



ECPGR Activity Grant Scheme Proposal Form

Fourth Call

Activity Proposal

Activity	
Full title	Safeguarding of potato onion (<i>Allium cepa</i> L. Aggregatum group) and garlic (<i>Allium sativum</i> L.) crop diversity in North Europe – Baltic region.
Acronym (or short title)	SafeAlliDiv
Duration of Activity (in months)	24
Starting date	June 15, 2017

Applying Working Group(s)

	Working Group	Indicate name and surname of Working Group Chair
1.	Allium	Helena Stavelikova
2.		
3.		
4.		

Activity Coordinator

Activity Coordinator	
Name and Surname	Helena Stavelikova
Nationality	Czech
Current position	WG chairman
Institute	Crop Research Institute
Country	Czech Republic
Telephone	(+420)585 208 965, (+420) 702 087 801
Email	stavelikova@genobanka.cz

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Activity Partners

Please note that each partner needs to be a member of a Working Group's Pool of Experts to be eligible.

A maximum of 12 funded partners can be listed. For self-funded partners please use the separate box below.

Partner ID No.	Name and Surname	Institute	Country
1	Helena Stavělková	Crop Research Institute	Czech Republic
2	Priit Põldma	Estonian University of Life Sciences	Estonia
3	Terhi Suojala-Ahlfors	Natural Resources Institute Finland (Luke), Horticulture	Finland
4	Līga Lepse	Pure Horticultural Research Centre	Latvia
5	Danguolė Juškevičienė	Institute of Horticulture, LRCAF	Lithuania
6	Chris Kik	Centre for Genetic Resources, the Netherlands (CGN)	Netherlands
7	Ingunn Molund Vågen	The Norwegian Institute for Agricultural and Environmental Research Bioforsk Øst Landvik	Norway
8	Matti Leino	Nordiska museet, Swedish Museum of Agriculture	Sweden
9	Küllli Annamaa	Estonian Crop Research Institute (ECRI)	Estonia
10	Dainis Rungis	Latvian State Forest Research Institute (LSFRI)	Latvia
11	Smiljana Goreta Ban	Institute of Agriculture and Toursim	Croatia

Self-funded partners

Partner No.	Name and Surname	Institute	Country
12	Jaroslava Ovesná	Crop Research Institute	Czech Republic

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Description of Activity

Please address the following aspects:

- *Background:* Explain the context behind the choice of this Activity, e.g. why this has been prioritized or selected. If this is the continuation of a preceding Activity, please indicate how and why the new Activity will build on previous results/experiences
- *Justification:* Explain why this Activity is justified in terms of making progress towards achieving the ECPGR objectives
- *Methodology or Approach:* Explain how the partners will operate. What are the respective roles and synergies they can add? Explain the rationale of meeting (or not) as part of the Activity.
- *Expected impact.* Clearly specify the expected impact from this Activity for the respective ECPGR objective(s), compared to the current state of progress of those same objectives. Explain how the impact will be obtained.
- *Links with other non-ECPGR projects or individuals:* If applicable, clearly explain the objectives of the linked projects and the reasons for complementarity with the ECPGR Activity.

Describe the Activity - (max. 1000 words):

European consumers have become increasingly interested in locally and organically produced crops. In addition, these crops represent a biocultural heritage across Europe – from the Balkans to the northern Norway. However, this biocultural heritage is under threat due to rapid and powerful commercialisation and changing lifestyles in Europe. This has an especially sharp impact on minor crop cultivation, including *Allium*. Alliums are the crop species representing the history and cultural heritage in certain countries – almost in every national cuisine you will find Alliums. The most broadly grown crops are garlic and onion. These two crops are considered as commercial crops, but the lack of legislation protecting the cultivation of local genotypes endangers and narrows genetic diversity. Cultivation of local genotypes is essential in changing climatic conditions, where locally adapted genotypes show the highest plasticity and resistance to marginal biotic and abiotic stresses. Being in active growing systems is assumed as a tool to keep the existing biodiversity and promote evolution of local genotypes simultaneously with concomitant climate changes. The development of a strategy to safeguard these precious *Allium* cropping systems is the goal of this project. The most important *Allium* species considered to be included in the project are garlic (*Allium sativum* L.) and potato onion (*Allium cepa* L. Aggregatum group). Potato onion is one of the species that is historically known in Europe and is therefore part of our biocultural heritage. Most potato onions are not cultivated commercially anymore, but are stored in genebank collections. Farmers' interest about this germplasm is increasing, as it can be used as niche product in organic and/or sustainable farming systems. It is also very well appreciated within the Slowfood movement and is often used in local cuisine in high class restaurants. In some locations these genotypes are still grown, but their cultivation area is very negligible and with the tendency to slowly disappear in the majority of European regions. Estonia can be considered as an exception, particularly villages near Lake Peipus, where potato onions are still organically cultivated and commercially attractive for farmers to produce.

Local garlic production around the Baltic sea is a historically well-known agricultural practice, which is endangered in recent decades during the lack of certified planting material of local germplasm. Some South or Central European genotypes are available in the seed market, but their cultivation has a negative influence on the maintenance of genetic diversity in particular regions. In some regions of Europe – Baltic countries and Scandinavia, garlic can be considered as a minor crop because there are no or only a limited number of registered varieties. Landraces are mainly grown in this region, where the lack of planting material is becoming a serious problem.

