builds upon a long history of analyzing species-diversity patterns of remote islands, but no previous studies have attempted to investigate corresponding patterns in functional traits on islands. Our analyses of functional diversity (FD) for spiders and beetles in the Azorean archipelago reveal that FD increases with species richness, which, in turn scales with island area regardless of the taxa and distributional group considered (endemics, natives, and exotics). Our results also support the hypothesis that each group contributes to FD in proportion to their species richness and that, being dominant, exotic species have significantly extended the realized trait space of the Azorean islands.

2.1.3. MACROECOLOGY


Reason: For the first time, demonstration that animal dispersal ability determines the scaling properties of species abundance distributions (SADs).

Reason: For the first time, demonstration that species abundance distributions (SADs) can be used to understand how species colonization status influences species community assembly on oceanic islands. We conclude that differences in the SAD models and diversity indices demonstrate that the study of these metrics is useful for biogeographical purposes.


Reason: Due to ongoing global changes, it is essential to establish a baseline record from which to determine future shifts in species distributions and community assembly patterns. In this context, we used digitised historical bryophyte distribution data along a 1021 m elevational gradient in Terceira Island (Azores) to determine how bryophyte species distribution varies with elevation and which spatial and climatic drivers contribute to this variation. Despite their inherent biases, our study shows that historically compiled data can be a valuable tool for preliminary assessment of macroecological patterns.


Reason: For the first time, demonstration that with a single parameter (alpha GAMBIN) it is possible to use species abundance distributions (SADs) to characterize levels of disturbance at large scales.

Reason: For the first time, a demonstration of the relevant scales of variation associated with the urbanization of coastal communities and how these vary between mainland and insular ecosystems.

2.1.4. EVOLUTION AND GENETICS


Reason: This study demonstrated that Higher per-species speciation rates caused by increasing isolation with elevation are the most plausible and parsimonious explanation for the globally consistent pattern of higher endemism at higher elevations.

2.1.5. COMMUNITY ECOLOGY


Reason: Nothing is published about the arbuscular mycorrhizal fungi (AMF) of the Azores archipelago, either with regard to individual species, or at the community level. This study, based on identification through spore morphological characteristics, compares the AMF community structure of semi-natural and intensively managed pasture. The results indicate that intensity of pasture management may not influence AMF richness but is probably an important factor influencing their composition and abundance.

In this study, we investigated the distribution, abundance, richness and composition of flower-visiting insects to assess their response to land-use change in Terceira Island (Azores). Our results revealed that the Azorean flower-visiting insect communities are highly simplified across the entire gradient with little difference between habitats. In the absence of strong exotic competitors, indigenous flower-visiting insects expand their range and occupy new anthropogenic habitats, also facilitating the expansion of a large number of exotic plant species.


Reason: This study highlights the overlooked role that native herbivorous fish can have in determining the distribution and population structure of a key engineer canopy-forming algal species, which are globally declining due to multiple disturbances, and how this interaction is likely to increase with ocean warming.


Reason: This study is one of few empirical evidences highlighting how, in diverse ecosystems, species’ complementary response to environmental heterogeneity ensures the temporal stability in an ecosystem process.

### 2.1.6. INVASION BIOLOGY


Reason: Demonstration that the level of invasiveness is very high in soil organisms in Macaronesia.

Reason: Understanding the processes that lead to successful invasions is essential for the management of exotic species. Our results revealed that the local effect of habitat type, plant origin and plant structure explain variations in the species richness observed at a regional scale. These results shed light on the mechanistic processes behind the role of habitat types in invasions, i.e., plant fidelity and plant structure are revealed as key factors, suggesting that native forests may act as physical barriers to the colonisation of exotic spiders.


Reason: Using the world’s most invasive insect as model species we performed a critical analysis of factors at the basis of its invasive success in mainland habitats, and contrasted these with factors that explain the apparent resilience of island habitats for its introduction and spread.

Reason: Using the world’s most invasive insect as model species we performed a critical analysis of factors at the basis of its invasive success in mainland habitats, and contrasted these with factors that explain the apparent resilience of island habitats for its introduction and spread.

2.1.7. CONSERVATION BIOLOGY AND ECOSYSTEM RESTORATION


Reason: This chapter presents and discusses updated information related to fishing in the NE Atlantic and Mediterranean from a perspective that focuses on three main interchangeable and multidisciplinary issues: a) local/artisanal fisheries, b) recreational fishing and c) marine protected areas. A comprehensive introduction is followed by an updated literature review. Perspectives and solutions show that recreational and artisanal fisheries are clearly understudied and possibly have several impacts that are being unmeasured and often unknown. Another major issue is the lack of a serious long term European compromise to standardize these fisheries since a strong political interference does dominate the whole issue. No solution is possible without knowledge. No knowledge is possible if countries within the Mediterranean basin and NE Atlantic are not strongly and apolitically committed to a wider research scale with the overall interest of small fisheries sustainability and maintenance of healthy stocks as a major goal.


Reason: First assessment of a species conservation profile in a novel Biodiversity Data Journal platform.


Reason: Coastal urbanisation, whereby natural shores are replaced by hard coastal structures, is increasing worldwide and is associated with the loss of diversity in coastal ecosystems. These papers explore some of the causes of this effect, and explore ways to compensate for them.


Reason: These authors created an innovative Index that quantifies levels of disturbance in small islands using as example Azores, but with some applications already performed in Madeira island.


Reason: This scientific article addresses the conservation planning and management issues of terrestrial ecosystems with particular insight to small islands (with examples of application in the Macaronesian archipelagos of Cape Verde, Canaries, Madeira and Azores). These examples involve possible land use and management changes and trade-off processes specific to each island that are listed and explained.


Reason: First modeling exercise in Azores to predict the effects of climate change on the distribution of indigenous species of several taxonomic groups.


Reason: This study builds on a number of case studies to highlight how ecological connectivity differs from genetic connectivity and how this distinction can be of paramount importance for the conservation of natural habitats, especially in the marine realm where Common Fisheries Policy often operates at scales divorced from ecological reality and actual stock definition. Researchers from the Azores Biodiversity Group (IBBC)/cE3c provided much of background data that sustains this paper and actively engaged (via past and ongoing projects) in research aimed at fostering a more scientifically sound and sustainable exploitation of the sea.


