



Hidden secrets of rice stored seeds: pathogens and pests in Guinea-Bissau's mangrove rice

Iberian
**PLANT
BIOLOGY**
2023

Braga Portugal
9-12 July

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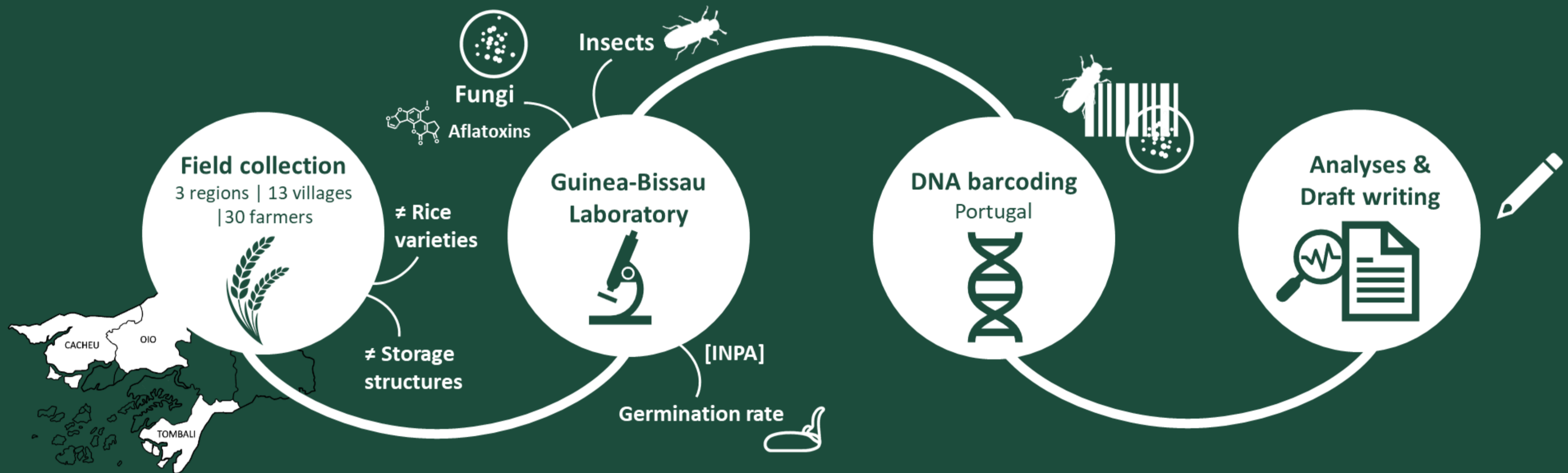
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AIM

Identification of pest insects and fungi potentially pathogenic and harmful to human consumption by morphological, DNA analysis and aflatoxin tests.

In 3 regions of Guinea-Bissau with major mangrove rice production, considering different rice varieties and storage structures.



METHODS

COLLECTION



Sample | different rice varieties and/or different storage structures of stored rice for sowing, collected by the own farmer the previous year.



BAG



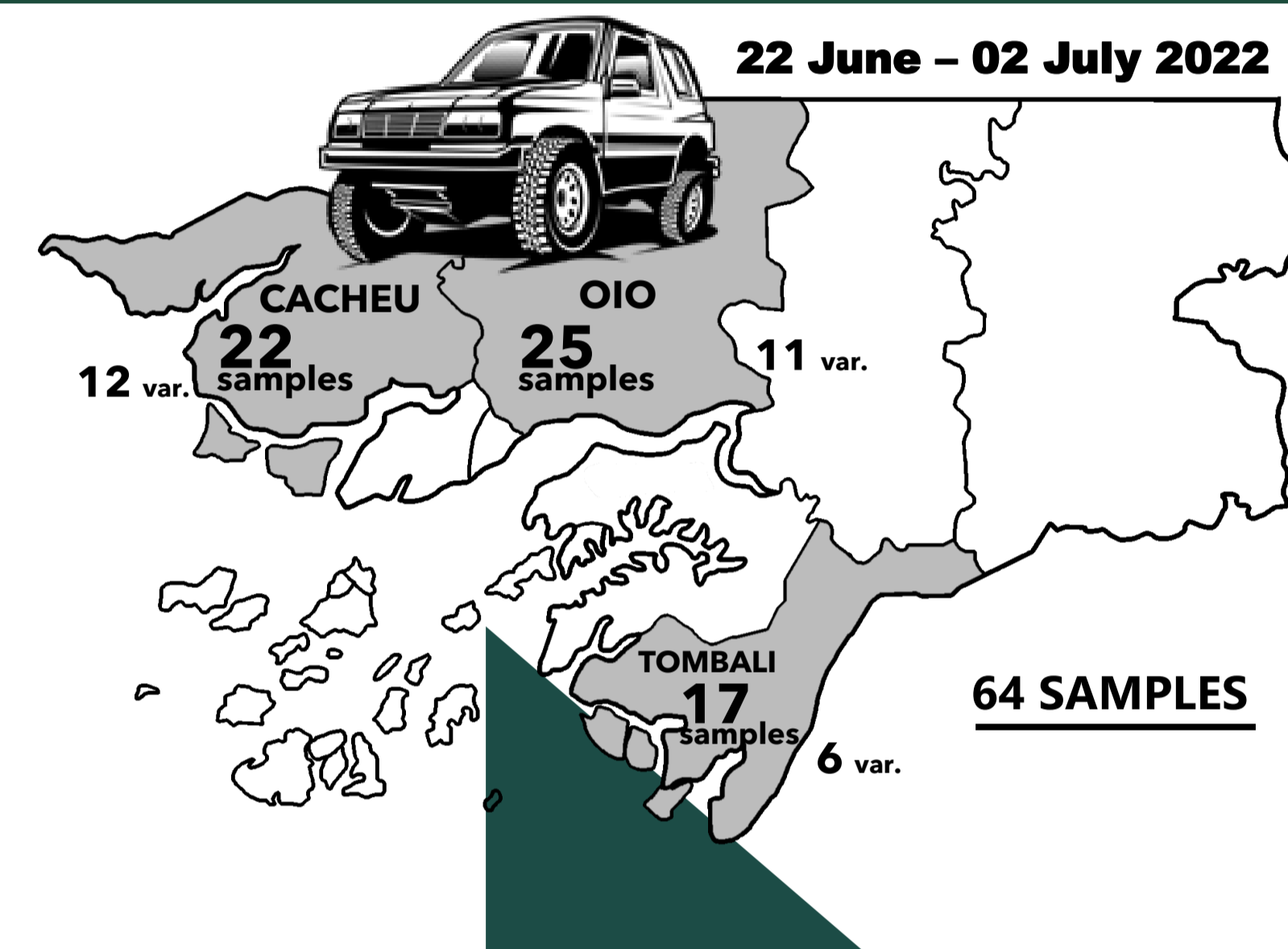
200 L CONTAINER
(METAL OR PLASTIC)



