



BFSP Open Call

Odyssey



Connecting molecular and geographical biodiversity data

Hands-on training

May 18th 2026



CERTH
CENTRE FOR
RESEARCH & TECHNOLOGY
HELLAS



UiO : **University of Oslo**



ΔΗΜΟΚΡΙΤΕΙΟ
ΠΑΝΕΠΙΣΤΗΜΙΟ
ΘΡΑΚΗΣ

**DEMOCRITUS
UNIVERSITY
OF THRACE**



WP5: Odyssey

The Odyssey Team



Project Leads

ELIXIR-NO Helle Tessand Baalsrud

ELIXIR-GR Aristotelis C. Papageorgiou



elixir-europe.org

NMBU

The Norwegian University of Life Sciences



DUTH The Democritus University
of Thrace



CERTH

The Centre for Research &
Technology



HCMR

The Hellenic
Centre for
Marine
Research



Scope



- to develop a **web portal** that will enable researchers, stakeholders and citizens to navigate the molecular biodiversity data in a user-friendly and informative way based on the **geographic information** of Greece and Norway
- a pilot application with the perspective to further develop the resources of the Biodiversity Community and the ELIXIR Nodes, enabling wider integration of more European countries



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Workflow

#	Work Package	M6	M12	M18
1	Connecting the Dots – Data Gathering	M1		D1
2	Application Design and Implementation		M2	D2, D3
3	Dissemination and Training		M3	D4
4	Project Management			M4, D5

Project duration: 18 months

4 Work Packages, 5 Deliverables, 4 Milestones

The Odyssey app

Data processing

- R shiny
- Maps, tables
- statistics



- Implemented as an **R package**:
 - Ready for submission to public archives (i.e., [CRAN](#), [Bioconductor](#))
 - Easily downloaded and run on a local machine
 - Planning for maintaining the app post-project

Installation

```
# install.packages("remotes")  
remotes::install_github("BiodataAnalysisGroup/Elixir-BFSP-Odyssey")
```

Usage

```
# library(Odyssey)  
Odyssey::run_odyssey()
```

The Odyssey app

Exploring Molecular Biodiversity

Input data sources

- ☒ ENA
☒ GBIF

Country of interest:

Greece

Dates of interest:

