EUROPEAN COOPERATION PROGRAM INTERREG VA GREECE - ITALY 2014/2020 - BEST PROJECT. PROCEDURE EX ART. 1 OF DLN 76 OF 16/07/2020 CONVERTED INTO LAW N. 120 OF 11/09/2020 AND PURSUANT TO ART. 95, PARAGRAPH 3 OF D.LGS. 50/2016 FOR THE ASSIGNMENT OF THE SERVICE OF "ANALYSIS OF AGROBIODIVERSITY AND STUDY OF VEGETABLE SPECIES GROWN AT RISK OF EXTINCTION IN THE AREA OF PILOT ACTION 1 OF THE BEST PROJECT AND RELATED ACTION PLAN". CUP: B38H19005670006 - CIG: 8730686601.

Report on the activities of the contractor LAG SEB scarl. Service referred to in point a) of art. 20 - TERMS FOR CARRYING OUT THE ACTIVITIES of the letter of invitation Prot . 5479_2021-07-06: descriptive and cartographic elaborate relating to the "UPDATING OF THE STATE OF THE ART OF TRADITIONAL CULTIVATED VEGETABLE SPECIES AND TRADITIONAL AGRONOMIC TECHNIQUES USED IN THE CULTIVATION SITES, REFERRED TO ART. 1 POINT 1 LETT. A) B) EC)"

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Premise

This report constitutes an account of the first part of the activity carried out in the context of the assignment of the service aimed at acquiring and updating the framework of knowledge on the genetic diversity preserved by agricultural operators and on its territorial distribution.

The BEST Project in which this service is inserted is carried out in consideration of the diversity in the agroecosystems and the ecological characteristics of the territory, also having regard to the presence of natural habitats and areas subject to particular protection regimes, as well as the definition of an Action Plan for a sustainable management of agriculture in three particular areas of the Apulian territory.

The area considered by the Project is identified by the municipalities of Polignano a Mare, Monopoli, Fasano and Ostuni and by the territory included in the perimeter proposed for the establishment of the Mar Piccolo Regional Natural Park, with particular reference to the coastal strip of the aforementioned Municipalities and the elements of connection between the coast and the inland areas identified in the regional ecological network.

PHASE 1 - Object of the service

The activities carried out as part of the first phase of the work concern the following points:

a) state of the art of traditional plant species cultivated, for at least 70- 80 years, in the pilot areas of the project, also identifying those common to the trans-border territory, through bibliographic, historical-documentary analysis and / or previous studies, as well as taking into account the studies launched by the Department of Agriculture, Rural and Environmental Development of the Puglia Region as part of the Puglia RDP 2014-2020 - Submeasure 10.2.1 - Projects for the conservation and enhancement of genetic resources in agriculture. Said cognitive analysis must also be integrated with field analysis;
b) description of the traditional agronomic techniques used in the cultivation sites;
c) systematization on a cartographic basis, in a GIS environment, of the acquired data in order to highlight the evolution over time of the intended use of the territory, in relation to plant species, providing for the elaboration of thematic maps;

1. Method of work

1.a) State of the art

This first part of the service is carried out bearing in mind some fundamental characteristics of the general concept of Agrobiodiversity and its monitoring over time in areas with an extension comparable to those of the BEST project areas.

JRC together with renowned EU experts from DG Environment and Eurostat , were co-authors of a recently published volume, entitled " Reconciling Agricultural Production with Biodiversity Conservation "which summarizes the research on ways to improve biodiversity in agricultural landscapes, addressing the challenge of its monitoring at EU level. Given this reference framework, publications capable of proving the cultivation of autochthonous varieties now neglected in the areas covered by the work are the subject of research.

We proceeded with the analysis of the historical-documentary bibliography found in historical archives and libraries from which it is possible to find, for example, notarial deeds, documentary finds and

historical photographs. The study is also addressed taking into account the digitized documentation by the Puglia Region in the context of document dematerialization projects such as the **SAST project (Territorial Historical Archives System)** dedicated to the conservation and enhancement of cartographic, photographic and documentary sources relating to the Apulian landscape. As part of the aforementioned project, the archival material, made available by the Conservation Institutes of the region, was cataloged, filed, digitized and made available for consultation via the web.

Finally, the studies launched as part of the Projects for the conservation and enhancement of genetic resources in agriculture (PSR Puglia 2014-2020 - Submeasure 10.2.1) offer a huge wealth of documentary resources, both historical and deriving from direct investigations, carried out since 2014. to 2018, with reference to 5 groups of Apulian Agrobiodiversity species. During the realization of this work, information relating to historical investigations and territorial prospecting carried out as part of the projects on the recovery of the germplasm of tree species (**Re.Ger.OP , Re.Ge.Vi.P , and Re.Ge.Fru.P**), herbaceous (**SaveGrain**) and vegetable (**BiodiverSO**) species.

Furthermore, the survey campaign in the field in the Apulian territories of interest for the BEST project was started in order to document, through geotagged photos , the permanence of some cultivars and / or the transformations that took place in the landscapes under study. The relevant activities, better specified in point 1.b) of the service, will also be useful for acquiring information relating to the characterization and description of agricultural landscapes and the agronomic techniques used.

1.b) Description of the traditional agronomic techniques used in the cultivation sites;

The description of the agricultural landscape and of the traditional techniques associated with the presence of agrobiodiversity species is an aspect addressed in the context of different projects of regional interest which have been taken into account in carrying out the specific point of the service and which constitutes the cognitive framework. for contextual field investigations. In particular, in the integrated projects for biodiversity (**Re.Ger.OP , Re.Ge.Vi.P , and Re.Ge.Fru.P** , **SaveGrain** , **BiodiverSO**)., The areas subject to territorial prospection have been classified from a pedoclimatic and agronomic point of view in order to investigate the conditions of permanence / transformation of the traditional agricultural structure. As part of the same PSR (2007-2013) a research project of the Department of Agro-Environmental and Territorial Sciences of the University of Bari, has made it possible to identify the Agricultural Areas with a high naturalistic value (**HNVF in Puglia - DISAAT**) with reference also to biodiversity. Specifically, the entire regional territory was the subject of surveys aimed at characterizing the agronomic environment in terms of: presence and quantification of natural elements of the agricultural landscape (dry stone walls, terracing, marginal woods, hedges and tree-lined rows),

agrobiodiversity at landscape scale (crop diversity index), intensity of crops (interpolation of data from the Italian Agricultural Accounting Network regarding mechanical processing, use of pesticides, fertilizers and water resources), presence of natural meadows and pastures and compatible habitats with the conservation of species of conservation significance .

Another project of interest for the characterization of the territory, despite the apparently distant theme, is represented by the project called **"Program for the protection and enhancement of the elements of rural culture in Puglia** " funded under the Institutional Agreement of the Program Framework Program Agreement in the field of Cultural Heritage and Activities for the Territory of the Puglia Region. As part of the aforementioned project, the underlying theme is the minor rural architecture of Puglia. However, the elements of the building heritage, as functional elements of rural culture, are often associated with specific substrates of agronomic species and cultivation techniques, constituting an excellent knowledge base for the point under consideration.

After having limited the previous studies to the areas of investigation and having analyzed in detail the agronomic characteristics of the cognitive framework, we proceeded with the planning of the relevant activities. To facilitate the surveys in the field and to have a paper confirmation of this activity, each detector, in addition to the detection devices and photographic documentation (GPS, Tablet, Camera with Geotag system , 3d camera, 360 ° shooting camera), will be also equipped with a detail CTR and an aerial photo (scale 1: 5000) showing the area under investigation associated with a record card in which the surveyor can write the appropriate annotations (also identifying the geographical reference on the cartography) any notes or comments. At the same time the cartography will be useful to better orient oneself and to highlight any errors reported in the cartography taken from the cognitive picture.

1.c) Systematization of data in a GIS environment

The data acquired on the evolution over time of the intended use of the territory together with the information found in points 1.a) and 1.b) of this service are subject to systematization on a cartographic basis. A **Project Territorial Information System** has been prepared containing the basic cartography useful for framing the areas under consideration from an environmental and infrastructural point of view.

Subsequently, we proceeded to the acquisition and organization of historical data and surveys that will constitute detailed cartographic layers, appropriately classified and geo-referenced so as to constitute single layers on which to carry out subsequent multitemporal analyzes and cartographic elaborations. Monitoring and evaluation appear inextricably linked not only to historical reconstruction, but also to a possible forecast of the capacity of the agricultural territory to preserve agrobiodiversity.

In the comparison between temporally different cartographic layers, some important aspects for the objectives of the BEST project are highlighted, including the dynamic variation of a territorial system with respect to time, the impacts on the territory as a function of initial hypotheses, such as: crop change, waterproofing actions, urbanization interventions, reduction of the ecological network. The representation of the environmental elements and the consequent evaluation is thus framed in a complex trend analysis capable of describing the risk / conservation scenarios of the varieties of agrobiodiversity being analyzed.

2. Results

2. a) State of the art

The results obtained in relation to the first point of the service concerning the state of the art of agro-biodiversity in the areas under investigation are reported below. The first category of sources consulted concerns the historical cartographic, documentary and photographic finds attributable to the three park areas. From these documents it is possible to trace the historical framework of the landscape and the agricultural territory in question. Subsequently, the scientific publications concerning the ancient and local agricultural varieties subject to research by scientific institutes and bodies were analyzed and listed. The publications found are the result of projects that have made it possible to identify and characterize the main agricultural varieties rediscovered on the agricultural territory of Puglia from a morphological and molecular point of view. Furthermore, the results of the 5 integrated biodiversity projects relating to the 5 types of agricultural species subject to attention for the BEST project are shown: trees (olive trees, grapevines, fruit trees); vegetable and herbaceous plants. Finally, the integration of the different data sources, together with the use of the project GIS (point 1.c), made it possible to identify a large list of agricultural varieties on which to pay particular attention. This first list constitutes the preliminary list of plant genetic resources within which, on the basis of the documentary and scientific information possessed and on the basis of the effective replicability of their cultivation in the park areas, it will be possible to choose the list of 15 varieties subject to analysis referred to in point 2 of the service below.

2.a.1 Historical finds

The first archival source consulted for the realization of the state of the art (Att. 1.a) is represented by the immense documentary endowment preserved, digitized and made available by the **SAST project** . The project was carried out within the ERDF OPERATING PROGRAM 2007 - 2013 AXIS IV - LINE OF INTERVENTION 4.2 - Action 4.2.1 "Protection, enhancement and management of cultural heritage". Activity "E" "Requalification and enhancement of the archive system. Preparation and strengthening of integrated territorial archival systems".

The conservation of historical documentation in digital format is nowadays the most suitable tool for protecting and managing these documents, especially those in precarious conditions of conservation. The project " **System of the Archives of the cartographic and photographic heritage of the Puglia Region** " constitutes a digital archive that allows you to quickly and efficiently access documents by indexing the data of the archival description and to have the reproductions available in real time. of the documents

both in digital format and possibly in paper form. The project is aimed at the conservation and use of a substantial historical documentation that allows to expand the knowledge on the main phases of formation and transformation of the Apulian landscape in the modern and contemporary age and thus contribute to the ordinary action of its protection and enhancement.

In particular, the research was carried out on three main document types: **photographic cards, cartographic units and documentary units** relating to the three territories of the BEST project. In order to allow a clear territorial reference, often not coinciding with that of the documents found, the search was based on the names of the municipalities belonging to the areas of interest for the project. Furthermore, the research was focused on the use of the territory of interest for agronomic purposes.

As for the photographic material, one of the aims of the SAST project was to enhance the historical and cultural role of photography and its ability to transmit and represent the "memory" of the territory, in all its variables and facets, including the use of territories for agricultural purposes. The filing of the selected photographic material was carried out in compliance with the standards of the Central Institute for Catalog and Documentation (ICCD) using the F 3.00 standard. Vintage photographs and aerial photographs belong to these types of documents. The former come from various historical funds, belonging to public and private institutions, and are often dedicated to the transformations of urban places, therefore only in some cases have they proved useful for the purposes of the historical classification of the agricultural areas of the BEST project. The latter, on the other hand, although difficult to interpret for the purposes of identifying the varieties, are in any case one of the main documentary sources on the landscape and its transformations over time and constitute a fundamental support for knowledge of the territory as they allow to integrate and, at times, interpret the data inferable from the cartography.

As regards the historical cartographic material, as part of the filing of cartographic documents, both information useful for the identification of the document, such as the unique identification code, and elements that allow the user to have information in on the context and content of the document in order to promote its accessibility. In fact, the information relating to usage data contains useful elements for the enhancement and final use. In this regard, the **locality of territorial relevance** to which the document refers, the **type of crop** , the **morphological characteristics of the territories** or (presence of active and inactive watercourses, coastal strip, wetland , etc.), the presence of rural, civil and religious buildings and other elements considered relevant. All toponyms have been indicated in the original form shown on the document, in order to provide information also on the evolution of toponymy.

