

ECPGR Activity Grant Scheme Proposal Form

Sixth Call – Phase X (2019-2023)

Activity Proposal

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| Activity | |
| Full title | Increasing the efficiency of conservation of <i>Vitis sylvestris</i> genetic resources in Europe |
| Acronym (or short title) | Sylvestris |
| Duration of Activity (in months) | 12 |
| Start date – End date | 01 March 2023 |

Applying Working Group(s)

| | Working Group | Indicate name and surname of Working Group Chair |
|----|---------------|--|
| 1. | Vitis | Georgios Merkouropoulos (Chair) |
| 2. | Vitis | Dragoslav Ivanišević (Vice-Chair) |

Activity Coordinator

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|----------------------|---|
| Activity Coordinator | |
| Name and Surname | Georgios Merkouropoulos |
| Working Group | Vitis |
| Nationality | Greek |
| Current position | Researcher |
| Institute | Hellenic Agricultural Organisation DIMITRA (ELGO-DIMITRA), Institute of Olive Tree, Subtropical Crops and Viticulture, Department of Vitis |
| Country | Greece |
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Activity Partners (ECPGR-funded)

* : these partners have been informed that they could receive ECPGR funds if/when they will be nominated as members of the WG/Vitis by their National Coordinator in a relatively short time.

| Partner ID No. | Name and Surname | Institute | Country |
|----------------|--------------------------------|---|----------------|
| 1 | Georgios Merkouropoulos | Hellenic Agricultural Organization DIMITRA (ELGO-DIMITRA), Institute of Olive tree, Subtropical crops, and Viticulture, Department of Vitis | Greece |
| 2 | Dragoslav Ivanišević | University of Novi Sad, Faculty of Agriculture Institute for Fruit Growing & Viticulture | Serbia |
| 3 | Frida Çarka | Institute of Plant Genetic Resources, Agricultural University of Tirana | Albania |
| 4 | Kristine Margaryan * | Institute of Molecular Biology NAS RA | Armenia |
| 5 | Goran Zdunic | Institute for Adriatic Crops and Karst Reclamation | Croatia |
| 6 | Savvas Savvides | Agricultural Research Institute | Cyprus |
| 7 | Thierry Lacombe | Institut Agro Montpellier & INRAE, Montpellier | France |
| 8 | Valérie Laucou * | | |
| 9 | David Maghradze | Scientific Research Center of Agriculture Caucasus International University (CIU) | Georgia |
| 10 | Franco Röckel | Julius Kühn-Institut (JKI) - Federal Research Centre for Cultivated Plants Institute for Grapevine Breeding Geilweilerhof | Germany |
| 11 | Dimitrios Taskos | Hellenic Agricultural Organization DIMITRA (ELGO-DIMITRA), Institute of Olive tree, Subtropical crops, and Viticulture, Department of Vitis | Greece |

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|----|--------------------------------------|--|----------------------------|--|
| 12 | Evangelia Avramidou | Hellenic Agricultural Organization DIMITRA (ELGO-DIMITRA), Institute of Mesditeranean Forest Ecosystems | | |
| 13 | Gabriella De Lorenzis | Università degli studi di Milano | Italy | |
| 14 | Oswaldo Failla | | | |
| 15 | Maria Antonietta Palombi | | | CREA – Research Centre for Viticulture and Enology |
| 16 | Jorge Cunha | National Institute for Agrarian and Veterinarian Research, I.P. (INIAV) | Portugal | |
| 17 | Lucia Cintia Colibaba | University of Life Sciences Iasi (IULS) | Romania | |
| 18 | Anamaria Mirabela Dumitru | National Research and Development Institute for Biotechnology in Horticulture, Ștefanesti - Arges | | |
| 19 | Andreea Elena Manolescu | | | |
| 20 | Dragan Nikolić | Faculty of Agriculture University of Belgrade | Serbia | |
| 21 | Edi Maletić | University of Zagreb, Faculty of Agriculture | Croatia | |
| 22 | Anastazija Jež Krebelj | Agricultural Institute of Slovenia | Slovenia | |
| 23 | Katja Šuklje Antalick | | | |
| 24 | Stanko Vršič | | | UC of viticulture and enology |
| 25 | Andrej Perko * | | | University of Maribor, Faculty of Agriculture and Life Sciences |
| 26 | Gregorio Muñoz Organero | IMIDRA | Spain | |
| 27 | Javier Tello * | Instituto de Ciencias de la Vid y del Vivo (ICVV) | | |
| 28 | Metin Kesgin | Manisa Viticulture Research Institute | Türkiye | |
| 29 | Selcuk Karabat * | | | |
| 30 | Klime Beleski | Dept for Vitis and Winery; Institute of Agriculture - Skopje | North Macedonia | |

Description of Activity (suggested max. 1000 words)

Please address the following aspects:

– **Background:**

The wild grapevine (*Vitis vinifera* subsp. *sylvestris* Gmel. – hereafter: *Sylvestris*), the ancestor of the cultivated grapevine, has been the focus of various research projects and expeditions during the last decades. ECPGR Grand Scheme Activity “Increasing the efficiency of conservation of wild grapevine genetic resources in Europe” (acronym: “InWiGrape”) recorded these efforts; an inventory was created listing the available scientific publications (“InWiGrape_Bibliography_Final_08_06_2017”) together with a distribution map of wild grape populations, and recommendations on *in-situ* and *ex-situ* preservation. A minimal check list of OIV descriptors for morphology evaluation of *Sylvestris* individuals in the wild was also produced.

