EVENTO DE MUESTREO | REGISTRADO

The MOVECLIM – AZORES project: Bryophytes from Pico Island (2012)

Publicado por Universidade dos Açores

Gabriel R • Morgado L • Coelho M C M • Aranda S C • Henriques D S G • Pereira F • Borges P A V • Hespanhol H • Sérgio C • Sim-Sim M • Ah-Peng C

4896 REGISTROS

JUEGO DE DATOS PROYECTO ESTADÍSTICAS ACTIVIDAD DESCARGA

In September 2012, Pico Island was surveyed along an elevational transept starting on Manhenha, at 10 m a.s.l., and ending on the Pico Mountain caldera, at 2200 m a.s.l. to obtain a systematic inventory of the bryophytes living in natural environments. A total of twelve sites were examined, separated by 200 m elevation steps. At each site, two 10 m x 10 m plots were established within 10-15 m from each other, and within each plot, three 2 m x 2 m quadrats were randomly selected and thoroughly sa…

Más

ID del proyecto: MOVECLIM – AZORES

Fecha de publicación: 27 de diciembre de 2023

Última modificación de metadatos: 27 de diciembre de 2023

Alojado por: Instituto Superior de Agronomia / Universidade de Lisboa

Cómo citar DOI 10.15468/j8tarb

4896
Registros de presencia

100%
Con coincidencia de taxón

100%
Con coordenadas

100%
Con año

4896 REGISTROS GEOREFERENCIADOS

Año 2012 EXPLORA UN ÁREA

878 EVENTOS

ID del Evento	Fecha del Evento	Protocolo de Muestreo	Número (cantidad) de registros
pic_1000_p1_q2_li1	7 septiembre 2012	Two plots of 10 m × 10 m (P1, P2), were set out at nature vegetation sites, every 200 m elevation, accross an elevation gradient from coastal areas to Pico summit. Each plot was subdivided into 25 quadrats (2 m × 2 m), from which three were randomly selected for the collection of bryophyte species. Within each quadrat, bryophytes were collected in small sampling units (microplots of 10 cm × 5 cm), obtaining, whenever possible, three replicates per surveyed substrate (RU, rock, TE,soil, HU, humus, LI, dead wood, T, bark at three heights from the tree [a, 1-50cm; b, 51-100cm; c, 101-200cm], LF, leaves/fronds).	21 (0 absent)
pic_1000_p1_q1_li3	7 septiembre 2012	Two plots of 10 m × 10 m (P1, P2), were set out at nature vegetation sites, every 200 m elevation, accross an elevation gradient from coastal areas to Pico summit. Each plot was subdivided into 25 quadrats (2 m × 2 m), from which three were randomly selected for the collection of bryophyte species. Within each quadrat, bryophytes were collected in small sampling units (microplots of 10 cm × 5 cm), obtaining, whenever possible, three replicates per surveyed substrate (RU, rock, TE,soil, HU, humus, LI, dead wood, T, bark at three heights from the tree [a, 1-50cm; b, 51-100cm; c, 101-200cm], LF, leaves/fronds).	20 (0 absent)

ID del Evento	Fecha del Evento	Protocolo de Muestreo	Número (cantidad) de registros
pic_1000_p1_q2_ta2	7 septiembre 2012	Two plots of 10 m × 10 m (P1, P2), were set out at nature vegetation sites, every 200 m elevation, accross an elevation gradient from coastal areas to Pico summit. Each plot was subdivided into 25 quadrats (2 m × 2 m), from which three were randomly selected for the collection of bryophyte species. Within each quadrat, bryophytes were collected in small sampling units (microplots of 10 cm × 5 cm), obtaining, whenever possible, three replicates per surveyed substrate (RU, rock, TE,soil, HU, humus, LI, dead wood, T, bark at three heights from the tree [a, 1-50cm; b, 51-100cm; c, 101-200cm], LF, leaves/fronds).	20 (0 absent)
pic_1000_p1_q2_ta3	7 septiembre 2012	Two plots of 10 m × 10 m (P1, P2), were set out at nature vegetation sites, every 200 m elevation, accross an elevation gradient from coastal areas to Pico summit. Each plot was subdivided into 25 quadrats (2 m × 2 m), from which three were randomly selected for the collection of bryophyte species. Within each quadrat, bryophytes were collected in small sampling units (microplots of 10 cm × 5 cm), obtaining, whenever possible, three replicates per surveyed substrate (RU, rock, TE,soil, HU, humus, LI, dead wood, T, bark at three heights from the tree [a, 1-50cm; b, 51-100cm; c, 101-200cm], LF, leaves/fronds).	18 (0 absent)
pic_0600_p2_q2_li1	5 septiembre 2012	Two plots of 10 m × 10 m (P1, P2), were set out at nature vegetation sites, every 200 m elevation, accross an elevation gradient from coastal areas to Pico summit. Each plot was subdivided into 25 quadrats (2 m × 2 m), from which three were randomly selected for the collection of bryophyte species. Within each quadrat, bryophytes were collected in small sampling units (microplots of 10 cm × 5 cm), obtaining, whenever possible, three replicates per surveyed substrate (RU, rock, TE,soil, HU, humus, LI, dead wood, T, bark at three heights from the tree [a, 1-50cm; b, 51-100cm; c, 101-200cm], LF, leaves/fronds).	17 (0 absent)