Reason: Fishing can prompt the reduction in the number and size of target populations. This study shows how fishing can have much wider implications than those already documented via changes in the timing of sex change in a protandrous patellid limpet, an important resource in the Azores. These findings have wider implications for the conservation of Patella aspera in the Azores and support the enforcement of regulations that not only protect the small individuals but also the larger-sized animals to safeguard the replenishment of the population.


Reason: Remote archipelagos are of outstanding importance in conservation biology due to the extensive loss of endemic species driven by anthropogenic disturbance. However, few, if any, studies have sought to determine drivers of extinction risk for highly threatened island invertebrates. By compiling and analyzing a unique dataset for endemic Azorean beetles, seven of which can be considered as extinct, we show that larger beetle species that are confined to the remaining 3% of original natural forest in the Azores are the most threatened with extinction. Our study provides a clear warning of the impact of habitat loss on island endemic biotas.
2.1.8. PEST MANAGEMENT


Reason: These two publications are important because describe a successful case of stakeholder participation in an ongoing monitoring study of 203 houses in five islands of the drywood termite *Cryptotermes brevis* (see Borges et al. 2014, J. Ins. Science) and a cost estimation for its control (Guerreiro et al. 2014, J. Econ. Entomol.).


Reason: Population dynamics studies are very important for any area-wide control program as they provide detailed knowledge about the relationship of Medfly [*Ceratitis capitata* (Wiedemann)] life cycle with host availability and abundance. The results from Sao Jorge Island indicate significantly lower male/female ratio than on Terceira Island. This is an important finding specially regarding when establishing the scenario parameters for a sterile insect technique application in each island. The population dynamics of *C. capitata* are generally linked with host fruit availability and abundance. However, on Terceira Island fruit infestation levels are not synchronized with the trap counts. For example, there was Medfly infestations in some fruits while in the nearby traps there were no captures at the same time. From this perspective, it is important to denote the importance of wild invasive plants, on the population dynamics of *C. capitata*, as well important to consider the possibility of having different densities of traps according to the characteristics of each area in order to improve the network of traps surveillance’s sensitivity on Terceira Island.

Reason: Extrapolation from quantitative sampling to the surrounding areas is an essential feature of many aspects of real world applications in pest management decision-making. However, these decisions are only as good as the accuracy of the methods that provided the information. The problem of estimating Mediterranean fruit fly population densities from trap grids is a specific case. The efficiency of three methods to estimate fruit flies trapped per day values for nonsampled areas in Terceira Island is evaluated, the inverse distance weighted, ordinary Kriging and the geographic weighted regression (GWR). The results demonstrate that the GWR method is capable of estimating hotspots for the next season and can be used to identify ecological corridors over a non-sampled area. The high spatial heterogeneity and topographical conditions present on Terceira Island may explain why a more mathematically complex method is more reliable than simpler methods for use in possible future wide-area control program for medfly.


Reason: Knowing where pest populations are in time and space is indispensable information needed to effectively plan, implement and evaluate area-wide integrated pest management programmes. With this awareness, area-wide control measures, such as sterile insect technique, might have better performance and even reduced programme costs through more precise spatial planning. The ordinary least squares estimation model calculated for each gender cannot provide a satisfactory general explanation for abundance of both genders of wild adults, yet it might generate some hypotheses about wild adult females of *C. capitata* fruit-seeking behaviour. Results from geographically weighted regression analysis can provide a satisfactory general explanation for abundance of both genders of wild adults. Both methods suggest that males are more dispersed than females, and because of that they might play an important role in scouting the surroundings for additional fruit hosts. The presence of some host-plants, even in places offering less protection
(like pasture areas), provides an ecological corridor that supports the spread of wild adults of C. capitata.

2.1.9. ENVIRONMENTAL RISKS


Reason: These three integrated publications are important because research was performed using integrative methodologies to evaluate soil health status in Azorean volcanic agricultural areas. Results provided knowledge about the health of volcanic soils, fundamental to design and implement strategies to sustainable use of volcanic soils for agriculture purposes. A bottom-up study, integrating soil physicochemical properties, biomarkers from belowground biota and small mammals, was carried to assess soil health. Research revealed that agricultural management practices in volcanic soils lead to stressful conditions to resident biota, compromising local soil health status and provision of soil-based ecosystem services. All biological endpoints measured in the selected biological indicators were sensitive to anthropogenic activities (land use type and soil management) and/or stressors (agrochemicals) present in soils, validating their applicability as tools to assess soil health status in volcanic areas and highlighting the relevance of an integrative approach in soil health assessment.
2.1.10. SCIENCE COMMUNICATION, CITIZEN SCIENCE POLICY AND OUTREACH


Reason: These two publications describe an Urban intervention " Açorianos há milhões de anos" (Azoreans for millions of years), Angra do Heroísmo, Terceira, Azores, which consisted of outdoors of macro photos of Azorean endemic insects accompanied by brief relevant species information. Actions to communicate scientific knowledge to the general public are critical, namely concerning biodiversity conservation on fragile island ecosystems, such as the Azores. This is relevant within the cE3c mission/vision, which includes combining research with action, and integrating science and education towards better informed citizens, to effectively promote change to achieve a more sustainable future.


Reason: The 50th anniversary of the publication of the seminal book, The Theory of Island Biogeography, by Robert H. MacArthur and Edward O. Wilson was a timely moment to review and identify key research foci that could advance island biology. Here we took a collaborative horizon-scanning approach to identify 50 fundamental questions for the continued development of the field. At a time when the current impact of invasive species and the future threat of climate change...
threatens the survival of endemic species of islands on a global scale, this publication will inspire a new generation of scientists to conduct fundamental and applied research in island systems. Researchers from the Azorean Biodiversity Group (IBBC; IERS) / cE3c are developing several strategic projects that will respond to some of these 50 issues, including the MACDIV, SLAM, BEST III, 2gether, MOMENTOS, PRAC projects.


Reason: The MONICET platform has been developed to guide the collection, to store and to disseminate information on cetacean observations made by whale watching companies. Operating since 2009 with support from cE3c, it now contains dozens of thousands of observations. This paper is the first of a series which aims to demonstrate the importance of these sources of information to the study of the ecological niche of animals which are notoriously difficult (and expensive) to monitor.
3. PROJECTS

A total of thirty nine projects run or were accepted in 2017, ten of which were coordinated by integrated members (see detailed list in 6.1): 19 received international funding, five were funded by National funds from FCT, seven by regional funds from DRCT and nine were funded by other Agencies. In the period between 2013 and 2017 most of funds were obtained from nacional (FCT) and regional sources with a stable income of funds (Figure 4).