The current proposal, “*Sylvestris*” is the follow-up of the “InWiGrape” Activity, aiming to update and enrich the findings on *Sylvestris* occurrence in Europe by providing the opportunity to WG/*Vitis* country members that did not actively participate in “InWiGrape” but are willing to catch up while being guided by the more experienced colleagues.

– **Justification:**

“Together, we are stronger”, this is a main ECPGR quotation: “...work together, share experience [and expertise], develop common way of work...” (<https://www.ecpgr.cgiar.org/>, video)

Task 1: Update the existing EU bibliography on *Sylvestris* populations

Task 1.1: Update the inventory that was created during “InWiGrape”. A detailed inventory of scientific publications, mostly by the participating country members, was created. This inventory will be updated with the latest published scientific studies; such studies concern *Sylvestris* populations from Andalusia, Tunisia, Türkiye, Bulgaria, Portugal, Georgia, Krim, Hungary, Israel, and Slovenia. Interestingly, some of them extend the focus of interest to areas other than characterization and preservation of *Sylvestris*, e.g. wine and oenology.

Task 1.2: For the non-English publications, the native speaker members of the group will take care to provide either the data in such a format that could be easily translated using web available applications, or the necessary links that would facilitate translation.

Task 2: In-situ and ex-situ protection

Update on the “indicators of vulnerability” and the methods ensuring the protection of vulnerable *Sylvestris* populations that were defined in “InWiGrape” will take place; the well-experienced members (country members that participated in “InWiGrape”) will share their expertise with the less-experienced members (country members that did not participate in “InWiGrape”).

Task 3: Characterisation and evaluation data on *Sylvestris*

There have been research projects within the framework of various EU activities that defined in details descriptors and protocols aiming to evaluate wild and cultivated grapevine, including the molecular approach. Although the minimal standard set of the nine OIV microsatellite markers will be applied to the samples collected from new areas of research focus (e.g. Greece, Romania, and Türkiye), the ultimate goal is the use of at least twenty

markers (including sex-determining marker(s)) harmonizing the differential approaches currently performed by the various laboratories. At the end, the existing data will be analysed leading to a joined publication describing comprehensively the updated European Sylvestris populations.

– ***Rationale for the choice of partners:***

The current proposal is the follow-up of the previous “InWiGrape” Activity that brought together the European grapevine community working for a common goal. The experienced partners will lead and guide the less experienced partners. For example, partners from Germany, France, Italy, Spain, Slovenia etc. are well-known for their achievements in terms of traditional and molecular ampelography. These partners will share their experience with those partners that are willing to develop their expertise.

– ***Methodology or Approach - Description of genetic material:***

Task 1: Locate sampling areas

Sylvestris populations will be located using available information (e.g. bibliography): four WG/Vitis country members (Georgia, Greece, Romania, and Türkiye) that did not participate in “InWiGrape” have registered in “Sylvestris” and have already located Sylvestris populations in their territories. So far, for example:

- i) The Georgian partner has located “female individuals of wild grapevine growing in the South Caucasus region” and already performed oenological studies on seven of them (Maghradze *et al.*, 2020, OENO One - DOI:10.20870/oeno-one.2020.54.4.3720),
- ii) The Greek partner has located six Sylvestris sites (three sites in the northern parts of the country, two sites in the southern parts of the mainland, and one site on an island of the north Aegean Sea),
- iii) The Romanian partner has registered eight Sylvestris accessions (ROM051-275 to ROM051-282) in the European Vitis Database, and have located at least three sites in the southeast part of the country, in Dobrogea (near the Black Sea),
- iv) the Turkish partner is organising a survey to locate Sylvestris populations.

Research groups from the country members that participated in the “InWiGrape” Activity, however, are still active in Sylvestris occurrence in their countries, locating, analyzing, and preserving new Sylvestris populations, such as:

- a) One of the Slovenian partners discovered three Sylvestris areas (one of which is large, close to Sava River – these results have been reported in the XIII International Symposium on Grapevine Breeding and Genetics: https://www.openagrar.de/receive/openagrar_mods_00080112), while continues to look for new Sylvestris populations: “the total number of plants is around 80 plants on different locations” (personal communication),
- b) Another Slovenian partner already maintains (for many years) Sylvestris plants collected from Vinje in a greenhouse
- c) The Spanish partner has “found some new sites in Spain that could be added to the list” (personal communication).

