PROSPECTS OF PLANT GENOME EDITING IN ARMENIA

Kristine Margaryan

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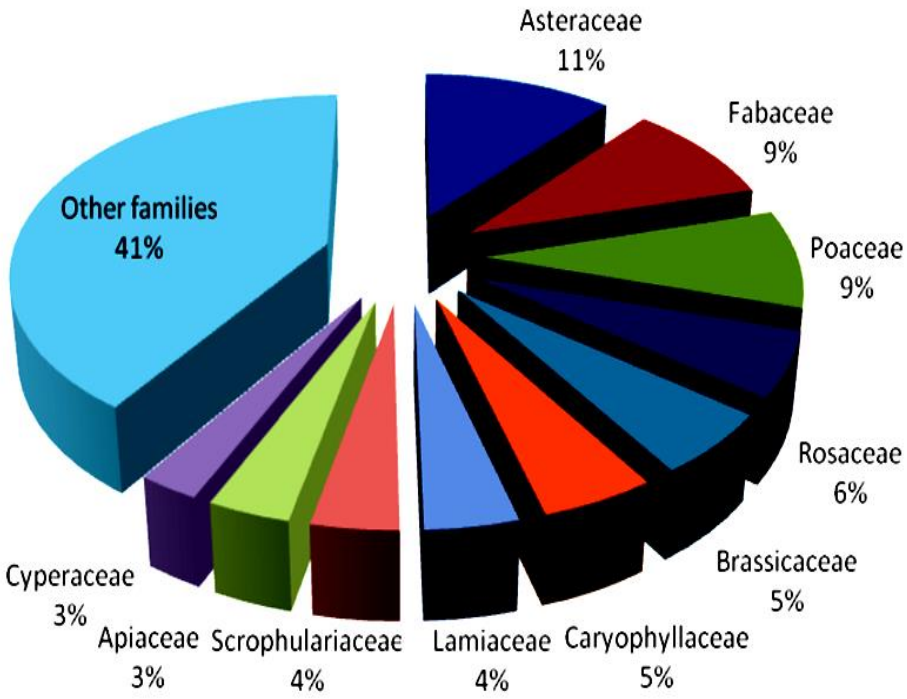
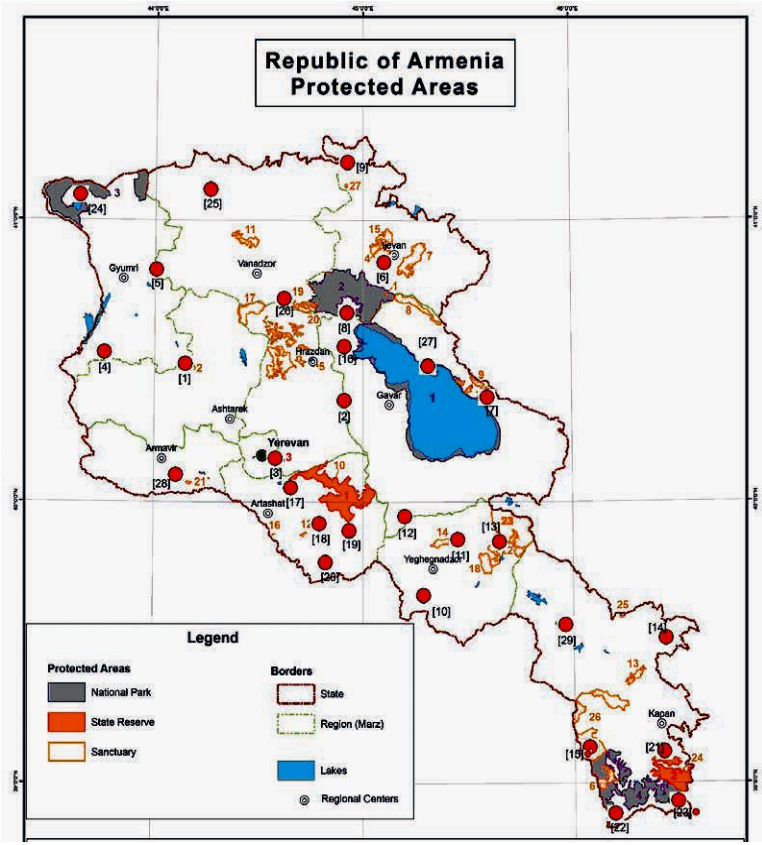
Armenia – “Biodiversity hotspot”

Armenia is considered as one of the five centers of diversity and origin of the world’s major crops described by N.I. Vavilov.

