

**Exploratory Research Projects type PCE**

Project No. 1063/2009 code 430

**RESEARCH ON FRUIT FORMATION BY  
APOMIXIS IN LOCAL WALNUT TREE  
CULTIVARS**

**Project manager:**

**Associate Professor Doctor COSMULESCU SINA NICULINA**

**2009-2011**

"[Apomixis is] an emerging tool of revolutionary potential impact for the agriculture of the 21st century."  
(Savidan, 2000)

## **SUMMARY**

Seeds formed by apomixis have maternal genotype because their embryo is derived from cells that have not undergone the events of meiosis and fertilisation that define sexual embryo development. Absence of meiotic process and paternal contribution to the embryo genotype do mean that apomixis offers a clonally propagating method of plants through seeds. As in most fruit tree species, walnut tree is a heterozygous plant, therefore the most certain way to get uniform plantations, with higher quality cultivars, is vegetative propagation.

Vegetative propagation in walnut tree by grafting is still a difficult method that involves higher expenses. Research conducted in walnut tree on fruit formation have shown that some cultivars can form fruit even without fecundation, by parthenocarpic or apomictic way. Opportunity of fruit formation without pollination in walnut, under normal conditions, has raised special interest for researchers in flowering biology and seed formation. Fruit formation by apomixy has theoretical and practical significance; the embryo, being homozygous, is transmitting the similar characteristics of mother plant.

This research project aims at knowledge development in the area, and to bring about new knowledge, by formulating hypotheses on apomixis in Romanian local walnut cultivars. It also follows on visibility increase of Romanian research on international level, by publishing articles in ISI quoted reviews and participation to International Congresses and Symposia.

## RESEARCH TEAM

No.	Surname and first name	Didactic /scientific title
1	Cosmulescu Sina Niculina	Associate Professor Doctor - Project Director-
2	Botu Mihai	Ph.D.Professor
3	Achim Gheorghe	Ph.D. Professor
4	Baciu Adrian Aurelian	Ph.D. Professor
5	Gruia Marius	Ph.D. Assistant

## PROJECT OBJECTIVES

The objective of this project is to study apomixis in Romanian local walnut cultivars, with the aim to obtain homozygous plants that can be used in breeding, research or propagation. Within this project the focus is put on investigating the opportunities of fruit formation by apomixis in some local cultivars, then on embryologic and cytologic studies in apomictic fruits, as well as on study of descendance by molecular markers to analyse genetic diversity.

This study has special theoretical and practical significance; the obtaining of haploid or diploid plants by apomictic way is efficient within programmes of genetic improvement. Romanian local walnut cultivars are to be used for investigations

In order to achieve the proposed aim, the following objectives are followed up:

- 1. Obtaining apomictic fruits.
- 2. Embryologic and cytologic studies in apomictic fruits
- 3. Study of descendance by chemical markers
- 4. Choosing apomictic selections of perspective.