ID del Evento	Fecha del Evento	Protocolo de Muestreo	Número (cantidad) de registros
pic_0600_p2_q3_tb3	5 septiembre 2012	Two plots of 10 m × 10 m (P1, P2), were set out at nature vegetation sites, every 200 m elevation, accross an elevation gradient from coastal areas to Pico summit. Each plot was subdivided into 25 quadrats (2 m × 2 m), from which three were randomly selected for the collection of bryophyte species. Within each quadrat, bryophytes were collected in small sampling units (microplots of 10 cm × 5 cm), obtaining, whenever possible, three replicates per surveyed substrate (RU, rock, TE,soil, HU, humus, LI, dead wood, T, bark at three heights from the tree [a, 1-50cm; b, 51-100cm; c, 101-200cm], LF, leaves/fronds).	17 (0 absent)
pic_0800_p2_q1_tb3	7 septiembre 2012	Two plots of 10 m × 10 m (P1, P2), were set out at nature vegetation sites, every 200 m elevation, accross an elevation gradient from coastal areas to Pico summit. Each plot was subdivided into 25 quadrats (2 m × 2 m), from which three were randomly selected for the collection of bryophyte species. Within each quadrat, bryophytes were collected in small sampling units (microplots of 10 cm × 5 cm), obtaining, whenever possible, three replicates per surveyed substrate (RU, rock, TE,soil, HU, humus, LI, dead wood, T, bark at three heights from the tree [a, 1-50cm; b, 51-100cm; c, 101-200cm], LF, leaves/fronds).	17 (0 absent)
pic_0600_p1_q1_li1	5 septiembre 2012	Two plots of 10 m × 10 m (P1, P2), were set out at nature vegetation sites, every 200 m elevation, accross an elevation gradient from coastal areas to Pico summit. Each plot was subdivided into 25 quadrats (2 m × 2 m), from which three were randomly selected for the collection of bryophyte species. Within each quadrat, bryophytes were collected in small sampling units (microplots of 10 cm × 5 cm), obtaining, whenever possible, three replicates per surveyed substrate (RU, rock, TE,soil, HU, humus, LI, dead wood, T, bark at three heights from the tree [a, 1-50cm; b, 51-100cm; c, 101-200cm], LF, leaves/fronds).	16 (0 absent)

ID del Evento	Fecha del Evento	Protocolo de Muestreo	Número (cantidad) de registros
pic_0600_p2_q2_tb2	5 septiembre 2012	Two plots of 10 m × 10 m (P1, P2), were set out at nature vegetation sites, every 200 m elevation, accross an elevation gradient from coastal areas to Pico summit. Each plot was subdivided into 25 quadrats (2 m × 2 m), from which three were randomly selected for the collection of bryophyte species. Within each quadrat, bryophytes were collected in small sampling units (microplots of 10 cm × 5 cm), obtaining, whenever possible, three replicates per surveyed substrate (RU, rock, TE,soil, HU, humus, LI, dead wood, T, bark at three heights from the tree [a, 1-50cm; b, 51-100cm; c, 101-200cm], LF, leaves/fronds).	16 (0 absent)
pic_0800_p2_q3_ta2	7 septiembre 2012	Two plots of 10 m × 10 m (P1, P2), were set out at nature vegetation sites, every 200 m elevation, accross an elevation gradient from coastal areas to Pico summit. Each plot was subdivided into 25 quadrats (2 m × 2 m), from which three were randomly selected for the collection of bryophyte species. Within each quadrat, bryophytes were collected in small sampling units (microplots of 10 cm × 5 cm), obtaining, whenever possible, three replicates per surveyed substrate (RU, rock, TE,soil, HU, humus, LI, dead wood, T, bark at three heights from the tree [a, 1-50cm; b, 51-100cm; c, 101-200cm], LF, leaves/fronds).	16 (0 absent)

