

Minutes of the EU.CHERRY kick-off meeting

6 April 2016, Naoussa, Greece

Participants:

Name	Institute	Country	Role
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Frantisek Paprstein	Research and Breeding Institute of Pomology Holovousy Ltd.	Czech Republic	EU.CHERRY partner
Hedi Kaldmäe	Estonian University of Life Sciences; Polli Horticultural Research Centre	Estonia	EU.CHERRY partner
Marine Delmas	French National Institute for Agricultural Research (INRA)	France	European <i>Prunus</i> DataBase (EPDB) Manager EU.CHERRY Coordinator
Monika Höfer	Institute for Breeding Research on Fruit Crops, JKI, Dresden	Germany	EU.CHERRY partner
Pavlina Drogoudi	Hellenic Agricultural Organization 'Demeter', Institute of Plant Breeding and Phytogenetic Resources, Dep. of Deciduous Fruit Growing in Naoussa	Greece	EU.CHERRY partner
Daniela Giovannini	CREA-Fruit Tree Research Unit of Forlì	Italy	<i>Prunus</i> WG Chair EU.CHERRY partner
Gunars Lacis	Latvia State Institute of Fruit-Growing	Latvia	EU.CHERRY partner
Felicidad Fernández	East Malling Research (EMR)	United Kingdom	EU.CHERRY partner
Jiri Sedlak	Research and Breeding Institute of Pomology Holovousy Ltd.	Czech Republic	Guest

Draft Agenda:

1. Welcome and presentation of the participants
2. Overview of the EU.CHERRY Activity
3. Candidate accessions
4. Data to be provided
 - a. Passport data
 - b. C&E data and First Priority Descriptors
 - c. Pictures
 - d. Molecular data
5. Databases: EURISCO and EPDB
6. The AEGIS European Collection

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Introduction

This meeting took place as part of the Activity “Collaborative action for updating, documenting and communicating the cherry patrimonial richness in EU (EU.CHERRY)”, funded by the ECPGR Activity Grant Scheme (Phase IX), Second Call.

See the [Activity Proposal](#)

Candidate accessions

The ten partner countries shared the lists of their candidate accessions before the meeting. Criteria for the selection were:

1. Original from the country
2. Landraces are preferred
3. Non-patented bred varieties
4. With at least one interesting trait
5. With some characterization and evaluation (C&E) data available

The table below shows the total number of accessions offered by country.

Table 1. Accessions offered by each partner during the kick-off meeting

Country	Offered Accessions	Number of landraces among offered accessions
Belgium	15	13
Bosnia and Herzegovina	15	15
Czech Republic	15	15
Estonia	18	5
France	26	25
Germany	15	15
Greece	15	12
Italia	15	12
Latvia	15	4
United Kingdom	16	12
TOTAL	165	129

Out of the 165 offered accessions, at least 150 were suitable for characterization (i.e. old enough) and partners agreed to provide:

- Passport data
- Leaves for molecular analysis
- Characterization and evaluation (C&E) data
- Pictures (on the tree and in the lab)

In the EU.CHERRY Activity proposal, it was planned to genotype up to 350 accessions: 150 (at least) from EU.CHERRY partners, and 200 from COST FA1104 partners. A goal is to include in the molecular analysis accessions originating from European countries, with a country coverage as wide as possible. In order to achieve this result, emails were sent before and after the meeting in Naoussa to inform the COST members about the objectives of the EU.CHERRY project and to invite them to participate

in the study on genetic diversity of European sweet cherries. Eight COST partners already offered accessions from their countries; hence the countries currently represented with accessions should be at least 18.

- ⇒ In case some COST partners do not offer enough accessions from their respective countries, partners agreed to provide, if available in their own collections, leaves of accessions original from the missing countries.

