Agricultural Institute of Slovenia

Leafy vegetables collection in Slovenia

Jelka Šuštar Vozlič

Third Meeting of the ECPGR Leafy Vegetables Working Group and the EVA lettuce Network
6-8 October 2026, Skierniewice, Poland

Conservation of plant genetic resources in Slovenia

- **The first projects** to collect Slovenian local varieties, populations, ecotypes, and old cultivars of agricultural species were initiated about **80 years ago**.
- **In 1996** the Ministry of Agriculture, Forestry and Food started financing the Slovene Plant Genetic Resources Programme with the goal to maintain, evaluate, regenerate and preserve Slovenian autochthonous species, ecotypes, populations and landraces of agricultural, medicinal and aromatic plants. Slovene Plant Gene Bank was established.
- **Since 2018,** the Plant Genetic Resources Programme in Slovenia has been implemented through the **Public Service for Plant Genetic Resources,** founded by the Ministry of Agriculture.
- Main objectives:
  - Collection PGRFA
  - Documentation and regeneration
  - Characterization and evaluation
  - Conservation
  - Utilization: exchange, research, breeding, on-farm use..



Photo: J. Verbič





Leafy vegetables collection

Collected in the period 1987-2017.

- *Lactuca sativa*: 199 accessions
- *Lactuca serriola*: 1 accession
- *Cychorium intybus*: 4 accessions
- *Diplotaxis* sp.: 18 accessions
- *Valerianella locusta*: 4 accessions

Material available for distribution under the SMTA.







Storage, regeneration, characterization and evaluation

Storage:

- Base and active collections: stored under long-term conditions (-20 °C)
- No safety-duplication in place yet

Regeneration:

- Lettuce: 20 accessions/year (indicators: germination, availability of the material)
- *Diplotaxis*: need for regeneration

Characterization and evaluation:

- Lettuce: phenotypic and partial molecular data available

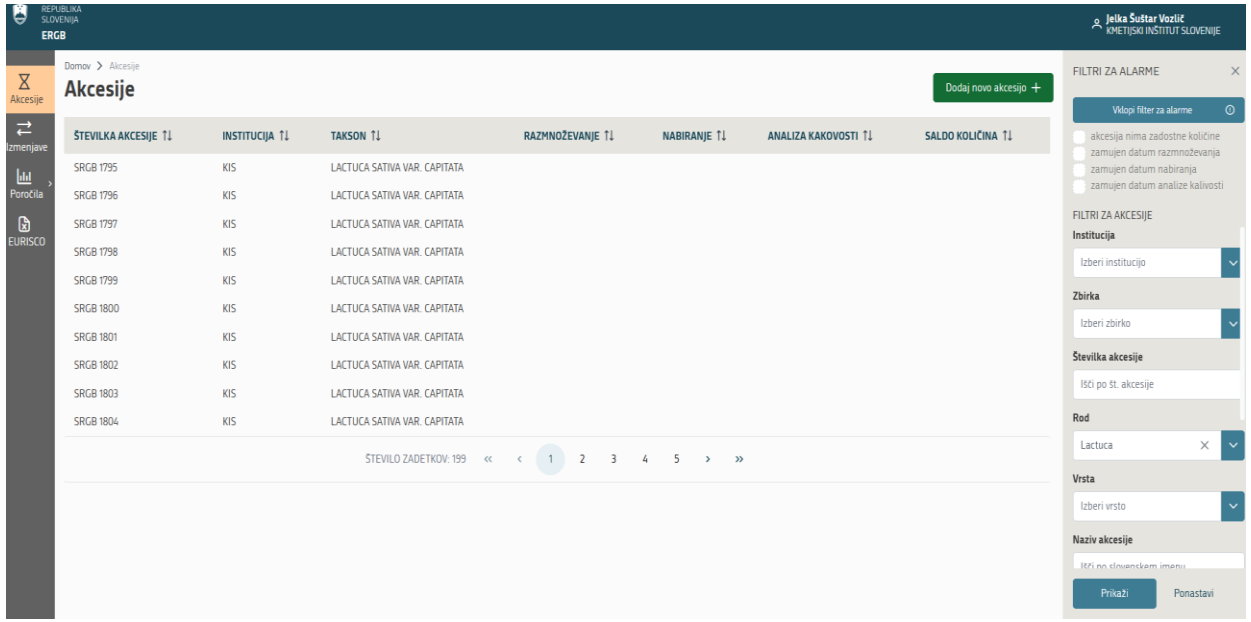
AEGIS: 3 accessions in EURISCO (lettuce)

