Identification of the list of possible rice varieties and collection of a subset of 20 target varieties

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PRIMA
PARTNERSHIP FOR RESEARCH AND INNOVATION IN THE MEDITERRANEAN AREA

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TECHNICAL REFERENCES

Project Acronym	TRACE-RICE
Project Title	
Project Coordinator	Carla Moita Brites carla.brites@iniav.pt
Project Duration	September 2020 – August 2024 (48 months)

Deliverable No.	D1.1
Dissemination level*	CONFIDENTIAL
Work Package	WP 1 - TEST SOLUTIONS FOR AUTHENTICITY, ORIGIN AND TRACEABILITY
Task	T1.1 – Selection of representative rice varieties for authenticity, origin and traceability tests
Lead beneficiary	INIAV
Contributing beneficiary/ies	IBET, UNL-ITQB, CASA DO ARROZ, EM, UNIV. ALEXANDRIA, CSIC-IATA,
Due date of deliverable	30 November 2020 (extended to 31st January 2021)
Actual submission date	28 July 2021

HISTORY OF CHANGES			
Date	Beneficiary	Version	Change
4 Nov 2020	UNL-ITQB		WP1 Leader informs the Project coordinator that due to COVID pandemics problems, Deliverable 1.1 is delayed
10 Dec 2020			Initial version – Proposal of list presented at the General Assembly Meeting
27 July 2021	INIAV	V1	Version 1 of the D1.1 sent to WP1 Leader
27 July 2021	UNL-ITQB	V2	Revision of version 1 of the deliverable
28 July 2021			Revised version (version 2) sent to Project Coordinator
29 July 2021	INIAV	Final	Final version approved by project coordinator

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1. Purpose

In order to address project objective 1 of TRACE-RICE project, which is to map European rice varieties with DNA-based authenticity analytical tools, it was first necessary **to select and collect the rice varieties** representing the available commercial rice varieties produced and adapted to the Mediterranean countries. Those varieties will be used for authenticity, origin, and traceability tests.

In this task a list of possibilities was revised, and the priorities were discussed aiming to select a subset of 20 target varieties (representative of the available diversity), to be used in the following Tasks and WPs.

The criteria for selection necessarily included the assurance of varietal certification and also took into consideration the relevance for each EU country. All these materials had to be obtained from the appropriate entities.

It was initially considered (project proposal), that the methods to develop in WP1 for authenticity and traceability of Mediterranean rice products would target “typical japonica varieties grown in Portugal, Spain and Italy (long and medium grain types), as well as Basmati varieties that have been approved for commercialization in the EU or that are waiting for approval (varieties originating from India and Pakistan). European aromatic varieties may also be considered.”. However, this was further enlarged to also include varieties relevant for the Egypt partner.

2. Identification and decision procedures

Decisions were made after numerous contacts made at online meetings or through e-mails, among the whole project team or only the member of WP1. The key aspects considered for the selection included: economical relevance of the variety, guarantee of access to enough seed for all the studies planned within the project, and guarantee that no mixtures would be supplied as if they were single varieties.

An additional criterion was still included which was the previous knowledge about full-genome sequencing of the target varieties. Whenever this info was already available, the team selected another equally relevant variety with no sequenced genome. This actually only happened for one Egyptian rice variety (Giza 178) that was passed over in favour of Giza 177 (equally relevant).

The key steps of the decision process are summarized below:

October 2020:

- Gathering opinions from stakeholders (breeders, farmers, and industrials) from Portugal, Italy, France, and Spain regarding rice varieties that are more cultivated and relevant for each country, including rice types: Long A, Long B, short and medium grain, European Aromatic, as well as Basmati varieties approved for commercialization in the EU.

November 2020:

- Contacts made with Egypt to obtain identical information.
- CASA do ARROZ started contacts in order to have access to the basmati seed from India and Pakistan.