![Figure 4](image)

**Figure 4** Funds executed in projects the period 2013-2017 by integrated members.

In the period between 2013 and 2017 a large quantity of funds were obtained for Ph.D. and Post-Doc grants mostly regional sources (Figure 5). Considering the global funds obtained in projects and grants there is a tendency for a decreasing in the last five years due to the fact that several regional and nacional funding programs will only start again in 2018.
Figure 5 Funds obtained in grants (mostly for Ph.D and Post-Doc) in the period 2013-2017.

Figure 6 Funds executed in projects and grants in the period 2013-2017 by integrated members.
3.1. Mobility projects and networks

Table 3 shows the name and projects of the students working within the GBA, coming from different areas and projects.

**Table 3: Mobility projects and networks on ABG during 2017.**

<table>
<thead>
<tr>
<th>Student</th>
<th>Project title</th>
<th>Scholarship type</th>
<th>Scholarship area</th>
<th>Supervisor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alessandro Dieste</td>
<td>Grazing preferences on <em>Asparagopsis armata</em> and native macroalgae.</td>
<td>Erasmus</td>
<td>Biodiversity; Ecology</td>
<td>Cacabelos, E. &amp; Neto, A.I.</td>
</tr>
<tr>
<td>Juan Manuel Taboada Alvarez</td>
<td>Triagem de artrópodes de amostras de armadilhas SLAM para avaliação do impacto de gradientes altitudinais na diversidade de artrópodes.</td>
<td>Erasmus</td>
<td>Biodiversity; Ecology</td>
<td>Borges, P.A.V.</td>
</tr>
<tr>
<td>Leire Lopetegui</td>
<td>Spatial and temporal distribution of macroalgal assemblages associated with the invasive <em>Asparagopsis armata</em> on intertidal rocky shore in Azores</td>
<td>Erasmus</td>
<td>Biodiversity; Ecology</td>
<td>Cacabelos, E. &amp; Neto, A.I.</td>
</tr>
<tr>
<td>Lidia Muñoz Sánchez</td>
<td>Developing field and laboratory work to (i) evaluate temporal changes in the structure of macroalgal communities in subtidal rocky shores of São Miguel Island and (ii) test if spatial variability in the distribution of microhabitats can affect snail behaviour.</td>
<td>Erasmus</td>
<td>Biodiversity; Ecology</td>
<td>Cacabelos, E. &amp; Neto, A.I.</td>
</tr>
<tr>
<td>Merili Martverk</td>
<td>Monitoring of the Diversity of arthropods in Azorean Native Forests.</td>
<td>Erasmus</td>
<td>Biodiversity; Ecology</td>
<td>Borges, P.A.V.</td>
</tr>
<tr>
<td>Agustín Jiménez Fernández Palacios</td>
<td>Assessing the effectiveness of Landsat 8 OLI multispectral satellite imagery for vegetation mapping in Macaronesian Islands.</td>
<td>Erasmus</td>
<td>Remote Sensing</td>
<td>Borges, P.A.V. &amp; Gil, A.</td>
</tr>
<tr>
<td>Michaela KUBOVÁ</td>
<td>Garden trees as hosts of biodiversity in the Azores.</td>
<td>Erasmus +</td>
<td>Biodiversity</td>
<td>Gabriel, R.</td>
</tr>
<tr>
<td>Eduardo de la ROSA-MERINO</td>
<td>Espécies invasoras na ilha Terceira</td>
<td>Erasmus +</td>
<td>Biodiversity and conservation</td>
<td>Gabriel, R.</td>
</tr>
<tr>
<td>Rebeca DíAZ-RODRIGUEZ</td>
<td>Apreciação sazonal de invertebrados obtidos por armadilhas SLAM em áreas naturais dos Açores</td>
<td>Erasmus +</td>
<td>Biodiversity and conservation</td>
<td>Borges, P.A.V. &amp; Gabriel, R.</td>
</tr>
<tr>
<td>Sophia Griese</td>
<td>Macroinvertebrate's early recruits at the Azorean rocky intertidal communities</td>
<td>Erasmus +</td>
<td>Life sciences</td>
<td>Neto, A.I.</td>
</tr>
<tr>
<td>Margarida Rodrigues Brito de Azevedo</td>
<td>Briófitos dos Açores: Recolha, Tratamento, Identificação, Organização e Gestão de Coleções Biológicas</td>
<td>Estagiar L</td>
<td>Biodiversity</td>
<td>Gabriel, R.</td>
</tr>
<tr>
<td>Celia López Cañizares</td>
<td>Biodiversidade dos Açores: Recolha e tratamento de dados sobre biodiversidade nativa dos Açores e perspetivas dos habitantes locais sobre a mesma.</td>
<td>Estagiar L</td>
<td>Biology, Biodiversity</td>
<td>Amorim, I.R. &amp; Elias, R.B.</td>
</tr>
</tbody>
</table>
### 3.2. Research contracts

We must highlight several research contracts with national and international entities:

1. **PEERS – Platform for Enhancing Ecological Research & Sustainability**, a consortium between the Center of Environmental Biology (University of Lisbon, Portugal), the Azorean Biodiversity Group (University of the Azores, Portugal) and the Center of Functional Ecology (University of Coimbra, Portugal).

2. **NATURE PARKS OF AZORES** – We started an unprecedented collaboration with several Azorean environmental organizations to perform a Long Term Ecological Study in the natural forest of several Azorean islands. This study is possible due to the collaboration with the Natural Parks of Santa Maria, Terceira, Faial and Pico islands, the Botanical Garden of Faial island and the Furnas Monitoring and Research Centre (São Miguel island);
3. **BIG – Biodynamical Island Group** – This is an International consortium research group implemented to model the General Dynamic Model of Island Biogeography. It includes 14 international Researchers, where five of them are either integrated members (P.A.V. Borges, F. Rigal), Ph.D. students (T. Matthews) or collaborators (K. Triantis, R. Whittaker) of the RG Island Biodiversity, Biogeography & Conservation.