2025-03-02 to 2025-05-20

GBIF basisOfRecord

☒ PRESERVED_SPECIMEN
☒ OBSERVATION
☒ MATERIAL_CITATION

Load Data

Table options

☐ Show filter

Group by

- ☐ Tax_division
☐ Scientific_name
☐ Tag1
☐ Tag2

Home Overview Table Map



Number of observations
753



Number of tax divisions
8

Number of scientific names
299

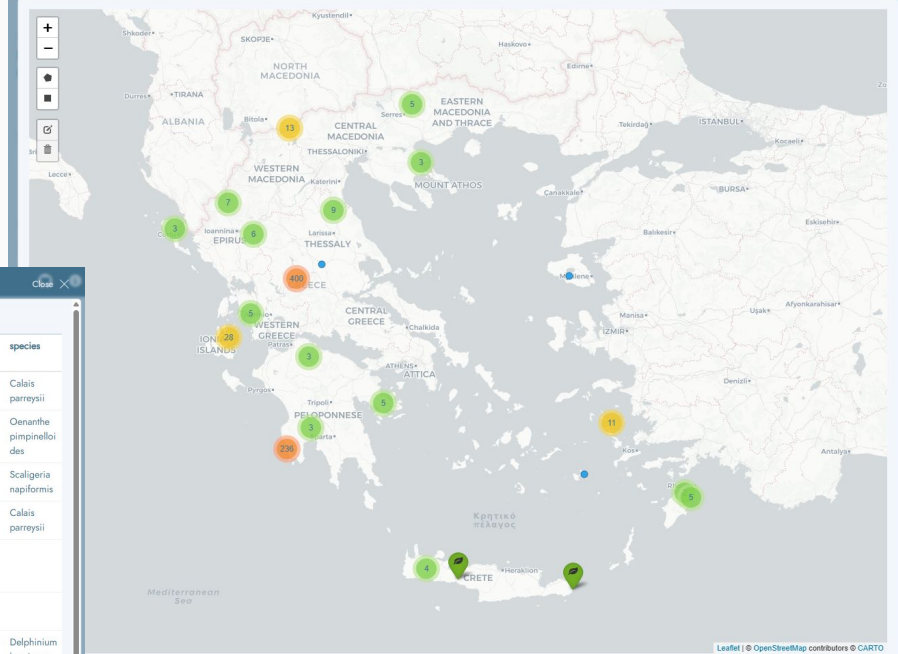
Taxonomy Tree



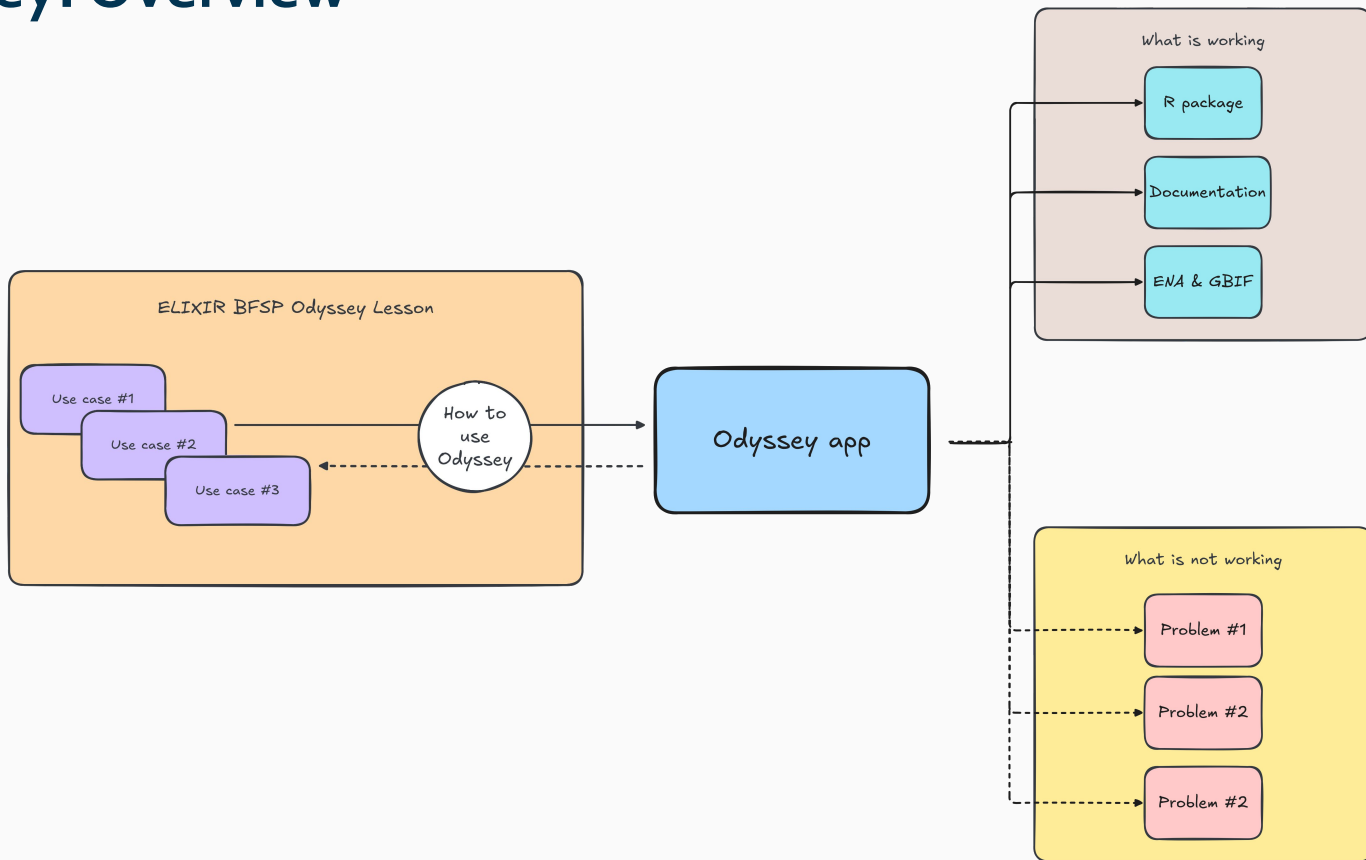
Exploring Molecular Biodiversity

ENA	GBIF	accession	scientific_name	country	first_public	basis_of_record	decimal_latitude	decimal_longitude	tax_division_2	phylum	class	order	family	genus	species
517488831		4	Calais parreyssii	Greece	2025-05-09	PRESERVED_SPECIMEN	36.348411	28.059689	Animalia	Arthropoda	Insecta	Coleoptera	Elateridae	Calais	Calais parreyssii
611580534		0	Oenanthe pimpinelloides	Greece	2025-05-08	PRESERVED_SPECIMEN	38.33927	20.72614	Plantae	Tracheophyta	Magnoliopsida	Apiales	Apiaceae	Oenanthe	Oenanthe pimpinelloides
611580542		1	Scaligeria napiformis	Greece	2025-05-08	PRESERVED_SPECIMEN	38.33927	20.72614	Plantae	Tracheophyta	Magnoliopsida	Apiales	Apiaceae	Scaligeria	Scaligeria napiformis
518544432		5	Calais parreyssii	Greece	2025-05-07	PRESERVED_SPECIMEN	36.348252	28.059878	Animalia	Arthropoda	Insecta	Coleoptera	Elateridae	Calais	Calais parreyssii