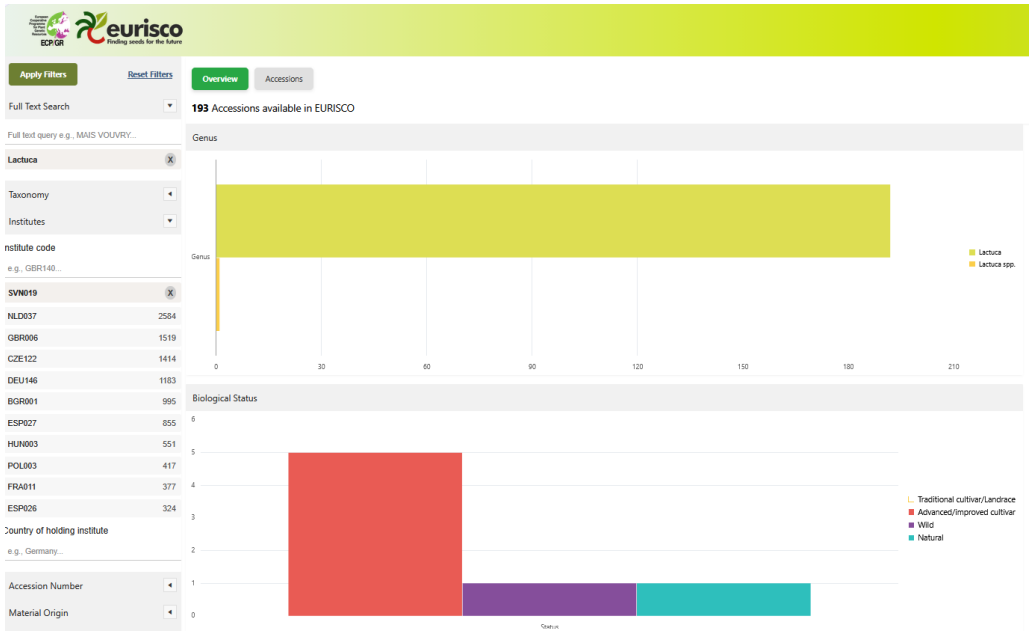




Documentation level of the collection

- Passport data available for all accessions
- National data base, passport data in EURISCO