Overall, it is evident that there is an on-going research interest among the WG/Vitis members on Sylvestris populations, not only to locate and preserve them but also to evaluate them aiming to their use by the wine industry.

Task 2: Collection of samples

Geographical coordinates will be recorded pointing to the sampling sites. Individual vines will be marked so as to be available for later collection of samples for molecular analysis and also collection of cuttings for future *ex-situ* conservation.

Task 3: Traditional and molecular ampelography

The collected samples will be analysed using at least the minimal standard set of the nine OIV microsatellite markers aiming, however, to the use of more than twenty markers (including the sex-determining ones). The current “Sylvestris” Activity Proposal is believed to increase laboratory harmonization among the partners.

The Greek partner has started analyzing molecularly more than 50 samples collected from the northeast part of the country using the 9 OIV loci; another ~50 samples will be collected and molecularly analysed in the spring of 2023. The Greek partner will also provide molecular assistance to the Romanian partner. The Turkish partner will perform similar efforts relying on its own resources.

The minimal check list of OIV descriptors suggested by “InWiGrape” will be used to briefly describe the marked vines during the initial months of the current project.

Task 4: Ex-situ conservation

Cuttings from the marked vines will be transplanted in *ex-situ* germplasm collections. For the Greek partner, there will be two *ex-situ* collections, both of them in the ELGO-DIMITRA premises: one of them will be located in the southern part of the country (Lykovrysi, Athens), whereas the other one will be located in the northern part of the country (Thermi, Thessaloniki).

Task 5: Joined publication

The partners will harmonise the collected molecular data, aiming to a scientific publication describing the European Sylvestris populations.

– ***Expected impact.***

- 1) The European Sylvestris distribution map will be updated by filling in data collected from various parts of the continent.
- 2) Molecular data will be created and analysed using genetic material from various parts of Europe, and providing insights on the migration of the species.
- 3) *Ex-situ* conservation of the Sylvestris populations will be performed.

– ***Links with other non-ECPGR projects or individuals:***

- 1) During the XIII International Symposium on Grapevine Breeding and Genetics that was held in Landau, Germany, between 10th-15th July 2022, the workshop “Vitis sylvestris: broad genetic basis of *Vitis vinifera* L. subsp. *sylvestris* for deep studies” took place and

a core group was organized. This group is going to operate and function: first Workshop is going to be held at JKI between 28 November and 02 December 2022. Since most of the participants of this Workshop are also active participants of the WG/Vitis, there will be close cooperation between the two groups.

- 2) The Sylvestris molecular data will update the relevant European Vitis Database resources.
- 3) During 2023, EURISCO will create space to receive *in-situ* population data, based on the principles agreed in the project “Extension of EURISCO for Crop Wild Relatives (CWR) in situ data and preparation of pilot countries’ data sets”. Therefore, the data created in the current project will feed EURISCO with information on CWR Sylvestris populations. The same could also be possible for AEGIS (this will be discussed during the kick-off E-meeting).

Expected products and related ECPGR Objectives

List concrete products and results that are obtained by the Activity and the corresponding number(s) of the ECPGR Outcome(s) and/or Output(s) and/or Activities to which each product/result will contribute.

| | Expected products/results |
|---|--|
| 1 | Sylvestris distribution map. |
| 2 | Creation of molecular data on Sylvestris populations. |
| 3 | Enrichment of Sylvestris <i>ex-situ</i> conservation. |
| 4 | Update European Vitis Database and EURISCO, (possibly AEGIS, too). |

Workplan for the proposed period of the Activity

Brief description of meetings and/or main actions of the Activity.

| Type of Action | |
|-----------------------|---|
| 1 – E-meeting | <p>Month 1: Partners will participate in a kick-off e-meeting in order to coordinate, organise and harmonise their actions, e.g. the update of the bibliographical data, collection of data regarding the molecular and ampelographic descriptions etc.</p> <p>During this first meeting, a decision will be made about the date of the physical Meeting of the WG/Vitis (either in June or in September).</p> <p>In addition, a decision will be made about the possibility that the new <i>ex-situ</i> accessions also become AEGIS accessions.</p> |

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| 2 – Other action | Month 1 to 6: Preparatory work: the partners will prepare/collect their data (location maps, initial ampelographic characteristics, molecular analysis). |
| 3 – Meeting | Month 4 (or 7): Presentation and evaluation of the results. |
| 4 – Other action | Month 8 to 11: Post meeting evaluation of results and preparation of reports. |
| 5 – E-meeting | Month 12: Final remarks. Organizing next actions and activities. |

Additional remarks

Indicate any additional remark(s) that is/are important for the evaluation/implementation of the proposed Activity

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| Remarks: |
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