The cartographic documents include: **the ancient surface measurements** used in the South by land surveyors, land surveyors , surveyors , engineers and architects called upon by a plurality of public and

private subjects to draw maps or draft projects **; Plates and cabrei** of ecclesiastical bodies and noble companies constitute an extremely rich source for the study of the territory and often contain annotations about the topography, the rural settlements, the cultural and productive structure of the farms; **Judicial appraisals** as well as representing an analytical description of the assets, contain many references to the most ancient documentary and cartographic sources.

Below are the results of the research carried out in relation to each of the areas of the BEST project. The names of the documents found, the link to the digitized documentation and the image acquired from the web platform of the SAST project are reported, as well as the significant elements that it was considered necessary to highlight for the purpose of creating the state of the art.

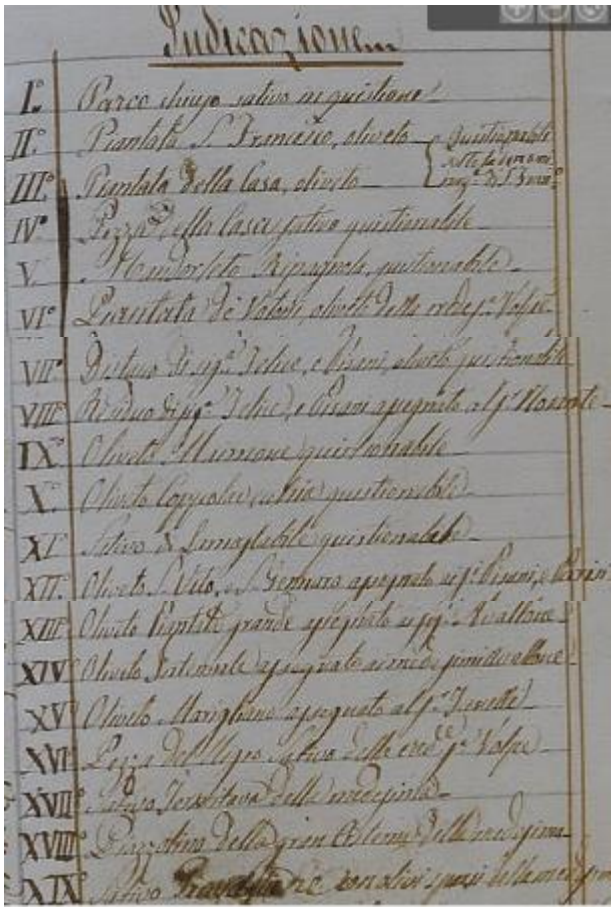
The research was set up starting from the toponymy of the individual areas and the name of the main rural elements and buildings found in the areas under investigation, selected thanks to the cartographic identification of the rural building elements on the areas under investigation.

Ripagnola " Regional Natural Park

In relation to the first area corresponding to the being instituted **"Costa Ripagnola " Regional Natural Park** the terms searched were: Ripagnola , Mussels, Incina , Gravaglione , Jazzo Vecchio, Masseria Crocifisso, Masseria Lacquain, Masseria Spina.

1.1 "Topographical plan of the Gravaglione , Ripagnola , or Macchia farm of the inheritance of the late Marquis Don Michele Lagreca belonging to his heir Donna Rufina Volpe, second wife of Don Nicola Miani in the Polignano estate"

Cartographic document dated 17/02/1846



Significant element: annotation of the indications in the legend relating to the use of the represented parcels (hereinafter the detail of the legend)

1.2 Audience of all the [...] collections [...] of this [Venera] bile Chapter of Polignano, with their respective [...] topographical plans [...] distinct from the trees, drawn up [...] in the year 1824 " Textual and cartographic document of 1824

Significant element: verification of the extension, boundaries and description of the assets belonging to the Chapter of Polignano

1.3 Polignano a Mare - Panoramic view near Torre Incina .

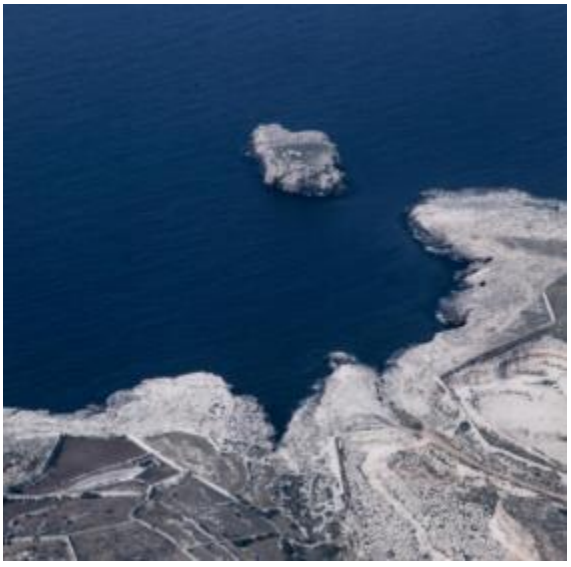
Photographic documents from 1950 (approx.)

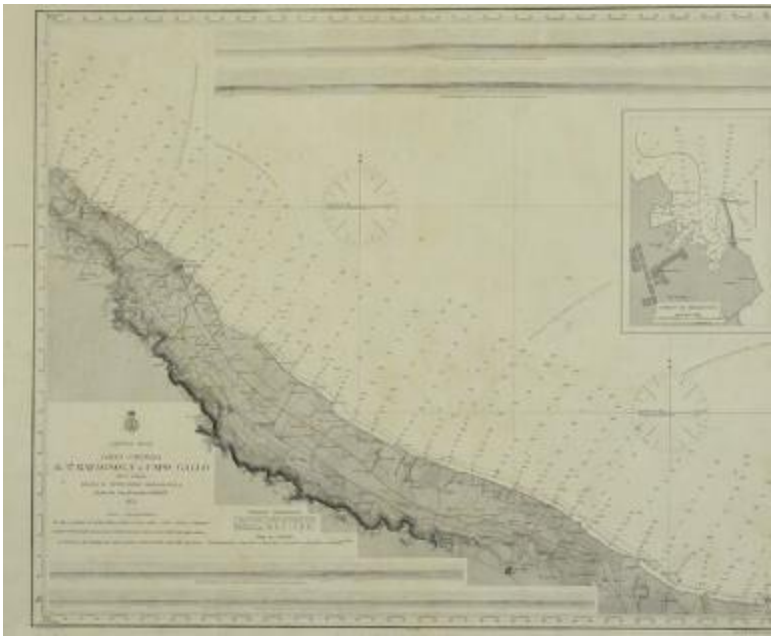
Significant element: detail of the natural vegetation interspersed with arboreal elements of agricultural interest (figs and olive trees).

1.4 Polignano a Mare - aerial view of the coast and the hermit's rock.

Slide dated between 1960 and 1980

Significant element: use of the land presumably for grazing and arable land in the coastal area and subdivision of the parcels with elements of the agricultural landscape (dry stone walls) still found in the area.





1.5 "Hydrographic office of the royal marine. Coastal map from Torre Rapagnola to Capo Gallo". Cartographic document of 1878

Significant element: coastal strip and port of Monopoli

1.6 Mussels - Monopoli - Coastline

Photographic document after 1950

Significant element: agricultural area of the coast between Cozze and Monopoli. Arable land and arboretums.

1.7 Mussels (Mola di Bari) - aerial view

Photographic document dated between 1960 and 1980

Significant element: agricultural area of the coast between Mola di Bari and Cozze. Arable land and olive groves.

The area of the Ripagnola coast has been cultivated since very ancient times. The area closest to the coast was traditionally cultivated with cereals and fodder or left uncultivated for livestock grazing, and this can already be seen in documents dating back to the early 19th century. The same is true for the allocation of tree crops in the inner part where it is possible to identify the so-called "planted" olive and almond trees. Moving on to more recent times, the availability of photographic records of the coast shows the continuation of arable farming and arable land arboreal. The arboreal elements such as olive, almond and fig trees stand out on the plowed fields to accommodate the cereal crops or fodder and to allow the stay of sheep, as well as happens inland with the so-called camporili oaks. The lame that furrow the terrritory, such as the one that flows near Torre Incina, having more fertile and deeper soils, have rare fruit trees and probably were also used as gardens for self-sustenance by the local population. Another distinctive element of the area, found in historical documents, is represented by the subdivision of the parcels with elements such as dry stone walls, often associated with natural windbreaks consisting of hedges of cane (Arundo donax) or prickly pear (Opuntia ficus-indica).

Regional Natural Park "Coastal dunes from Torre Canne to Torre S.Leonardo "

In relation to the second area corresponding to **the Regional Natural Park "Coastal dunes from Torre Canne to Torre S.Leonardo "** the terms searched were: Torre Canne, Villa Clara, Masseria Fiume Grande, Masseria Torre Bassa, Masseria Fiume piccolo, Masseria Parco Tombagno , Masseria Torrebianca , River Morello / i, Pezze Caldaia, Masseria Gravinella , Masseria Pilone, Masseria Tutosa , Masseria Faggiola, Masseria Lamacornola , Small Taverns, Great Taverns, Downloadface Masseria .

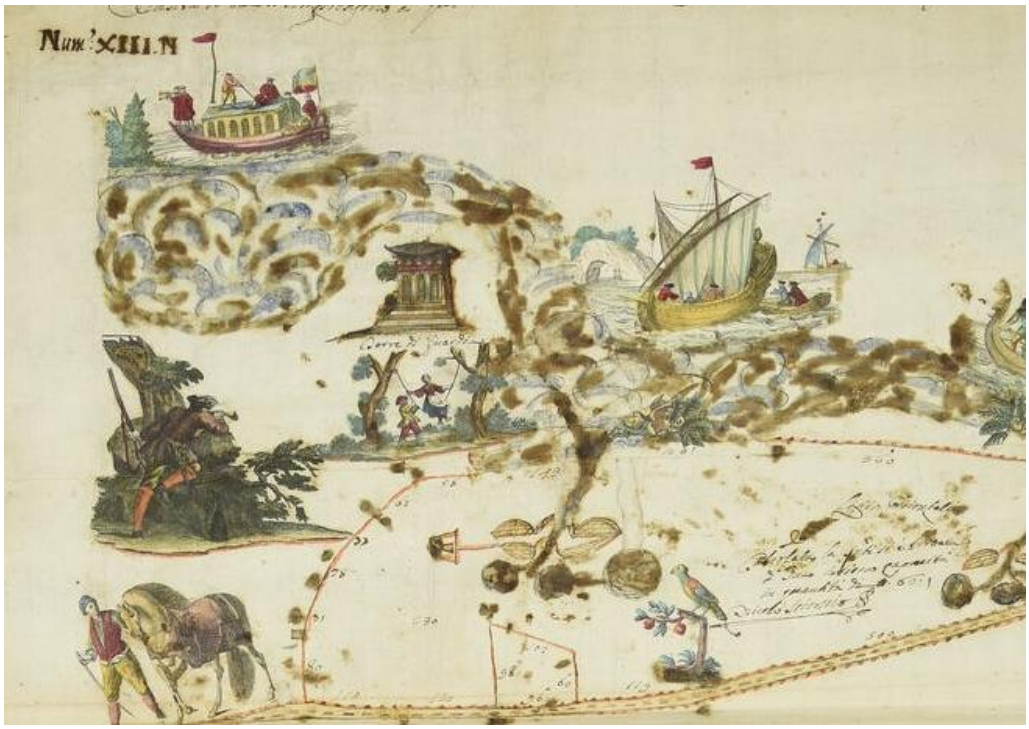
2.1 Events n. 786 Torre Canne motel aerial view 25/6/1971