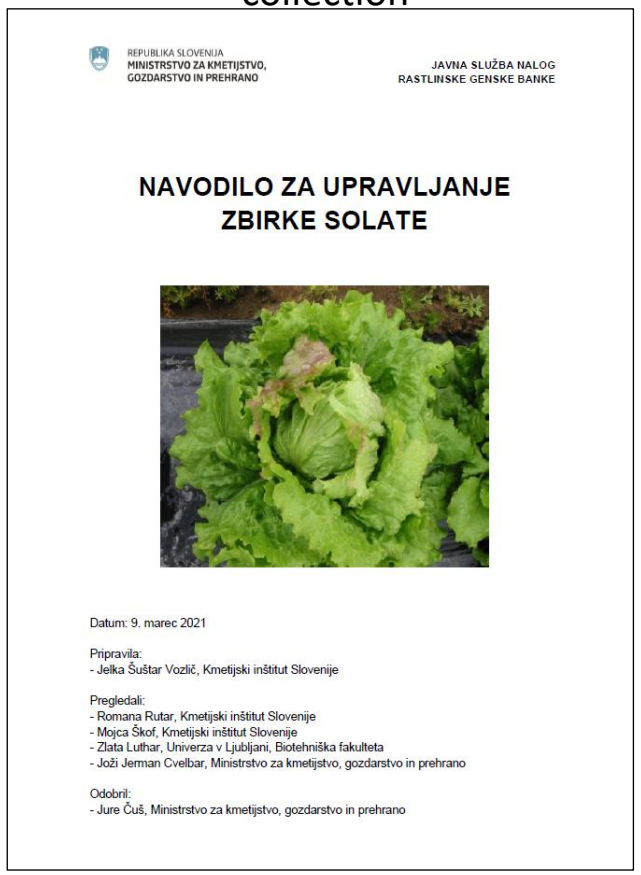


Guidelines for the management of germplasm collections

Content:

- Introduction
- Management of collection
  - Acquisition
  - Drying in storage
  - Maintenance of viability
  - Regeneration
  - Characterization and evaluation
- Documentation
- Exchange and distribution
- Safety duplication
- Reference documents
- Appendices

Guidelines for managing the lettuce collection



REPUBLIKA SLOVENIJA
MINISTRSTVO ZA KMETIJSTVO, GOZDARSTVO IN PREHRANO

JAVNA SLUŽBA NALOG RASTLINSKE GENSKE BANKE

NAVODILO ZA UPRAVLJANJE ZBIRKE SOLATE

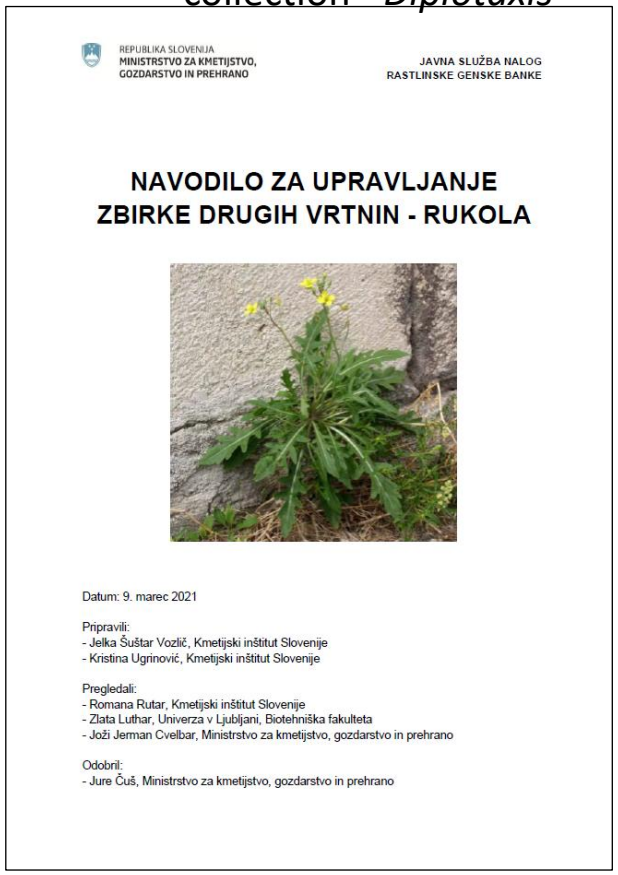
Datum: 9. marec 2021

Pripravila:
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- Zlata Luthar, Univerza v Ljubljani, Biotehniška fakulteta
- Joži Jerman Cvelbar, Ministrstvo za kmetijstvo, gozdarstvo in prehrano