4. **Development and Coordination for “RCE Açores”** - part of UN international education network Regional Centre of Expertise on Education for Sustainable Development, accredited by the United Nations University, Institute of Advanced Studies.
4. OUTREACH ACTIVITY

Besides the presentation of our research in multiple forums, the ABG/cE3c, aims to share information with the public, keeping web-based resources, engaging in different initiatives and advertising them in the media.

4.1. Web-based resources in the Period 2008-2017

1. Azorean Biodiversity Group Page (http://www.gba.uac.pt/)
2. Azorean Biodiversity Portal (http://www.azoresbioportal.angra.uac.pt/)
3. Azorean Biodiversity Gallery (http://galeria.azoresbioportal.angra.uac.pt/)
4. ATLANTIS database (http://www.atlantis.angra.uac.pt/)
5. Azorean Spiders: (http://www.jorgenlissner.dk/azoreanspiders.aspx)
6. Termites of the Azores (http://sostermitas.angra.uac.pt)
8. IBBC and IERS Groups with cE3c
   (http://ce3c.ciencias.ulisboa.pt/teams/profile/?id=9)
   (http://ce3c.ciencias.ulisboa.pt/teams/profile/?id=10)
10. ISLAND LAB (http://islandlab.uac.pt/)
11. IBIG (http://www.ibigbiology.com/)
12. MAIISG - IUCN SSC MID-ATLANTIC ISLAND INVERTEBRATES SPECIALIST GROUP
    (http://www.maiisg.com/)

4.2. Public awareness activities

   "Historic gardens of the Azores as a tourist attraction of the archipelago: A survey
   carried out by the European funded research project 'Green Gardens - Azores'
   (GreenGA)". Culture, Sustainability, and Place: Innovative Approaches for Tourism
   Development. Universidade dos Açores, Ponta Delgada, Ilha de São Miguel, Portugal.


13. **Boieiro, M.** (2017) Fantastic beetles (and other amazing creatures) and where to find them in Madeira archipelago.


4.3. Radio/Journal news/Interviews


5. SCIENTIFIC MEETINGS ORGANIZATION

Our group also participated, in 2017, on the organization of one international conference, one international symposium, two meetings and one forum.


6. APPENDIX SECTION

6.1. DETAILED INFORMATION FOR 2017 PROJECTS

6.1.1. INTERNATIONAL PROJECTS

1. (2008-2022) IUCN/SSC Grouper and Wrasse Specialist Group

Coordinators: Dr. Yvonne Sadovy de Mitcheson - Co-Chair, University of Hong Kong (China) and Dr. Matthew Craig – Co-Chair, National Oceanic and Atmospheric Administration (USA).

Group members: João Pedro Barreiros (Universidade dos Açores- GBA – cE3c).

Budget for the ABG: not funded.


Coordinator: Alison L. Neilson.

Members: Rosalina Gabriel, Ana Moura Arroz, Enésima Mendonça, Paulo A.V. Borges, Fernando Pereira (Universidade dos Açores- GBA – cE3c) and Ana Simões.


Budget for the ABG: 22.950,00 Euros.


Budget for the ABG: 28.000,00 Euros.


Coordinator: Michael Borregaard and Robert Whittaker (based at the University of
Oxford, UK).

Members: Paulo A.V. Borges, Isabel Amorim, François Rigal, Tom Matthews (Universidade dos Açores- GBA – cE3c) and Kostas A. Triantis.

Budget for the ABG: 10.000,00 Euros.

5. **(2014-2017) ESMERALDA - Enhancing ecoSysteM sERvices mApping for poLicy and Decision mAking**

Funding Institution: European Community (H2020-SC5-2014- CSA).


Budget for the ABG: 2.500,00 Euros.

6. **(2014-2018) Distribution and potential negative effects of the recently arrived invasive coccinellid species Harmonia axyridis in agricultural, rural and urban landscapes in Chile: local to landscape and regional impacts**

Funding Institution: National Commission for Science & Technology (CONICYT), Government of Chile. FONDECYT 1140662.

Coordinator in Azores: António Onofre Soares (Universidade dos Açores- GBA – cE3c).

Budget for the ABG: 12.000,00 Euros.

7. **(2014-2020) IUCN - Spider and Scorpion Specialist Group**

Coordinator: Pedro Cardoso (Finnish Museum of Natural History, Univ. Helsinki, Helsinki, Finland).


Budget for the ABG: not funded.
8. **(2015-2020) - IUCN Mid-Atlantic Island Invertebrates Specialist Group**


Group members: Carla Rego, Mário Boieiro, Virgílio Vieira, Isabel Amorim, Rosalina Gabriel, Ana M. Arroz (Universidade dos Açores- GBA – cE3c) Pedro Cardoso (Finnish Museum of Natural History, Univ. Helsinki, Helsinki, Finland) and Simone Fattorini.

Budget for the ABG: 6.000,00 Euros.


Funding Institution: European Union.

Participants from ABG: Rosalina Gabriel (Universidade dos Açores- GBA – cE3c).

Budget for the ABG: 1.200,00 Euros.

10. **(2016-2020) - Vertebrate Natural History**

Coordinators: Prof. Dr. Ivan Sazima (Universidade Estadual de Campinas, São Paulo, Brazil).

Group members: João Pedro Barreiros (Universidade dos Açores- GBA – cE3c).

Budget for the ABG: not funded.

11. **(2016-2026) IUCN/SSC Species Monitoring Specialist Group**

Coordinator: Peter J. Stephenson.

Group members: Paulo A.V. Borges (Universidade dos Açores- GBA – cE3c) and Pedro Cardoso (Finnish Museum of Natural History, Univ. Helsinki, Helsinki, Finland).

Budget for the ABG: not funded.

12. **(2017-2019) PERVEMAC II - Agricultura Sostenible y seguridad alimentaria en la Macaronesia: investigacion de los beneficios y riesgos por la ingesta de productos vegetales para la salud de los consumidores y desarrollo de estrategias de minimizacion de peligros**


Participants from ABG: David João Horta Lopes (Universidade dos Açores- GBA – cE3c).

Coordinators: GMR Canarias.