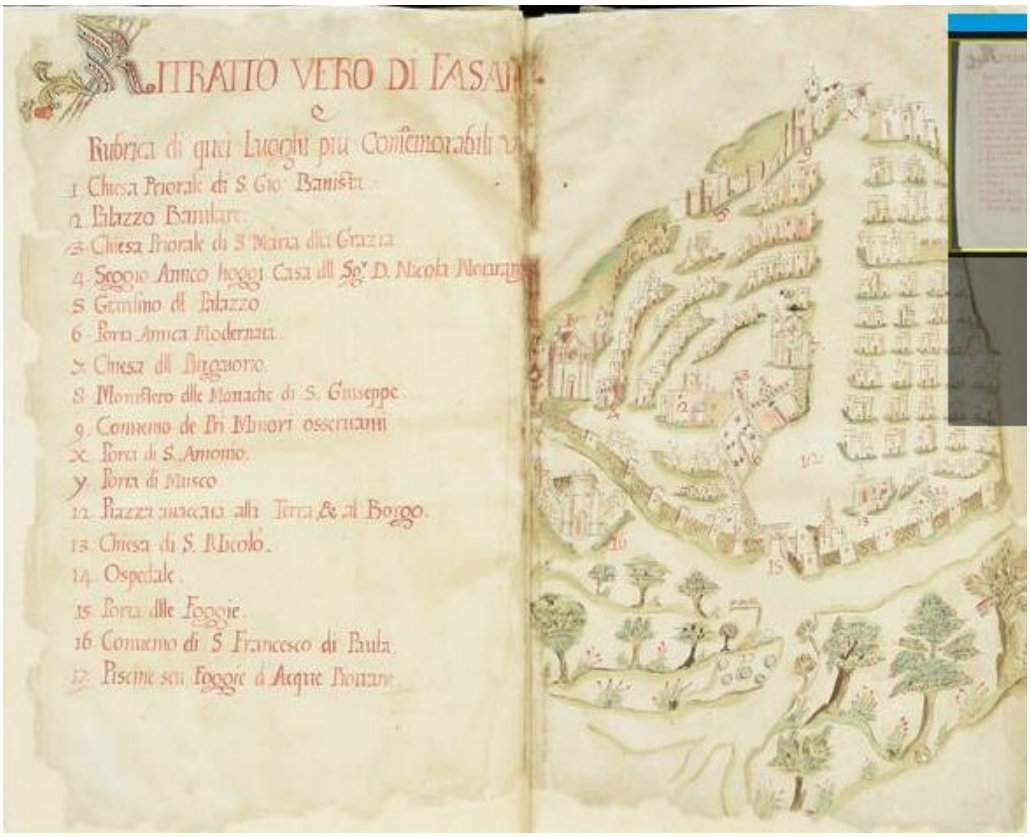
1971 aerial photograph of Torre Canne

Significant element: land use of the area (mainly arable land and olive groves) currently eroded by the development of the urban fabric.

2.2 "1748. Fasano. Plants of the cabreo di Fasano from 1748"

Plan c 14 and 14bis





Significant elements: extracts of the plants of the city of Fasano and the area of Marina di Fasano with representation of tree species for the former (olive and fruit trees) and land use for the latter (mainly pasture and scrub)

2.3 Ing. Cavalieri Tank of Torre Canne. General view 11-14-1952 Cassa per il Mezzogiorno

Photographic document from 1952 belonging to the photographic collection of the Apulian Aqueduct

Significant element: large sixth arboretum composed mainly of almond and olive trees.

2.4 Completion of the aqueduct serving the towns of Pozzo Vacito and Torre Canne 1952 (section between Pozzo Vacito and Torre Canne) Ing. Cavalieri (Bari) Cassa per il Mezzogiorno

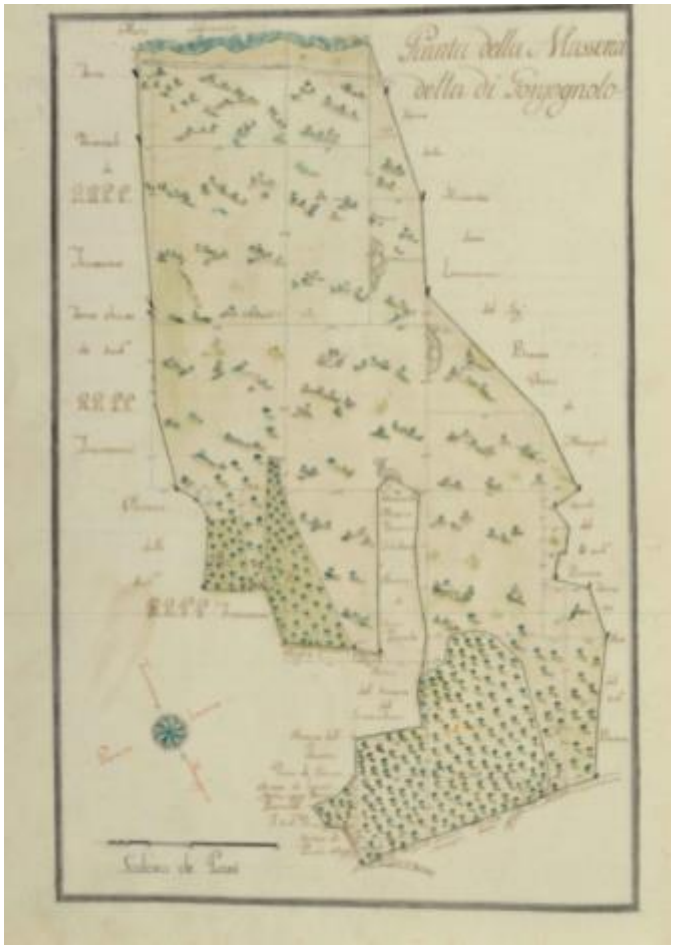
Photographic document from 1952 belonging to the photographic collection of the Apulian Aqueduct

Relevant element: almond grove with a regular wide sixth. Plant in the foreground probably Carrubo or Sorbo.

2.5 Legal background.

"Legal audience. Or may he be Champion of all the country buildings, who owns this Most Reverend Chapter of the City of Ostuni both in the capitular mass, and those tributes in portions with varj Benefits or Legates Pii, of which the measurement, confinement and Geometric Plants with their descriptions , purchases, and annexed weights formed by the Royal Surveyor Engineer Michele Ciracì of the aforementioned City of Ostuni, which was begun in the year 1794 and finished in 'Year 1800 "


109
Pianta del Terraggio sito in luogo e Marittimo sopramano
la Lama di S. Lucia
Mare
Terre
Chiuso
della Masseria
Terre della


Pianta della Masseria
della di Zingognolo

Significant elements: differentiation of land use to arboretum in the hinterland and to herbaceous crops on the coast (areas of S.Lucia, Gorgognolo).

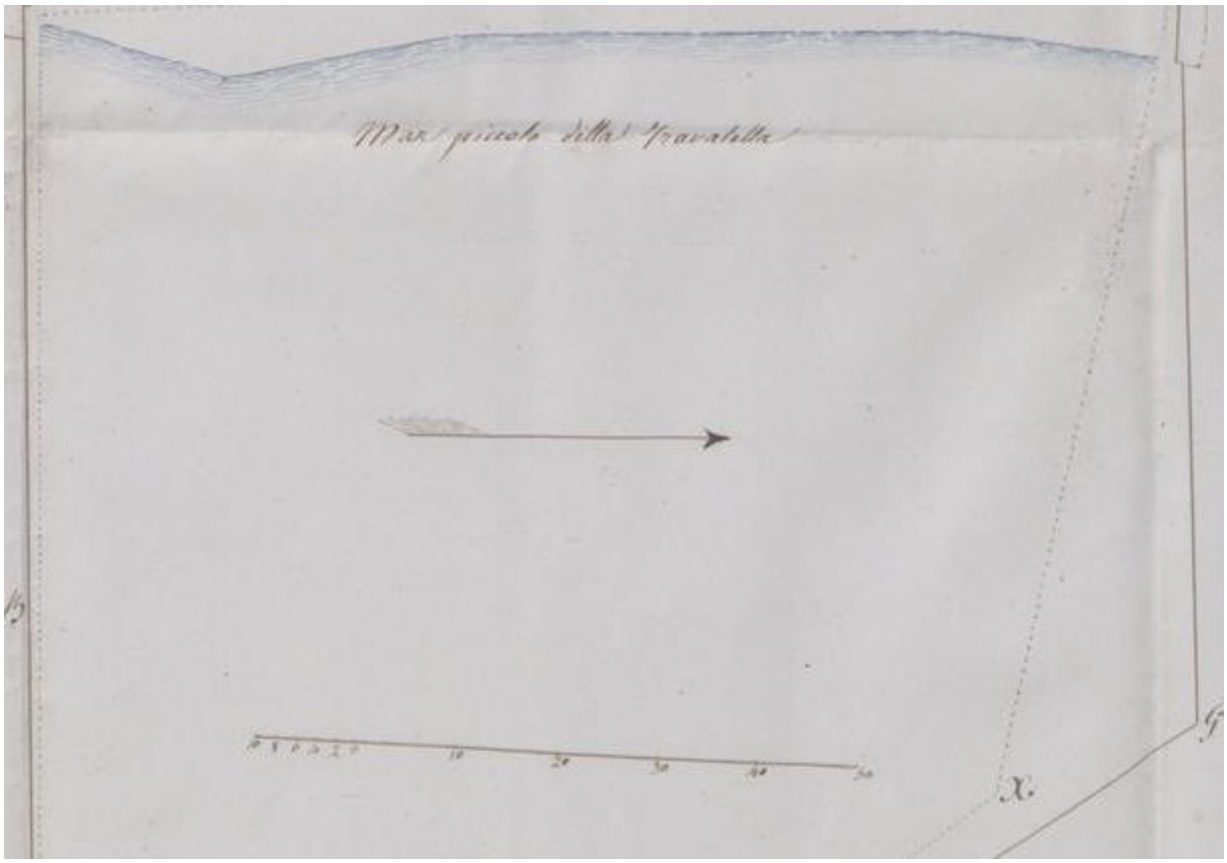
The territory identified with the area of the coastal dunes has always been of particular natural value, but also of importance for the economy of the entire district of Fasano and Ostuni. As far as the naturalistic importance is concerned, it is worth mentioning the presence of a considerable portion of the area, which is still occupied by fragmiteti, reed thickets, retrodunal scrub and small salt lakes (once used for aquaculture). From the documents of the eighteenth and nineteenth century is not possible to determine whether the area that is currently cultivated with arable land had already been reclaimed for agricultural use. It is probable that it was used as pasture for sheep-breeding and was converted to forage or wheat and legumes only in more recent times. The innermost area of the park, given the presence of monumental olive and carob trees, is certainly pre-existing and established centuries-old origin if not thousands of years. Arriving at the documents of the mid-twentieth century, it is possible to infer the presence of tree crops other than olive trees, which have a very traditional setting: just think of the wide and regular planting distance used in almond trees. For the area behind the built-up area of Torre Canne, since the beginning of the '70s there has been a pressure of urbanization towards both the natural area and the agricultural lands, often object of building.

"Mar Piccolo Natural Park"

In relation to the third area corresponding to **the "Natural Park of the Mar Piccolo" Regional Natural Park,** the terms sought were: Taranto, Mar Piccolo, Piana Tarantina, Tarantino Amphitheater, Masseria Cicena , Masseria Santa Teresa, Masseria Caselle, Masseria San Pietro, Masseria Sant'Andrea, Masseria Natrella , Masseria Le Lamie, Masseria Vaccarella, Masseria Malvasia, Masseria Palombarella , Masseria Cicoria, Masseria Galizia, Masseria La Penna, Masseria Caronella , Masseria Scardante, Masseria La Mutata, Masseria Saracino, Masseria Pantaleo, Masseria Patrovaro , Masseria Tuglia , Masseria D ' aiala , Torre D' aiala , Casina Bianca, Church of San Barnabaa , Torre Adducci , Torre Marangia , Casa Teresa, Torre Carolina.

3.1 Map of the funds in the Mar Piccolo in Taranto

Documentary artifact from 1839



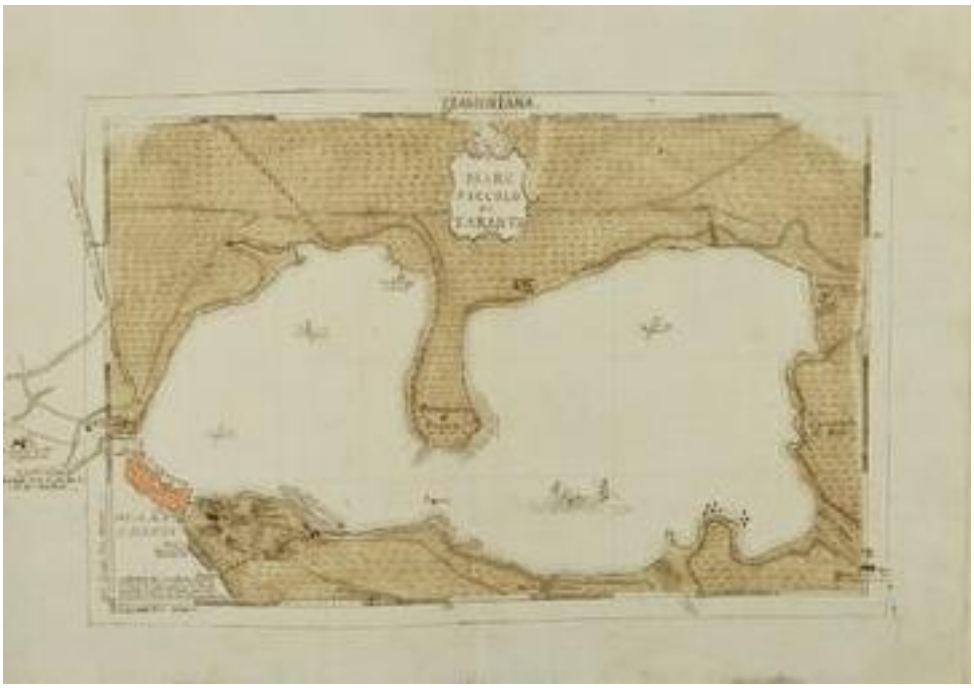
Significant elements: representation of agricultural land in the coastal strip of the Mar Piccolo. Based on commonly used symbology, no agricultural features emerge. It is inferred that the most likely land use is pasture or arable.