Data to be provided

Passport data

In order to choose the minimum passport descriptors that each partner has to provide we use two references:

- The AEGIS selection of Most Appropriate Accessions: [List of minimum passport descriptors for all *Prunus* species](#) (ECPGR *Prunus* Working Group, 2010)
- The [FAO/Bioversity Multi-crop passport descriptors v2.1](#) (2015)

Seven mandatory descriptors were presented and agreed:

- ACCENUMB: Accession number = the unique identifier for accessions within a genebank, assigned when a sample is entered into the genebank collection
- ACCENAME: Accession name (if existing); First letter uppercase. Multiple names are separated by a semicolon without space. Example: Accession name: Bogatyr; Symphony;Emma.
- INSTCODE: Holding Institute FAO WIEWS code (3-letter ISO 3166 country code)
- GENUS: *Prunus*
- SPECIES: *avium*
- ORIGCTY: Country of origin of the variety = 3-letter ISO 3166-1 code of the country in which the sample was originally collected (e.g. landrace, crop wild relative, farmers' variety), bred or selected (breeding lines, GMOs, segregating populations, hybrids, modern cultivars, etc.). (not to be confused with the country of the donor!)
- NICODE: National Inventory code (new – mandatory for EURISCO). Code identifying the National Inventory; the code of the country preparing the National Inventory - Example: NLD

Recommended descriptors:

Although not mandatory, the importance of using the following passport descriptors was highlighted:

- DONORCODE (FAO-WIEWS code of the institute which provided material of that accession, if any),
- DONORNAME (i.e. name of that institute) which will be particularly useful to trace duplicates in the European Collection. Everyone can add other field(s) (e.g.: subspecies).

Seven other passport descriptors are recommended:

- ACQDATE: Acquisition date (i.e. date on which the accession entered the collection) [YYYYMMDD] Missing data (MM or DD) should be indicated with hyphens or '00' [double zero].

- OTHERNUMB: Other identification (numbers) associated with the accession
- BREDCODE and BREDNAME (BREDESCR): Information about the breeding institute (i.e. FAO code and/or name of the breeding institute)
- SAMPSTAT: Biological status of accession
- STORAGE: Type of germplasm storage
- HEALTHSTATUS: Pest and disease status
- IDENTIF: Identification of material

One new recommended passport descriptor is proposed (not yet referenced):

- **PARENTS:** Name of the parents of a bred cultivar

C&E data and First Priority Descriptors

The two concepts of FPDs and SPDs were explained:

- **First Priority Descriptors (FPDs)** are the descriptors that should be prioritized as they are the most important and effective in describing and distinguishing different genotypes
 - **Second Priority Descriptors (SPDs)** are those deemed useful to supplement FPDs.
- In order to choose the Priority descriptors, in her presentation Daniela Giovannini showed the results of a survey conducted by Monica Höfer in the framework of the COST Action FA104 (Survey circulated to COST participants asking which descriptors they used for characterization and evaluation of their cherry genetic resources). She presented the most used cherry descriptors:

Table 2. Descriptors most used by the COST FA1104 respondents (2/3 of respondents)

IPGRI #	UPOV # TG35/7	ECPGR	DESCRIPTOR NAME	most used in task 2
6.2.1.	40		Phenology: Time of beginning of flowering	x
4.2.2.	41	33	Phenology: Time of beginning harvesting	x
6.1.2.	1		Tree: vigor	x
6.1.1.	2	39	Tree: habit	x
6.2.3.	20		Fruit: size (g/mm)	x
6.2.4.	21		Fruit: shape (lateral view)	x
6.2.12	24		Fruit: length of stalk (mm)	x
4.2.3.	27	34	Fruit: skin color	x
6.2.6.	31		Fruit: color of flesh	x
6.2.5.	32	35	Fruit: color of juice	x
6.2.9.	33	37	Fruit: flesh firmness	x
6.2.8.	35/34		Fruit: sensorial analysis of sugar/acid ratio	x
6.2.7			Fruit: sensorial analysis of global taste	x
6.2.10.	36		Fruit: flesh juiciness	x
6.3.2.	38		Stone: shape (in ventral view)	x

It was proposed and accepted that the 15 descriptors most frequently used by sweet cherry curators in Europe will be included in the list of sweet cherry FPDs.

Descriptors lists of references used are:

- [Cherry Descriptors](#) (IBPGR/CEC, 1985)
- [Guidelines for the conduct of tests for distinctness, homogeneity and stability. SWEET CHERRY / UPOV Code: PRUNU AVI / Prunus avium L.](#) (UPOV, 2006)

- [The European Prunus Database – A new list of Prunus passport data and descriptors](#) (ECPGR, 2011)
- BBCH scale ([Growth stages of mono-and dicotyledonous plants. BBCH Monograph.](#) Meier, 2001)
- NAP Descriptors ([Obst-Deskriptoren NAP / Descripteurs de fruits PAN.](#) Szalatnay and Bauermeister, 2006)

⇒ [16 FPDs and 17 SPDs were agreed by participants](#) (Table 3).