Partners: Universidade dos Açores (UAC), Instituto Nacional de Investigação e Desenvolvimento Agrário (INIDA), Instituto Tecnológico de Canarias, S.A. (ITC), Dirección General de Agricultura del Gobierno de Canarias (DGA), Instituto Nacional de Saúde Pública (INSP), Dirección General de Salud Pública del Gobierno de Canarias (DGSP), Direção Geral da Agricultura e Desenvolvimento Rural (DGADR), Universidad de Las Palmas de Gran Canaria (ULPGC), Secretaria Regional de Agricultura e Pescas (SRAP), Dirección General de Agricultura del Gobierno de Canarias, S.A.U. (GMR Canarias), Universidad de La Laguna (ULL), Agencia de Regulação e Supervisão dos Productos Farmacêuticos e Alimentares (ARFA).

Budget for the ABG: 103.488,95 Euros.

13. (2017-2020) MACBIOBLUE - Development of new products & processes derived from macroalgae in the context of Macaronesian Blue Biotechnology & Transfer to Enterprises

Coordinator: Eduardo Portillo Hahnefeld, Instituto Tecnológico de Canárias (Gran Canaria, Spain).

Group members: Maria do Carmo Barreto (Azores team leader), Ana Seca and Ana Neto (Universidade dos Açores- GBA – cE3c).

Partners: FEDER partners - Fundação Gaspar Frutuoso; FICIC (Fundación Canaria del Instituto Canario de Investigación del Cancer); Universidad de Las Palmas de Gran Canaria; Universidade da Madeira; Universidad de La Laguna. Instituto Canario de Investigaciones Agrarias; Non-FEDER Partners/Third countries - Universidad de Cabo Verde; Universidade de Ciências, de Tecnologia e de Medicina (Mauritania); Université Cheikh Anta DIOP (Senegal).

Other participants/enterprises - CEAMED SA (Canarias, Spain); Salinas Marinas de Fuertecaliente S.L. (Canarias, Spain); ECOS Estudios Ambientales y Ocenografia (Canarias, Spain); Natur Extracts S.A. (Madeira, Portugal); BRC Infraestructuras Hidráulicas (Canarias, Spain); Martell Lozano S.L.; (Canarias, Spain); Algalimento S.L. (Canarias, Spain); Ayuntamiento de Las Palmas de Gran Canaria (Canarias, Spain); COAG-Canarias (Coordinadora de Organizaciones de
Agricultores y Ganaderos) (Canarias, Spain); IDEAQUA FISH & AQUAPONIC SL (Canarias, Spain); UBQ II Lda (Madeira, Portugal); Biocanarias scp (Canarias, Spain).

Budget for the ABG: 92.123,00 Euros.


Coordinator: Luís Filipe Dias Silva (CIBIO-A).

Funding entity: FRCT (M1.1.C/2/001/2017) - BIODIVERSA ERA-NET

Group members: Patrícia V. Garcia, Maria do Carmo Barreto and Carolina Parelho (Universidade dos Açores- GBA – cE3c).

Budget for the ABG: 50.000 Euros of a total of 100.000 Euros.

15. (2017-2020) Ecofibras - Eco-sustainable valorisation of invasive vegetal species in Macaronesia to obtain fibers with industrial use

Funding Institution: FEDER – EU.

Participants from ABG: Rui Elias (Universidade dos Açores- GBA – cE3c).

Other participants from other Institutions: Alfredo Borba, Carlos Vouzela, Henrique José & Duarte Rosa (University of the Azores).

Coordinators: Universidad de Las Palmas de Gran Canaria.

Partners: Universidade da Madeira (Madeira Chemistry Research Centre), Cabildo de Gran Canaria (through Jardín Botánico Canario Viera y Clavijo), Universidade dos Açores and Fundaçao Gaspar Frutuoso.

Budget for the ABG: not funded.

16. (2016-2018) CAMBIO- Holocene insular biodiversity changes on the Macaronesian and Balearic Islands (II)

Funded by Ministerio de Economia, Industria & Competitividad; Spain.

Coordinator: Josep Antoni Alcover Tomás (Departament de Biodiversitat i Conservació, Institut Mediterrani d’Estudis Avançats; Mallorca, Balearic Islands (Spain);

Members: Paulo A.V. Borges and Fernando Pereira (Universidade dos Açores- GBA –
Budget for the ABG: not funded.

17. **(2018-2019) sEcoEvo - Biodiversity Dynamics – The Nexus Between Space & Time**

Funded by German Centre for Integrative Biodiversity Research (iDiv) Halle-Jena-Leipzig.

Coordinator: Rosemary Gillespie (University of California, Berkeley) and Michael Hickerson (City College of New York, USA).

Members: Paulo A.V. Borges and Jairo Patiño (Azorean Biodiversity Group – cE3c).

Other participants: Brent C. Emerson; Rampal S. Etienne; Catherine Graham; Joaquin Hortal; Petr Keil; Tiffany Marie Knight; Luke Mahler; Francois Massol; Angela McGAughran; Brian McGill; Isaac Overcast; Christine Parent; Katie Wagner; James Rosindell; Dylan Craven; Harmon, Luke; Andy Rominger; Jonathan Chase.

Budget for the ABG: 2.000,00 Euros.

18. **(2018-2020) DynaCom - Dynamics of oceanic island arthropod communities in space and Time**

Funded by Ministerio de Economia, Industria & Competitividad, Spain.

Coordinator: Brent Emerson (Instituto de Productos Naturales y Agrobiología (IPNA-CSIC), Tenerife, Canary Islands). Team: Marcelino del Arco Aguilar (Universidad de La Laguna); Jairo Patiño Llorente; Heriberto López Hernández, Paula Arribas Blazquez; Carmelo Andújar Fernández (IPNA-CSIC); Paulo A.V. Borges (Universidade dos Açores- GBA – cE3c).

Members: Paulo A.V. Borges and Jairo Patiño (Universidade dos Açores- GBA – cE3c).

Budget for the ABG: 10.000,00 Euros.

6.1.2. **Funded by FCT (Portuguese Science Foundation)**


Coordinator: António Santos Silva (LNEC).

Other participants from ABG: Lina Nunes.
Budget for the ABG: 186.160,00 Euros.


Coordinator: Mário Boieiro.

Other participants from ABG: Paulo A.V. Borges, Carla Rego, Fernando Pereira (Universidade dos Açores- GBA – cE3c), José Carlos Carvalho and Pedro Cardoso (Finnish Museum of Natural History, Univ. Helsinki, Helsinki, Finland).