3.2 "Mar Piccolo" of Taranto, in a rare English print of the early 19th century (Collez . N. Vacca)

Document dating from 1892.

Significant element: rural landscape consisting of pasture and arable land.

3.3 Map "Mare Piccolo di Taranto" in the volume "Atlante Sallentino or both the Province of Otranto divided into its ecclesial dioceses "



Textual and cartographic document dating back to 1803

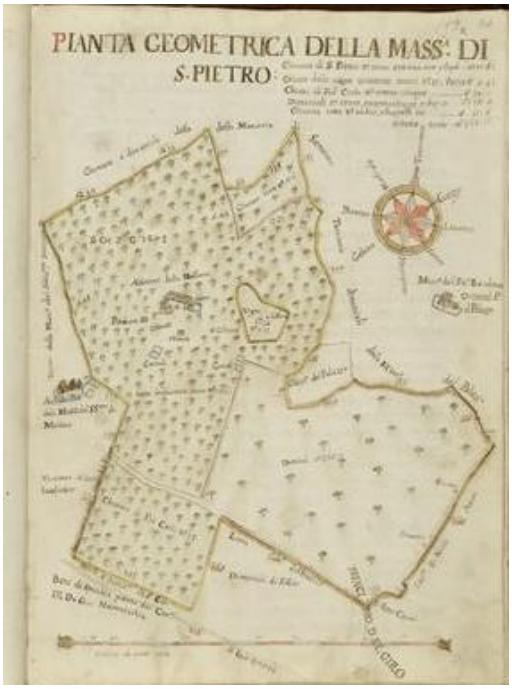
Significant element: development of the urban fabric of the city of Taranto.

3.4 Murgia Taranto - Masseria Vaccarella - aerial view

Photographic documents dating from 1940 onwards

Significant element: use of the land consisting mainly of olive groves, vineyards and arable and uncultivated land.

3.5 "Geometric Plan of the Masseria di San Pietro"



Cartographic document forming part of the volume

"Platea seu Champion of all stable country properties. Annual rents over the houses, and own houses owns the Venerable Convent of San Domenico della Terra di Ceglie under the title of San Giovanni Evangelista [...] built, measured and placed in painted by Pietro di Summa di Francavilla. AD MDCCXXXXIV. 1744 "

Significant element: use of the land in the area in front of the San Pietro farm consisting of olive groves and vineyards.

The agricultural use of the area surrounding the Mar Piccolo of Taranto is documented by plans and illustrations dating back to the early nineteenth century. Although on these graphical elements it is not possible to find with certainty the cultivation and even less the species cultivated, the rural artifacts that can be observed here are particularly important. These are visible in illustrations of rural areas far from the city development. The data suggests that the interest of the area for agricultural purposes is very old, in particular for the grazing of sheep, but not excluded also for the cultivation of herbaceous species,

mainly cereals and legumes. The hinterland immediately nearer to the coastal strip is more varied in terms of cultivated species. Since the 40's of the 20th century, it is possible to identify different cultivations near the cores of agricultural production, the Masserie. It is easy to distinguish fields of olive trees with wide and regular plantings, vineyards interspersed with arable land and vegetable gardens for the livelihood of the conductors.

Link to access the resources found on the SAST portal of the Puglia Region

Code	Link
1.1	http://sast.beniculturali.it/index.php/teca-digitale?option=com_tecaviewer&view=showimg&myId=6267b9e4-8f83-4c10-bae8-dd01277f378d
1.2	http://sast.beniculturali.it/index.php/teca-digitale?option=com_tecaviewer&view=showimg&myId=44862946-6a8c-4717-81f1-d9780e7695b8
1.3	http://sast.beniculturali.it/index.php/teca-digitale?option=com_tecaviewer&view=showimg&myId=50b30c6e-79ab-41b1-9273-c1f02eed63b8
1.4	http://sast.beniculturali.it/index.php/teca-digitale?option=com_tecaviewer&view=showimg&myId=db04e2df-2168-4c2e-b6d4-27f685c8f937
1.5	http://sast.beniculturali.it/index.php/teca-digitale?view=show&myId=d0810b65-7000-4451-baa3-18200007fec6
1.6	http://sast.beniculturali.it/index.php/teca-digitale?view=show&myId=76417b2a-d6df-4aa3-8d14-d60d7bf986bf
1.7	http://sast.beniculturali.it/index.php/teca-digitale?option=com_tecaviewer&view=showimg&myId=4762cfad-8233-427a-8cd7-feebb33ea98d
2.1	http://sast.beniculturali.it/index.php/teca-digitale?option=com_tecaviewer&view=showimg&myId=8e438ab8-272d-47f0-ab59-515ac3abe67e
2.2	http://sast.beniculturali.it/index.php/teca-digitale?option=com_tecaviewer&view=showimg&myId=19dcf47d-9752-4395-9012-f3ccdc7f09ea
2.3	http://sast.beniculturali.it/index.php/teca-digitale?option=com_tecaviewer&view=showimg&myId=b83a51e2-fbe4-45ea-bdec-5bed2b157db5
2.4	http://sast.beniculturali.it/index.php/teca-digitale?option=com_tecaviewer&view=showimg&myId=d56abbef-5980-4b38-88a7-c7be740385d4
2.5	http://sast.beniculturali.it/index.php/teca-digitale?option=com_tecaviewer&view=showimg&myId=b7fbdf56-e483-47f1-b854-db65f67da314
3.1	http://sast.beniculturali.it/index.php/teca-digitale?view=show&myId=33d1bef4-df56-480a-83d0-67d8ffc51fcf
3.2	http://sast.beniculturali.it/index.php/teca-digitale?view=show&myId=3d3e3285-7eab-4d6a-b348-e3be2d929960
3.3	http://sast.beniculturali.it/index.php/teca-digitale?view=show&myId=896b9ad6-c998-4ee7-bd37-0f28d4071a2b
3.4	http://sast.beniculturali.it/index.php/teca-digitale?option=com_tecaviewer&view=showimg&myId=79c28ee1-f333-4882-8812-4b945b8c6b6f
3.5	http://sast.beniculturali.it/index.php/teca-digitale?option=com_tecaviewer&view=showimg&myId=d1aba146-738d-45c7-9df2-5f9ac7475c7b

Historical Cartography

The historical documents have been relocated in the GIS project in the form of a geodatabase easily accessible through the positioning of a point geometry in correspondence of the geographical coordinates most representative of the area described by the same document. The geodatabase contains, in addition to the link for viewing the historical document, the identifying and descriptive attributes such as: the indication of the code used for classification in the reference paragraph, the year of realization and the description of the survey elements. Below we show the maps created on each of the project areas and the relational table of the geodatabase created.

Figura 1 Location of areas represented by individual historical documents for Costa Ripagnola, Coastal Dunes, and Mar Piccolo parks.

id	Codice	Year	Descr	link	Name	wkt_geom
1	1.1	1846	annotation of the indications in the legend relating to the use of the plots represented (below the detail of the legend). Mainly olive groves, arable land and almond groves	G:\.shortcut-targets-by-id\0B2NZWxMLJX7gVjBXT0lYWjNQVEU\SINAGRI\01_PROGETTI AVVIATI\BEST GAL\REALIZZAZIONE\GIS_BEST\Indagine_storica\1.1.png	Pianta topografica della masseria Gravaglione, Ripagnola.	Point (1909786.836071556899 69659 5016728.1931156367063 5223)
2	1.3a	1950	detail of natural vegetation interspersed with tree elements of agricultural interest (fig and olive trees).	G:\.shortcut-targets-by-id\0B2NZWxMLJX7gVjBXT0lYWjNQVEU\SINAGRI\01_PROGETTI AVVIATI\BEST GAL\REALIZZAZIONE\GIS_BEST\Indagine_storica\1.3.png	Polignano a Mare - Veduta panoramica nei pressi di Torre Incina	Point (1920950.151939319446 68293 5008990.5839138105511 6653)
3	1.3b	1950	detail of natural vegetation interspersed with tree elements of agricultural interest (fig and olive trees).	G:\.shortcut-targets-by-id\0B2NZWxMLJX7gVjBXT0lYWjNQVEU\SINAGRI\01_PROGETTI AVVIATI\BEST GAL\REALIZZAZIONE\GIS_BEST\Indagine_storica\1.3b.png	Polignano a Mare - Veduta panoramica nei pressi di Torre Incina	Point (1920973.555571537464 8571 5008826.7584882834926 2476)
4	1.4	1970	land use presumably pasture and arable land of the coastal area and subdivision of the parcels with elements of the agricultural landscape (dry stone walls) still found in the area	G:\.shortcut-targets-by-id\0B2NZWxMLJX7gVjBXT0lYWjNQVEU\SINAGRI\01_PROGETTI AVVIATI\BEST GAL\REALIZZAZIONE\GIS_BEST\Indagine_storica\1.4.png	Polignano a Mare - veduta aerea della costa e dello scoglio dell'eremita	Point (1918725.940077400300 65179 5011387.2892131851986 0506)
5	1.6	1950	agricultural area of the littoral between Cozze and Monopoli. Arable land and arboretum	G:\.shortcut-targets-by-id\0B2NZWxMLJX7gVjBXT0lYWjNQVEU\SINAGRI\01_PROGETTI AVVIATI\BEST GAL\REALIZZAZIONE\GIS_BEST\Indagine_storica\1.6.png	Cozze - Monopoli - Litorale	Point (1922546.583037013653 66578 5008440.8152569774538 2786)
6	1.7	1970	Agricultural area of the littoral between Mola di Bari and Cozze. Arable land and olive groves	G:\.shortcut-targets-by-id\0B2NZWxMLJX7gVjBXT0lYWjNQVEU\SINAGRI\01_PROGETTI AVVIATI\BEST GAL\REALIZZAZIONE\GIS_BEST\Indagine_storica\1.7.png	Cozze (Mola di Bari) - veduta aerea	Point (1907557.423402472864 83645 5018147.6884197564795 6133)

7	2.1	1971	land use of the area (mainly arable land and olive groves) currently eroded by the development of the urban fabric	G:\.shortcut-targets-by-id\0B2NZWxMLJX7gVjBXT0lYWjNQVEU\SINAGRI\01_PROGETTI AVVIATI\BEST GAL\REALIZZAZIONE\GIS_BEST\Indagine_storica\2.1.png	Avvenimenti n. 786 Torre Canne motel veduta aerea	Point (1944926.956446514930 57609 4987282.6315299738198 5188)
8	2.2a	1748	extracts of the plants of the city of Fasano and the area of Marina di Fasano with representation of tree species for the first (olive and fruit trees) and land use for the second (mainly pasture and scrub)	G:\.shortcut-targets-by-id\0B2NZWxMLJX7gVjBXT0lYWjNQVEU\SINAGRI\01_PROGETTI AVVIATI\BEST GAL\REALIZZAZIONE\GIS_BEST\Indagine_storica\2.2.png	Piante del cabreo di Fasano	Point (1946890.044448991073 29547 4986354.5583273284137 249)
9	2.2b	1748	extracts of the plants of the city of Fasano and the area of marina di Fasano with representation of tree species for the first (olive and fruit trees) and land use for the second (mainly pasture and scrub)	G:\.shortcut-targets-by-id\0B2NZWxMLJX7gVjBXT0lYWjNQVEU\SINAGRI\01_PROGETTI AVVIATI\BEST GAL\REALIZZAZIONE\GIS_BEST\Indagine_storica\2.2b.png	Piante del cabreo di Fasano	Point (1944241.100002257619 05313 4985869.1496590767055 7499)
10	2.3	1952	arboretum with large sixth composed mainly of almond and olive trees	G:\.shortcut-targets-by-id\0B2NZWxMLJX7gVjBXT0lYWjNQVEU\SINAGRI\01_PROGETTI AVVIATI\BEST GAL\REALIZZAZIONE\GIS_BEST\Indagine_storica\2.3.png	Serbatoio di Torre Canne	Point (1944791.735460303490 98146 4986555.1144534293562 1738)
11	2.4	1952	almond orchard with regular wide sixth. Plant in the foreground probably Carob or Rowan.	G:\.shortcut-targets-by-id\0B2NZWxMLJX7gVjBXT0lYWjNQVEU\SINAGRI\01_PROGETTI AVVIATI\BEST GAL\REALIZZAZIONE\GIS_BEST\Indagine_storica\2.4.png	Completamento dall'acquedotto a servizio degli abitati di Pozzo Vacito e Torre Canne	Point (1943819.184521417133 51011 4985294.7855183659121 3942)
12	2.5a	1794	differentiation of the use of the land to arboretum in the hinterland and to herbaceous cultivations on the coast (zones of S.Lucia, Gorgognolo).	G:\.shortcut-targets-by-id\0B2NZWxMLJX7gVjBXT0lYWjNQVEU\SINAGRI\01_PROGETTI AVVIATI\BEST GAL\REALIZZAZIONE\GIS_BEST\Indagine_storica\2.5a.png	Platea legale	Point (1964384.042832531966 26902 4979218.9425539011135 6974)