Table 3. FPDs and SPDs for the EU.CHERRY Activity

References				most used in task 2	DESCRIPTOR NAME	FPD	SPD
BBCH	IPGRI #	UPOV # TG35/7	ECPGR				
BBCH61	6.2.1.	40		x	Phenology: Time of beginning of flowering	x	
BBCH85	4.2.2.	41	33	x	Phenology: Time of beginning harvesting	x	
	6.1.2.	1		x	Tree: vigor	x	
	6.1.1.	2	39	x	Tree: habit	x	
		17			Flower: diameter		x
		18			Flower: shape of petals		x
		19			Flower: arrangement of petals		x
	6.2.2.		38		Flower: self-fertility of flowers		x
	6.2.3.	20		x	Fruit: size (g/mm)	x	
	6.2.4.	21		x	Fruit: shape (lateral view)	x	
		22			Fruit: pistil end		x
		23			Fruit: suture		x
	6.2.12	24		x	Fruit: length of stalk (mm)	x	
		25			Fruit: width of stalk		x
	4.2.3.	27	34	x	Fruit: skin color	x	
	6.2.6.	31		x	Fruit: color of flesh	x	
	6.2.5.	32	35	x	Fruit: color of juice	x	
	6.2.9.	33	37	x	Fruit: flesh firmness	x	
					Fruit: soluble sugar content (SSC)	x	
					Fruit: titratable acidity (TA)	x	
		39			Fruit: ratio fruit/stone	x	
	6.2.11.		36		Fruit: skin cracking susceptibility		x
					Fruit: depth of stalk cavity		x
					Fruit: Fruit removal force from the tree		x
					Fruit: Stalk removal force from the fruit		x
		26			Fruit: abscission layer between stalk and fruit		x
	6.2.8.	35/34		x	Fruit: sensorial analysis of sugar/acid ratio		x
	6.2.7			x	Fruit: sensorial analysis of global taste		x
	6.2.10.	36		x	Fruit: flesh juiciness	x	
	6.3.2.	38		x	Stone: shape (in ventral view)	x	
	6.3.1.	37			Stone: size (weight)		x
					Stone: degree of adherence to the flesh		x
			42		Susceptibility: monilia		x
Total						16	17

Protocols (sampling, scales, etc.) were debated. For several descriptors, participants need to check the descriptors list of references in more detail.

⇒ So, it was decided to prepare, before the beginning of the sweet cherry harvest season, [guidelines for using the selected descriptors](#), with the most common protocols.

Pictures

For each accession **one picture of fruits on tree**, and **one picture of fruits on light grey background** will be taken, on a set-up according to NAP descriptors (Figure 1):

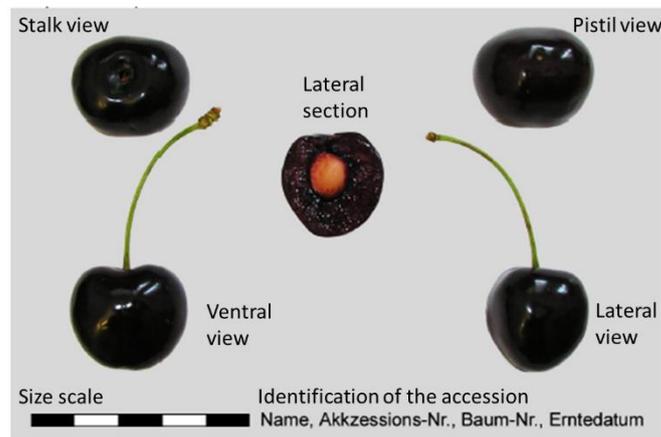


Figure 1. Picture set-up according to NAP descriptors.

Molecular data

Partners will send leaves samples of the accessions offered to Felicidad Fernández, according to a protocol prepared by Felicidad in order to optimize and harmonize the quality of the material. Felicidad will perform a SSR analysis using a set of SSRs composed by the best performant among the 16 ECPGR SSRs proposed by Clarke and Tobutt (2009) and new SSRs that proved to be performant and informative in cherry.