Armenia – “Biodiversity hotspot”



The species composition of vascular plants registered in Armenia



On a territory of 29,740 km^2 Armenian flora comprises about 3600 species of vascular plants, which makes about half of entire Caucasian flora.

By the density of high vascular plants Armenia is ranked among first-place countries in the world with about 107 species per 1000 km^2 .

National Strategy on Plant Genetic Resources of Armenia

Recovery

Characterization

Conservation

Management

Case study: Armenian National Grapevine Collection: Conservation, Characterization and Prospects

World's oldest winery unearthed in Armenian Areni-1 cave

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Phenotypic and genotypic biodiversity

Due to different …

wild genetic pools

climates

soil conditions

human contexts

CURRENT SITUATION

Armenia before 1990 s

In the central collection of Armenia were preserved 900 grape varieties

Armenia before 2012's

Three ampelographic collections

in all collections	**140 varieties**
local	**125 varieties**
old autochthonous	**70 varieties**

Nowadays

Armenian National Grapevine Collection contains *293* different varieties and wild species from all the wine-growing areas in Armenia

Armenian National Grapevine Collection established in 2016

Totally -*293* varieties

Foreign - *13* varieties

Wild and semiwild - *19* species

Aboriginal, rare, neglected varieties - 261

ARMENIAN *VITIS* DATABASE: CONSERVATION AND DOCUMENTATION OF GRAPEVINE GENETIC RESOURCES IN ARMENIA

www.vitis.am

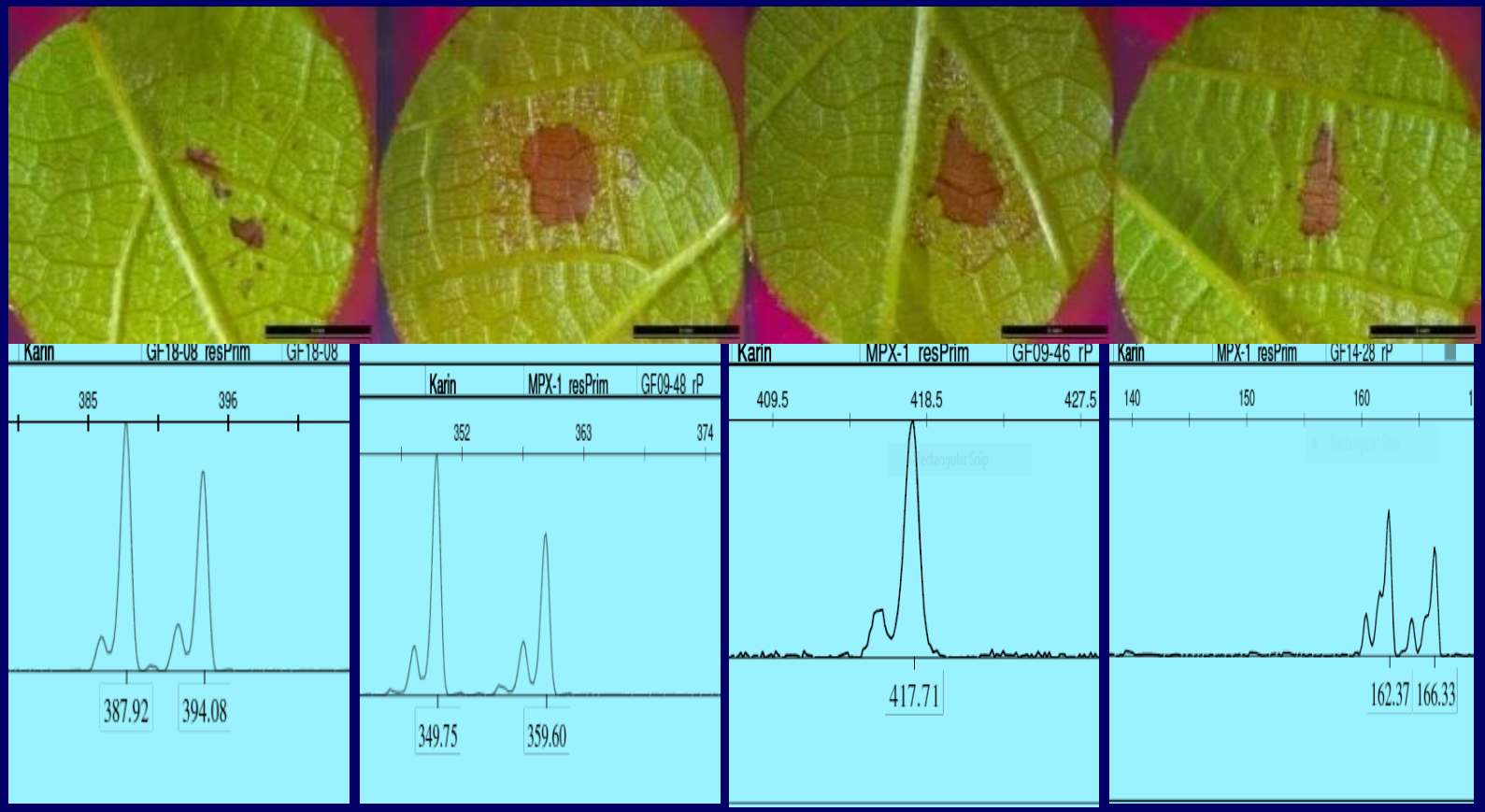
AVD is available on http://www.vivc.de/, *Important Link*

