

The SaltyBEATS project: Salty symphonies

Bringing back biodiversity in marginal saltlands

A. Castagna¹, F. Cappa², A. Coppi², G. Guardigli², A. Masoni², M. Santin¹, G. Santini², N. Bazihizina²

¹Dept. Agriculture, Food and Environment, Pisa Univ., Pisa, Italy

²Dept. Biology, Florence Univ., Florence, Italy



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Global challenge

Soil salinization is a **critical global issue** affecting agriculture, ecosystems, and economies across all climate zones.

Key drivers

- Saltwater intrusion
- Irrigation with brackish water
- Prolonged drought periods
- Groundwater overexploitation

With **shrinking freshwater resources** and increasing extreme weather events, salinization is expected to accelerate globally, making sustainable solutions more urgent than ever.



Project objectives

SaltyBEATS aims to **revitalize marginal salt-affected lands** through innovative research and practical solutions

- ✓ **Understand** the role of halophytes in naturally saline landscapes
- ✓ **Translate** knowledge into practical biodiversity restoration solutions
- ✓ **Improve** resilience of marginal agricultural sites across Europe and North Africa
- ✓ **Enable** comparative and context-sensitive approaches across diverse agro-climatic zones



Research methodology

Comprehensive multi-trophic biodiversity assessment combining **above- and below-ground** ecosystem analysis.

Biodiversity mapping

Natural saline habitats and agricultural lands

Soil analysis

Salinity characteristics and microbiome assessment

Plant communities

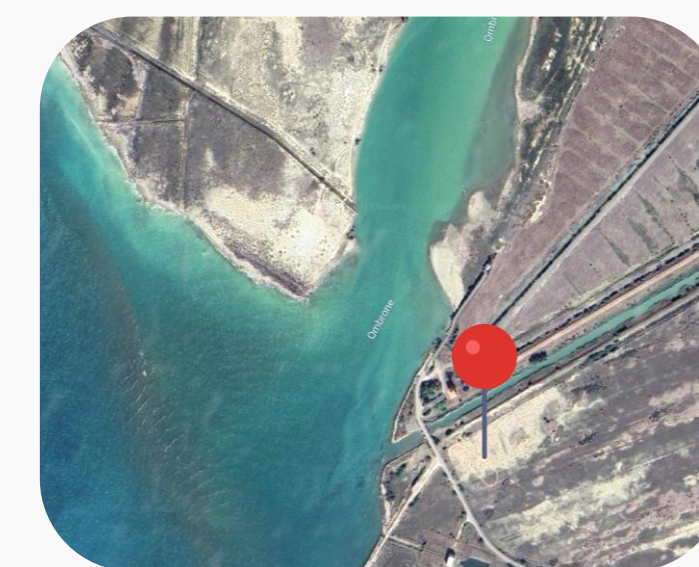
Halophytic species richness and distribution