13	2.5b	1794	Differentiation of the use of the land for arboretum in the hinterland and for herbaceous cultivations on the coast (S.Lucia, Gorgognolo areas).	G:\.shortcut-targets-by-id\0B2NZWxMLJX7gVjBXT0lYWjNQVEU\SINAGRI\01_PROGETTI AVVIATI\BEST GAL\REALIZZAZIONE\GIS_BEST\Indagine_storica\2.5b.png	Platea legale	Point (1961603.344604415586 21824 4980295.5096359839662 9095)
14	3.1	1839	Representation of agricultural land use in the coastal strip of the Mar Piccolo. Based on the commonly used symbology, no agricultural element emerges. It can be inferred that the most probable land use is pasture or arable land.	G:\.shortcut-targets-by-id\0B2NZWxMLJX7gVjBXT0lYWjNQVEU\SINAGRI\01_PROGETTI AVVIATI\BEST GAL\REALIZZAZIONE\GIS_BEST\Indagine_storica\3.1.png	Mappa dei fondi nel mar Piccolo in Taranto	Point (1926341.005259648198 26186 4934405.3208601260557 7707)
15	3.2	1892	Rural landscape composed of pasture and arable land.	G:\.shortcut-targets-by-id\0B2NZWxMLJX7gVjBXT0lYWjNQVEU\SINAGRI\01_PROGETTI AVVIATI\BEST GAL\REALIZZAZIONE\GIS_BEST\Indagine_storica\3.2.png	"Mar Piccolo" di Taranto, in una rara stampa inglese dei primi anni dell'800	Point (1928299.975956512847 91529 4935643.1129641644656 6582)
16	3.3	1803	development of the urban fabric of the city of Taranto	G:\.shortcut-targets-by-id\0B2NZWxMLJX7gVjBXT0lYWjNQVEU\SINAGRI\01_PROGETTI AVVIATI\BEST GAL\REALIZZAZIONE\GIS_BEST\Indagine_storica\3.3.png	Mappa "Mare Piccolo di Taranto"	Point (1922932.742967579746 61887 4935823.4076123712584 3763)
17	3.4	1940	land use consisting mainly of olive groves, vineyards and arable land and uncultivated land	G:\.shortcut-targets-by-id\0B2NZWxMLJX7gVjBXT0lYWjNQVEU\SINAGRI\01_PROGETTI AVVIATI\BEST GAL\REALIZZAZIONE\GIS_BEST\Indagine_storica\3.4.png	Masseria Vaccarella	Point (1923636.152135944226 75669 4940147.4453651625663 0421)
18	3.4b	1940	land use composed mainly of olive groves, vineyards and arable land and uncultivated	G:\.shortcut-targets-by-id\0B2NZWxMLJX7gVjBXT0lYWjNQVEU\SINAGRI\01_PROGETTI AVVIATI\BEST GAL\REALIZZAZIONE\GIS_BEST\Indagine_storica\3.4b.png	Masseria Vaccarella	Point (1923623.150118044577 53897 4940644.1224489258602 2615)

19	3.5	1744	land use of the area in front of the farm of San Pietro composed of olive groves and vineyards.	G:\.shortcut-targets-by-id\0B2NZWxMLJX7gVjBXT0lYWjNQVEU\SINAGRI\01_PROGETTI AVVIATI\BEST GAL\REALIZZAZIONE\GIS_BEST\Indagine_storica\3.5.png	Pianta Geometrica della Masseria di San Pietro	Point (1927564.386793845100 32833 4940001.4977142373099 9231)

2.a.2 Scientific production

The second document category on which we focused for the preparation of the state of the art is represented by scientific publications relating to the different aspects of regional agro-biodiversity. The articles published in the last twenty years in relevant scientific journals in the national and international context were examined. The articles report survey methodologies and interesting results relating to various ancient and / or typical agricultural varieties cultivated in Puglia. Furthermore, they often represent reports of research projects that have allowed the identification, selection, conservation and enhancement of the aforementioned varieties. **The crops most dealt with in the scientific production analyzed concern: grapevines (table and wine grapes), vegetables (artichoke, carousel, carrot, cabbage, zucchini and tomato), tree crops (fig, olive for oil and table, almond), legumes (broad bean, cowpea), cereals (durum wheat and soft wheat) and wild herbs (orobanche).**

Bibliographic references on agro-biodiversity in Apulia

Articolo	**Specie e varietà / tema trattato**
Alba, V., Gentilesco, G., & Tarricone, L. (2021). Climate change in a typical Apulian region for table grape production: spatialisation of bioclimatic indices, classification and Future Scenarios. OENO One, 55(3), 317-336.	Table grape: Italia, Regina, Victoria, Michele Palieri and Red Globe
Ancona, S., De Mastro, G., Jenderek, M. M., & Ruta, C. (2021). Micropropagation Supports Reintroduction of an Apulian Artichoke Landrace in Sustainable Cropping Systems. Agronomy, 11(6), 1169.	Artichoke Troianella
Bonasia, A., Conversa, G., Lazzizera, C., Gambacorta, G., & Elia, A. (2021). Morpho-Biometrical, Nutritional and Phytochemical Characterization of Carrot Landraces from Puglia Region (Southern Italy). Sustainability, 13(7), 3940.	"Carota a punta lunga" and "Carota a punta tonda"
Capone, R., El Bilali, H., & Bottalico, F. (2016). Assessing the sustainability of typical agro-food	Study on the biodiversity of typical Apulian food production

products: insights from Apulia Region, Italy. New Medit, 15(1), 28-35.	
Ciarmiello, L. F., Piccirillo, P., Carillo, P., De Luca, A., & Woodrow, P. (2015). Determination of the genetic relatedness of fig (Ficus carica L.) accessions using RAPD fingerprint and their agro-morphological characterization. South African Journal of Botany, 97, 40-47.	Fig: (Colubmro, Fionone nero, Tauro, Mariana, Fico del Vescovo and Arodio, Fico nigro, Calvarina, Siconero and Ziuledda). Interesting work for methodological aspects dealing with the characterization and determination of genetic relatedness of figs
Conversa, G., Lazzizera, C., Bonasia, A., Cifarelli, S., Losavio, F., Sonnante, G., & Elia, A. (2020). Exploring on-farm agro-biodiversity: A study case of vegetable landraces from Puglia region (Italy). Biodiversity and Conservation, 29(3), 747-770.	Ortive: 163 vegetable crop landraces
De Cillis, F., Leoni, B., Massaro, M., Renna, M., & Santamaria, P. (2019). Yield and quality of faba bean (Vicia faba L. var. major) genotypes as a vegetable for fresh consumption: A comparison between Italian landraces and commercial varieties. Agriculture, 9(12), 253.	Cegliese, Iambola, San Francesco, and FV5) of faba bean (Vicia faba L. var. major Harz)
De Giorgio, D., & Polignano, G. B. (2001). Evaluating the biodiversity of almond cultivars from germplasm collection field in Southern Italy. Sustaining the Global Farm, 56, 305-311.	88 Almond variety
Di Falco, S., & Chavas, J. P. (2008). Diversity, productivity and resilience in agro-ecosystems: An example from cereal production in Southern Italy. In Agrobiodiversity Conservation and Economic Development (pp. 194-206). Routledge.	Cereal crop diversity study

Di Rienzo, V., Miazzi, M. M., Fanelli, V., Sabetta, W., & Montemurro, C. (2016, October). The preservation and characterization of Apulian olive germplasm biodiversity. In VIII International Olive Symposium 1199 (pp. 1-6).	30 Olivo genotipe
Elia, A., & Santamaria, P. (2013). Biodiversity in vegetable crops, a heritage to save: the case of Puglia region. Italian Journal of Agronomy, 8(1), e4-e4.	Carota di Polignano (Polignano carrot) and carota di sant'Ippazio (Saint Ippaziocarrot) (Apiaceae), cipolla di Acquaviva delle Fonti(Acquaviva delleFonti onion) and cipolla bianca di Margherita(Margherita whiteonion) (Liliaceae), cima di rapa(broccoli raab) (Brassicaceae), unripemelon - carosello, barattiere, meloncella, etc. (Cucurbitaceae), cata-logna chicory - cicoria di Molfetta e cicoria di Galatina(Molfetta'schicory and Galatina's chicory)(Asteraceae)
Filippetti, A., & Ricciardi, L. (2001). On-farm safeguard of biodiversity, genetic piracy and farmers' rights: principles, state of the art, problems. Options Méditerranéennes. Série A: Séminaires Méditerranéens (CIHEAM).	Insight on rights of farmers and of local communities that provide germplasm
Hammer, K., Montesano, V., Direnzo, P., & Laghetti, G. (2018). Conservation of crop genetic resources in Italy with a focus on vegetables and a case study of a neglected race of Brassica oleracea. Agriculture, 8(7), 105.	Neglected Race of Brassica Oleracea: Mugnoli, italica Plenck, Mugnolicchio

Lacirignola, C., Capone, R., Bottalico, F., El Bilali, H., & Debs, P. (2015). Sustainability of typical quality products for food and nutrition security in the Mediterranean: lessons from the case of Apulia region in Italy. Feeding Expo Milano with Mediterranean Perspectives, 32.	Sustainability of Crop species and cultivar diversity and Use of local crop cultivars and animal breeds
Laghetti, G., Bisignano, V., & Urbano, M. (2018). Genetic resources of vegetable crops and their safeguarding in Italy. Horticulture International Journal, 2(3), 72-4.	Diplotaxis tenuifolia (L.) DC, Silene vulgaris (Moench) Garcke Sinapis alba L, Calamintha nepeta (L.) Savi and Micromeria thymifolia (Scop.) Fritsch. Scolymus hispanicus L. and very recently Salicornia patula
Lioi, L., Morgese, A., Cifarelli, S., & Sonnante, G. (2019). Germplasm collection, genetic diversity and on-farm conservation of cowpea [Vigna unguiculata (L.) Walp.] landraces from Apulia region (southern Italy). Genetic Resources and Crop Evolution, 66(1), 165-175.	13 accessions of V. unguiculata
Margiotta, B., Colaprico, G., Urbano, M., Veronico, G., Tommasi, F., & Tomaselli, V. (2020). Halophile wheatgrass Thinopyrum elongatum (Host) DR Dewey (Poaceae) in three Apulian coastal wetlands: vegetation survey and genetic diversity. Plant Biosystems-An International Journal Dealing with all Aspects of Plant Biology, 1-15.	Thinopyrum elongatum: analysis of vegetation, plant communities and soil samplings were carried out to investigate the ecological context of 24 populations collected of this halophile wheatgrass, along with biochemical characterization
Miazzi, M. M., D'Agostino, N., di Rienzo, V., Venerito, P., Savino, V. N., Fucilli, V., ... & Taranto, F. (2020). Marginal grapevine germplasm from Apulia (Southern Italy) represents an unexplored source of genetic diversity. Agronomy, 10(4), 563.	128 genotypes of marginal grapevine germplasm