Descripción

In September 2012, Pico Island was surveyed along an elevational transept starting on Manhenha, at 10 m a.s.l., and ending on the Pico Mountain caldera, at 2200 m a.s.l. to obtain a systematic inventory of the bryophytes living in natural environments. A total of twelve sites were examined, separated by 200 m elevation steps. At each site, two 10 m x 10 m plots were established within 10-15 m from each other, and within each plot, three 2 m x 2 m quadrats were randomly selected and thoroughly sampled for bryophytes using microplots of 10 cm x 5 cm, collected to paper bags. Six substrates were explored within each quadrat: rock, soil, humus, organic matter, tree bark and leaves/fronds; three replicates were made for each substrate, whenever available and colonized by bryophytes, totalling a maximum of 18 microplots per quadrat, 54 microplots per plot, 108 microplots per site and 1296 microplots on the 12 sites of Pico Island. It was possible to collect two thirds of the maximum expected

number of microplots (N=878; 67,75%), resulting in 4896 specimens, the great majority of which (n=4869) were identified to the species/subspecies level. Overall, it was possible to identify 70 moss' and 71 liverwort' species and subspecies. The elevation levels both with a greater number of microplots and higher richness of species were those between 600-1000 m a.s.l., coinciding with the native forest plots. The study contributed to improve the knowledge of Azorean bryophyte diversity and distribution at both local and regional scales, including the recording of new taxa for Pico Island and the Azores.

Escala temporal

- 5 de septiembre de 2012 - 10 de septiembre de 2012

Escala geográfica

The study was carried out in Pico Island (Azores Archipelago, Portugal). The 12 sampling sites, were distributed across the three municipalities of the island: Lajes do Pico, São Roque do Pico and Madalena.

Escala taxonómica

Mosses and liverworts.

Reino

Plantae Plants

Filo

Bryophyta Mosses

Marchantiophyta Liverworts

Clase

Bryopsida Mosses

Jungermanniopsida Leafy liverworts

Marchantiopsida Thallose liverworts

Polytrichopsida Mosses

Sphagnopsida Peat mosses

Metodología

Grado de estudio

This study covers 12 sites, each including two plots of 100 m2 each, placed along an elevation gradient, with a 200 m elevation step, from 10 m to 2200 m a.s.l. in Pico Island (Azores, Portugal). The transect starts in Manhenha, at 10 m a.s.l., and ends at the large Caldeira of Pico Mountain, at 2200 m. a.s.l., roughly following an East-West direction.

Muestreo

The inventory was conducted during September 2012 under the responsibility of Rosalina Gabriel and Claudine Ah-Peng, with the participation of Márcia Catarina Mendes Coelho, Silvia Calvo Aranda, Débora S. G. Henriques and Fernando Pereira. Paulo A.V. Borges generally helped in the field.
Bryophytes were sampled along the elevation gradient using a modified BRYOLAT standardised method in order to include taxonomic information of phorophytes and environmental data (Ah-Peng et al., 2012; Gabriel et al., 2014; Borges et al., 2018).
At each site, two plots of 10 m x 10 m were set 10-15 m apart. Each plot was thus divided into 25 quadrats (2 m x 2 m), from which three were randomly selected to further inspection. Each quadrat was carefully examined to collect three microplots of 50 cm2 (10 cm x 5 cm) for each of the substrates that were colonized by bryophytes: rock, soil, humus, organic matter, tree bark and leaves/fronds. The three microplots from bark were sampled in stratified way along the height of the tree, at the lowest (1-50 cm), medium (51-100 cm) and higher (101-200 cm) spots.
Environmental data for each microplot was obtained in ordinal scales for Light, Evaporation, Humidity and Rugosity, using the scales proposed by Gabriel & Bates (2005).

