Molecular identification, ampelographic description, and oenological evaluation of grapevine varieties from Monemvasia: **the birth place of Malvasia wines**

Dimitrios Miliordos[1], Georgios Merkouropoulos[2], Dora Pitsoli[2], Polydefkis Hatzopoulos[3], Yiorgos Kotseridis[1]

[1] Agricultural University of Athens, Department of Food Science and Human Nutrition, Oenology Laboratory.

[2] Hellenic Agricultural Organisation "Demeter" (HAO-D), Institute of Olive tree, Subtropical Plants & Viticulture, Viticulture Department.

[3] Agricultural University of Athens, Department of Biotechnology, Molecular Biology Laboratory.

VI^th International Symposium "Mediterranean Malvasias"
Bosa (Sardegna) September 7-8, 2018

ΓΕΩΠΟΝΙΚΟ ΠΑΝΕΠΙΣΤΗΜΙΟ ΑΘΗΝΩΝ
AGRICULTURAL UNIVERSITY OF ATHENS

Introduction

- Malvasia wines-Geographically defined
- Term Malvasia is a degenerative form of the name Monemvasia (Port town/Peloponnese, Greece) transported since 13th century by Venician merchants
- Common characteristic: sweet and distinctive aroma

The rebirth of Monemvasia- Malvasia

The white varieties used:

- Monemvasia, (min 51%)
- Assyrtico
- Kydonitsa
- Asproudi

Minimum of ageing in oak barrels for 2 years

Aim of the project...

… to describe a number of grapevine varieties that are traditionally cultivated in the very prime site of origin of Malvasia: Monemvasia, …

… using a holistic approach, involving:

- Molecular Identification
- Ampelographic Recognision and Description
- Oenological evaluation

Materials and Methods

i. Molecular identification

- The following 16 samples (young leaves from 16 distinct plants) were collected from the Tsimpidis Estate:
  - Asprovaria (various): 8 samples,
  - Monemvasia: 3 samples,
  - Kydonitsa: 2 samples,
  - Asyrtico: 1 sample,
  - Gaidouria: 1 sample,
  - Glykerithra: 1 sample.

  Note: varieties are named as they are known locally.

- 29 samples from the corresponding varieties were collected from the National Ampelographic Collection (HAO-D, Lykovrysi, Attica), in order to serve as controls.
  - Asproudes (various): 6 samples,
  - Monemvasia: 5 samples,
  - Kydonitsa: 4 samples,
  - Asyrtico: 5 sample,
  - Gaidouria: 3 sample,
  - Glykerithra: 5 sample.

  Note: i) since genotyping of the National Ampelographic Collection (HAO-D) is under way, multiple samples were used as controls to compare the TE material.
  ii) An extra control DNA sample was kindly donated from the Julius Kühn-Institut (Geilweilerhof, Germany).

- Microsatellite analysis was performed on 10 SSR loci. Six of the SSRs used (VVS2, VVMD5, VVMD7, VVMD27, VrZAG62 and VrZAG79) are already incorporated as descriptors #801-806 in the 2009-OIV Catalogue. The remaining four SSRs were the following: VVMD25, VVMD28, VVMD32, and VrZAG67.

- In this study we present the initial results. Confirmatory repeats are already under way.

- Plant material, DNA extractions, and microsatellite analysis were all performed according to the following publication:

  Merkouropoulos et al. (2015) A combined approach involving ampelographic description, berry oenological traits and molecular analysis to study native grapevine varieties of Greece. Vitis 54 (Special Issue), 99–103.

ii. Ampelographic description

- Observation between berry set and veraison. Examination of 10 mature leaves from the middle third of several shoots (OIV, 2009, 2nd edition).

- Plant material for both the molecular identification and for the ampelographic description was sampled from the same plants.