Other participants from other Institutions: Artur Serrano, Carlos Aguiar and Rui Rebelo (Univ. Lisbon, cE3c); Luisa Carvalheiro (University of Brasília) and Dília Menezes (SPNM – Serviço do Parque Natural da Madeira).

Project’s consultants: Jens Mogens Olesen (Department of Bioscience - Genetics, Ecology and Evolution, Aarhus University) and Xavier Espadaler Gelabert (CREAF, Universitat Autònoma de Barcelona).

Budget for the ABG: 139.368,00€ (10.140,00 Euros for FGF).


Coordinators: Paulo A.V. Borges (Universidade dos Açores- GBA – cE3c) and François Rigal.

Other participants from ABG: Pedro Cardoso (Finnish Museum of Natural History, Univ. Helsinki, Helsinki, Finland), Isabel Amorim, Mário Boieiro, Carla Rego, Rosalina Gabriel, Fernando Pereira (Universidade dos Açores- GBA – cE3c) and José Carlos Carvalho.

Other participants from other Institutions: Octávio Paulo (Univ. Lisbon, cE3c); Brent Emerson (Island Ecology and Evolution Research Group, Instituto de Productos Naturales y Agrobiología, Canary Islands, Spain) and Miquel Arnedo, Luís Crespo (Departament de Biologia Animal, Universitat de Barcelona, Barcelona, Spain); Jagoba Malumbres Olarte (University of Copenhagen); Maria Romeiras (ISA, Univ of Lisbon).

Project’s consultants: Robert Whittaker (Biodiversity Research Group, Oxford University Centre for the Environment); Costas Triantis (Department of Ecology and Taxonomy, Faculty of
Biology, University of Athens); Rosemary Gillespie (University of California, Berkeley) and José
María FernándezPalacios (University of La Laguna).

Budget for the ABG: 197.628,00 Euros.

diversity”

Coordinator: Luis Borda-de-Água (CIBIO).

Other participants from ABG: Paulo A.V. Borges, Rosalina Gabriel (Universidade dos
Açores- GBA – cE3c) and Pedro Cardoso (Finnish Museum of Natural History, Univ. Helsinki,
Helsinki, Finland).

Other participants from other Institutions: Henrique Pereira (Biodiversity Conservation,
iDiv, Leipzig) and Francisco Dionísio (cE3c).

Budget for the ABG: 7.290,00 Euros of a total of 98.574,00 Euros.

6.1.3. Funded by DRCT (Azorean Science Foundation)


Coordinator: Paulo A.V. Borges (Universidade dos Açores- GBA – cE3c).

Other participants from ABG: Rosalina Gabriel, Ana M. Arroz, Isabel Amorim, António
Onofre Soares, Enésima Mendonça, Rui Elias (Universidade dos Açores- GBA – cE3c) and Pedro
Cardoso (Finnish Museum of Natural History, Univ. Helsinki, Helsinki, Finland).

Budget for the ABG: 300.000,00 Euros.

and Tablets

Coordinator: Mónica Maria Tavares de Moura (Universidade dos Açores).

Members: Luís Filipe Dias e Silva (Universidade dos Açores), Maria Teresa Pinheiro de
Melo Borges Tiago (Universidade dos Açores) and Rosalina Gabriel, Rui Elias (Universidade dos
Açores- GBA – cE3c).

Budget for the ABG: not funded.

25. (2016-2018) PO AçORES - ECOSYSTEM IMPACTS AND SOCIOECONOMIC BENEFITS OF
ASPARAGOPSIS ARMATA IN THE AZORES

Coordinator: Ana Neto (Universidade dos Açores- GBA – cE3c)

Members: Afonso Prestes, Ana Seca, Eva Cacabelos, João Santos, Marc Morrion and Maria Carmo Barreto (Universidade dos Açores- GBA – cE3c).

Budget cE3c: 150.000,00 Euros.


Coordinator: Luís Filipe Dias e Silva (Universidade dos Açores)

Members: Mónica Maria Tavares de Moura (Universidade dos Açores), Maria Anunciação Mateus Ventura (Universidade dos Açores), João José Monteiro Mora Porteiro (Universidade dos Açores), Rui Elias (Universidade dos Açores- GBA – cE3c), Ana Isabel Damião de Serpa Arruda Moniz (Universidade dos Açores), Fernando Rosa Rodrigues Lopes (Universidade dos Açores), Francisco José Ferreira Silva (Universidade dos Açores)

Budget for the ABG: not funded.

27. (2016-2019) PO Açores - SMART ► TOURISM

Coordinator: Maria Teresa Pinheiro de Melo Borges Tiago (Universidade dos Açores)

Members: João Pedro de Almeida Couto (Universidade dos Açores), Artur Gil (Universidade dos Açores- GBA – cE3c), Flávio Gomes Borges Tiago (Universidade dos Açores), Sandra Dias Faria (Universidade dos Açores), Maria Luz Paramio Martin (CEEAplA), Francisco Amaral (Universidade dos Açores)

Budget for the ABG: not funded.


Coordinator: Maria Isabel Whitton Terra Soares de Albergaria (Universidade dos Açores)

Members: Maria Isabel Whitton Terra Soares de Albergaria (Universidade dos Açores), Ana Moura Arroz (cE3c-GBA), Rosalina Gabriel (Universidade dos Açores- GBA – cE3c), João Porteiro (Universidade dos Açores), Maria João Pereira (Universidade dos Açores), Carlos Santos (Universidade dos Açores), Paulo A.V. Borges ((Universidade dos Açores- GBA – cE3c); Consultor)
Budget for the ABG: 12,000,00 Euros.

29. **(2016-2018) PO Açores - PROAAcXXIs - Projecções das alterações climática nos açores para o século XXI: Implicações hidrológicas de interesse agronómico e ambiental**

Coordinator: Eduardo Brito de Azevedo (Universidade dos Açores)

Members: Eduardo Brito de Azevedo (Universidade dos Açores), Paulo A.V. Borges, Rosalina Gabriel and Rui Elias (Universidade dos Açores- GBA – cE3c), Joana Barcelos Ramos (Universidade dos Açores), Jorge Pinheiro, João S. Madruga, Luís Santos Pereira (Instituto Superior de Agronomia, Lisboa, Portugal; Consultor), Pedro M. Miranda (Faculdade de Ciências da Universidade de Lisboa, Portugal; Consultor)

Budget for the ABG: not funded.


