



UNIVERSITÀ DEGLI STUDI
DI MILANO

Cost action FA1003 - GRAPENET
East-West Collaboration for Grapevine Diversity Exploration and
Mobilization of Adaptive Traits for Breeding

FULL PROGRAM & ABSTRACT BOOK

Final Conference

PROGRESS IN *VITIS VINIFERA* **DIVERSITY EVALUATION AND USE**

7-8 October 2014

Final Management committee

9 October 2014

INIAV - Instituto Nacional de Investigação Agrária e Veterinária
Av. da República, Quinta do Marquês, Oeiras (Lisbon - Portugal)

Edited by Gabriella De Lorenzis, Laura Rustioni and Osvaldo Failla

IDENTIFICATION AND CHARACTERIZATION OF GRAPEVINE GENETIC RESOURCES MAINTAINED IN EASTERN EUROPEAN COLLECTIONS

Erika MAUL¹, Reinhard TÖPFFER¹, Frida CARKA², Vladinir CORNEA³, Manna CRESPIAN⁴, Marina DALLAKYAN⁵, M. Teresa DE ANDRÉS DOMÍNGUEZ⁶, Gabriella DE LORENZIS⁷, Liviu DEJEU⁸, Svitlana GORYSLAVETS⁹, M. Stella GRANDO¹⁰, Nelli HOVANNISYAN⁵, Martina HUDCOVICOVA¹¹, Tzvetanka HVARLEVA¹², Javier IBÁÑEZ¹³, Erzsébet KISS¹⁴, Laszlo KOCSIS¹⁵, Thierry LACOMBE¹⁶, Valerie LAUCOU¹⁶, David MAGHRADZE¹⁷, Edi MALETIC¹⁸, Gagik MELYAN¹⁹, Maja Z. MIHALJEVIĆ¹⁸, Gregorio MUÑOZ-ORGANERO⁶, Mirza MUSAYEV²⁰, Anna NEBISH²¹, Carmen F. POPESCU⁸, Ferdinand REGNER²², Valentina RISOVANNA⁹, Silvija RUISA²³, Vugar SALIMOV²⁴, Gheorghe SAVIN³, Anna SCHNEIDER²⁵, Natasa STAJNER²⁶, Levan UJMAJURIDZE²⁷, Osvaldo FAILLA⁷

¹ JKI - Julius Kühn-Institut, Institut für Rebenzüchtung Geilweilerhof, Siebeldingen, Germany.

² Genetic Resources Centre, Agricultural University of Tirana, Albania.

³ Research and Practical Institute for Horticulture and Food Technologies, Chisinau – Republic of Moldova.

⁴ Consiglio per la Ricerca e la sperimentazione in Agricoltura, Centro di ricerca per la Viticoltura, Conegliano, Italy.

⁵ Department of Ecology and Nature Protection - Yerevan State University, Armenia.

⁶ Instituto Madrileño de Investigación y Desarrollo Rural, (IMIDRA), Finca El Encín, Alcalá de Henares, Spain.

⁷ Università degli studi di Milano, Dipartimento di Scienze Agrarie ed Ambientali, Milano, Italy.

⁸ University of Agronomic Sciences and Veterinary Medicine, Faculty of Horticulture, Bucharest, Romania.

⁹ National Institute of Vine & Wine “Magarach”, Yalta, Ukraine.

¹⁰ Istituto Agrario di San Michele all’Adige (IASMA), San Michele all Adige, Italy.

¹¹ Plant Production Research Center Piestany, Piestany, Slovak Republic.

¹² AgroBioInstitute Molecular Genetics, Sofia, Bulgaria.

¹³ Instituto de Ciencias de la Vid y del Vino (Universidad de La Rioja). Logroño, Spain.

¹⁴ Szent István University, Institute of Genetics and Biotechnology, Gödöllő, Hungary.

¹⁵ University of Pannonia, Georgikon Faculty, Department of Horticulture, Keszthely, Hungary.

¹⁶ INRA – SupAgro Montpellier, UMR DIAPC, Équipe Génétique Vigne, Montpellier, France.

¹⁷ Institute of Horticulture, Viticulture and Oenology. Agrarian University of Georgia, Tbilisi, Georgia.

¹⁸ University of Zagreb, Faculty of Agriculture, Department of Viticulture and Enology, Zagreb, Croatia.

¹⁹ Armenian Academy of Viticulture and Wine-making, Yerevan, Armenia.

²⁰ Genetic Resources Institute of the Azerbaijan National Academy of Sciences (AGRI), Baku, Azerbaijan.