Under Examination Varieties

Asprovaria


Assyrtico


Glykerithra


Kydonitsa


Monemvasia

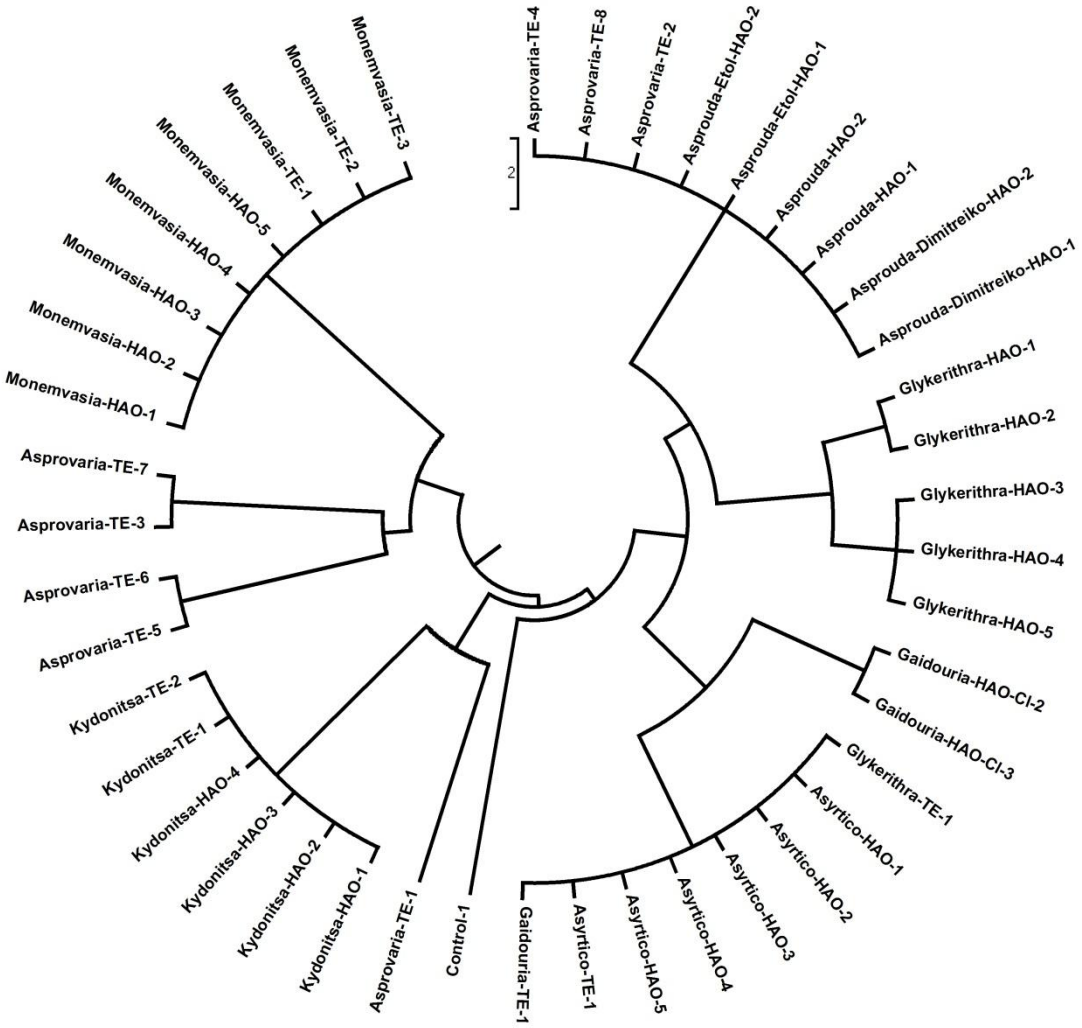

ii. Oenological evaluation

- Wine analyses were carried out produced from those varieties
- Oenological evaluation described by carrying out the following analyses:

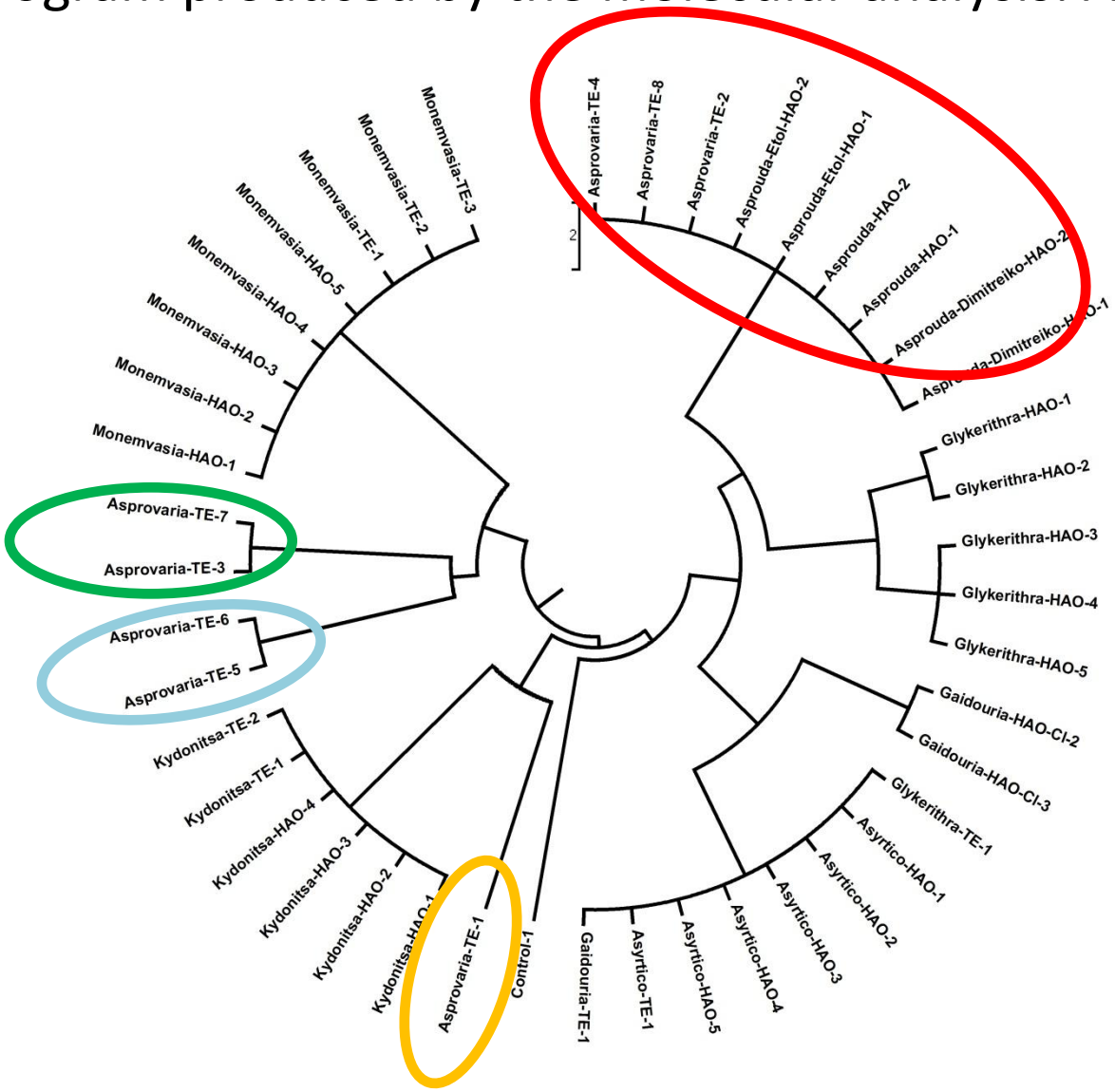
- Alcoholic strength,
- Residual sugars g/ L,
- pH,
- Total Acidity g/L as tartaric acid,
- Volatile acidity g/ L as acetic acid

Results

Dendrogram produced by the molecular analysis



Dendrogram produced by the molecular analysis: Asprovaria



Molecular analysis showed that Asprovaria is distinguished in at least four groups. Oenological evaluation of each group in under way.

Dendrogram produced by the molecular analysis: Monemvasia

Molecular analysis showed that TE Monemvasia is very closely related to Monemvasia from the National Collection (HAO-D).

Dendrogram produced by the molecular analysis: Kydonitsa

Molecular analysis showed that TE Kydonitsa is very closely related to Kydonitsa from the National Collection (HAO-D).

Dendrogram produced by the molecular analysis: Asyrtico group-I

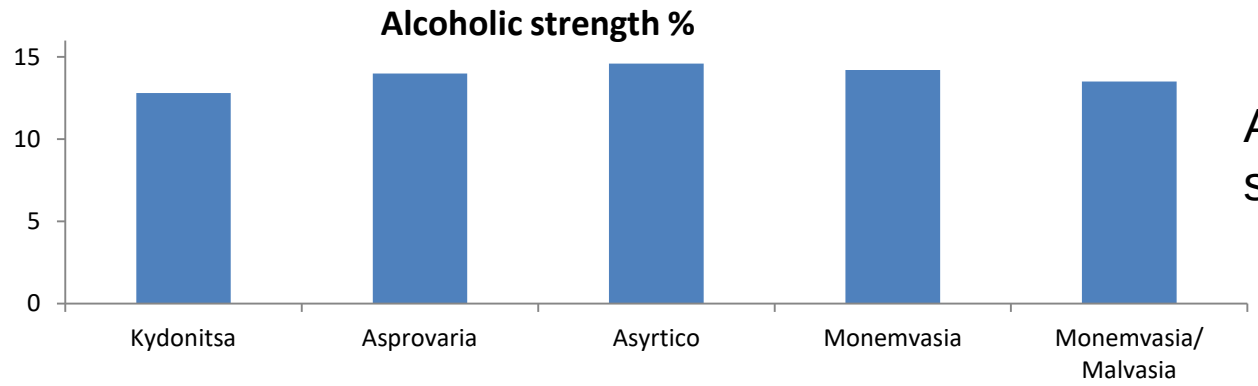
Molecular analysis showed that TE Asyrtico is very closely related to Assyrtico from the National Collection (HAO-D).