Odobril:
- Jure Čuš, Ministrstvo za kmetijstvo, gozdarstvo in prehrano

Guidelines for managing other vegetables collection - *Diplotaxis*



REPUBLIKA SLOVENIJA
MINISTRSTVO ZA KMETIJSTVO, GOZDARSTVO IN PREHRANO

JAVNA SLUŽBA NALOG RASTLINSKE GENSKE BANKE

NAVODILO ZA UPRAVLJANJE ZBIRKE DRUGIH VRTNIN - RUKOLA

Datum: 9. marec 2021

Pripravili:
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- Kristina Ugrinović, Kmetijski inštitut Slovenije

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- Joži Jerman Cvelbar, Ministrstvo za kmetijstvo, gozdarstvo in prehrano

Odobril:
- Jure Čuš, Ministrstvo za kmetijstvo, gozdarstvo in prehrano

Guidelines for the inclusion of accessions in the European Collection (AEGIS)

Content:

- Introduction
- Criteria for inclusion in the European Collection
- Instructions for the inclusion of Slovene accessions in the European Collection
  - Procedures
  - Instructions for fulfilment of AEGIS status in the application
- Reference documents
- Appendices



REPUBLIKA SLOVENIJA
MINISTRSTVO ZA KMETIJSTVO, GOZDARSTVO IN PREHRANO

NAVODILO ZA VKLJUČITEV AKCESIJ V EVROPSKO KOLEKCIJO (AEGIS)

Datum: 9. marec 2021

Pripravili:
- Jelka Šuštar Vozlič, Kmetijski inštitut Slovenije
- Zlata Luthar, Univerza v Ljubljani, Biotehniška fakulteta

Pregledala:
- Romana Rutar, Kmetijski inštitut Slovenije



Navodila za vključitev akcesij v Evropsko kolekcijo (AEGIS), Kmetijski inštitut Slovenije, Biotehniška fakulteta UL, marec 2021

REPUBLIKA SLOVENIJA
MINISTRSTVO ZA KMETIJSTVO, GOZDARSTVO IN PREHRANO

PROGRAM RAZVOJA PODEŽELJA
Evropski kmetijski sklad za razvoj podeželja: Evropa investira v podeželje

Izdelava navodil je bila opravljena v okviru projektne naloge 430-51/2019 'Priprava priročnikov oziroma splošnih in specifičnih standardnih operativnih postopkov za *ex situ* ohranjanje rastlinskih genskih virov', številka pogodbe 2330-20-000010 in aneks številka 1. Naloga je bila financirana iz naslova podukrepa M10.2 - Podpora za ohranjanje, trajnostno rabo in razvoj genskih virov v kmetijstvu v sklopu Programa razvoja podeželja 2014-2020 in sofinancirana iz Evropskega kmetijskega sklada za razvoj podeželja (EKSRP).

Fotografija na naslovni strani: AEGIS (https://www.ecpgr.cgiar.org/aegis/about-aegis/overview)

Kmetijski inštitut Slovenije

Univerza v Ljubljani
Biotehniška fakulteta

2/9

Lettuce collection

- Lettuce has been cultivated in Slovenia for centuries and is still grown in almost every home garden. Crisphead type predominates.
- Numerus landraces have developed over the centuries; one of the most popular being **'Ljubljanska ledenka'.** Its name refers to the place of origin, the town of Ljubljana, the capital of Slovenia.
- In 19th century it spread to Austria and other countries in Europe where it was marketed as 'Laibacher Eis'.
- 'Ljubljanska ledenka' is considered as an 'umbrella variety' - some of the derived varieties have been listed in the CCVVS as 'Blonde a bord rouge' 2, 3, 4, and 5 and their synonyms (e.g. 'Laibacher Eis', 'Grazer Krauthäuptel', 'Glaciale di Lubiana'…).


