



The effects of environmental factors on the grapevines cultivated in Malta

La protezione dell'ambiente nelle isole del Mediterraneo attraverso la valorizzazione di un sistema culturale arboreo



1. Introduction - The Maltese Case

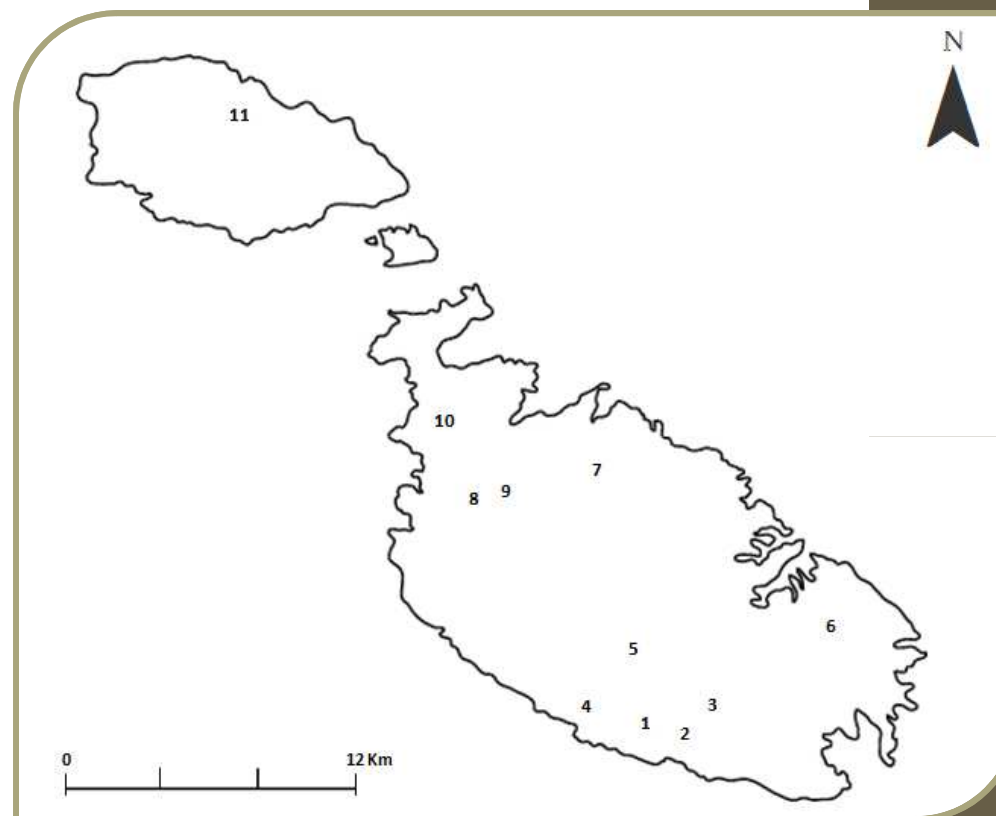
1. Introduction - The Maltese Case

Southern Malta Northern Malta

- | | |
|---------------|------------------------|
| 1: Vermentina | 7: Gellewza |
| 2: Girgentina | 8: Girgentina |
| 3: Chardonay | 9: Syrah |
| 4: Zibibbo | 10: Cabernet Sauvignon |
| 5: Syrah | |
| 6: Syrah | |

Gozo

- 11: Merlot



Sampling locations across Malta and Gozo

1. Introduction - The Maltese Case

According to the Maltese Soil Information System (MALSIS) (2000 - 2004):

Soil pH - Slightly and moderately alkaline (pH 7.3 - 8.5)

Soil Electrical Conductivity:

- Non irrigated: Non-saline (~ 347 μScm^{-1})
- Irrigated soils: Slightly saline (~ 695 μScm^{-1})



2. Collection of Samples and Analysis

2a. Methodological Framework

Sampling Method:

- Different sample spots from each field
- Topsoil (first 5cm) and bottom (30cm beneath) samples
- Sample of irrigation water
- Sample of leaves and branches
- Collection of wines derived from the ProMed grapevines



Methodological Framework

Laboratory Analysis:

- Pulverisation, processing and storage of soil samples
- Soil and irrigation water pH testing and electrical conductivity tests

- Determination of ochratoxins in the leaf samples
- Determination of ochratoxins in wines

- Determination of polyphenols in wines

Methodological Framework

- To achieve these goals we had done extensive scientific literature review on how to analyse these parameters.
- This process provided us the opportunity to learn new laboratory procedures
- To achieve these goals of analysing the various parameters we had to purchase a number of scientific instruments.

Methodological Framework

Equipment Purchased

- **Vacumm Manifold for Solid Phase Extraction**



- Used for sample preparation process
- Sample is cleaned from many substances not required for the specific analysis

Methodological Framework

Equipment Purchased

- Fluorescence Detector to complement our UHPLC system



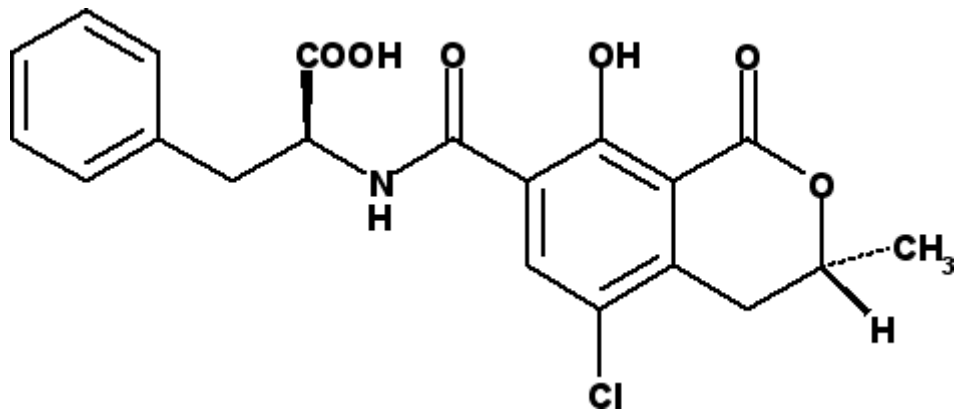
Ochratoxins in wines



Methodological Framework

Equipment Purchased

- **Fluorescence Detector to complement our UHPLC system**
 - Infection of grapes by several fungal species in the field usually result in the presence of **ochratoxins** in leaves and wine.



Concentration are quite low

However they can still pose a health hazard

Only method is Fluorescence Detector

Methodological Framework

Equipment Purchased

- Spectrophotometer plate reader



- To analyze the total polyphenolic content in wine and leaves we also purchased a spectrophotometer plate reader
- However through the various Italy Malta missions we have participated we also now have the research capacity to analyze the individual poly-phenols by HPLC methods

Methodological Framework

Other equipment purchases to support these specific research include.

- **Autoclave**
- **Shacking Incubator**
- With all the equipment obtained we enable us to further our research in vines and wine.
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- The research on vines and wine will not stop which we have initiated will not stop by by the end of PROMED II
- We are looking forward to Italy Malta 2015-2020