

Cover Sheet for Technical Report

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TITLE of AGREEMENT	CWR in Georgia
AGREEMENT NUMBER	L24ROM158
IMPLEMENTING PARTNER	Scientific Research Centre of Agriculture (SRCA)
AUTHOR OF THE REPORT	Levan Ujmajuridze, Tekle Zakalashvili (grape CWR), Ana devidze (Legume CRW), Tamar Jinjikhadze (Aegilops and CWR Database)
DATE SUBMITTED	31/01/2025
REPORTING DATES (DD/MM/YY-DD/MM/YY)	May 14st, 2024 until December 31st2024
TYPE OF REPORT	Technical Report Preparation and inclusion in EURISCO of in situ Crop Wild Relative datasets from Georgia.
ABSTRACT (maximum 200 words)	<p>The crop wild relatives (CWR) are taxa related to species of direct socio-economic importance, which includes the progenitors of crops.</p> <p>CWRs are an important source of genetic variation for improving domesticated species. Wild plants give unique opportunities to diversify agricultural production and generate farmer incomes. The actions to improve their conservation first of all include survey and monitoring of their natural populations. Project implemented in Georgia covered annual and perennial crops, which is important for the country and has a significant contribution for the country. These are following crop wild relatives: grapevine, legume, and wheat; during the project implementation mentioned crops added to national register of CWR. Project was signed in May 14 2024 and started operational on 1 June</p>

	<p>Project activities so far cover the following period from June to December 2024 and January 2025.</p> <p>For the collecting of CWR were undertake 6 collecting missions, CWR passport data was collected from 12 new sites totally 30 accessions. 3 species.</p>
KEYWORDS	<p>Country/region: Georgia</p> <p>Crop(s): Grape (<i>Vitis vinifera silvestris</i>), sainfoin (<i>Onobrychis kachetica</i>), Wheat (<i>Aegilops</i> sp), CRW</p> <p>Subject: collection and inclusion CWR into national database.</p>

Executive Summary

Crop wild relatives (CWR) are taxa related to species of direct socio-economic importance, including the progenitors of crops. According to the modern concept of wild relatives, CWR encompasses all species related to cultivated plants.

The flora of Georgia is characterized by high endemism and remarkable diversity. Approximately 2,000 species in Georgian flora have direct economic value, contributing to the production of food, timber, animal feed, medicinal products, natural dyes, and industrial and essential oils. Notably, Georgia is considered one of the birthplaces of wheat and grapevines. Of the twenty or so wheat species distributed worldwide, five are endemic to Georgia, and the country is also home to a particularly diverse range of local grapevine varieties.

The Caucasus is recognized as a center of evolution for many unique life forms and a natural museum of genetic resources (Vavilov, 1992). The region’s flora is rich in economically important and food plants, particularly the wild relatives of cultivated crops such as grapevines, wheat, barley, rye, oats, seed and fodder legumes, fruits, and vegetables

A list of wild relatives of Georgia was published in 2015 and it covers cereal, vegetables and medicinal crops Author (Maia Akhalkatsi, Department of Plant Genetic Resources, Institute of Botany, Ilia State University (appendix1).

The natural populations of many species of CWRs are increasingly at risk. The primary causes of diversity loss of wild plant species are habitat loss, degradation and fragmentation. Many cereal CWRs, including wild wheat and millet species, occur in arid or semi-arid lands and are severely affected by over-grazing and desertification. Climate change is having significant impacts of species distributions and survival in a concrete habitat. One of the most important

threats to the diversity of CWRs are genetic erosion and pollution. Another problem is that many species of important CWRs occur in centers of plant diversity and crop diversity located mainly in developing countries, which often lack resources to invest in the necessary conservation activities. South Caucasus and Georgia in particular is the center of origin and diversity of many of the world's important crop plants.

Project implemented in Georgia covered annual and perennial crops, which is important for the country and has a significant contribution for the country. These are following crop wild relatives: grapevine, legume, and wheat; during the project implementation mentioned crops added to national register of CWR.