²¹ Department of Genetics - Yerevan State University, Armenia.

²² HBLAuBA Klosterneuburg, Klosterneuburg, Austria.

²³ Latvia State Institute of Fruit –Growing, Dobeles, Latvia.

²⁴ Azerbaijani Scientific Research Institute of Viticulture and Wine-making, Baku, Azerbaijan.

²⁵ Consiglio Nazionale delle Ricerche, Istituto di Virologia Vegetale, Grugliasco, Torino, Italy.

²⁶ University of Ljubljana, Ljubljana, Slovenia.

²⁷ AGRO - National Center for Grapevine and Fruit Tree Planting Material Propagation, Mtskheta, Georgia

INTRODUCTION – The Near East and in particular Caucasus region are considered as the cradle of viticulture and the area of domestication. Already in the 1920’s Negrul first suggested the Caucasus as the grapevine gene centre. His perception was based on the abundantly thriving wild wines and the enormous morphologic diversity he encountered. Being both gene and domestication centre for grapevine a genetic wealth is highly expected in that area. A survey of the grapevine genetic resources present in Armenia, Azerbaijan, Georgia, Moldova, Russian Federation and Ukraine which took place from 2003 to 2007 in the scope of the project “Conservation and Sustainable Use of Grapevine Genetic Resources in the Caucasus and Northern Black Sea Region” was funded by the government of Luxembourg and managed by Bioversity. The outcome of 5 years intensive collaboration was the estimation that the maintained 2654 accessions may belong to 1283 cultivars. But trueness to type assessment by morphology and genetic fingerprinting still needed to be done. In the scope of COST Action FA1003, 1098 mainly *Vitis vinifera* accessions and 76 *Vitis sylvestris* individuals were analyzed by molecular markers. In addition to the six countries mentioned above Albania, Austria, Bulgaria, Croatia, Hungary, Lithuania, Romania, Slovakia and Slovenia participated, too.

AIMS AND SCOPES –The study aimed at determination of the accessions identity by molecular markers, confirmation of identity by morphology and bibliographical references, estimation of germplasm existing in the countries of origin only and identification of endangered germplasm to initiate duplicate conservation.

MATERIALS AND METHODS – Nine SSR-markers (VVS2, VVMD5, VVMD7, VVMD25, VVMD27, VVMD28, VVMD32, VrZag62, VrZag79) recommended by the European project GrapeGen06 were applied and analyzed either by the countries mentioned above or by Western European laboratories. DNA extraction, PCR and fragment size determination was carried out according to each laboratories protocol. Fingerprints were checked by seven SSR-marker databases (3 from Italy, 2 from Spain, France and Germany) for matching allelic profiles.

RESULTS AND DISCUSSIONS – From the 1098 mainly *Vitis vinifera* accessions, 997 turned out to be indigenous to the participating countries. The remaining 101 accessions were Western European cultivars (e.g. Luglienga bianca, Madeleine Angevine and Pinot), hybrids (e.g. Silva and Spulga), rootstocks (e.g. Rupestris du Lot and SO4) and new crosses (e.g. Ametyst and Neronet). The 997 fingerprints investigated further resulted in 658 unique profiles/cultivars. Somatic mutation was considered when respective information was available like for Rkatsiteli B and Rkatsiteli Vardisperi RS. From the 658 unique profiles/cultivars 54% were maintained in the countries of origin only. In addition 46% from the 658 unique profiles/cultivars existed in only one Eastern European collection. The analysis of more accessions maintained in Eastern European countries will reduce that proportion but might on the other hand add further unique fingerprints as well. With respect to cultivar identity confirmation/rejection the study revealed unambiguously the necessity of morphologic description and photos (a) for comparison with bibliography, (b) for a clear and explicit definition of the cultivar and (c) the detection of sampling errors and misnomers.

CONCLUSIONS AND POSSIBLE APPLICATIONS – With respect to cultivar identity assessment the study revealed the necessity of morphologic description and photos (a) for comparison with bibliography, (b) for a clear and explicit definition of the cultivars identity and (c) for the detection of sampling errors and misnomers. Intense exchange between collection curators and skilled personnel are needed to work on questionable accessions. Duplicate preservation needs to be initiated for the rare and thus endangered accessions. Documentation of the entire information in the European *Vitis* Database will assist both germplasm maintenance and documentation of cultivar specific data. The importance of the accession number is again emphasized. To draw a real picture of the situation continuation of fingerprinting is recommended.