BOTTLE



FUULE



LAB PROCEDURE

INSECTS

1. Storage insect screening

Preservation in 96% alcohol

2. Preliminary taxonomic identification

Separation into Morphotypes

3. Selection and isolation of the samples to DNA identification

4. DNA barcoding

DNA sequence

DNA barcoding

DNA sequence

Insect ID

Comparison with Barcode Databases

FUNGI

1. Fungi isolation

2. Fungi re-isolation

3. Extraction

4. DNA Barcoding ID

dark room | ± 23°C | upside down

Isolation

Re-isolation

Extraction

DNA extraction

DNA quantification

PCR

PRIMERS: ITS 1 and ITS 4

DNA Barcoding

DNA Barcoding

Bioinformatics Analysis (BLAST)

Barcode Databases

Barcode Databases

National Center for Biotechnology Information

NCBI

MGX BANK DATABASE

FungiDB

AFLATOXINS

Mixed rice samples (from the 13 villages)

SGS

Samples of rice were analysed to check the four major aflatoxins: **B1** (AFB1), **B2** (AFB2), **G1** (AFG1), and **G2** (AFG2). It was determined by SGS Multilab with the SGSLABETS089 method.

GERMINATION RATE

13 VILLAGES

100 SEEDS / PETRI DISH

Trials done to support variety sheets information for INPA [Seeds Viability and Seeds Vigour]