Control de calidad

FIELD: Plots were placed within homogeneous areas of the most representative native vegetation found at each sampled elevation. A visit made by PAVB and RG in July 2012 prospected the best sampling sites. Sampling was made by experienced bryologists, who ensured the samples were properly collected, while avoiding the excessive removal of material.

STORAGE: After the collection of the microplots for paper bags, these were left open and separated in a darkened room until complete dehydration. After identification, every sample was transferred to herbarium envelopes properly identified. All these envelopes were stored on the Herbarium of the University of the Azores (AZU), Section Bryophytes, under the name “MOVECLIM – AZORES project: Bryophytes from Pico Island (2012)”.

TAXONOMY: All efforts were made to achieve an accurate identification of the specimens: (i) the most updated keys and floras were used by / under the supervision of experienced bryologists; (ii) challenging samples were sent to specialists for confirmation / identification; (iii) identification of extremely small or etiolated specimens was not pursued to the species level.
Mosses were identified using the floras of Smith (2004) and Casas et al. (2006), whereas

liverworts were identified using the floras written by Paton (1999) and Casas et al. (2009) and the taxonomic key of Schumacker and Váňa (2005). Visual guides (e.g. Atherton et al. 2010; Lüth, 2019) were also consulted, as well as the BBS Field Guide online pages, the Bildatlas der Moose Deutschlands for morphological and ecological data. Nomenclature follows Gabriel et al. (2010) and adaptations available on the Azorean Biodiversity Portal (2023).
Species identification was performed by Márcia Catarina Mendes Coelho, under the supervision of Rosalina Gabriel, and by Helena Hespanhol. In 2023, all the Frullania specimens were reviewed by Leila Nunes Morgado under the supervision of Rosalina Gabriel. The identification of some challenging specimens was performed by Manuela Sim-Sim and Cecília Sérgio.

REPRESENTATIVENESS OF THE PICO BRYOFLORA: Species accumulation curves were generated based on a presence–absence microplot-scale matrix using Chao 2 estimator. Sampling completeness was high both for liverworts (87.5%) and mosses (94.5%) (Coelho et al., 2021).

Pasos de la metodología

Firstly, field and laboratory work were completed in order to have herbarium records fully identified (Coelho et al., 2021): 1. Conceptualize an adequate research design to improve the knowledge of the bryoflora of native habitats in Pico Island (Azores, Portugal); 2. Select 12 sites along an elevational transect in Pico Island, using areas with the highest cover of native vascular plant species; 3. Select two study plots (10 m x 10 m) per site, separated by 10-15 m within a homogeneous vegetation area; 4. In each plot, randomly select three quadrats (2 m x 2 m) for further inspection; 5. In each selected quadrat, examine all available substrates, including rock, soil, humus, organic matter, bark, and leaves/fronds. Collect three samples, replicates or microplots (10 cm x 5 cm) from each substrate; 6. Dry the material in an airy and darkened room; 7. Identify the species present in each microplot; 8. Store samples in the Herbarium of the University of the Azores – Section Bryophytes (AZU-B). Secondly, data files were prepared to share information regarding Pico Island bryophytes with GBIF and other platforms, using Darwin Core Archive (DwC-A), which is a standardized format for sharing biodiversity data as a set of one or more data tables. 1. Prepare a core data table (events), containing the 878 records, corresponding to each microplot of 10 cm x 5 cm; 2. Prepare one data table extension (occurrence), with 4896 records, corresponding to the inventory of all bryophytes found in the microplots.

Bibliografía

1. Ah-Peng, C., Wilding, N., Kluge, J., Descamps-Julien, B., Bardat, J., Chuah-Petiot, M., ... & Hedderson, T. A. (2012). Bryophyte diversity and range size distribution along two altitudinal gradients: Continent vs. island. Acta Oecologica, 42, 58-65.