Ljubljanski Krakovski vrtovi okoli 1930 (Vrhovnik, 1933)



Ljubljanska ledenka

Genet Resour Crop Evol (2021) 68:185–203
https://doi.org/10.1007/s10722-020-00978-5

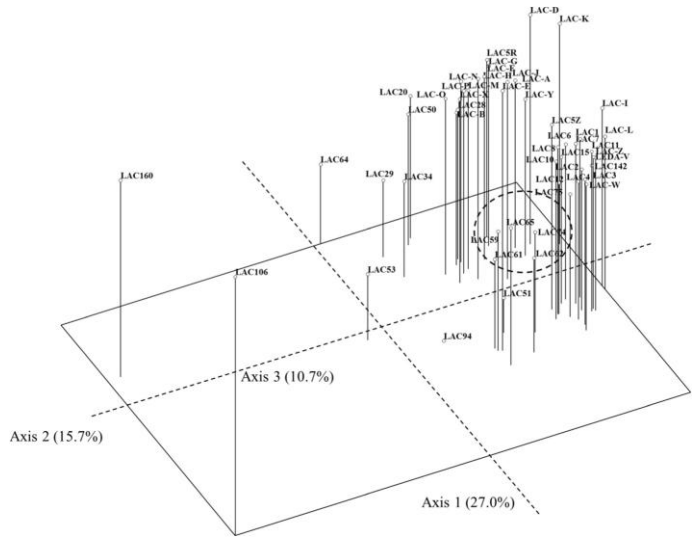
RESEARCH ARTICLE

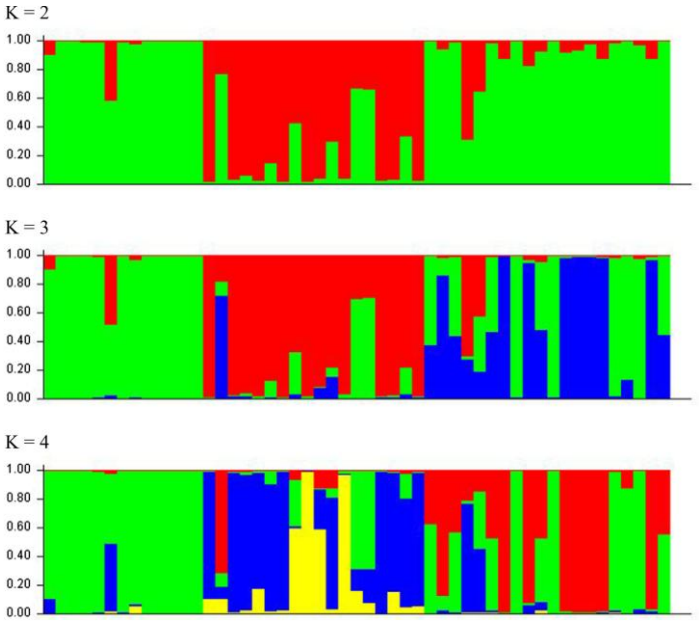
Morphological and genetic diversity of Slovene lettuce landrace 'Ljubljanska ledenka' (*Lactuca sativa* L.)

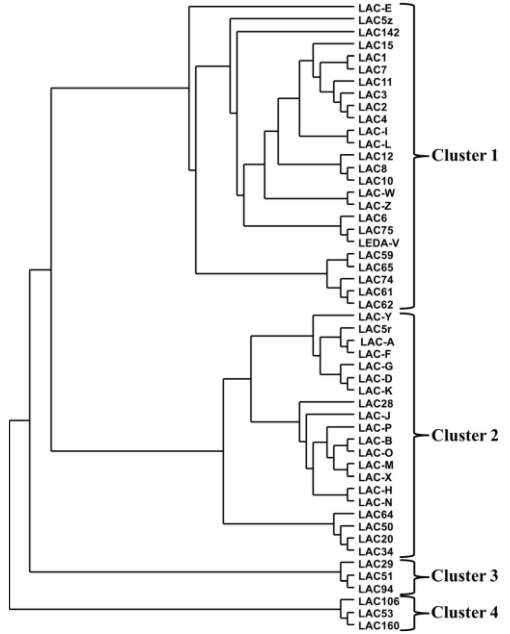
Jelka Šuštar-Vozlič · Kristina Ugrinović · Marko Maras · Eva Křístková · Aleš Lebeda · Vladimir Meglič