Coordinator: Maria Teresa Pires de Medeiros

Members: Carlos Alberto da Silva Melo Santos (CEEAPlA), Ana Isabel Damião de Serpa Arruda Moniz (CEEAPlA), Licínio Manuel Vicente Tomás (Departamento de História, Filosofia e Ciências Sociais da Universidade dos Açores & CICS.NOVA.UAC), Osvaldo Dias Lopes Silva (Departamento de Matemática da Universidade dos Açores & CICS.NOVA.UAC), Virgílio Fernando Ferreira Vieira (Departamento de Biologia da Universidade dos Açores & (GBA – cE3c)) e o Consultor Joaquim Armando Gomes Alves Ferreira (IPCDVS e Unidade de Investigação FCT da Faculdade de Psicologia e Ciências da Educação da Universidade de Coimbra).

Budget for the ABG: not funded.

6.1.4. Other Funding Institutions

31. **(2012-2017) Long Term Ecological Study of the Impacts of Climate Change in the natural forest of Azores**

Coordinator: Paulo A.V. Borges (Universidade dos Açores- GBA – cE3c).

Members: Rui Nunes and Rui Carvalho (Universidade dos Açores- GBA – cE3c).
Partners: Natural Parks of Santa Maria, Terceira, Faial, Pico, Flores, Graciosa, SPEA, the Botanical Garden of Faial and the Furnas Monitoring and Research Centre.

Budget for the ABG: Grants from Erasmus and Eurodisseia (see mobility projects and networks).


Funded by Mayor of Praia da Vitória and DRAM – Azores – Contract S_257_2013

Coordinator: Paulo A.V. Borges (Universidade dos Açores- GBA – cE3c).

Members: Lina Nunes (LNEC) and Orlando Guerreiro (Universidade dos Açores- GBA – cE3c).

Budget for the ABG: 50,000,00 Euros.

33. (2014-2018) LIFE Recover Natura

Funded by Programa LIFE+, Natura2000, Região Autónoma da Madeira - Governo Regional, Secretaria Regional do Ambiente e Recursos Naturais, Parque Natural da Madeira, Sociedade Portuguesa para o Estudo das Aves.

Coordinator: Madeira Natural Park.

Members: José carvalho & Mário Boieiro (Universidade dos Açores- GBA – cE3c).

Budget for the ABG: not funded.

34. (2015-2017) GestAqua-Desenvolvimento de metodologias para a recuperação e melhoria de gestão de ecossistemas aquáticos insulares no âmbito da implementação da Diretiva Quadro da Água

Funded by DRAM – Azores.

Coordinator: CIBIO Azores.

Members: José M. Azevedo (Universidade dos Açores- GBA – cE3c).

Budget for the ABG: not funded.

Vitória (Terceira) and Horta (Faial)” SAI-DRA-2015/2614 -P009.07.01/193

Funded by DRAM – Azores.

Coordinator: Paulo A.V. Borges (Universidade dos Açores- GBA – cE3c).

Members: Lina Nunes (LNEC) and Orlando Guerreiro (Universidade dos Açores- GBA – cE3c).

Budget for the ABG: 14.950,00 Euros.


Funded by DRAM – Azores.

Coordinator: Paulo A.V. Borges (Universidade dos Açores- GBA – cE3c).

Members: Lina Nunes (LNEC) and Orlando Guerreiro (Universidade dos Açores- GBA – cE3c).

Budget for the ABG: 29.994,00 Euros.


Funded by Azores Regional Government, Praia da Vitória City Council & Portuguese Navy.

Coordinator: João Pedro Barreiros (Universidade dos Açores- GBA – cE3c).

Members: Vidal Haddad Jr., Madaíl Ávila, Juergen Pollerspock.

Budget for the ABG: not funded.

38. (2016-2020) Investigating the influence of environmental boundaries on the population structure of Yellowmouth Barracuda, Sphyraena viridensis

Funded by Natural Environmental Research Council (NERC).

Coordinator:

Members: João Pedro Barreiros (Universidade dos Açores- GBA – cE3c).
Budget for the ABG: not funded.


Funded by DRAM – Azores.

Coordinator: Paulo A.V. Borges (Universidade dos Açores- GBA – cE3c).

Members: Maria Teresa Ferreira (Universidade dos Açores- GBA – cE3c).

Budget for the ABG: 30,250,00 Euros.

6.2. DETAILED INFORMATION FOR 2017 PUBLICATIONS

6.2.1. INTERNATIONAL PEER REVIEWED PAPERS WITH IMPACT FACTOR (SCI)

6.2.1.1. By at least one integrated member (n=56)


Vieira, V. (2017) Vanessa virginiensis (Drury, 1773) in the Azores islands (Lepidoptera: Nymphalidae). SHILAP-Revista De Lepidopterologia, 45(177), 75-81. (IF2016 0,264; Q4 Entomology) (P0906)

6.2.1.2. By Associate Research Fellows only (n=12)


tropical landscape. *Biodiversity and Conservation*, **26**(12), 2803-2819. DOI:10.1007/s10531-017-1387-8 (IF2016 2,265; Q1 Biodiversity Conservation) (P0969)


6.2.2. BOOKS

6.2.2.1. By at least one integrated member (n=2)

6.2.3. BOOK CHAPTERS

6.2.3.1. By at least one integrated member (n=9)


**6.2.4. NATIONAL AND INTERNATIONAL PEER REVIEWED PAPERS (NO IMPACT FACTOR)**

**6.2.4.1. By at least one integrated member (n=18)**


6.2.4.2. By Associate Research Fellows only (n=1)


6.2.5. PAPERS ON PROCEEDINGS OF SYMPOSIA

6.2.5.1. By at least one integrated member (n=4)


6.2.6. EDUCATION AND OUTREACH PUBLICATIONS

6.2.6.1. By at least one integrated member (n=7)


6.2.7. OTHER TYPE OF PUBLICATIONS

6.2.7.1. By at least one integrated member (n=60)


6.2.7.2. By Associate Research Fellows only (n=3)


6.3. PUBLISHED ABSTRACTS IN CONFERENCES


6.4. SCIENTIFIC MEETINGS PARTICIPTION

In Table 4 it is possible to see some data on the scientific meetings attended by the members of the Azorean Biodiversity Group. A total of 23 events were international and 11 were national.