Dendrogram produced by the molecular analysis: Asyrtico group-II

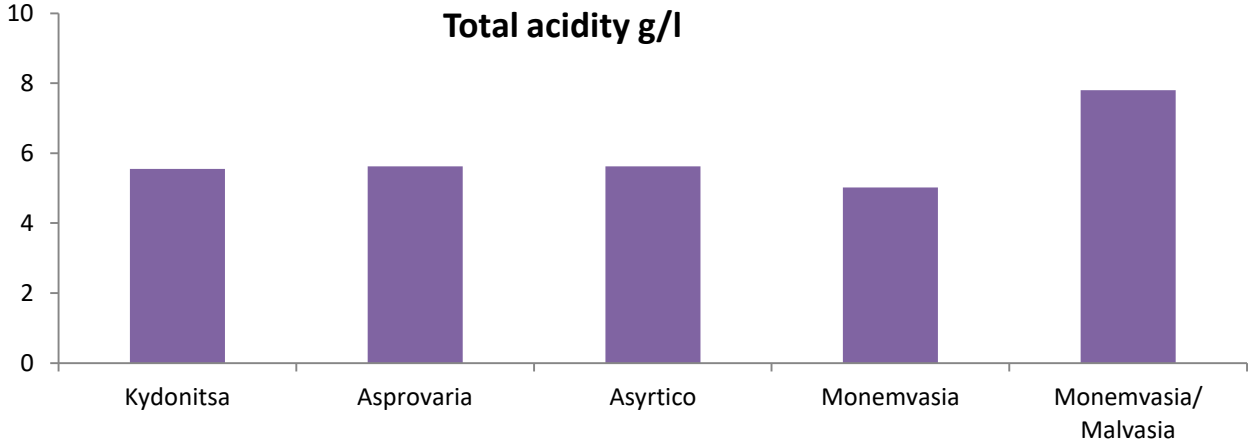
Molecular analysis showed that TE Glykerithra when compared to similar varieties from the National Collection (HAO-D) was found to be related to Asyrtico.