Objective of the Project

Preparation and inclusion in EURISCO of in situ Crop Wild Relative datasets from Georgia.

Project activities

The Project was signed in May 14 2024 and started operational on 1 June

Project activities so far cover the following period from June to December 2024 and January 2025.

Site location of the Project for the reporting period covers following regions: Tbilisi, Mtskheta - Mtianeti, Shida Kartli, Kvemo kartli, Lechkhumi, Kakheti, Imereti.

The National CWR database has been created based on the EURISCO in situ Passport Descriptors. All passport data of the collected material is included in the National Database, which covers only passport information on this stage.

Activity -Identify priority taxa and populations for the project

Project team selected three main crops and its CWR for the project – Grape (*Vitis vinifera silvestris*), from the Legume crops- Sainfoin (*Onobrychis kachetica*), and Wheat (*Aegilops* sp.).

for this reason, is done the assessment of the current conservation status of CWR and knowledge:

1. Access and analyze existing herbarium collections for CWR specimens. Were checked Herbarium records: of the Institute of Botany, National Botanical Garden, National Museum,
2. Literature review: Review scientific publications, botanical records, and research articles existing dataset of CWR, identified collection sites, and planned the collection missions

Activity - Prepare the national database structure;

National database is created in “Access” program,

The database structure is built according to Descriptors for in situ CWR passport data to EURISCO to information of:

- the taxonomy of the CWR (family, genus, species, subtaxon, common name)
- Site descriptors (geographic coordinates, name of the site or municipality, country, site protection, habitat descriptors)
- Population descriptors (most recent **observation date, holding institution, biological status, herbarium specimen**).

Activity -Collecting missions

During the reporting period, six collecting missions were organized to collect CWR in different regions of Georgia.

For this purpose, six main regions were explored: Kakheti, Shida Kartli, Kvemo Kartli, Mtskheta-Mtianeti, Lechkhumi, and Imereti. The collecting missions followed standard collection procedures.

Collecting mission forms were created, and all collected data has been included in the database. Collection sites included roadsides, mountainous hills, and wild areas. In total, 30 accessions of CWR were collected.

Additionally, a map of the explored sites, herbarium specimens, and photos were created (see the appendix).

Collected CWR

During the project reporting period, multiple field expeditions were conducted to locate *Vitis vinifera* ssp. *sylvestris* Gmel., the wild relative of the cultivated grapevine *Vitis vinifera* ssp. *sativa* DC. Various methods are available to differentiate between wild and cultivated forms, including ampelographic measurements, seed morpho-biometric criteria, other morphometric analyses, and DNA studies.

In our field investigations, team employed ampelographic characteristics to assess and identify whether a given sample belonged to *Vitis vinifera* ssp. *sylvestris* Gmel.

Several locations in Georgia were surveyed for the presence of *Vitis vinifera* ssp. *sylvestris*. In some cases, information about the growing areas was already known from the scientific articles

or literature, while in others, team relied on local knowledge obtained through interviews with villagers, who provided insights into the possible locations of wild *Vitis*.

The identified sites were predominantly located near rivers, aligning with the fact that river basins serve as natural habitats for wild *Vitis*. The collected samples were primarily found growing on trees, a characteristic attributed to their genetic trait of acrotony. As natural lianas, wild grapevines utilize trees for structural support, thriving within mixed deciduous forests.

Soil conditions varied across regions; however, all sites had soils rich in organic matter due to their location. Given their proximity to rivers, moisture levels remained consistently high. The areas were predominantly shady, with wild vines favoring semi-shaded to well-lit conditions, often growing toward the canopy to access sunlight.

During the vegetation period, while conducting field expeditions, some samples showed no symptoms of fungal diseases despite growing in a highly humid environment. In certain cases, symptoms of leaf phylloxera were observed. Some samples lacked bunches entirely, whereas others exhibited small, well-developed bunches with seeds—a characteristic typical of wild *Vitis*.