Fig. 1 Different types of 'Ljubljanska ledenka': type with closed head (Sever katalog. Sever&komp. Ljubljana, podružnica Zemun, 1941, p. 19) (top left); type with semi-closed head and red hew on the leaf edge (top right); type with closed head and red hew on the leaf edge (bottom left); type without red hew on the leaf edge (bottom right)







Agricultural Institute of Slovenia

PREPARATORY ACTION

EU plant and animal genetic resources in agriculture

Compendium of projects

SLOVENIA

Ljubljanska ledenka



The publication is part of the study "Preparatory action on EU plant and animal genetic resources in agriculture". The Preparatory Action has been initiated by the European Parliament and financed by the European Commission.

The objectives of the Preparatory action are to better understand the stakes of European neglected genetic resources in agriculture and to tap onto their economic potential.

It aims to provide inspiring examples of how to make the conservation of neglected breeds and varieties economically viable and encourage farmers and other stakeholders to engage.

Funded by the European Union

Agricultural Institute of Slovenia

1 Introduction



Ljubljanska ledenka is an autochthonous variety of lettuce which is part of national and cultural heritage in Slovenia. Its name derives from the capital of Slovenia, Ljubljana. The project "Ljubljanska ledenka" aims at preserving this vegetable variety, also registering it in the Slovenian National list of Varieties and/or in the Common Catalogue of Varieties of Vegetable Species of the EU (CCVVS).

2 Description of the genetic resource

Ljubljanska ledenka is an old Slovenian autochthonous variety of lettuce that has been grown and consumed in Slovenia for centuries. It originates from the region of Ljubljana (Trnovo, Krakovo quarter). During the 19th century, it was spread to Austria (Vienna, Graz) and to Czech Republic (Prague).

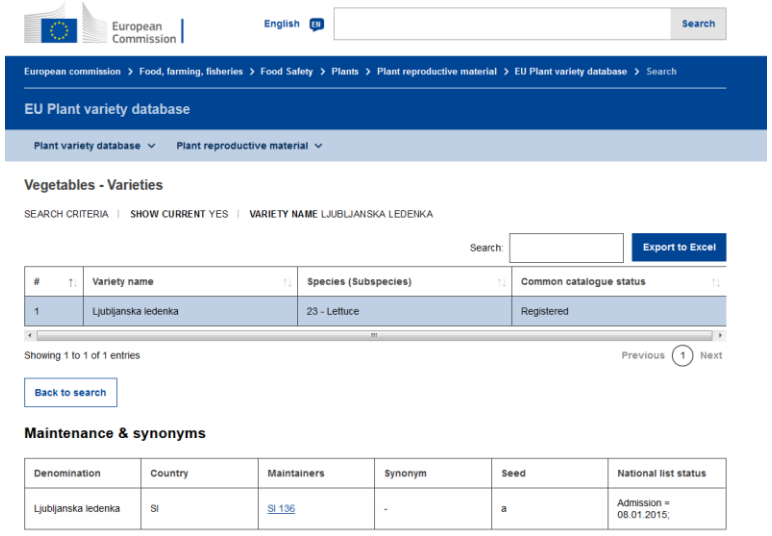


The original population of Ljubljanska ledenka is of "Batavia" type, with more or less evident red leaf edge. Ljubljanska ledenka is considered as an "umbrella variety"; some of the varieties that derived from it are included in the CCVVS, under synonyms Laibacher Eis 2, 3 and 4. All these varieties have a characteristic red leaf edge.