The EURALLIVEG project was closely related to garlic propagation and maintenance issues. We see this new application as logical continuation of the EURALLIVEG with a broadened

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partnership, increasing the representation of the North Europe region.

The main objective of the present proposal is to involve *potato onion and garlic* germplasm in active farming in order to promote active on-farm conservation. There are two **sub-objectives** foreseen:

- to investigate the situation in Europe in *Allium* crops cultivation (both, commercial and home-garden scale) and to clarify the scale of potato onion and garlic cultivation as part of the biocultural heritage;
- to develop a North Europe - Baltic region conservation plan in order to safeguard the potato onion and garlic cultivation systems from extinction.

Project activities are planned in two directions: 1) molecular analyses of *Allium* accessions. Genotyping will be done using SSR markers (Fischer and Bachmann (2000) Theor Appl Genet 101:153–164). 15-18 SSR markers will be tested, and the most informative (approx. 12) will be utilised to genotype *Allium* accessions from the Baltic states and central Europe. A number of Nordic accessions have already been genotyped using the same markers, and therefore a number of previously genotyped Nordic accessions (approx. 4-6) will also be genotyped in order to enable calibration of the two data sets. Genetic diversity and differentiation will be assessed. Given that the majority of *Allium* accessions are vegetatively propagated, this will allow identification of duplicates prior to inclusion into AEGIS. In addition, Estonian *Allium* (in particular in the Lake Peipus region) have been traditionally propagated through seed. The level of genetic diversity will be compared between the vegetatively and generatively propagated accessions. In addition, previous studies have indicated that Finnish *Allium* accessions are differentiated from other Scandinavian accessions, and comparison with other European accession may resolve the reasons for this differentiation. It is planned to genotype existing *Allium* collections from the participating countries' genebanks (with collections to be made only for the generatively propagated accessions). The genotyping results will be utilised to investigate the genetic structure of European *Allium* accessions, and allow prioritisation of conservation and collection efforts in order to maximise the conserved genetic diversity of European *Allium*. ;

2) to organize two seminars - meetings of AWG members:

- 1st in Estonia in 2017 with the aim of investigating the situation of *Allium* crop cultivation in Europe (both, commercial and home-garden scale) and to clarify the scale of minor crop cultivation as part of the biocultural heritage. It is planned to organize a one day field trip during the meeting to visit villages near Lake Peipus in order to obtain experience concerning the growing/marketing of potato onion landraces. After the 1st meeting, country representatives will work in their countries in order to inventory the actual state of the minor *Allium* crop (particularly focussed on potato onion and garlic) cultivation in particular countries and to discuss selection criteria for accessions to be included in the molecular analysis activity.
- during the 2nd meeting in 2018, an action plan for safeguarding focused *Allium* species cultivation in each country at the national level will be discussed and presented. Visiting Czech Republic garlic growing institutions, it is planned to get an introduction to production of planting material. Possibilities of cryopreservation for *Allium* especially for garlic and potato onion, will be presented/discussed.
- Molecular analyses results will be discussed in order to obtain a representative insight on potato onion genetic background and diversity across Europe.

The project output will be two reports of all activities – 1st year reporting on the results of the 1st meeting and following activities in member countries in inventorying the *Allium* biocultural heritage and cultivation extent for particular species; and 2nd year report on the results of the 2nd meeting and subsequent activities in each country in promoting *Allium* cultivation. Results of the molecular analyses will be presented in a separate report and a scientific publication will be

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prepared and submitted on the basis of the obtained results.

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	Corresponding ECPGR outcome, output, activity
1	Elaboration of sub-regional strategy for <i>on farm</i> conservation of focused <i>Allium</i> crops in involved countries	4.4 Increased awareness of the value of PGRFA amongst users and the wider public
2	Investigation of genetic diversity of potato onion (<i>Allium cepa</i> L. <i>Aggregatum</i> group)) by molecular tools and a scientific publication prepared on the genetic relationships and diversity of the European <i>potato onion</i> collection	4.4 Increased awareness of the value of PGRFA amongst users and the wider public

Workplan for the proposed period of the Activity

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

	Type of Action (indicate if "meeting" or "other action")
1	Meeting in 2017 aimed at investigating the situation in <i>Allium</i> crop cultivation and maintenance in participating countries.
2	Meeting in 2018 aimed at discussing/presenting the action plan for each country for safeguarding of focused <i>Allium</i> crops
3	To perform Molecular analysis for potato onion (<i>Allium cepa</i> L. <i>Aggregatum</i> group) to determine the genetic diversity and relationships among European accessions
4	To prepare high level scientific publication on obtained molecular analyses results
5	To prepare popular publications in farmers magazines in involved countries in order to increase awareness of wider public on possibilities for cultivation and use of focused <i>Alliums</i>

Additional remarks

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

Remarks:
We see the new application as logical continuation of the EURALLIVEG with a broadened partnership, increasing the representation of the North Europe –Baltic region and a broadened scope of crop species.

Please send the completed form together with the budget table to the

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Chair of the submitting Working Group for submission of the Activity proposal.