December 2020 – January 2021:

- First list was produced representing the available diversity. Varieties from Egypt and Basmati type were still missing.
- Contacts were made with the different countries to guarantee access to the corresponding certified seeds (assurance of varietal certification) in the amount required for the Project (seed availability) and at a short time.
- A first version of the subset of target varieties was presented and discussed at the General Assembly Meeting that took place (online) on the 10th Dec. 2020 (Figure 1).
- A WP1 – Task 1.1 team meeting took place to update information on varieties List and to discuss how to surpass problems in obtaining enough quantity of seed for the experiments.
- Version 2 of the List and a summary of the decisions made were sent to WP1 team members (Figure 2).

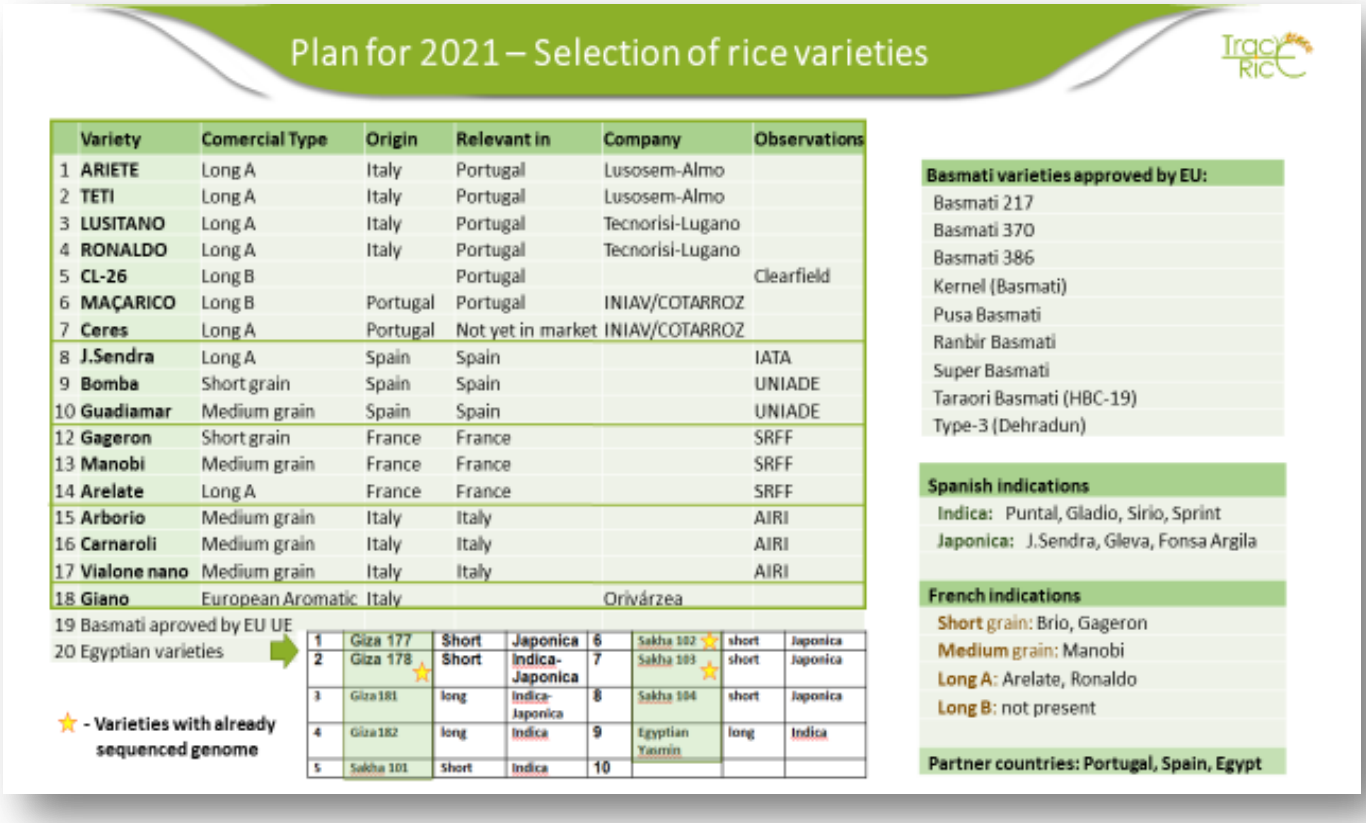
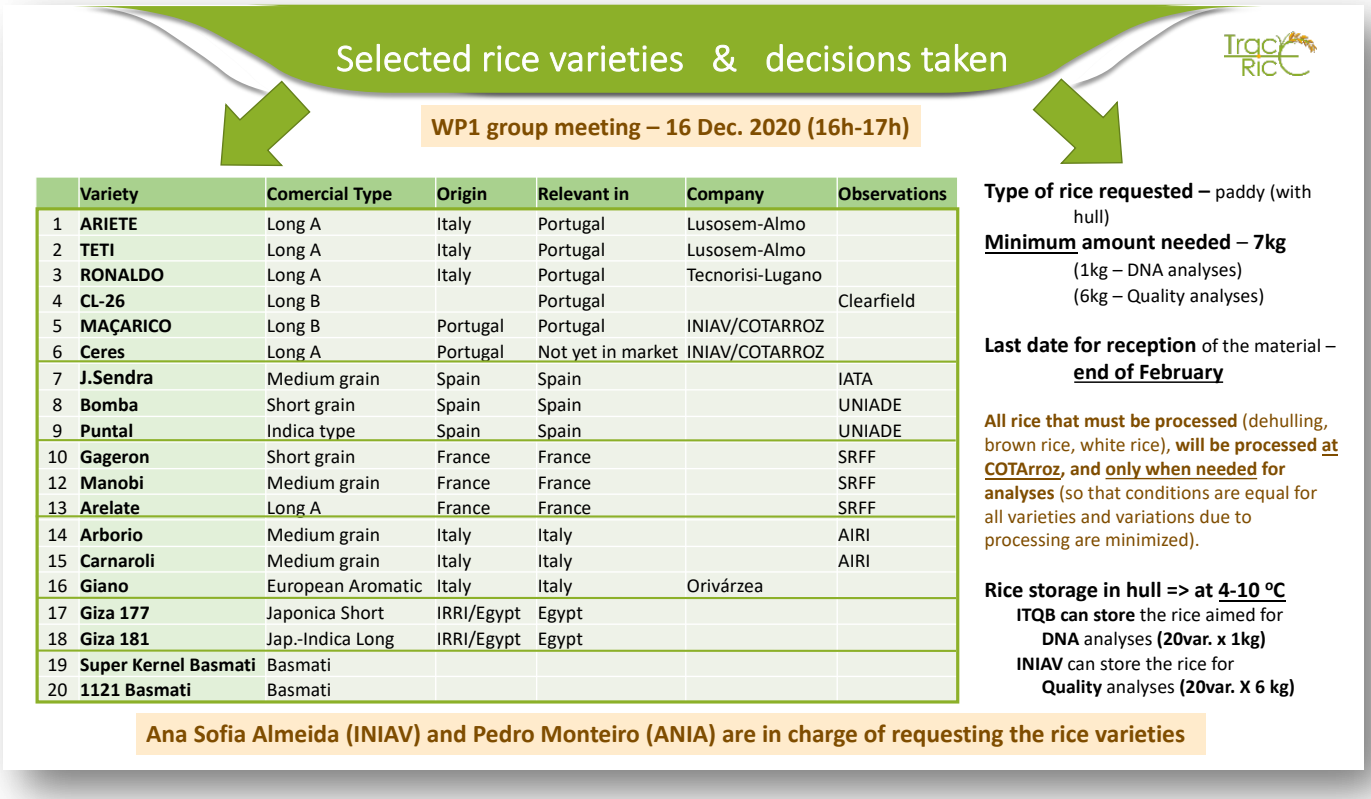


Figure 1 - Version 1 of the List of varieties presented and discussed in the Dec.2020 General Assembly Meeting (10th Dec.2020, online).