The genus *Aegilops*, a wild relative of wheat, is represented by 7 species. These species naturally grow in various habitats including dry slopes and sandy places, open woodlands, semi-deserts and steppes in the lowland, foothill and mountainous areas of Georgia.

Roadsides are completely covered with *Aegilops cylindrica*, during the missions is clear the spread of the *Aegilops tauschii* is limited, and under the treat.

The genus *Onobrychis* Miller comprises about 170 species, three of them are widely used in the culture: *Onobrychis viciifolia* Scop. – Common sainfoin (sativa, european) and *Onobrychis arenaria* Kit. D.C. introduced into culture about 500 years ago; *Onobrychis transcaucasica* (*antasiatica*) Khin. is the most ancient sainfoin species with more than a thousand year history of cultivation in Transcaucasia.

The sainfoin is less demanding to the soil and in presence of moisture in the soil produces high yields even in the poorest soils. This plant has a high resistance to cold, drought, and responds favorably to moisture, high adaptive flexibility and high nutritive value.

Wild species of the genus *Onobrychis* have some interesting agronomic and ecological features such as deep root system, and high-stress tolerance, which make them suitable for future cultivation under climate change. Wild *Onobrychis* species are multipurpose species, which can be utilized for fodder and honey production.

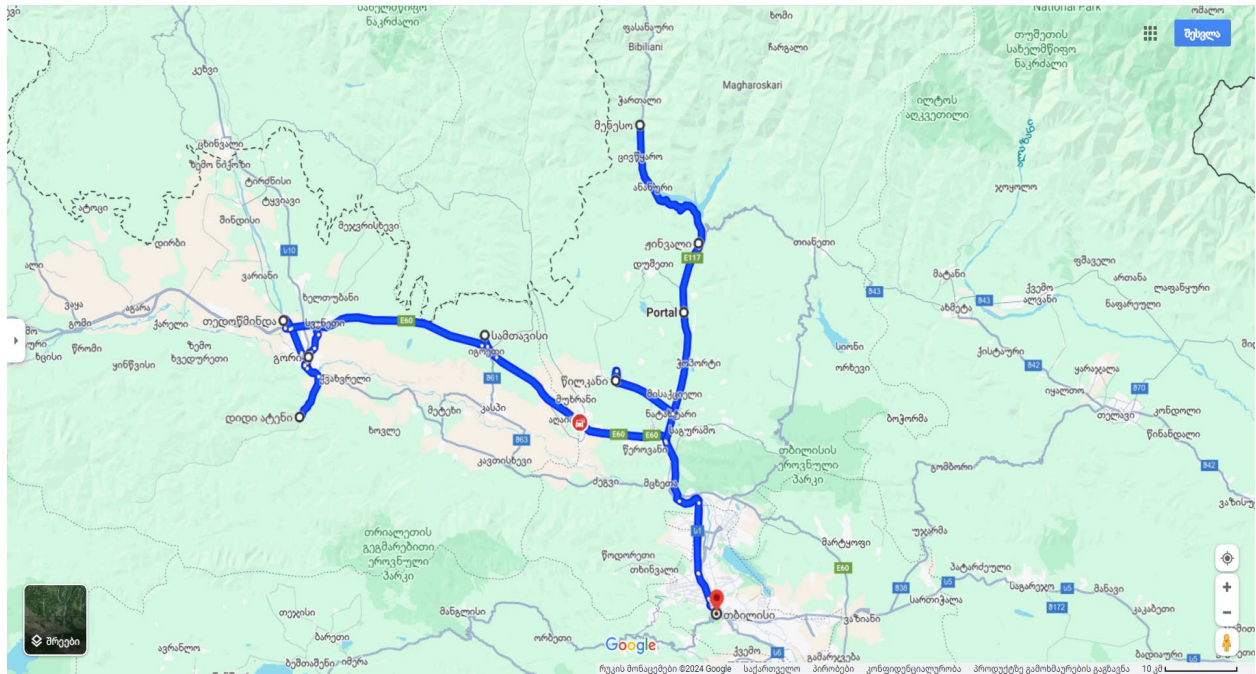
Wild *Onobrychis* species are less studied.