The lettuce selection process which took place in Slovenia over the past decades was oriented towards types without red leaf edge: the Ljubljanska ledenka variety was marketed as a "red leaf edge" lettuce, although the related typologies have never been inscribed in the CCVVS. Further selection of lettuce typologies without red leaf edge resulted in the Leda variety, the only one inscribed in the CCVVS. With the introduction of the Leda variety on the market, seed production for Ljubljanska ledenka ceased, resulting in the disappearance of both original red leaf edge varieties and green leaf edge varieties of Ljubljanska ledenka from the market.

3 Objectives of the project

Autochthonous variety Ljubljanska ledenka not only represents a part of Slovenian and Central European cultural heritage: it also has commercial potential, thanks to specific organoleptic features which are still sought by consumers.



European Commission | English (en) | Search

European commission › Food, farming, fisheries › Food Safety › Plants › Plant reproductive material › EU Plant variety database › Search

EU Plant variety database

Plant variety database | Plant reproductive material

Vegetables - Varieties

SEARCH CRITERIA | SHOW CURRENT YES | VARIETY NAME LJUBLJANSKA LEDENKA

Search: | Export to Excel

#	Variety name	Species (Subspecies)	Common catalogue status
1	Ljubljanska ledenka	23 - Lettuce	Registered

Showing 1 to 1 of 1 entries | Previous 1 Next

Back to search

Maintenance & synonyms

Denomination	Country	Maintainers	Synonym	Seed	National list status
Ljubljanska ledenka	SI	SI 136	-	a	Admission = 08.01.2015;

The aim of the project was to identify the autochthonous lettuce variety Ljubljanska ledenka, which has some distinctive features compared to Leda variety and to all the other varieties registered in the National List of Varieties or CCVVS. The identification is relevant from an economic standpoint, as the variety is deemed to have an unexploited commercial potential.

4 Actors involved and roles



The Agricultural Institute of Slovenia is responsible for maintenance of the Slovenian Plant Gene Bank, which holds a collection of more than 200 lettuce accessions that were obtained through several germplasm collecting missions held in Slovenia from the early 1990s to the present days. These lettuce accessions were obtained from local markets, from farms with the help of the agricultural advisory service or through personal contacts with farmers, thanks to advertisements in newspapers and from collecting trips. Accessions were characterised, evaluated and multiplied: the seeds were stored afterwards.

5 Steps and activities undertaken

A total of 138 lettuce accessions from the Slovenian Plant Gene Bank and 17 accessions of Ljubljanska ledenka from other gene banks around the world were covered by the project. 38 morphological and phenological parameters were evaluated according to the International Union for the Protection of New Varieties of Plants (UPOV) descriptors for lettuce. 41 lettuce accessions which corresponded to the type of Ljubljanska ledenka were selected for further evaluation. The red leaf edge was observed in 7% of lettuce accessions from Slovenian Plant Gene Bank and in 80% of accessions from other gene banks worldwide. Based on the results of these evaluations, the most interesting accessions were selected for further characterisation, evaluation and selection.

6 Results to date

Through the collection of morphological and phenological data and through the results of the analyses made, it was possible to select some accessions of the variety Ljubljanska ledenka which differed from the variety Leda and from all the other varieties. Furthermore, one variety with green leaf edge was inscribed in the National list of Varieties as well as in the Common Catalogue of Varieties of Vegetable Species of the EU under the name Ljubljanska ledenka.