Ver artículo • Google scholar

2. Atherton, I., Bosanquet, S., & Lawley, M. (Eds.). (2010). Mosses and liverworts of Britain and Ireland: a field guide. Plymouth: British Bryological Society. ISBN 978-0-9561310-1-0
Google scholar

3. Azorean Biodiversity Portal. (2023, october, 12). Portal da Biodiversidade dos Açores. https://azoresbioportal.uac.pt/
Ver artículo • Ver artículo • Google scholar

4. Borges, P. A., Cardoso, P., Kreft, H., Whittaker, R. J., Fattorini, S., Emerson, B. C., ... & Gabriel, R. (2018). Global Island Monitoring Scheme (GIMS): a proposal for the long-term coordinated survey and monitoring of native island forest biota. Biodiversity and conservation, 27, 2567-2586.
Ver artículo • Google scholar

5. Casas, C., Brugués, M., Cros, R. M. & Sérgio, C. (2006). Handbook of mosses of the Iberian Peninsula and the Balearic Islands: illustrated keys to genera and species. Institut d'Estudis Catalans. ISBN 84-7283-865-X
Google scholar

6. Casas, C., Brugués, M., Cros, R. M., Sérgio, C. & Infante, M. (2009). Handbook of liverworts and hornworts of the Iberian Peninsula and the Balearic Islands: illustrated keys to genera and species. Institut d'estudis Catalans. ISBN 9788492583553
Google scholar

7. Coelho, M. C., Gabriel, R., Hespanhol, H., Borges, P. A., & Ah-Peng, C. (2021). Bryophyte diversity along an elevational gradient on Pico Island (Azores, Portugal). Diversity, 13(4), 162.
Ver artículo • Google scholar

8. Gabriel, R., & Bates, J. W. (2005). Bryophyte community composition and habitat specificity in the natural forests of Terceira, Azores. Plant ecology, 177, 125-144.
Ver artículo • Google scholar

9. Gabriel, R., Sjögren, E., Schumacker, R., Sérgio, C., Aranda, S. C., Claro, D., ... & Martins, B. (2010). List of bryophytes (Anthocerotophyta, Marchantiophyta, Bryophyta). A list of the terrestrial and marine fungi, flora and fauna from the Azores, pp. 99-115. Princípia.
Google scholar

10. Lüth, M. (2019). Mosses of Europe - A Photographic Flora. Freiburg, Germany. ISBN 978-3-00-062952-5

Google scholar

11. Paton, J. A. (1999). The liverwort flora of the British Isles. Harley Books. ISBN 0946589607
Google scholar

12. Schumacker, R., & Vána, J. (2005). Identification keys to the liverworts and hornworts of Europe and Macaronesia (2nd ed.). Station Scientifique des Hautes-Fagnes. ISBN 10: 8389949113
Google scholar

13. Smith, A. J. E. (2004). The moss flora of Britain and Ireland. Cambridge university press.
Ver artículo • Google scholar

Contactos

Rosalina Gabriel

Autor • Autor de metadatos •
Punto de contacto administrativo
Associate Professor
Centre for Ecology, Evolution and Environmental Changes (cE3c)/Azorean Biodiversity Group, CHANGE – Global Change and Sustainability Institute
School of Agricultural and Environmental Sciences, University of the Azores, Rua Capitão João d´Ávila, Pico da Urze
Angra do Heroísmo 9700-042
Azores
Portugal
rosalina.ma.gabriel@uac.pt
00351295402200
http://gba.uac.pt/member/rosalina-maria-de-almeida-gabriel
https://orcid.org/0000-0002-3550-8010

Leila Morgado

Autor
Researcher
IITAA – Instituto de Investigação e Tecnologias Agrárias e do Ambiente
Rua Capitão João D'Ávila. Pico da Urze, São Pedro
Angra do Heroísmo 9700-042
Azores
Portugal
leila.morgado1@gmail.com
https://iitaa.uac.pt/?i=leila-morgado
https://orcid.org/0000-0002-0561-1666

Márcia Catarina Mendes Coelho

Autor
Researcher
Centre for Ecology, Evolution and Environmental Changes (cE3c)/Azorean Biodiversity Group
Rua Capitão João D'Ávila. Pico da Urze, São Pedro
Angra do Heroísmo 9700-042
Azores