3 DAYS



5 DAYS *



10 DAYS

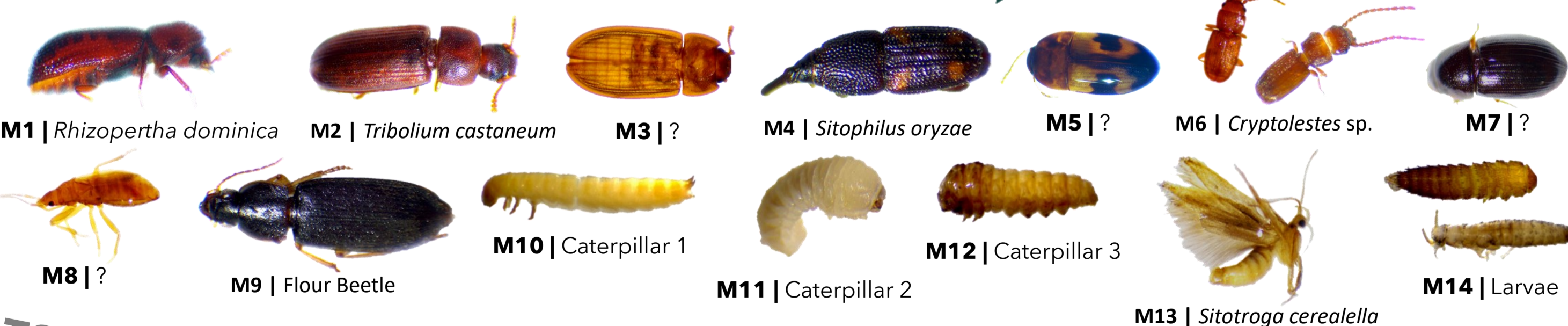


14 DAYS **

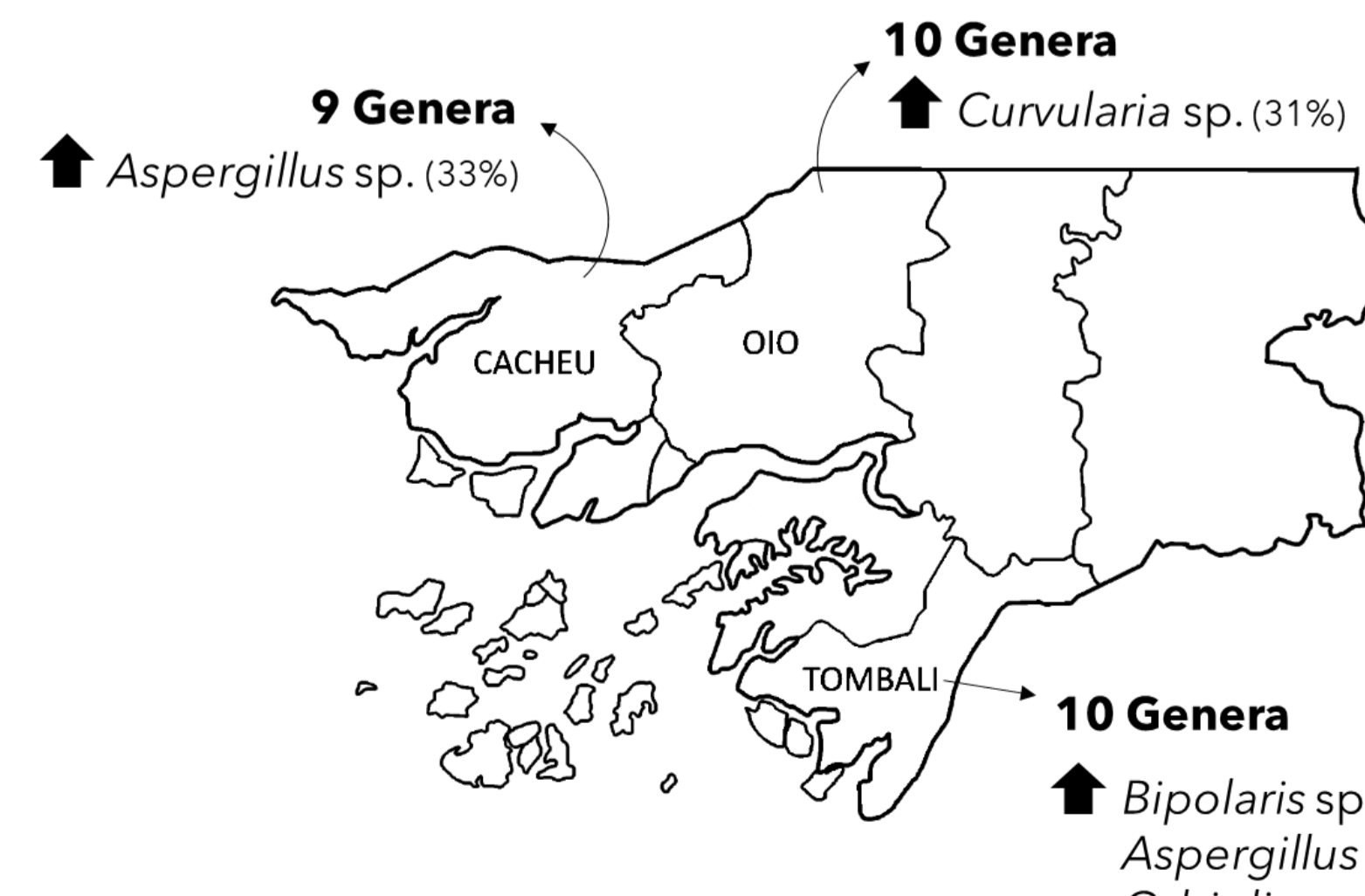
Germination rate

(* Measurement of rootlets
(**) Flag sheet measurement

RESULTS (PRELIMINARY)



INSECTS



FUNGI

Only 4 Genera are common in the 3 regions

Aspergillus sp.
Bipolaris sp.
Chaetomium sp.
Curvularia sp.

↑ Most represented specie

< 1,0 µg/kg

Results from aflatoxins shows that the aflatoxin content is much lower (< 1,0 µg/kg) than the regulated maximum amount allowed in staple crops stored worldwide.

Funding |

This research benefits from a Ph.D. SC grant (FOOD/2019/412-700), with backing from CEF (UIDB/00239/2020) and LEAF (UID/AGR/04129/2020), both research units funded by Fundação para a Ciência e a Tecnologia I.P. (FCT), Portugal (UIDB/00239/2020) and by the Laboratory for Sustainable Land Use and Ecosystem Services (LA/P/0092/2020). Also by CIBIO, InBio and Biopolis, Porto.