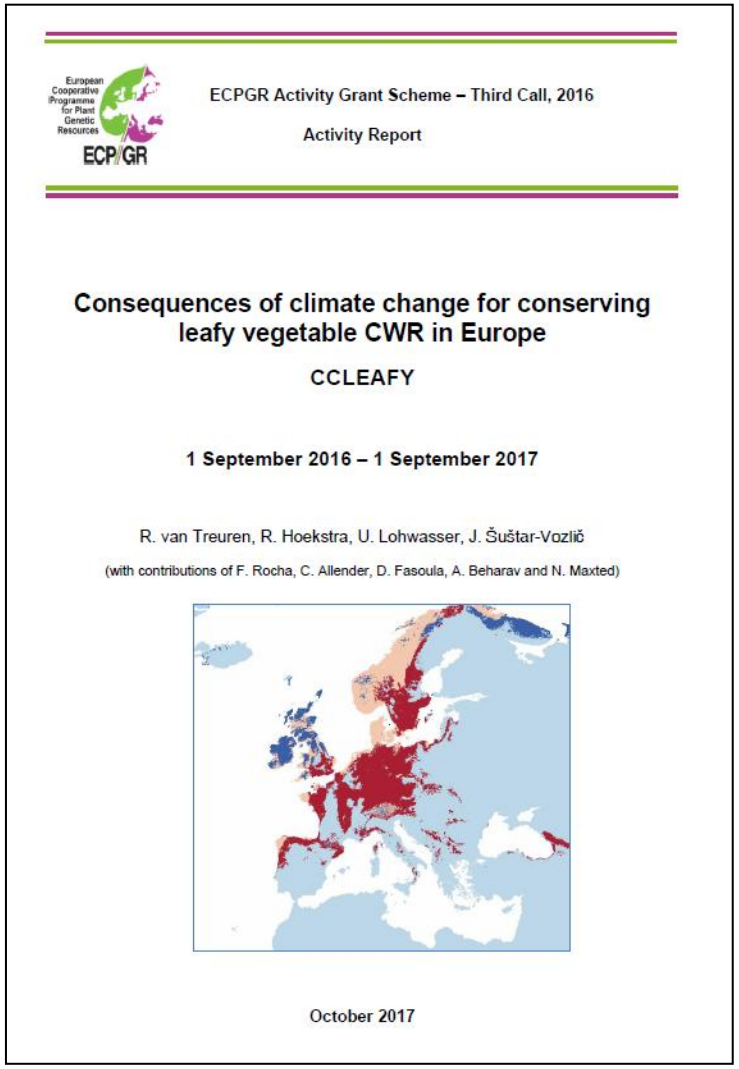
7 Next steps

It is planned to continue the research activities in order to select the Ljubljanska ledenka variety with red leaf edge, and to register it in the National list of Varieties as conservation variety. The results of the project will enable farmers to cultivate and market the original variety of Ljubljanska

Status of *in situ* conservation actions and CWR of leafy vegetables

ECPGR Activity Grant Scheme: CCLEAFY (2016-2017)

- An inventory was made of the genepools of 19 leafy vegetable crops, from which nearly **30 CWR that have their main distribution in the European region were selected for further analysis.**
- None of the examined CWR are considered threatened in Europe by the IUCN Red List, but climate change is expected to reduce the future distribution of the majority of these species in the European region. Since climate change is expected to shift the distribution range of many species northwards.
- Climate change will increase the importance of north-western Europe as *in situ* conservation area.
- A high conservation priority should be given to species that have their main distribution in the southern part of the European region and that are not expected to migrate northwards, such as nearly all artichoke CWR and *Asparagus maritimus.*


ECPGR Activity Grant Scheme – Third Call, 2016

Activity Report

Consequences of climate change for conserving leafy vegetable CWR in Europe

CCLEAFY

1 September 2016 – 1 September 2017

R. van Treuren, R. Hoekstra, U. Lohwasser, J. Šuštar-Vozlič

(with contributions of F. Rocha, C. Allender, D. Fasoula, A. Beharav and N. Maxted)

October 2017

Constraints to efficient conservation, Future priorities

- Safety duplication
- *In situ* conservation and CWR
- Selection and flagging of accessions for the European Collection - AEGIS accessions
- Further characterization and evaluation
- ….

Expectations from the Working Group

- Collaboration at all levels and across all areas





Photo: J. Verbič

Acknowledgment

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ECPGR
- Lorenzo Maggioni and the ECPGR ‚Community'