Associated organisms

Pollinators and arthropod communities



Study site



Location: Maremma Regional Park, Alberese (GR), Tuscany

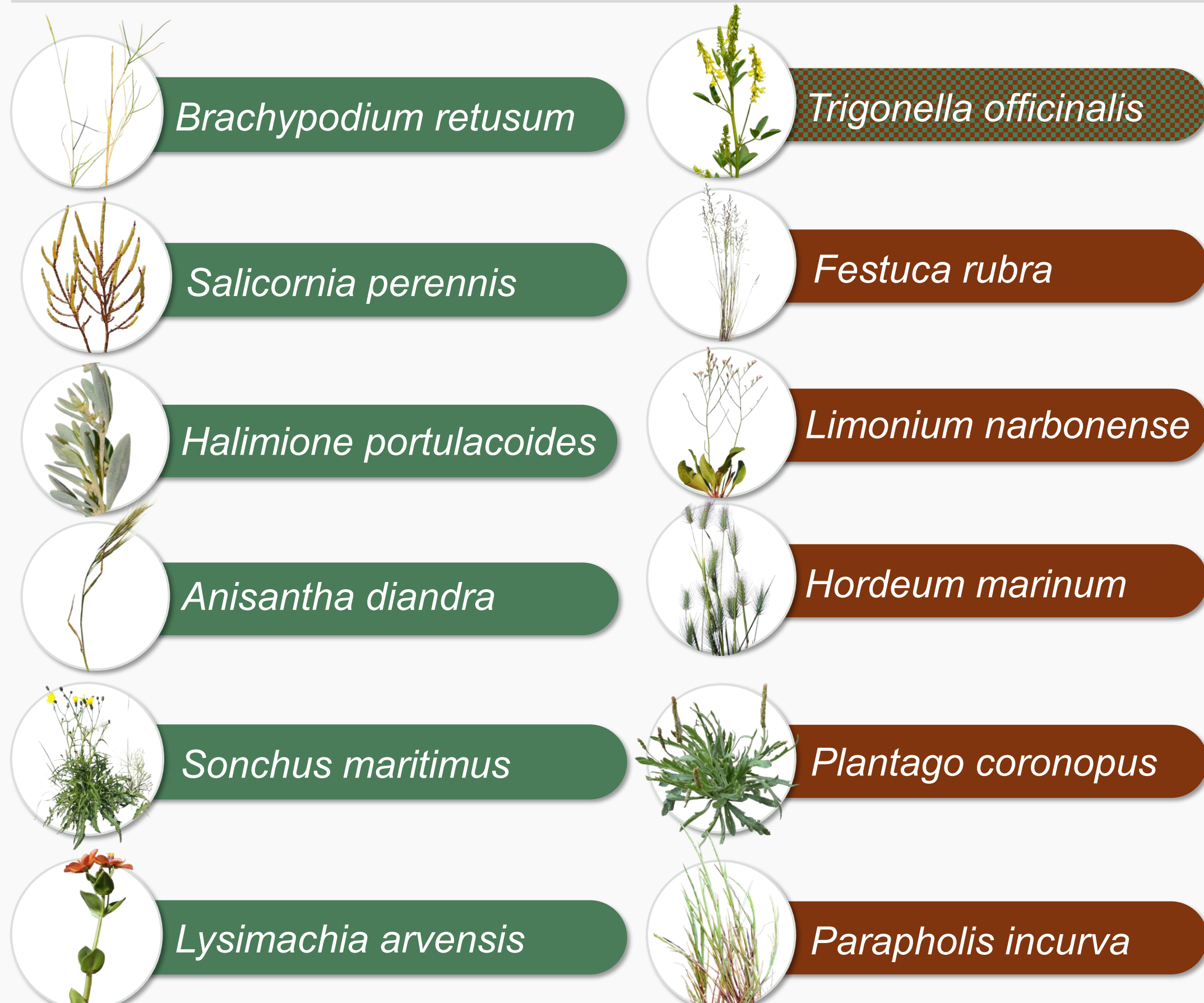
Area: Coastal plains around the Ombrone River mouth

Significance: One of Tuscany's most salinized areas

Ecosystem: Mosaic of natural and semi-natural habitats with exceptional scientific and ecological importance



Preliminary results - Plant biodiversity monitoring



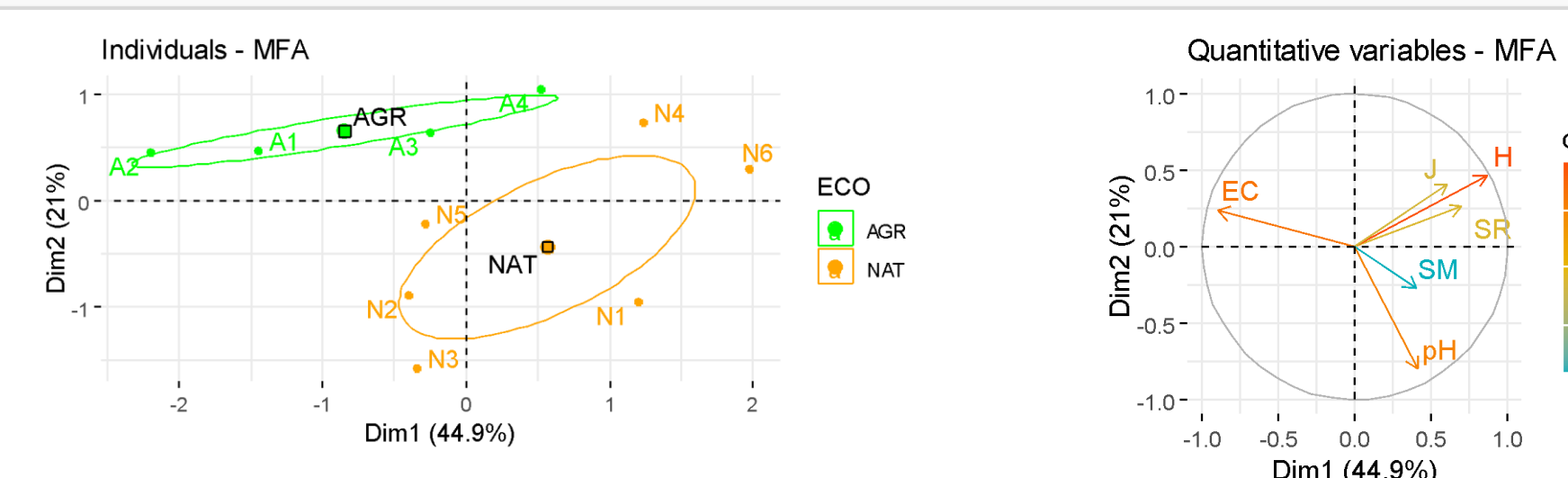
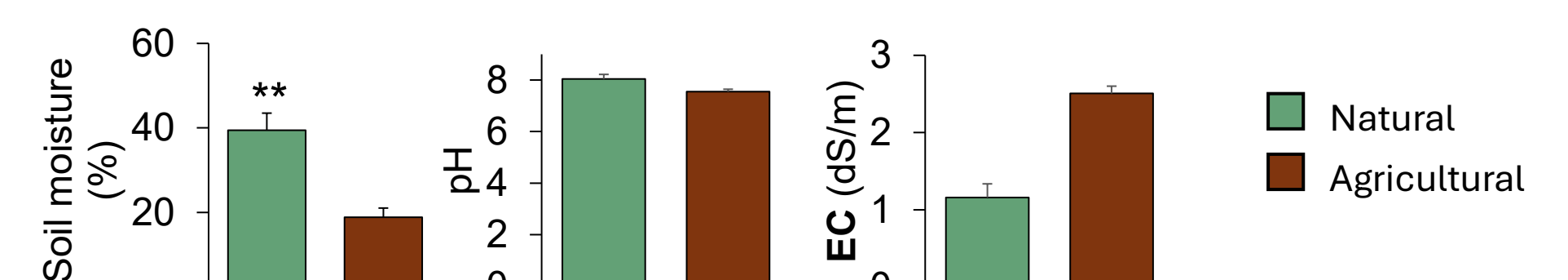
Natural site plot