523648631		Z	Carcina Hubner, 1825	Greece	2025-05-07	MATERIAL_CITATION	35.234867	24.41405	Animalia	Arthropoda	Insecta	Lepidoptera	Peleopodidae	Carcina	Carcina
611580539		0	Asteraceae	Greece	2025-05-06	PRESERVED_SPECIMEN	38.3593	20.70751	Plantae	Tracheophyta	Magnoliopsida	Asterales	Asteraceae		
611580540		8	Delphinium brevicorne	Greece	2025-05-06	PRESERVED_SPECIMEN	38.35794	20.70706	Plantae	Tracheophyta	Magnoliopsida	Ranunculales	Ranunculaceae	Delphinium	Delphinium brevicorne
611580541		0	Vicia villosa	Greece	2025-05-06	PRESERVED_SPECIMEN	38.35833	20.70833	Plantae	Tracheophyta	Magnoliopsida	Fabales	Fabaceae	Vicia	Vicia villosa
611580542		2	Matricaria chamomilla	Greece	2025-05-06	PRESERVED_SPECIMEN	38.36511	20.72212	Plantae	Tracheophyta	Magnoliopsida	Asterales	Asteraceae	Matricaria	Matricaria chamomilla
611580533		8	Hyoseris radiata	Greece	2025-05-05	PRESERVED_SPECIMEN	38.36958	20.71827	Plantae	Tracheophyta	Magnoliopsida	Asterales	Asteraceae	Hyoseris	Hyoseris radiata

Exploring Molecular Biodiversity



Odyssey: Overview



Odyssey: Current status

- GitHub repository
 - <https://github.com/BiodataAnalysisGroup/ELIXIR-BFSP-Odyssey>
 - GitHub issues for new features, bugs - [Issues · ELIXIR-BFSP-Odyssey · GitHub](#)
- GitHub page
 - Active at: <https://biodataanalysisgroup.github.io/ELIXIR-BFSP-Odyssey/>
- Odyssey training lesson
 - Active at: <https://biodataanalysisgroup.github.io/ELIXIR-BFSP-Odyssey-Lesson/>