There are some of endemic species of Sainfoin in Georgia, *Onobrycis kachetica* Boiss. & Buhse is one of them. It is described in literature as a rare species. During the field expeditions several places of its distribution have been investigated. It grows well on dry, stony and grassy slopes, open places, in hot climate conditions.

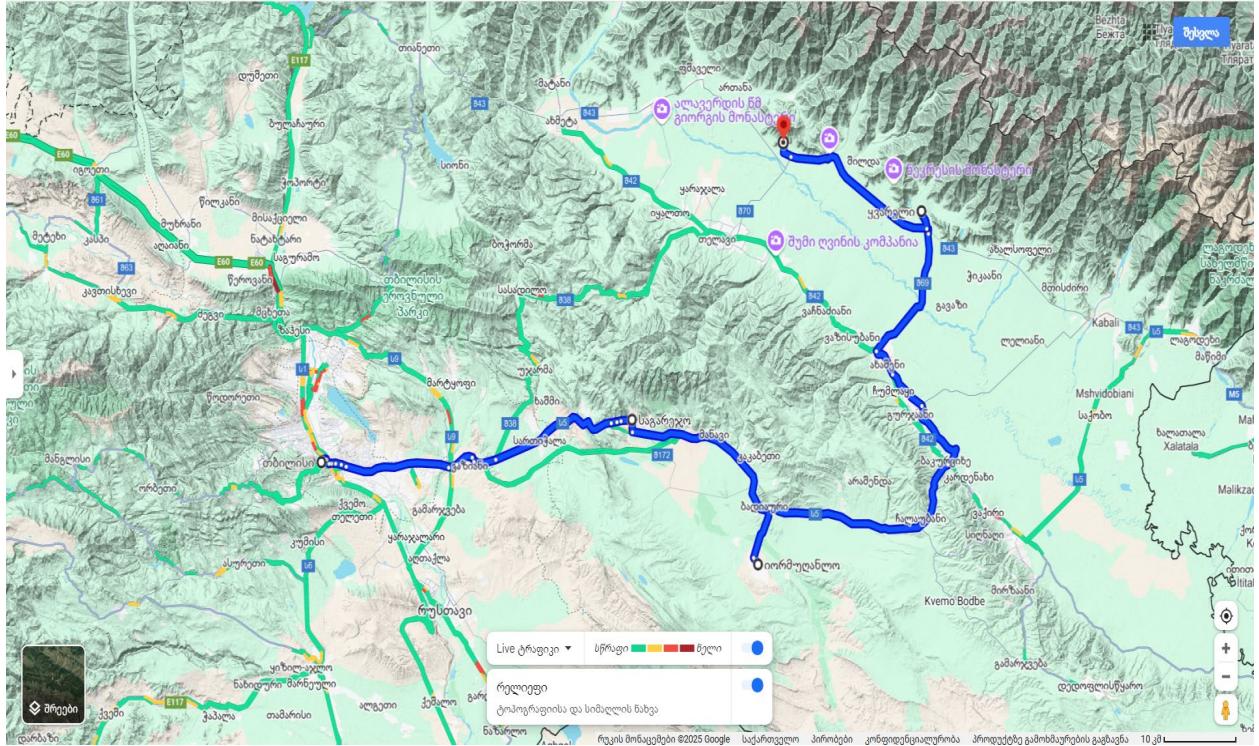
During the missions created herbaria of the collected material, maps.

Routes of Missions (passed villages)

Region - Shida kartli route: Gori/Ateni valley/ village skra



Map of Kakheti region route Tbilisi-Sagaredjo-Kvareli, Village Shakriani-Tbilisi



Photos of mission