February to June 2021:

- From discussions with Italian colleagues it was found that two key Italian varieties included in the list could represent mixtures of genotypes, since their names became generalized to define specific rice types. We have therefore requested the original varieties from the appropriate sources to ensure genotypic certification.
- It was further noticed that from some varieties identified in Figure 2 (namely Ceres and CL-26), we could not access enough seed. These varieties had to replaced (by Caravela and CL-28, respectively).
- CASA DO ARROZ and INIAV jointly with seed companies ensured the access to original samples. The technical barriers related to the acquisition of genuine rice variety samples (crucial for the genetic analysis), proved to be very time consuming to overcome.
- The selected rice varieties seed, requested to each country and shipped to Portugal, was always certified.
- Husked varieties were always requested, but for the Basmati ones only dehusked seed could be obtained.



	Variety	Comercial Type	Origin	Relevant in	Company	Observations
1	ARIETE	Long A	Italy	Portugal	Lusosem-Almo	
2	TETI	Long A	Italy	Portugal	Lusosem-Almo	
3	RONALDO	Long A	Italy	Portugal	Tecnorisi-Lugano	
4	CL-26	Long B		Portugal		Clearfield
5	MAÇARICO	Long B	Portugal	Portugal	INIAV/COTARROZ	
6	Ceres	Long A	Portugal	Not yet in market	INIAV/COTARROZ	
7	J.Sendra	Medium grain	Spain	Spain		IATA
8	Bomba	Short grain	Spain	Spain		UNIADE
9	Puntal	Indica type	Spain	Spain		UNIADE
10	Gageron	Short grain	France	France		SRFF
12	Manobi	Medium grain	France	France		SRFF
13	Arelate	Long A	France	France		SRFF
14	Arborio	Medium grain	Italy	Italy		AIRI
15	Carnaroli	Medium grain	Italy	Italy		AIRI
16	Giano	European Aromatic	Italy	Italy	Orivárzea	
17	Giza 177	Japonica Short	IRRI/Egypt	Egypt		
18	Giza 181	Jap.-Indica Long	IRRI/Egypt	Egypt		
19	Super Kernel Basmati	Basmati				
20	1121 Basmati	Basmati				

Figure 2 - Version 2 of the List and summary of the decisions made regarding Task 1.1 in a team meeting (16th December 2020, online).

3. Final subset of target varieties (20 varieties)

The subset of 20 rice varieties selected and collected (Table 1) to procced with tasks of WP1 include varieties that are currently in the European market (or on the way) and mostly are typical japonica varieties (long, medium, and short grain) grown in Portugal, Spain, Italy, France, and Egypt; one Egyptian japonica-indica rice, an European aromatic variety; and 2 Basmati varieties approved for commercialization in the EU (from India and Pakistan).

As above-mentioned the selection of the varieties considered the assurance of varietal certification, the relevance of the variety for each European country and the availability of seed to guarantee the amounts required for all subsequent project tasks.

Table 1 - Final list of the subset of 20 target varieties selected and collected on WP1-Task 1.1.

	Variety name	Type of rice (*)	Relevant in	Origin
1	**ARIETE**	Long A	Portugal	Italy
2	**TETI**	Long A	Portugal	Italy
3	**RONALDO**	Long A	Portugal	Italy
4	**CL-28**	Long B	Portugal	Italy
5	**MAÇARICO**	Long B	Portugal	Portugal
6	**CARAVELA**	Long A	(Registered 2021)	Portugal
7	**ARBORIO**	Long A	Italy	Italy
8	**CARNAROLI**	Long A	Italy	Italy
9	**ELETTRA**	European aromatic (Long B)	Italy	Italy
10	**ULISSE**	Long A - Arborio type	Italy	Italy
11	**J SENDRA**	Medium	Spain	Spain
12	**BOMBA**	Short	Spain	Spain
13	**PUNTAL**	Long B	Spain	Spain
14	**GAGERON**	Short	France	France
15	**MANOBI**	Medium	France	France
16	**ARELATE**	Long A	France	France
17	**GIZA 177**	japonica short	Egypt	IRRI/Egypt
18	**GIZA 181**	japonica-indica Long	Egypt	IRRI/Egypt
19	**SUPER BASMATI**	Basmati	Europe	Pakistan
20	**DEHADRUN BASMATI Type III**	Basmati	Europe	India

(* The type of rice indicated reflects only information received from provider, and not yet any characterization performed within TRACE-RICE).