Odyssey: Current issues

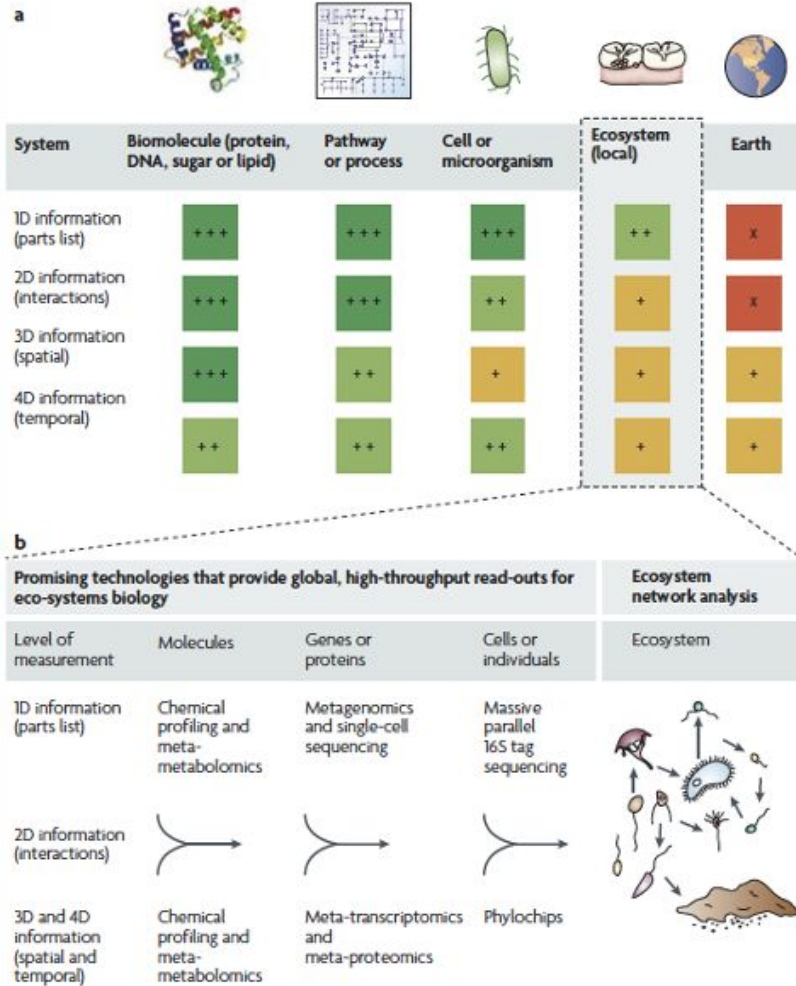
- Challenges related to ENA and GBIF datasets
 - Records with **missing metadata values**
 - Records with **incorrect geographical location**
 - User-defined geographical area **does not** include non geographically defined data entries

Perspective - moving ahead

- We will keep working on the app after the end of the funded period and integrate the effort to existing and future plans.
 - Node Level (GR/NO),
 - EU level (open/future calls 2027),
 - Collaboration with similar initiatives and projects
 - Work closely with GBIF and ELIXIR

Systems Biology: from proteins to environments

Source: **Molecular eco-systems biology: towards an understanding of community function.** Raes J. and Bork P. (2008) Nat. Rev. Microbiol., 2008, 6, 693–699.



+, a few scattered non-high-throughput data sets available and model building is restricted to case studies;

x, almost no data available).

Inspiration: **Eco-systems biology**

Odyssey

1D: visualizing the parts

3D and 4D: geographical (map-based) and timespan query

BFSP WP 2027 - 2028

2D: (biotic) interactions
FAIR Data, Task 3, lead
Dr. Patrick Ruch)

Food for thought, heading to the next agenda item

- Features to add/improve
 - Import/show custom user datasets
 - Import layers
 - Earth surface/bathymetry satellite data
 - Natura 2000 - Marine Protected Areas
 - Land usage
 - Environmental feature data maps
 - Export data/layers/sequences retrieval
 - LLMs to better translate location names into (approximate) coordinates, or to flag records (e.g. according to the sequence type, like marker gene, plastome, ...)
- Involve more countries and ELIXIR nodes to cover larger areas

Acknowledgements

- ELIXIR BFSP co-chairs & hub personnel
Physilia, Katharina, Tereza, Cyril, Rob
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@DUTH, GR; @NMBU, NO
- Dag Endresen, GBIF Norway
- To the API providers (ENA, GBIF) without
whose resources, and documentation, an
approach like Odyssey would not have
been possible



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59°57'32.0"N 10°48'12.5"E (59.95889, 10.80346)

March, 4th, 2026, 18:19



Thank you



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