In order to ascertain the performance of the ECPGR set proposed in 2009 basing on the results of a number as large as possible of studies carried out so far with this set, before the meeting, Felicidad Fernández and Daniela Giovannini carried out a survey among COST and ECPGR members, asking for molecular results of their studies by using the ECPGR original SSR set for cherry. Fifteen partners have already answered this survey and provided data from their genotyping studies.

A poster on the SSR topic was presented during the COST Naoussa meeting.

Recommendations for sampling and sending were discussed.

⇒ [The protocol for leaf sampling was sent to all Partners on 11 May 2016 \(Annex I\).](#)

Databases: EURISCO and EPDB

The procedures for delivery of data to EURISCO and EPDB were presented.

Procedure for delivery of data to EPDB

For the **EPDB**, each partner will have to **fill an Excel template**, with descriptors in columns, and data by accession in rows (see Figure 2). This template will be created by the DB Manager with the descriptors selected by the EU.CHERRY Partners.

	Passport Data			C&E Data		
	Field1	Field2	...	Field1	Field2	...
Accession 1						
Accession 2						
...						

Figure 2. Model of the template for EPDB

Procedure for delivery of data to EURISCO

The only way to import data to EURISCO is **through the National Focal Points (NFPs)** (for legal reasons). The list of NFPs for the partners was presented (Table 4).

Table 4. List of National Focal Points for the EU.CHERRY partners

Country	NFP Name	Organisation
Belgium	Mr Marc Lateur	Dept. of Biological Control and Plant Genetic Resources Centre Wallon de Recherches, Agronomiques C.R.A. - W, Rue de Liroux 4, 5030, Gembloux, Belgium http://www.cra.wallonie.be/craw/units/d3/
Bosnia and Herzegovina	Ms Marina Radun-Antić	Genetic Resources Institute, University of Banja Luka Bulevar vojvode Petra Bojovica 1A, 78000 Banjaluka, Republika Srpska, Bosnia and Herzegovina http://www.griunibl.rs.ba/
Czech Republic	Ms Ludmila Papoušková	Genebank Department, Crop Research Institute (CRI) Drnovská 507, 161 06 Praha-Ruzyne, Czech Republic http://genbank.vurv.cz/genetic/resources/asp2/default_a.htm
Estonia	Mr Vahur Kukk	Estonian Crop Research Institute Aamisepa 1, 48309 Jõgeva, Estonia
France	Ms Anne-Françoise Adam-Blondon	INRA (Institut National de la Recherche Agronomique) Route de Saint-Cyr, 78 026 Versailles cedex, Franc
Germany	Ms Sarah Sensen	Federal Office for Agriculture and Food (BLE), Information and Coordination Centre for Biological Diversity (IBV) Deichmanns Aue 29, 53179, Bonn, Germany http://www.ble.de/
Greece	Mr Parthenopi Ralli	Agricultural Research Centre of Northern Greece (NAGREF) Greek Gene Bank, P.O. Box 60458, 57001, Themi-Thessaloniki, Greece
Italy	Ms Maria Antonietta Palombi	CRA - Centro di Ricerca per la Frutticoltura Via Fioranello, 52, 00134, Roma, Italy http://planta-res.entecra.it
Latvia	Mrs Anita Gaile	Genetic Resources Centre Latvian State Forest Research Institute "Silava" Rigas Str. 111 LV-2169, Salaspils, Latvia http://www.genres.lv
United Kingdom	Mr Ian D. Thomas	Institute of Biological, Environmental and Rural Sciences (IBERS) Aberystwyth University, Ceredigion Y23 3EB, United Kingdom http://www.aber.ac.uk/en/ibers/

The [EPDB Manager proposed to contact each NFP](#) in order to know the template they are respectively using. As a matter of fact, the templates could be different among NFPs. For example, in Estonia or in France, EURISCO is supplied by national databases, so the template to use is the template for the national databases.

For the delivery of data to EURISCO by partners, the EPDB Manager will use the EPDB templates filled by each partner, and then convert them into the EURISCO templates.

Participants asked if data from different countries but from the same **project could be included in EURISCO through only one focal point.** [This question will be shared with the EURISCO Coordinator.](#)

Inclusion of C&E data in EURISCO

Since 2015, EURISCO turned into a repository for C&E data.

The data model for the EURISCO C&E data consists of five components: GENOTYPE, SCORE, TRAIT, EXPERIMENT and DATASET (which comprise different experiments).