Plant species	Cover (%)
<i>B. retusum</i>	81.25
<i>A. diandra</i>	3.25
<i>S. perennis</i>	3.00
<i>H. portulacoides</i>	2.75
<i>T. officinalis</i>	2.50
<i>S. maritimus</i>	1.00
<i>L. arvensis</i>	0.50
Total cover	94.25

Agricultural site plot

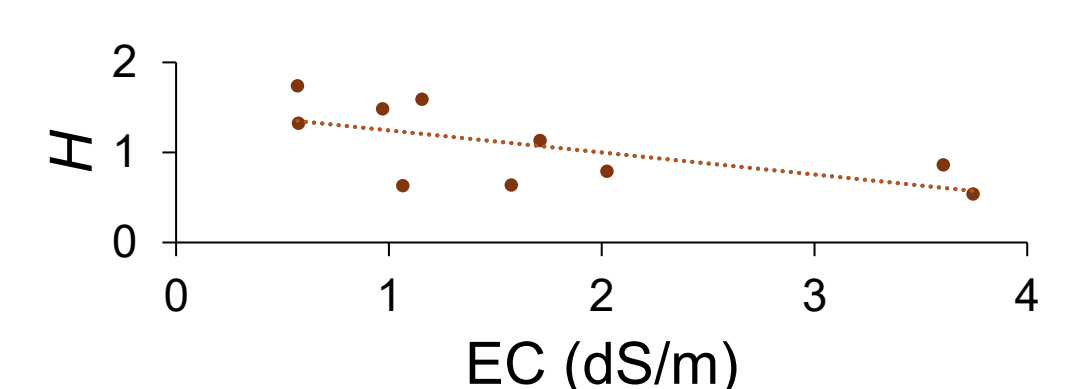
Plant species	Cover (%)
<i>F. rubra</i>	30.50
<i>T. officinalis</i>	15.00
<i>L. narbonense</i>	4.00
<i>H. marinum</i>	3.50
<i>P. coronopus</i>	0.75
<i>P. incurva</i>	0.25
Total cover	54.00

Soil characteristics



The Multiple Factor Analysis revealed the contribution of plant diversity and soil variables in differentiating natural (NAT) and agricultural (AGR) sites.

Shannon-Wiener diversity (H') significantly decreases with the increase of EC.



Halophytic species richness and distribution, evaluated throughout the years, will be correlated with **soil characteristics, soil microbiome, pollinators and arthropod communities**



SaltyBEATS

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<https://saltybeats.com/>



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Contacts:

antonella.castagna@unipi.it
nadia.bazihizina@unifi.it