STUDYING THE VARIABILITY OF OLIVE TREE (OLEA EUROPEA L.) MOTHER PLANTS IN XYLOKASTRON REGION NURSERIES

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INTRODUCTION

Fruit tree propagation in Greece is generally done in private nurseries. The existence of a large number of Greek olive varieties, the close genetic similarity, as well as, the different varietal denomination in each region makes difficult their identification. Propagation is mostly done by grafting and the grafts are obtained from the nurseries' mother plants which should meet specific requirements.

The aim of the study was the identification and diversification of the olive mother plants in nurseries at Xylokastron region using RAPD (Randomly Amplified Polymorphic DNA) markers.

MATERIALS AND METHODS

54 samples from 12 Greek olive varieties were collected from "Salis" nursery. From each variety, either 3 or 5 mother trees were used. DNA extraction was performed by using CTAB method. Thirty two 10-mer RAPD primers were tested and 7 of them were finally used.

The 12 different varieties used in the present study and the number of the different trees per variety.

VARIETAL	SAMPLES NUMBER	SAMPLES DESIGNATION
KOLOVI	5	KOLOVI – 1, 2, 3, 4, 5
PATRINI	5	PATRINI – 1, 2, 3, 4, 5
MANAKI	5	MANAKI – 1, 2, 3, 4, 5
GAIDOUROELIA	5	GAIDOURELIA – 1, 2, 3, 4, 5
MEGARON	5	MEGARON – 1, 2, 3, 4, 5
KORONEIKI	5	KORONEIKI– 1, 2, 3, 4, 5
AMFISSIS	5	AMFISSIS– 1, 2, 3, 4, 5
THROUMBA	5	THROUMBA– 1, 2, 3, 4, 5
KALAMON	5	KALAMON – 1, 2, 3, 4, 5
ADRAMYTINI	3	ADRAMYTINI – 1, 2, 3
ANOISANA	3	ANOISANA– 1, 2, 3
CHALKIDIKIS	3	CHALKIDIKIS– 1, 2, 3
TOTAL	54	

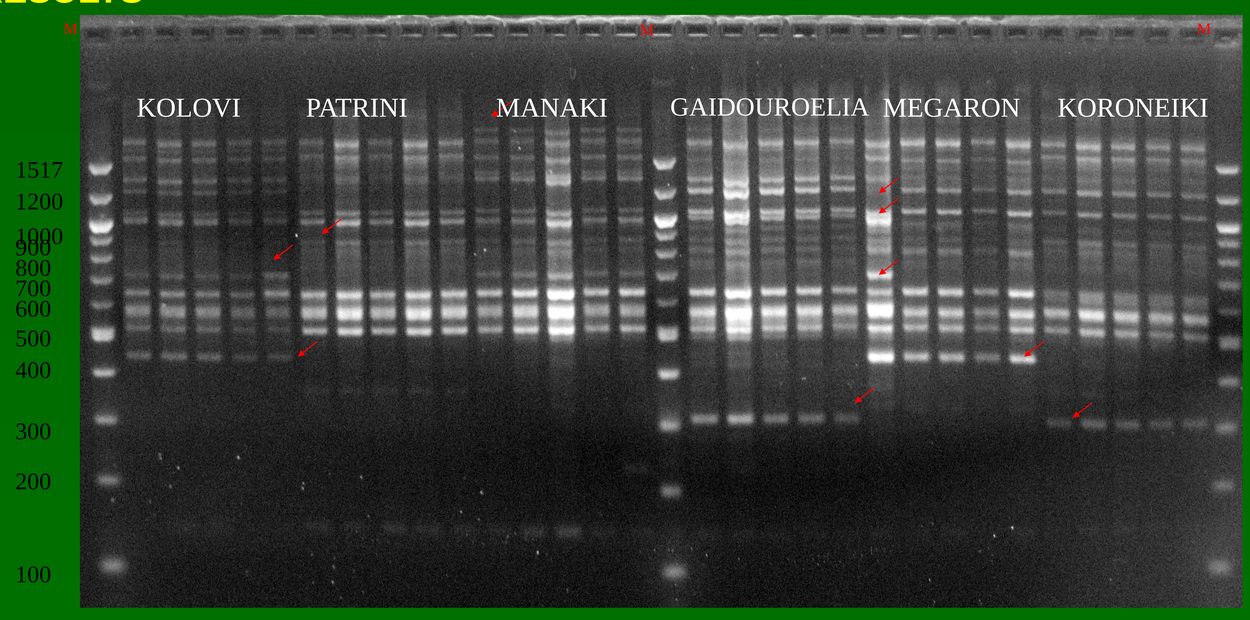
Mixture PCR-RAPD
270 mM dNTPS,
1xBuffer
3 mM $MgCl_2$,
0,2 μM RAPD primer,
1 U Taq,
100 ngr DNA

FINAL VOLUME: 30 μl.