RESISTANCE TO BIOTROPHYC PATHOGENES

research with JKI, Germany

2017-2019

LERNATU x FIOLETOVYI RANNII



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THE WILD GRAPE GENETIC POOL

Do they have evolved towards tolerance/resistance against pathogens?

The current status : National Biosafety Policy

Biosafety related activities started in 1993 when the National Assembly of RA ratified the Convention on Biological Diversity

	Name of Law	*In Force*
1.	Constitution of RA	July 5, 1995
2.	Principles of Legislation on Nature Protection of RA	July 29, 1991
3.	Law on Environmental Impact Assessment	April 3, 2000
4.	Law on Fauna	March 16, 2000
5.	Law on Flora	November 23, 1999
6.	Law on Protection and Quarantine of Plants	March 20, 1999
7.	Law on Environmental Education	November 20, 2001
8.	Law on Activities of State Agricultural Inspection	May 15, 1996

9, 10 ……

The current status : National Biosafety Policy

➢ The biosafety issues are highlighted in the Cartagena Protocol of the Convention on the Biological Diversity (CBD) and are based on the concept of necessity of protecting environment, biodiversity and human health from the possible adverse effects caused by living modified organisms (LMOs) obtained through the application of modern biotechnologies.

➢The National Assembly of the Republic of Armenia has ratified the *Cartagena Protocol of Convention on Biological Diversity on March 16, 2004.* It was the first significant step towards ensuring the active participation of Armenia in international cooperation in the framework of the Protocol.

The current status : National Biosafety Policy

Law on Genetically Modified Organisms, Republic of Armenia

- In 2018 the updated version of the draft Law was again put in circulation by government and was subject for public discussion (https://www.e-draft.am/en/projects/1178/about)

- The goal of the Law on "Genetically Modified Organisms" is to regulate the use of genetically modified organisms in the Republic of Armenia and ensure biosafety, excluding their possible adverse impact on the environment, biodiversity, agricultural land and on the safety of products of plant and animal origin.

Article 2 : Basic concepts of Low and used definitions

The Republic of Armenia specifies the following concepts and their definitions:

- **Genetically modified organisms**

organism in which the genetic material has changed in a non-natural way through recombination

- **Genetic safety zone**

the area within which the use and / or functioning of genetically modified organisms is prohibited

- **The use of genetically modified organisms**

research, acquisition, testing, storage, use, import, transplantation, destruction or neutralization of genetically modified organisms in any form, including export and transit of genetically modified organisms

- **Biosafety associated with the use of genetically modified organisms**

the integrity of measures, which guarantees the elimination of any adverse effects of genetically modified organisms on the environment and biodiversity

- **Authorized body (bodies)**

state body authorized by the Government of the Republic of Armenia in the spheres of protection, use and reproduction of agriculture, fauna and flora of the RA

Plant genome editing in Armenia: limitations

The effective conservation of Armenian plant biodiversity and its sustainable use are a priority for Armenia as it intends to reinforce economic power through sustainable agricultural development.

- ✓ lack of awareness
- ✓ increased human impact
- ✓ increased pests and diseases virulence
- ✓ global climate changes

the main factors seriously threaten plant diversity in country.

Hence, it has critical importance for Armenia to strengthen its capacity to pursue biosafety policies based on well-balanced decisions on the introduction of innovations as plant genome editing technologies.

Plant genome editing in Armenia: prospects

- **The strategic directions are:**

- Improvement of legislative and institutional frameworks
- Assessment and comparison of the regulatory approaches to genome editing in the EU, implementation in Armenia based on national priorities
- Elimination the main causes of plant biodiversity loss through regulation of intersectoral relations and public awareness-raising
- Enhancement related scientific research, knowledge management and capacity-building

Thank you!

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