Silvia Calvo Aranda

Autor
Researcher
Museo Nacional de Ciencias Naturales
Madrid
España
silviac@mncn.csic.es
https://silviacaranda.wordpress.com/

marciacmcoelho@gmail.com
https://gba.uac.pt/member/marcia-catarina-mendes-coelho
https://orcid.org/0000-0002-5829-6073

https://scholar.google.com/citations?user=TheOat8AAAAJ

Débora Sofia Gouveia Henriques
Autor
Researcher
Banco Genético Vegetal Autóctone
Empresa Municipal Cascais Ambiente, Estrada de Vale de Cavalos, Alcabideche
Cascais
Lisboa
Portugal
debhenriques@gmail.com
https://orcid.org/0000-0002-2529-6720

Fernando Pereira
Autor
Researcher
Azorean Biodiversity Group
School of Agricultural and Environmental Sciences, Rua Capitão João D'Ávila. Pico da Urze, São Pedro
Angra do Heroísmo 9700-042
Azores
Portugal
fernando.ea.pereira@uac.pt
https://gba.uac.pt/member/fernando-pereira
https://orcid.org/0000-0002-2238-9681

Paulo A. V. Borges
Autor • Punto de contacto
Associate Professor with Aggregation
Centre for Ecology, Evolution and Environmental Changes (cE3c)/Azorean Biodiversity Group, CHANGE – Global Change and Sustainability Institute
School of Agricultural and Environmental Sciences University of the Azores, Rua Capitão João D'Ávila. Pico da Urze, São Pedro
Angra do Heroísmo 9700-042
Azores
Portugal
paulo.av.borges@uac.pt
00351295402200
http://gba.uac.pt/member/paulo-a-v-borges
https://orcid.org/0000-0002-8448-7623

Helena Hespanhol
Autor
Researcher
CIBIO - Centro de Investigação em Biodiversidade e Recursos Genéticos / InBIO Laboratório Associado / BIOPOLIS Program in Genomics, Biodiversity and Land Planning
Campus de Vairão, Universidade do Porto
Vairão 4485-661
Porto
Portugal
helenahespanhol@gmail.com
https://cibio.up.pt/en/people/details/helena-hespanhol/
https://orcid.org/0000-0002-8109-8112

Cecília Sérgio
Autor
Senior Researcher
Centre for Ecology, Evolution and Environmental Changes (cE3c) / Natural History & Systematics (NHS) CHANGE – Global Change and Sustainability Institute
Faculty of Sciences, University of Lisbon
Campo Grande 1749-016
Lisboa
Portugal
csergio@fc.ul.pt

Claudine Ah-Peng
Autor
Researcher
UMR PVBMT - Pôle de Protection des Plantes Université de La Réunion 7 Chemin de l'IRAT
Saint-Pierre 97410
La Réunion
Francia
claudine.ahpeng@univ-reunion.fr
https://umr-pvbmt.cirad.fr/l-unite/annuaire/ah-peng-claudine

00351213921891
https://ce3c.ciencias.ulisboa.pt/member/ceciliasergio
https://orcid.org/0000-0001-5145-5329
https://scholar.google.com/citations?user=rftSlf0AAAAJ&hl=en

Descripción de datos

Idioma de los metadatos: Inglés

Idioma de los datos: Inglés

Registro en GBIF

Fecha de registro: 13 de noviembre de 2023

Última modificación de metadatos: 27 de diciembre de 2023

Fecha de publicación: 27 de diciembre de 2023

Alojado por: Instituto Superior de Agronomia / Universidade de Lisboa

Instalación: GBIF Portugal IPT

Contactos de instalación: Rui Figueira

Punto final: http://ipt.gbif.pt/ipt/archive.do?r=bryophytes_pico_2012 (Archivo Darwin Core) • http://ipt.gbif.pt/ipt/eml.do?r=bryophytes_pico_2012 (EML)

Identificador recomendado: DOI 10.15468/j8tarb

Identificadores alternativos: http://ipt.gbif.pt/ipt/resource?r=bryophytes_pico_2012

See details in the GBIF Registry

Cita

Gabriel R, Morgado L, Coelho M C M, Aranda S C, Henriques D S G, Pereira F, Borges P A V, Hespanhol H, Sérgio C, Sim-Sim M, Ah-Peng C (2023). The MOVECLIM – AZORES project: Bryophytes from Pico Island (2012). Version 1.4. Universidade dos Açores. Sampling event dataset https://doi.org/10.15468/j8tarb accessed via GBIF.org on 2024-01-15.