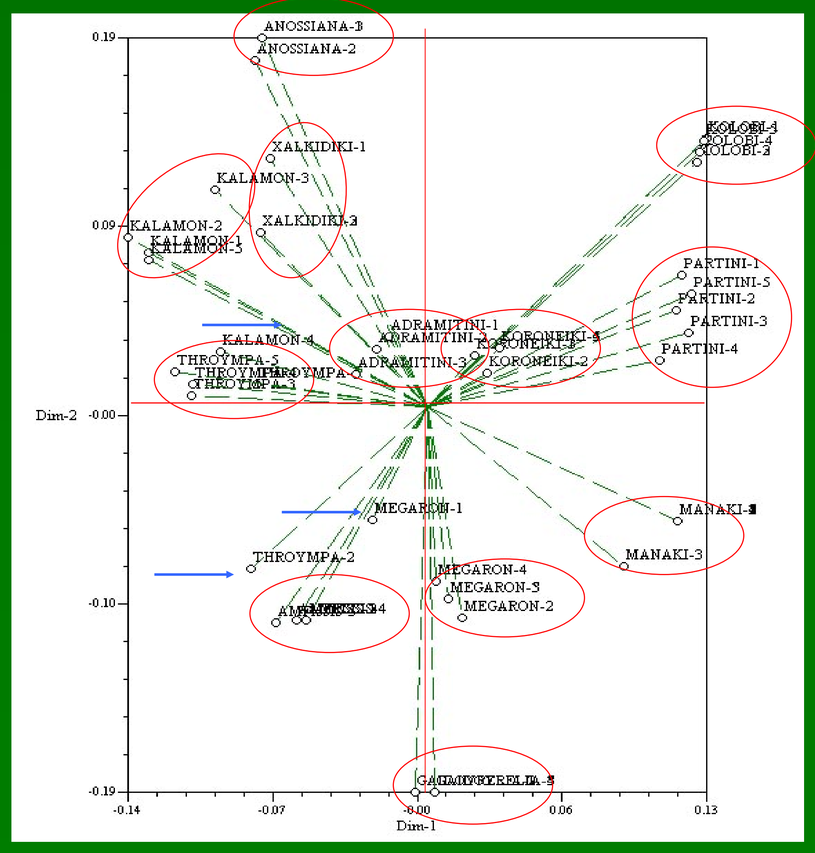
PCR timeline

- ✓94°C for 2 minutes
- ✓30 cycles: 94°C for 45 sec, 40°C for 1 min, 72°C for 2 min.
- ✓72°C for 7 min

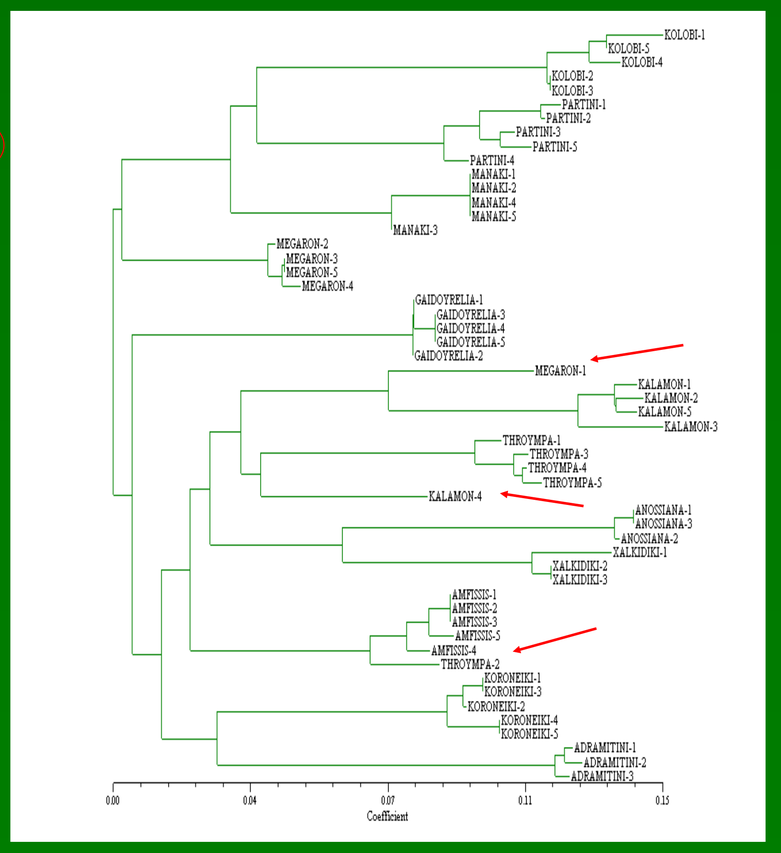
RESULTS



25 samples from 6 out of the 12 olive varieties studied, amplified by OPB-11 RAPD marker. Letter "M" indicates the standard size of molecular weights (NEW ENGLAND BIOLABS, 100bp DNA Ladder, cat. No. N3231S). Electrophoresis was conducted in agarose gel 2,0% (w/v), stained with ethidium bromide. Red arrows indicate diversifications (presence or absence of DNA amplified bands) between varieties and between samples from the same variety.



Principal Component Analysis (PCOORDA). Red circles include samples from the same varieties. Blue arrows point diversified samples.



The dendrogram was constructed using the NJoin method. Samples from the same variety are clustered together. Varieties are distinct from one another. The exceptions found (MEGARON-1, KALAMON-4, THROUMBA-2) are interpretable.

DISCUSSION - RESULTS

- **Samples were grouped similarly, using both methods (NJoin και PCOORDA).**
- **Samples obtained from the same variety but different trees were grouped together.**
- **All varieties were grouped and isolated from the others indicating the diversity of every variety.**
- **Only three samples were not grouped according to the varieties they were theoretically obtained.**
- **The applied methodology is considered adequate for the identification of the nursery mother plants, detecting certain potential problems indicating also the intravarietal uniformity and the clear cultivars diversity.**

REFERENCES

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