

Biodiversity inventory of the Protected Area for the Management of Habitats or Species of Matela (Terceira, Azores, Portugal)

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Resource Citation

Sousa M A, Lamelas-López L, Martins B S, Romão J, Roxo J, Elias R B, Gabriel R, Borges P A V (2024). Biodiversity inventory of the Protected Area for the Management of Habitats or Species of Matela (Terceira, Azores, Portugal). Version 1.6. Universidade dos Açores. Samplingevent dataset. http://ipt.gbif.pt/ipt/resource?r=matela_project&v=1.6

Abstract

The database we present include data from different taxonomical groups, as bryophytes, arthropods, vascular plants, birds and mammals, from sampling campaigns performed in 2022, on an Azorean Protected Area – “Protected Area for the Management of Habitats or Species of Matela”, located on Terceira Island (Azores, Portugal). This area is a well-preserved small fragment of native forest, located at medium-low altitude (300-400 m.a.s.l.), which was recently invaded by exotic plant species. The main objectives of this study were (i) provide an updated inventory of bryophytes, vascular plants, arthropods, birds and mammals; and (ii) compare recent sampling data with historical data.

The sampling protocol was based on GIMS - A Global Island Monitoring Scheme protocols, where bryophytes were sampled using 2x2 quadrats and microplots, vascular plants were sampled using 5x5 sampling-plots, soil and canopy arthropods were sampled using the BALA methodology, complementarily with pitfalls and SLAM traps, birds were sampled using standardized counter points (observations and listening) and mammals were sampled using camera-traps.

For bryophytes, we identified 75 taxa (43 mosses; 32 liverworts), 71 of which were indigenous, four indeterminate and one invasive (*Campylopus introflexus*). The temporal comparison with previous data registered a decrease in richness; however, 23 new species were added to the area. A total of 103 arthropods taxa were identified. For soil arthropods, eight indigenous and 25 introduced taxa were recorded, with the disappearance of endemic taxa and a significant increase in introduced species between 2002 and 2022. A total of 36 indigenous and 18 introduced canopy arthropods taxa were identified. Among the arthropods captured in the SLAM traps, 24 indigenous and 15 introduced taxa were recorded. For vascular plants, 54 species were identified, 28 of which were indigenous taxa and 26 were introduced. From the 54 identified species, 43 were new records for Matela. A total of 12 indigenous and one introduced bird were recorded, decreasing the number of taxa recorded for that area. Finally, eight introduced mammals were recorded, which are considered new records for Matela, and one endemic species (*Nyctalus azoreum*).

Despite Matela harboring numerous native and endemic species, thereby maintaining a highly notable natural heritage, it has recently fallen object to the invasion of introduced species, some of them also invasive. The number of recorded species has substantially increased across almost all groups for which historical data allows comparisons. The genuine impact of these invasive species on native communities remains not fully clarified; nevertheless, the imperative to address this pressing issue for nature conservation in the Azores is unequivocal.

Keywords: Sampling event, Arthropods, Azores, Birds, Bryophytes, Endemic species, introduced species, Mammals, Protected areas, Vascular plants, Specimen

Project details

Project title: Multitaxa Inventory of Matela (Terceira, Azores, Portugal) - Protected Area for the Management of Habitats or Species

Personnel: Mariana Aguiar Sousa, Lucas Lamelas-López, Bruna Sousa Martins, Joana Romão, Joana Roxo, Rui B. Elias, Rosalina Gabriel, Paulo A. V. Borges

Funding: FCT-UIDB/00329/2020-2024 (Thematic Line 1 – integrated ecological assessment of environmental change on biodiversity); Azores DRCT Pluriannual Funding (M1.1.A/FUNC.UI&D/010/2021-2024); Viridia – Conservation In Action Contract “Matela – uma ilha de biodiversidade”.

Study area descriptions/descriptor: Matela (Latitude: 38°41'59"N, Longitude:

27°15'40"W) is located at low-medium altitude (300-400 m.a.s.l.) inland of Terceira Island, the third biggest island of the Azorean archipelago (about 400 km²). Matela is included on Natural Park of Terceira Island, and is considered a Protected Area for the Management of Habitats or Species (Regional Legislative Decree n° 11/2011/A, of 20 April). It has a total area of 220,530 m², and although the main habitat comprises natural forests, mainly dominated by *Laurus azorica*, also include small patches of eucalyptus and Japanese cedar plantations, and seminatural pastures (CMAH, 2007; Elias et al., 2016)