Oenological evaluation

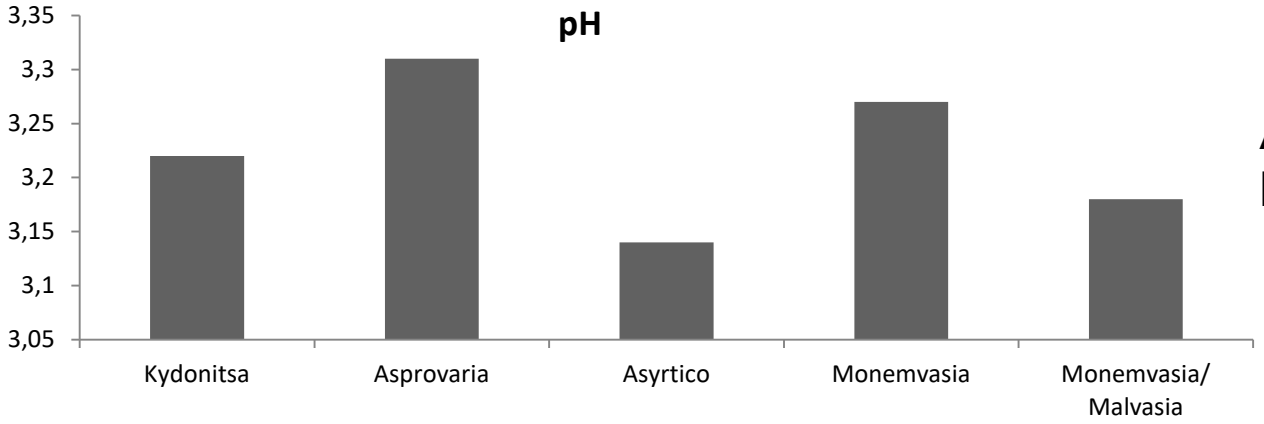
Basic wine parameters I



Alcohol levels were almost similar for all the wines

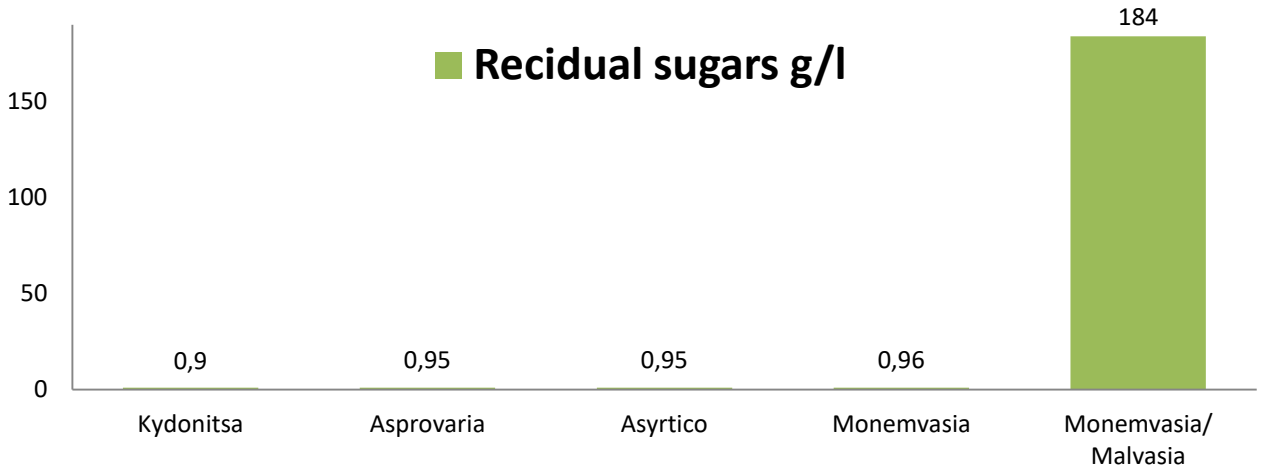


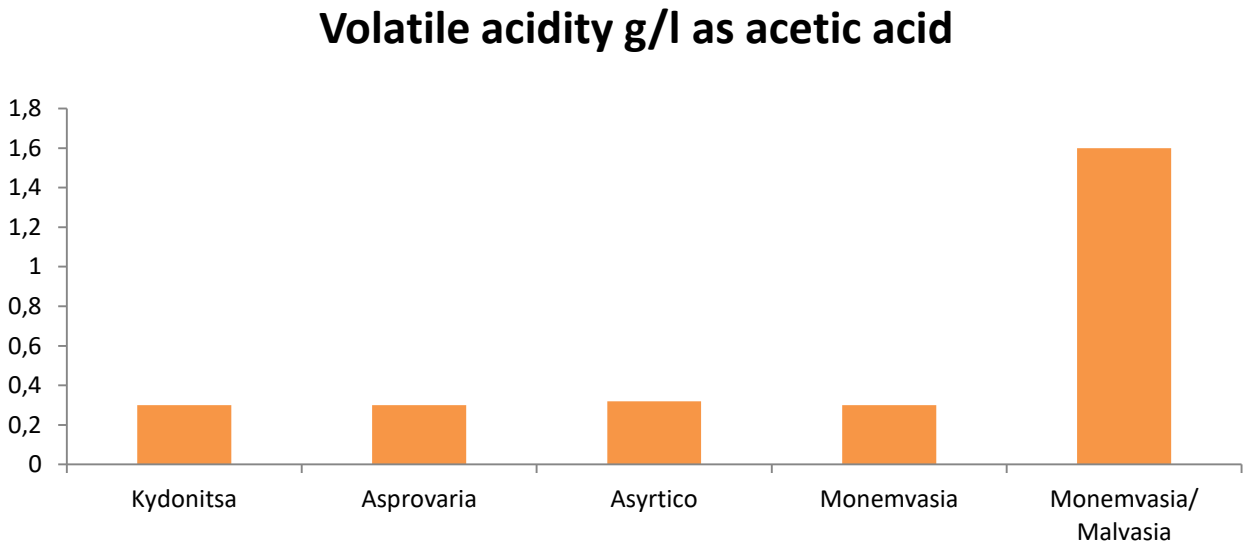
Total acidity were the same for the dry white wines



Assyrtico scored the lowest pH, as expected

Basic wine parameters II





Sweet Malvasia wine

Conclusions

Work to be done

- Additional sampling and verification of the current results
- Sampling from the rest vegetative stages
- Further analysis of the diverse Asprovaria group, including oenological approaches
- Analysis for the parameters which affect the diversification

Thank you for your attention…!