Montemurro, C., Di Rienzo, V., Mita, G., Caponio, F., De Bellis, L., Sardaro, R., ... & Fucilli, V. (2015). The Re. Ger. OP project for the preservation of apulian olive germplasm biodiversity. In Joint Congress SIBV-SIGA "Feeding the planet: plant science and breeding for the future of agriculture". ITA.	Study on 200 olive accessions
Motti, R. (2021). Wild plants used as herbs and spices in Italy: An ethnobotanical review. Plants, 10(3), 563.	Ethnobotanical Review on 34 studies about 78 wild taxa used in Italy as herbs or spices.
Nocco, S. (2021). Apulia agro-biodiversity between rediscovery and conservation: the case of the Salento km0» network. Central European Journal of Geography and Sustainable Development, 3(1), 49-59.	Review of the 5 biodiversity projects
Pacicco, L., Bodesmo, M., Torricelli, R., & Negri, V. (2018). A methodological approach to identify agro-biodiversity hotspots for priority in situ conservation of plant genetic resources. PLoS One, 13(6), e0197709.	establishing nationwide 53 and 197 agro-biodiversity hotspots
Palmitessa, O. D., Durante, M., Leoni, B., Montesano, F., Renna, M., Serio, F., ... & Santamaria, P. (2021). Enhancement of a Landrace of Carosello (Unripe Melon) through the Use of Light-Emitting Diodes (LED) and Nutritional Characterization of the Fruit Placenta. Sustainability, 13(20), 11464.	Carosello (Unripe Melon) var. 'Carosello leccese'
Perrino, E. V., & Calabrese, G. (2014). Vascular flora of the ancient olive groves of Apulia (southern Italy). Natura Croatica, 23(1), 189.	Olive: 3 cultivated varieties
Perrino, E. V., Signorile, G., & Marvulli, M. (2013). A first checklist of the vascular flora of the Polignano a Mare coast (Apulia, southern Italy). Natura	457 species of vascular plants

Croatica: Periodicum Musei Historiae Naturalis Croatici, 22(2), 295-318.	
Piergiovanni, A. R. (2021). Legumes: staple foods used in rituals and festive events of Apulia region (southern Italy). Food, Culture & Society, 1-19.	utilization of local legumes in Apulian rituals, banquets, religious and social events
Piergiovanni, A. R., & Margiotta, B. (2021). On farm survival of Apulian legume and cereal landraces in relation to land cover/land use changes. A case study. Italian Journal of Agronomy.	Grano: Grano Buono di Rutigliano, Cannulino, Miracle wheat, cece di Nardò, fqagiolo dei monti Dauni, fava di Carpino, pisello di Vitigliano, fava di Zollino, Grano Saragolla, Grano Bianchetta, Fava di muro leccese, cece nero di Muro leccese,
Portarena, S., Russo, G., Chiocchini, F., Ciolfi, M., Farinelli, D., Famiani, F., ... & Lauteri, M. Agro-biodiversità e tracciabilità in Olea europaea L.-Sostenibilità e adattamento al cambiamento climatico dell'agroalimentare. Agro-biodiversity and traceability in Olea europaea L.-Climate change adaptation and sustainability of the agro-food sector.	Olive cultivar: Leccino, Frantoio, Moraiolo, San Felice, Carolea, Ottobratica, Coratina, Ogliarola, Casaliva, Nocellara, Arbequina, Manzanilla, Picholine, P. Marocaine e Kalamon.
Progetto REGEFRUP Atlante dei Frutti Antichi di Puglia PSR Puglia 2014-2020	All fruit varieties found in biodiversity fruit project
Renna, M., D'Imperio, M., Gonnella, M., Durante, M., Parente, A., Mita, G., ... & Serio, F. (2019). Morphological and chemical profile of three tomato (Solanum lycopersicum L.) landraces of a semi-arid mediterranean environment. Plants, 8(8), 273.	Tomato (Solanum lycopersicum L.): Manduria, Crispiano, Regina
Renna, M., Montesano, F. F., Signore, A., Gonnella, M., & Santamaria, P. (2018). BiodiverSO: A case study of integrated project to preserve the biodiversity of vegetable crops in Puglia (Southern Italy). Agriculture, 8(8), 128.	Polignano carrot; Catalogna chicory cultivated group (Cichorium intybus L.) "puntarelle"

Renna, M., Serio, F., Signore, A., & Santamaria, P. (2014). The yellow–purple Polignano carrot (Daucus carota L.): a multicoloured landrace from the Puglia region (Southern Italy) at risk of genetic erosion. Genetic resources and crop evolution, 61(8), 1611-1619.	yellow-purple Polignano carrot
Renna, M., Signore, A., Montesano, F. F., Gonnella, M., & Santamaria, P. (2019). Biodiversity of Vegetable Crops, A Living Heritage.	All the vegetable crops found in biodiversity project
Renna, M., Signore, A., Paradiso, V. M., & Santamaria, P. (2018). Faba greens, globe artichoke's offshoots, crenate broomrape and summer squash greens: Unconventional vegetables of Puglia (Southern Italy) with good quality traits. Frontiers in plant science, 9, 378.	Globe artichoke (Cynara cardunculus L. subsp. [L.] scolymus Hayek), summer squash (Cucurbita pepo L.) and faba bean (Vicia faba L.)
Rita, A., Conversa, G., Luigi, R., Gabriella, S., & Pietro, S. (2018). Nuovo Almanacco BiodiverSO-Biodiversità delle Specie Orticole della Puglia. Università degli Studi di Bari.	Offshoots (so-called cardoni or carducci) of globe artichoke; cardoons (C. cardunculus L. var. altilis DC). The stems, petioles, flowers and smaller leaves of summer squash (so-called cime di zucchini) chicory (Cichorium intybus L.) and Swiss chard (Beta vulgaris L.). Apex of faba beans (so-called cime di fava); crenate broomrape (Orobanche crenata Forssk.), root parasite plant that produces devastating effects on many crops (mostly legumes), is used like asparagus (Asparagus officinalis L.)

Sardaro, R., Bozzo, F., Petrillo, F., & Fucilli, V. (2017). Measuring the financial sustainability of vine landraces for better conservation programmes of Mediterranean agro-biodiversity. Land Use Policy, 68, 160-167.	50 regional vine landraces and case study on Uva di Troia and Somarello rosso.
Sardaro, R., Fucilli, V., Acciani, C., Bozzo, F., Petrontino, A., & Girone, S. (2016). Agro-biodiversity: an economic evaluation of benefits provided to regional community by the Apulian olive landraces. Rivista Italiana di Economia Demografia e Statistica, 70(3).	Socio-economical analysis of Apulian Olive landraces (all)
Sardaro, R., Girone, S., Acciani, C., Bozzo, F., Petrontino, A., & Fucilli, V. (2016). Agro-biodiversity of Mediterranean crops: farmers' preferences in support of a conservation programme for olive landraces. Biological Conservation, 201, 210-219.	Farmers' preferences in support of a conservation programm for all Apulian landraces.
Scarano, A., Semeraro, T., Chieppa, M., & Santino, A. (2021). Neglected and Underutilized Plant Species (NUS) from the Apulia Region Worthy of Being Rescued and Re-Included in Daily Diet. Horticulturae, 7(7), 177.	Roquette, Eruca vesicaria L. Cav. (formerly E. sativa Mil; Diplotaxis tenuifolia L; D. melanogaster; Salicornia (Salicornia patula); Salina dei monaci"; Purslane (Portulaca oleracea; Leopoldia comosa L.; Milk thistle (Sylibum marianum L.; Cynara cardunculus L. and Scolymus hispanicus L. (golden thistle)
Signore, A., Renna, M., D'Imperio, M., Serio, F., & Santamaria, P. (2018). Preliminary evidences of biofortification with iodine of "Carota di Polignano", an Italian carrot landrace. Frontiers in plant science, 9, 170.	Polignano carrot

Somma, A., Palmitessa, O. D., Leoni, B., Signore, A., Renna, M., & Santamaria, P. (2021). Extraseasonal Production in a Soilless System and Characterisation of Landraces of Carosello and Barattiere (Cucumis melo L.). Sustainability, 13(20), 11425.	Landraces of Carosello and Barattiere (Cucumis melo L.) 'Allungato' and 'Tondo', Carosello 'Scopatizzo' and 'Tomentoso' (CAT)

2.a.3 Regional projects for the recovery of agro-biodiversity

Biodiversity is a complex of communities of plants, animals and microorganisms in continuous evolution, which interact with the environment and human action. Ecosystems with more species have been shown to be better preserved. This is also why the EU wanted to start a process that would reduce the high extinction rates of species and restore natural ecosystems as much as possible. This community guideline has been acknowledged by the member states and by the European regions through the implementation of 2 EAFRD programming cycles in which the objective of safeguarding agricultural biodiversity has been explicitly stated. In the context of the Puglia RDP 2007-2013 and the Puglia RDP 2014-2020, 5 integrated projects were carried out which contributed to this objective.

The studies launched thanks to the integrated projects for the conservation and enhancement of genetic resources in agriculture offer a huge wealth of resources and information in reference to 5 species groups of the Apulian Agrobiodiversity: **olive tree (Re.Ger.OP. Project), grapevine (Re.Ge.Vi.P. project), fruit trees (Re.Ge.Fru.P. project), vegetables (BiodiverSO project) and herbaceous (SaveGrain project).** The information relating to the activities and results obtained in carrying out the aforementioned regional germplasm recovery projects is summarized below.

Arboreal species

Fruit

As for the Apulian fruit tree species, the Pugliese Fruit Germplasm Recovery project (Re.Ge.Fru.P) represented a first real knowledge base regarding all the fruit species cultivated in the region. The Re.Ge.Fru.P integrated project has the primary objective of recovering the lost native Apulian fruit varieties and enhancing their properties.

As explained in the project, in fact, the Mediterranean is one of the richest centers in the world in plant genetic diversity since it is a region of ancient agriculture, of strong migrations, characterized by vast mountainous areas and highly diversified environments for climate conditions and of land.

With the advent of industrial fruit growing, the varietal landscape has undergone considerable changes over the years as a result of the continuous introduction of new cultivars. Thus, the old ones have been progressively replaced by others, characterized by a high adaptability to mechanized cultivation, a greater production potential with large fruits, very colorful, resistant to manipulation, but with a not excellent organoleptic quality.

The renewed focus on minor agricultural species and local varieties represents a great opportunity to develop projects for the collection, conservation, evaluation and sustainable use of biodiversity.

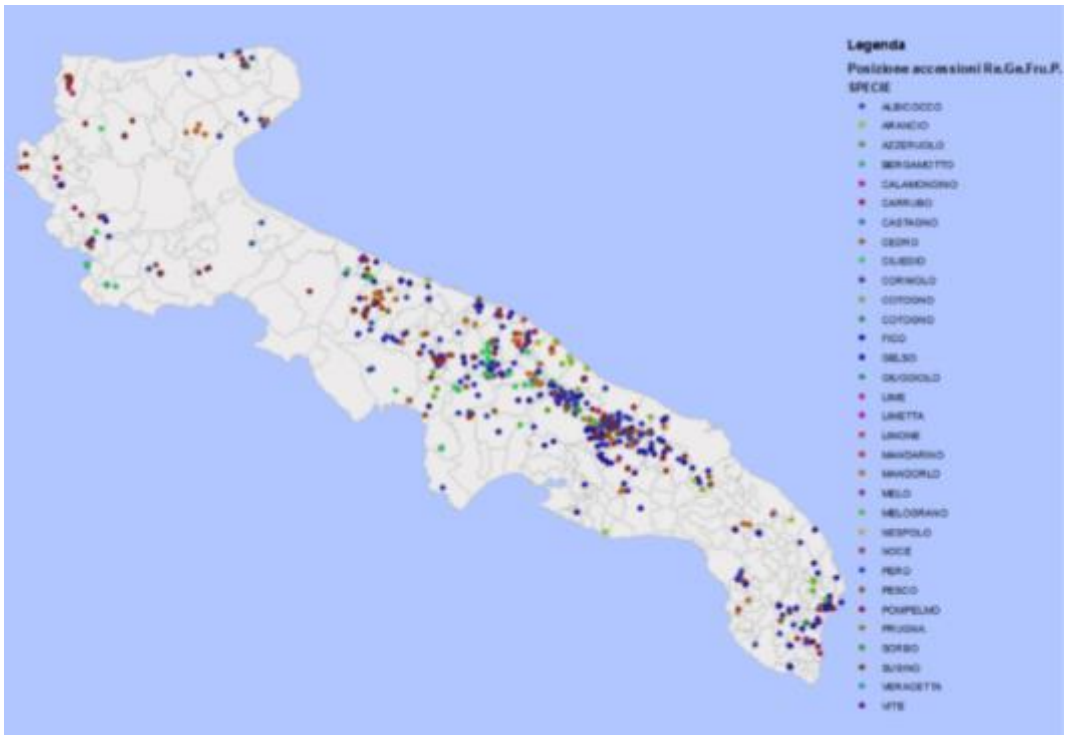
In Puglia there are several indigenous varieties, in danger of extinction, characterized by a high value both for vegetative characteristics and for productive aspects (eg Percoco di Turi). Among the arboreal plants, in addition to vines and oil, figs, citrus fruits, the various stone fruits and pome fruits, represent characteristic elements of the Apulian territory.