GENOTYPE is identified by the unique combination of the four EURISCO passport descriptors NICODE, INSTCODE, ACCENUMB and GENUS.

SCORE is the value of one trait for one genotype. In this component EURISCO can use the field SCORE_LINK (link to a publication on accession level). This field will not be used in EU.CHERRY project.

TRAITS will be equivalent to the EU.CHERRY C&E descriptors. Three fields exist for this component: TRAIT_NAME; TRAIT_REMARK; TRAIT_METHOD. [A sheet will be prepared for compiling these three fields for all the FPDs and SPDs.](#)

EXPERIMENT makes reference to metadata helping to interpret C&E data. For this component, the fields proposed in EURISCO are:

- EXPERIMENT_DESCRIPTION
- EXPERIMENT_START_YEAR
- EXPERIMENT_END_YEAR
- EXPERIMENT_LONGITUDE
- EXPERIMENT_LATITUDE
- EXPERIMENT_REPORT

Participants specified the [recommended information to fill in the field EXPERIMENT_DESCRIPTION.](#)

Rootstock used appears to be a very important information. Available reference cultivars, climate and soil description or collection design description could be mentioned in this field too.

The AEGIS European Collection

The main propositions made in the PRUNDOC project about AEGIS collections were presented.

According to the decisions made at the PRUNDOC meeting in April 2015 in Leuven (see [Minutes of the meeting](#)), accessions to be selected for the European Collection have to be:

- bred in the country and genetically unique
- or known to have originated in the country (chance seedling of known origin, landraces)

- or, if of unknown origin, known to have been present/cultivated in the country for long time
- or introduced material to Europe with breeding, research, education or historical interest.

Criteria for selection of Most Appropriate Accessions (MAAs) are (in order of priority):

1. **Free from quarantine diseases**
2. Accession maintained in its **country of origin**
3. Accession verified for its identity, and well **characterized**
4. **Quality standards** of genebank sufficient to insure the quality of the accession (according to [Prunus-specific standards \(PGS\) for genebank management \(V1, January 2016\)](#)).

The first criterion raised many interrogations. It is very difficult (or expensive) in perennial plants to conserve accessions without quarantine diseases because **orchard collections are always at risk of contamination by vector insects.**

⇒ [So, must the decision be to only propose for inclusion in the European Collection accessions that are grown under greenhouse conditions or that are stored as *in vitro* material?](#)

Today, only one EU.CHERRY partner fulfils these conditions for a part of his cherry collection (France, which, unfortunately, is still not a member of AEGIS).

Participants proposed to [contact the ECPGR Vitis Working Group](#) in order to know how they are dealing with this question.

Annex I. Leaf sampling protocol

Please, read the following instructions carefully. They have been put together to ensure that leaves are collected at the best stage for DNA extraction and the material remains as fresh as possible during transport.

- Prepare bags for sampling (preferably plastic bags that can be sealed, e.g. zip-lock bags) by labelling and having ready a small amount of damp but not dripping wet tissue, this will keep the leaves hydrated during storage and travel.
- For collection, select fully extended leaves before they harden but once they are no longer 'sticky', free from pests or diseases and spray residues (this will improve the chances of obtaining a good quality DNA extract on first attempt). Collect 2 to 5 leaves attached to the woody shoot and, to maintain hydration, wrap the base of the stem in damp tissue before placing them in the labelled bag.
- If this is not possible, freeze-dried material can be sent and, ideally, you should keep a back-up sample too.
- Keep material refrigerated until postage and, if posting in high-temperature, add a cool pack in the container to maintain freshness.
- Sample identification code: as agreed in Naoussa, each sample bag should be clearly and individually labelled with an alphanumeric code. The code will start with your Institute code followed by a three digit unique number.
- A key corresponding to each unique code with full sample info (cultivar, source, location etc.) must be included in the shipment and e-mailed to us at the time of sending. If you handwrite your labels, please avoid 'unclear' numbers (e.g. 1 that could be mistaken with a 7 etc.).
- To sum up, the shipment should contain bagged samples, key document and frozen gel packs (if needed).
- Finally, please make sure that on your customs declaration you indicate the samples are: 'plant material for destructive testing' this way you do not need to provide a Plant Passport and it will avoid delays at UK border customs.