Design description: The sampling protocol was carried out in 2022, and it is based on GIMS - A Global Island Monitoring Scheme protocols (Borges et al. 2018). For bryophytes, nine quadrats of 2 m x 2 m were sampled, and three samples (microplots) of 10 cm x 5 cm per substrate were collected, for a total of 71 samples; For vascular plants, inventories were made in 72 sub-plots measuring 5 m x 5 m, in addition to a list of all observed species; For sampling arthropods, the BALA methodology was used, complementing a set of 30 pitfall traps to sample arthropods from the soil with hits in the canopy of dominant trees (10 samples per tree species); in addition to this protocol, flight interception traps (SLAM traps) were also used to sample flying arthropods or arthropods with great dispersal capacity; the bird census was carried out at 25 observation points, always between 07:00 and 11:00 am, applying the listening point method and other observations; the mammal inventory was carried out using camera traps at 30 sampling points.

The historical data was obtained from herbarium and other unpublished data, and through a bibliographic revision (from 1970 to date).

Data published through GBIF: http://ipt.gbif.pt/ipt/resource?r=matela_project

Taxonomic coverage

General taxonomic coverage description: The following Phylum are covered: Bryophyta, Arthropoda, Marchantiophyta, Magnoliophyta, Lycopodiophyta, Pteridophyta, Pinophyta and Chordata.

Taxonomic ranks

Phylum: Arthropoda, Bryophyta, Marchantiophyta, Magnoliophyta, Lycopodiophyta, Pteridophyta, Pinophyta

Common names: Arthropods, Mosses, Liverworts, Vascular Plants, Clubmosses, Ferns, Gymnosperms, Chordates

Spatial coverage

General spatial coverage: Matela (Latitude: 38°41'59"N, Longitude: 27°15'40"W) is located at low-medium altitude (300-400 m.a.s.l.) inland of Terceira Island, the third biggest island of the Azorean archipelago (about 400 km²).

Coordinates: 38°41'42"N and 38°42'3.6"N Latitude; 27°15'54"W and 27°15'10.8"W Longitude

Temporal coverage: July 1, 2015 - November 15, 2022

Natural collections description

Collection name: Entomoteca Dalberto Teixeira Pombo (DTP)

Collection identifier: DTP

Natural collections description

Collection name: AZU_Section Bryophytes

Collection identifier: AZU_Section Bryophytes

Specimen preservation method: Alcohol

Specimen preservation method: Dried

Methods

Method step description: For Bryophytes the final validation was made by Rosalina Gabriel. For arthropods the final validation was made by Paulo A. V. Borges. For Vascular Plants the final validation was made by Rui B. Elias. For Birds and Mammals, the identification was made by Mariana Aguiar Sousa.

Study extent description: The sampling was performed in 2022 on the “Protected Area for the Management of Habitats or Species of Matela”, located on Terceira Island (Azores, Portugal). This area is a well-preserved small fragment of native forest, located at medium-low altitude (300-400 m.a.s.l.), which was recently invaded by exotic plant species.

Sampling description: The sampling protocol is based on GIMS - A Global Island Monitoring Scheme protocols (Borges et al. 2018). For bryophytes, nine quadrats of 2 m x 2 m were sampled, and three samples (microplots) of 10 cm x 5 cm per substrate were collected, for a total of 71 samples; For vascular plants, inventories were made in 72 sub-plots measuring 5 m x 5 m, in addition to a list of all observed species; For sampling arthropods, the BALA methodology was used, complementing a set of 30 pitfall traps to sample arthropods from the soil with hits in the canopy of dominant trees (10 samples per tree species); in addition to this protocol, flight interception traps (SLAM traps) were also used to sample flying arthropods or arthropods with great dispersal capacity; the bird census was carried out at 25 observation points, always between 07:00 and 11:00 am, applying the listening point method and other observations; the mammal inventory was carried out using camera traps at 30 sampling points.

The historical data was obtained from herbarium and other unpublished data, and through a bibliographic revision (from 1970 to date).

Quality control description: All collected specimens were identified or revised by a taxonomical expert.

Datasets

Dataset description

Object name: Darwin Core Archive Biodiversity inventory of the Protected Area for the Management of Habitats or Species of Matela (Terceira, Azores, Portugal)

Character encoding: UTF-8

Format name: Darwin Core Archive format

Format version: 1.0

Distribution: http://ipt.gbif.pt/ipt/archive.do?r=matela_project

Publication date of data: 2024-05-20

Language: English

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Metadata language: English

Date of metadata creation: 2024-01-10

Hierarchy level: Dataset

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