The Apulian territory, for bioclimatic reasons, has always expressed its vocation for dry fruit growing, becoming an important element of the economy of numerous farms. The representative tree of this type of arboriculture is certainly the olive tree which in marginal lands is replaced by an income-bearing fruit particularly linked to this land, namely the almond tree. Among the native Apulian fruit trees there is another even more representative plant, the fig, present in the territories of Brindisi, Salento, Murge and Gargano.

The agricultural landscape of Puglia was also characterized by other essences such as pear, carob, citrus, pomegranate, quince, mulberry, rowan, medlar used mainly for the nutrition of farmers . Most of the native Apulian varieties and of the intrinsic pomological characteristics, with the advent of intensive agriculture, have been gradually lost.

Among the project results it is possible to include:

- 107 digitized documents (monographs, articles in periodicals, extracts, conference reports, catalogs);
- over 1100 accessions belonging to over 400 names of fruit bearers;
- 268 accessions present in the existing collection fields
- 697 accessions inserted in the new collection fields
- over 960 morphologically characterized accessions
- more than 149 local almond cultivars preserved in germplasm banks
- 156 Apulian autochthonous varieties / accessions rehabilitated from a phytosanitary point of view
- over 960 pomological and phytosanitary cards produced
- over 1200 biodiverse plants belonging to the almond, fig, pear, cherry, apple and other minor fruit species



Olive tree

As for arboriculture in Puglia, the olive tree (Olea europea L.) has the richest germplasm, consisting of thousands of varieties in cultivation and populations of wild olive trees (oleaster) widespread in the Mediterranean area, Africa, Asia and Australia. In Puglia the olive tree is the plant par excellence and constitutes an inseparable element of the agricultural landscape.

The entire genetic variability of the species has remained almost intact until today thanks to the particularity of the plants, the adaptation to the different micro-environmental and climatic conditions of the cultivation areas and the failure to replace traditional varieties with new improved genotypes.

The very rich native varietal platform constitutes a source of unexplored genetic variability and useful both in programs for the enhancement of local olive growing and in those of genetic and health improvement.

Olive growing is a prime resource for the Puglia region which hosts a vast and ancient varietal heritage largely to be characterized and enhanced, in order to guarantee added value to the production of oil and table olives.

For this reason, there is a real need for an accurate identification and varietal characterization, which examines the complex genetic relationships existing among the hundreds of cultivars of the vast Apulian

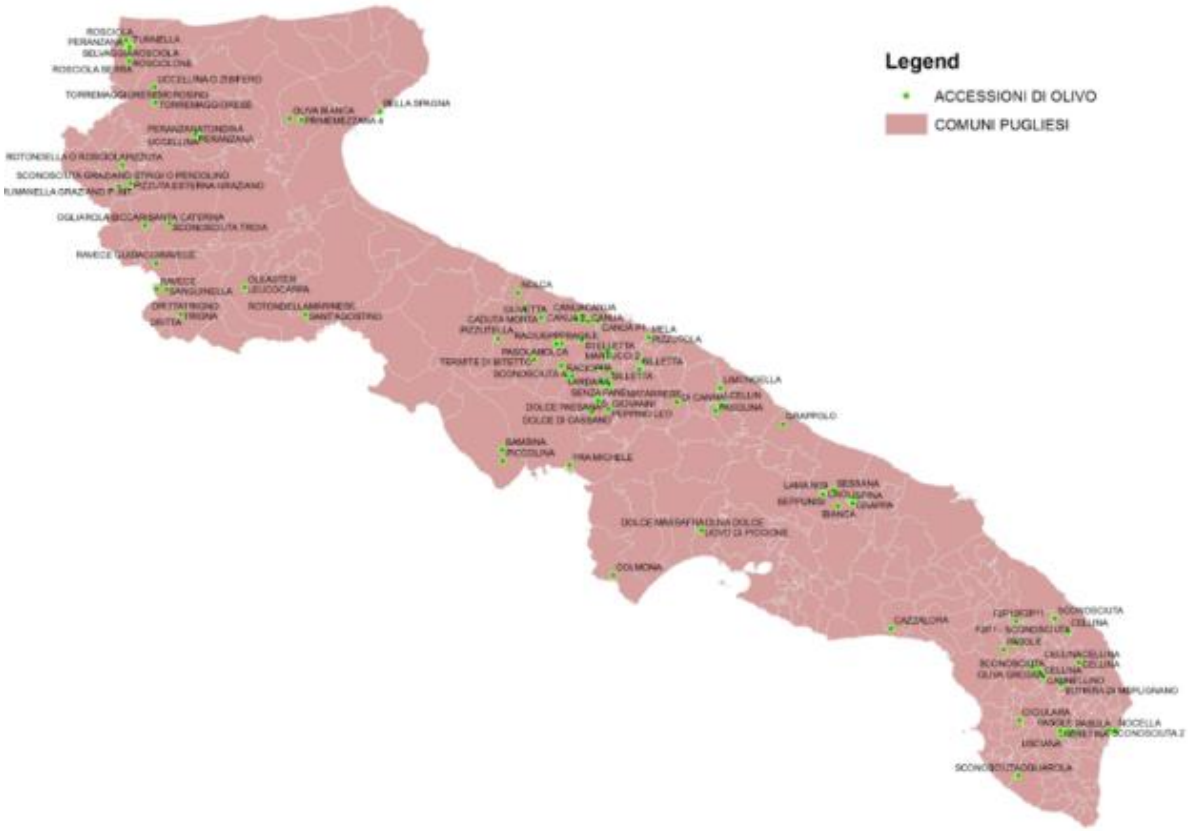
olive growing panorama and allows for a reorganization for an enhancement of the regional olive germplasm.

The integrated project Recovery of the Apulian Olive Germplasm (Re.Ger.OP) was born precisely as a response to these needs and has made a contribution to the Apulian olive biodiversity through cataloging, characterization, conservation, rehabilitation of the local germplasm, evaluation economic analysis of the services provided and the historical and social investigation of the uses of the products of the olive growing accessions concerned.

The goal is to protect agricultural biodiversity by placing oil at the center of the regional historical, environmental and cultural heritage.

Regarding the project on the study of the Apulian olive germplasm, the results obtained include:

- consultation of over 39 archives archives / libraries, 10 notary offices and ecclesiastical sites consulted and over 420 documents found
- 2 economic surveys with over 960 interviews with agricultural operators and the Apulian community.
- 30 meetings in the area to collect reports on the germplasm to be recovered
- over 300 inspections in the area in search of the lost germplasm!
- over 550 georeferenced plants in the area
- 250 accessions placed in the collection fields
- 181 new accessions selected from scratch
- 10 olive tree collections implemented
- 12 It has more of areas reserved for native germplasm
- 146 accessions characterized on a morphological and bioagronomic level and drafting of as many files.
- monovarietal oils obtained
- 250 accessions characterized at the molecular level
- 300 plants tested from a phytosanitary point of view, 83 rehabilitated accessions and the establishment of 59 primary sources.
- Creation of 146 elaiographic cards
- Increase of 5 private collections for the in situ conservation of the olive tree



Wine vine

As stated in the Re.Ge.Vi.P. Project for the recovery of the Apulian Viticultural Germplasm , agriculture can and must satisfy human needs in a sustainable way, keeping natural resources intact and avoiding the degradation of the environment, in order not to compromise the development of future generations.

According to FAO: "The genetic diversity of the plants we grow and feed on and their wild relatives could be lost forever, with a serious threat to food security, if an effort is not made not only to conserve them but also to use them" .

The aging of the rural population, particularly in the inland areas of the Gargano, Daunia, Murgia and Salento, has brutally interrupted the inter-generational transfer: more than a physical extinction of the vines, there has been a serious loss of knowledge and memory! In many cases the varieties have been saved thanks to ex situ conservation fields, at Scientific Bodies, pending a return to cultivation, for a redemption that has recently begun only for some varieties (Susumaniello, Minutolo, Maresco).

Puglia is a region rich in agricultural bioversity , in particular viticultural, for historical and geographical reasons.

By virtue of its position in the Mediterranean, Puglia has been a crossroads of trade and a meeting point for people and peoples for thousands of years. For these reasons and for the vocation of the territories, it is the home of many native or local vines, often in danger of extinction (minor vines), little known, forgotten or known with wrong names, sometimes related or synonyms of more important vines elsewhere.

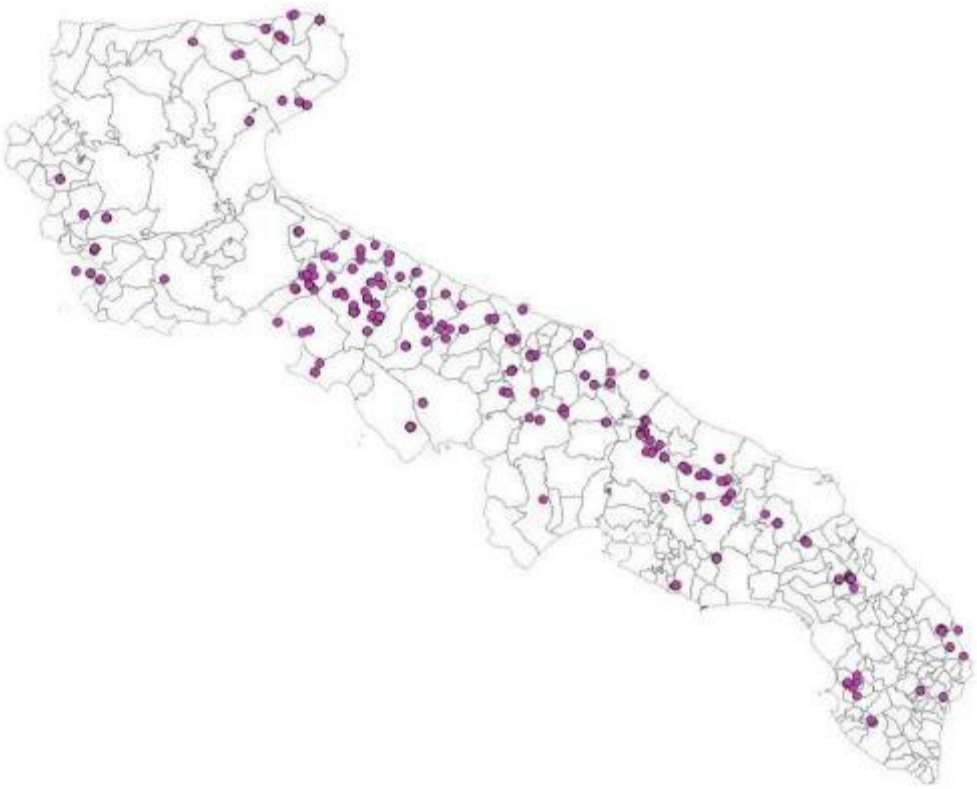
Recently the market is rewarding those few entrepreneurs who have successfully invested in some ancient genetic resources, bringing them back into cultivation and on the label.

The integrated project for the recovery of the Apulian Viticultural Germplasm has the objective of ensuring the conservation of the intraspecific and intravarietal viticultural biodiversity , improving the knowledge on the productive and technological characteristics of the Apulian vines, restoring and registering the propagation materials in the National Register of Vine Varieties to allow its use in accordance with legislation.

With regard to the development of the project on the study of Apulian viticultural germplasm, the following results were obtained:

- 39 sites explored (22 libraries and 4 regional archives, 13 extra-regional libraries), 13 online databases and 674 documents digitized and inserted in the digital archive.
- 70 meetings carried out throughout Puglia
- 205 names in the list, 47 varieties present in the recovered list, 112 names resulting from the field activity and not present in the list, 101 new names deriving from the bibliographic search
- 91 sites identified for ex situ conservation
- 153 accessions launched for morphological characterization analyzes
- identification of numerous new genotypes / varieties
- identification of several cases of synonymy and homonymy
- over 400 accessions analyzed from a morphological, molecular, technological and phytosanitary profile.
- 106 varieties / accessions healed
- 600 accessions detected, entered and geo -referenced in the project GIS
- Drafting of ampelographic, pomological and phytosanitary cards of the indigenous Apulian vines

- Presentation to the MiPAF of the dossier for official registration / homologation to the National Catalog of variety of grapevine.
- Creation of collection fields of biodiversity (varietal and intravarietal) regional viticulture with an educational / dissemination function



Vegetable species

In accordance with the International Treaty on Plant Genetic Resources for Food and Agriculture (RGV), in the project "Biodiversity of the horticultural species of Puglia" (BiodiverSO) reference is made to two RGV: cultivated varieties and spontaneous species. A cultivated variety reproduces by seed or by vegetative propagation and represents a variable population, however easily identifiable and which usually has a local name; it has not been the subject of an organized genetic improvement program, is characterized by a specific adaptation to the environmental and cultivation conditions of a given area and is closely associated with the uses, knowledge, habits, dialects and recurrences of the human population who developed it and / or continues its cultivation. Instead, spontaneous species are species that have not

undergone the process of domestication, are therefore not cultivated, but are used by humans for food purposes.