Table 4 Scientific meetings participation from some Azorean Biodiversity Members during the year of 2017.

<table>
<thead>
<tr>
<th>Title of Presentation</th>
<th>Authors (ABG members underlined)</th>
<th>Type</th>
<th>Name of the Meeting</th>
<th>Local</th>
<th>Date(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A roadmap for island biology: 50 fundamental questions after 50 years of the theory of island biogeography</td>
<td>Borges, P.A.V.</td>
<td>Oral</td>
<td>CIÊNCIA 2017 - FCT</td>
<td>Lisbon, Portugal</td>
<td>3-5 July</td>
</tr>
<tr>
<td>Title of Presentation</td>
<td>Authors (ABG members underlined)</td>
<td>Type</td>
<td>Name of the Meeting</td>
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<td>Farmácia Marinha: o potencial das Macroalgas</td>
<td>Barreto, M.C.</td>
<td>Oral</td>
<td>Conferências - Investigação Aplicada em Macroalgas</td>
<td>Funchal, Madeira</td>
<td>8 February</td>
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<tr>
<td>Fish trophic chains in the Indo-Pacific</td>
<td>Barreiros, J.P. &amp; Viviani, J.</td>
<td>Oral</td>
<td>The 10th Indo-Pacific Fish Conference</td>
<td>Tahiti</td>
<td>2-6 October</td>
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<tr>
<td>Inovação como fator crítico de sucesso</td>
<td>Soares A.O.</td>
<td>Oral</td>
<td>Seminário: Fórum Triple Hélix 2017</td>
<td>Ponta Delgada, S. Miguel, Azores</td>
<td>15 March</td>
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<tr>
<td>Native coccinellids and biological control: A positive partnership that can be threatened by the Invasion of an alien species.</td>
<td>Grez, A.A., Zaviezo, T., González, C., Soares, A.O. &amp; Poch, T.</td>
<td>Oral</td>
<td>5th International Symposium on Biological Control of Arthropods.</td>
<td>Langkawi, Malásia</td>
<td>11-15 September</td>
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<tr>
<td>The path to excellence: is eE3c</td>
<td>Santos-Reis M., Matos M.,</td>
<td>Oral</td>
<td>Frontiers in E3: eE3c Annual</td>
<td>Ponta Delgada, S.</td>
<td>5-6 June</td>
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<tr>
<td>Title of Presentation</td>
<td>Authors (ABG members underlined)</td>
<td>Type</td>
<td>Name of the Meeting</td>
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<tr>
<td>keeping the right track?</td>
<td>Magalhães S., Mágua C., Rebelo R., Bentz J. &amp; Borges, P.A.V.</td>
<td>Meeting</td>
<td>Miguel, Azores</td>
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<tr>
<td>Transversal topic on biological invasions: what have we been doing since 2014?</td>
<td>Soares, A.O., Mágua C., Magalhães, S. &amp; Rebelo, R.</td>
<td>Oral</td>
<td>Ponta Delgada, S. Miguel, Azores</td>
<td>5-6 June</td>
<td></td>
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<tr>
<td>Un nouveau prédateur des pucerons en serre: Leucopis annulites</td>
<td>Barriault, S., Soares, A.O. &amp; Lucas, E.</td>
<td>Oral</td>
<td>Saint-Bruno-de-Montarville, Canada</td>
<td>14 February</td>
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<tr>
<td>Vacaloura.pt</td>
<td>Rego, C.</td>
<td>Oral</td>
<td>Lisbon, Portugal</td>
<td>26 October</td>
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<tr>
<td>Associações ecológicas entre cefalópodes e peixes: do oportunismo à predação</td>
<td>Barreiros, J.P.</td>
<td>Oral (Invited)</td>
<td>Santa Catarina, Brazil</td>
<td>13-17 November</td>
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<tr>
<td>Desafios para a conservação da fauna cavernícola</td>
<td>Borges, P.A.V.</td>
<td>Oral (Invited)</td>
<td>Ponta Delgada, S. Miguel, Azores</td>
<td>6-7 October</td>
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<tr>
<td>Title of Presentation</td>
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<td>Micronuclei in oral epithelial cells as sensitive and non-invasive biomarkers of occupational exposure to low doses of ionizing radiation</td>
<td>Pinto, D.C.G.A., Gouveia, V.L.M., Barreto, M.C., Silva, A.M.S. &amp; Seca, A.M.L.</td>
<td>Oral presentation</td>
<td>XXIII Encontro Galego-Portugues de Quimica</td>
<td>Ferrol, Spain</td>
<td>15-17 November</td>
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<tr>
<td>Title of Presentation</td>
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<td>Flavonols isolated from Hedychium gardnerianum leaves.</td>
<td>Oliveira, M., Barreto, M.C., Silva, A.M.S., Pinto, D.C.G.A. &amp; Seca, A.M.L.</td>
<td>Poster</td>
<td>XXV Encontro Nacional da Sociedade Portuguesa de Química</td>
<td>Lisbon, Portugal</td>
<td>16-19 July</td>
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<tr>
<td>Title of Presentation</td>
<td>Authors (ABG members underlined)</td>
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<tr>
<td>Mapping the spatial impact of livestock grazing activity in Pico Island (Azores, Portugal) in a 15-year period (1998-2013)</td>
<td>Gil, A.</td>
<td>Poster</td>
<td>EGU General Assembly 201</td>
<td>Vienna, Austria</td>
<td>23-28 April</td>
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<tr>
<td>Mortalité du prédateur furfiphage Leucopis annulipes et comparaison avec celle du prédateur commercial Aphidoletes aphidimyza</td>
<td>Barriault, S., Soares, A. O. &amp; Lucas, E.</td>
<td>Poster</td>
<td>Congrès de la société d’entomologie du Québec</td>
<td>Longueuil, Montréal, Canada</td>
<td>23-24 November</td>
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<tr>
<td>Title of Presentation</td>
<td>Authors (ABG members underlined)</td>
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<td>ilha Terceira, Açores</td>
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<tr>
<td>Vegetation Mapping in European Outermost Regions by using Rapideye high-resolution multispectral imagery - the case study of Madeira Island (Portugal)</td>
<td>Gil, A.</td>
<td>Poster</td>
<td>ESA World Cover 2017 Conference</td>
<td>Frascati, Italy</td>
<td>14-16 March</td>
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</tbody>
</table>