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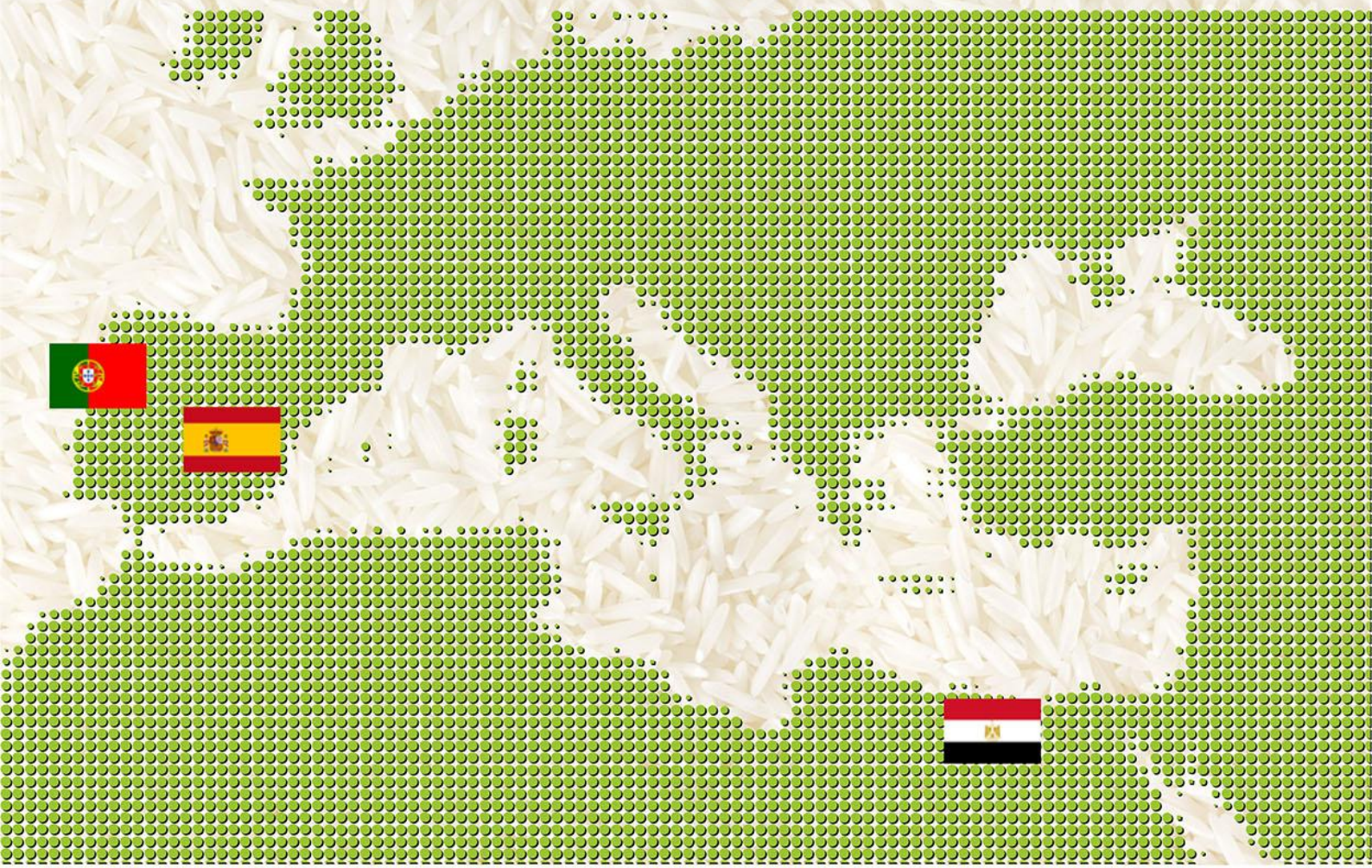

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