As a premise to the project activities, it is stated that, in the Apulian territory, a thorough and systematic survey of the vegetable RGVs present has not been carried out. Germplasm conservation actions are often entrusted to the initiatives of individual farmers who pass on seeds or other parts of plants from generation to generation, and to ex situ conservation which is normally practiced by public bodies, such as CNR and Universities. The re-evaluation of genotypes of local varieties and / or their rehabilitation can broaden the genetic basis of the horticultural sector allowing better tolerance to biotic and abiotic stresses, to safeguard the health of the consumer and the environment, as well as to enhance some typical Apulian products.

Italy, and Puglia in particular, represents the center of domestication and / or diversification of some crops, such as for example some Brassicaceae, artichoke, melon, etc. Puglia is particularly rich in cultivated varieties of vegetables: carrots from Polignano and Sant'Ippazio, among the Apiacee; onion from Acquaviva and Margherita, among the Liliacee; cauliflower, broccoli - black top, kale, mugnoli - and turnip tops, among the Brassicaceae; immature melon - carousel and barter - and in winter, among the Cucurbitaceae; chicory - from Molfetta, Galatina, Otranto - and artichoke, among the Asteraceae; the Regina tomato and the Manduria tomato, among the Solanaceae. Some of these cultivated varieties have been included in Annex 8 of the Puglia RDP 2007-2013, which includes 14 local varieties of vegetables at risk of genetic extinction (of which only six have received applications for aid from custodian farmers), others are included among the Traditional Agri-food Products (PAT).

The main purpose of the integrated BiodiverSO project was to contribute to achieving a significant reduction in the erosion rate of the biodiversity of Apulian horticultural species by intervening on all the local varieties listed in Annex 8 of the PSR Puglia 2007-2013 (and therefore on cauliflower, cabbage, broccoli, artichoke, tomato, batata, carrot, chicory, melon), as well as on carousel, barter, turnip greens, catalonia chicory, onion, St. Hippatius carrot, winter melons, chard and cowpea.

After having found the horticultural genetic resources at risk of genetic erosion in the Apulian territory, they were cataloged (using computerized tools), preserved and characterized.

Other information (place of collection, farmer or other holder, etc.), or the so-called "passport data", has been combined with the access identification code. All these data made it possible to uniquely identify an access, in order to avoid cases of homonyms, overlaps and other elements of confusion. An element of confusion, both for accessions and for local varieties, is their denomination. Sometimes, in fact, a single denomination is not applied to a certain resource, but numerous denominations (synonyms), or vice versa the same name is used to indicate different resources (homonyms).

An integrated strategy was applied to the Project, which includes, with mutual support, ex situ, in situ and on farm conservation.

Ex situ conservation, in addition to guaranteeing the use of germplasm, has the role of safeguarding the varieties threatened with disappearance from extinction in order to attempt a subsequent reintroduction. For example, in the case of the Gallipoli melon, the Morciano melon and the Morciano tomato, ex situ conservation becomes the mandatory conservation tool, because these sensu lato populations are no longer cultivated due to the effects of anthropogenic activity, and in particular of the introduction of modern varieties.

The ex situ conservation of the plants is carried out in different ways: collections of plants in the field (catalog fields of turnip tops, onion, Catalonian chicory, carousel, barattiere, Regina tomato, chard and alimurgic garden), collections of seeds maintained " in double ", by IBBR-CNR and DISSPA-UNIBA, in their seed banks, collections of propagation material maintained in vitro (for the local varieties of artichoke and Batata from Lecce, which propagate vegetatively, and the varieties of melon of Gallipoli and Morciano, at risk of extinction), from DISAAT-UNIBA, in conditions of slowed growth, to allow to keep the material in healthy conditions, in small spaces and at low cost.

The phases in which the organization and monitoring of in situ / on farm conservation have been explained are the following:

1. collection of information on existing local varieties (inventory) and collection of propagation material for ex situ safety conservation and characterization activity;

2. identification of the areas to be assigned primarily to in situ / on farm conservation (choice of the areas where to implement, with priority, promotion, organization and monitoring activities);

3. characterization and evaluation of the distinguishability of local varieties;

4. assessment of the size of the populations and of the genetic structure of local varieties kept in situ / on farm;

5. construction and management of an information system relating to the conservation work in situ / on farm, creation and management of this website.

The objective of in situ / on farm conservation is to maintain the current and potential usefulness of genetic resources to meet the needs of current and future generations, also intervening in the farms of so-called custodian farmers, to protect the rights of farmers.

The correct identification of materials, which becomes fundamental for the correspondence between a certain genetic identity and a certain name, is established after morphological and molecular characterization.

The morpho-agronomic characterization involved all the local varieties taken into consideration, while the genetic one concerns: Margherita onion, Acquaviva onion, carousel, barattiere, winter melon, Manduria tomato (using deep sequencing), artichoke (one of the varieties healed by deep sequencing performed before and after remediation), etc.

The knowledge system has been strengthened through the formation of an efficient regional biodiversity network that has brought together farmers-custodians (holders of local varieties), farms, stakeholders (agritourisms, agri-food industry, catering), local authorities responsible for enhancement of environmental, cultural and historical-architectural resources. All this is aimed at a redevelopment of the territory both from an environmental and an economic point of view, with the activation of micro -supply chains to support the existing ones.

The results obtained by the project include the following:

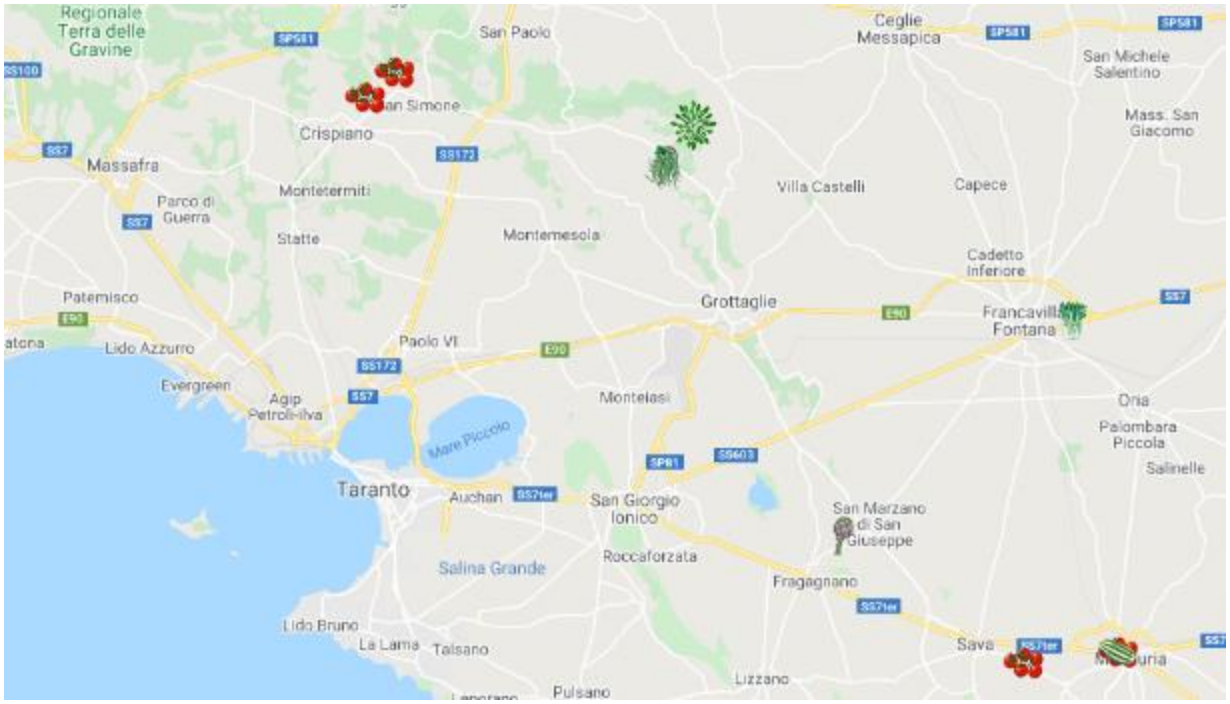
- Through historical investigations it has been possible to recover 243 documents so far, of which the oldest dates back to 1768; in addition, interviews, films, geo -referenced photos and 125 thematic maps were made
- Through territorial surveys, geographic and topographical information was acquired on the cultivation areas of horticultural varieties of specific interest. Thanks to this activity, 345 companies were visited and 528 descriptive cards were prepared. The material was also cataloged through photographic documentation and posters. Furthermore, the birth of the Regional Network of Horticultural Biodiversity has made it possible to promote and disseminate the exchange of information among the interested parties by involving them in a participatory process of exchange of knowledge and knowledge.
- The *ex situ conservation* was implemented through the creation of catalog fields, that is collections of plants in the field, of seed collections also kept "in duplicate" in the seed banks, collections of propagation material, in vitro or in conditions of slowed growth, to keep the material in health conditions, reducing space and costs.
- carrying out laboratory analyzes to determine the qualitative-nutritional characteristics of the plant resources under study. Furthermore, by identifying genetic resources for their uniqueness, typicality and genetic diversity, it was possible to promote and establish

actions to enhance local and traditional products to safeguard the genetic heritage and the territorial areas that hold them.

- Registration of Apulian Traditional Agri-food Products (PAT) in the national catalog. Of the 122 horticultural varieties studied and published in the BiodiverSO Almanac (ECO-logical publisher 2015) 51 have the PAT trademark linked to the consolidated presence in the territory of the variety or product and the use of traditional production methods (ten PATs have been registered thanks to to the BiodiverSO Project), and two the Protected Geographical Indication (PGI) mark
- Web GIS with thematic cartography collection and App for smartphones and tablets to have Apulian horticultural biodiversity within your "pocket"
- creation of printed and multimedia publications as well as editorial products aimed at disseminating the results of the Project.

Extracts from the WebGIS BiodiverSO related to the three areas of interest for the BEST project.


Monopoli
Cozzano
Capitolo
Antonelli
L'assunta
Savelletri
Fasano
Torre Canne
Selva di Fasano
Pezze di Greco
Coreggia
Alberobello
San Marco
Speziale
Montalbano
Caranna
Villanova
Costa Merlata
Locorotondo
Cisternino
Casalini
Zona Sisri
Specchiolla
Ostuni
Sisto
Carpari
Villaggio del Fanciullo
Martina Franca
Galante
Carovigno
Serranova


Regionale Terra delle Gravine
San Paolo
Ceglie Messapica
San Michele Salentino
Crispiano
Massafra
Mass. San Giacomo
Montetermiti
Villa Castelli
Capece
Parco di Guerra
Statte
Montemesola
Cadetto Inferiore
Patemisco
Grottaglie
Francavilla Fontana
Lido Azzurro
Paolo VI
Evergreen
Agip Petroli-Ilva
Montelasi
Oria
Palombara Piccola
Salinelle
Taranto
Auchan
San Giorgio Ionico
San Marzano di San Giuseppe
Salina Grande
Roccaforzata
Fragagnano
Lido Bruno
La Lama
Talsano
Sava
Lizzano
Pulsano

Herbaceous species

In the past, Puglia was particularly rich in local varieties of legumes and grain cereals, cultivated alternately following the traditional techniques of crop rotation or rotation used for centuries in agriculture to preserve the fertility of the soil. The genetic diversity existing in these ancient varieties, well adapted to the pedoclimatic conditions of the regional territory, has long been threatened by erosion resulting from the progressive diffusion of new, more productive varieties. Farmers, the scientific community and the most attentive Apulian politicians have underlined the importance and urgency of recovering, preserving and preserving this ancient and precious regional varietal heritage in Banks of the Germplasm. For the local Apulian varieties of legumes and grain cereals, it was possible to record a lack of historical information, on the origins, traditions, uses and popular knowledge, on the reasons that contributed to their persistence in some areas and of precise data on their current diffusion on the territory, phytosanitary status, genetic structure, nutritional and qualitative characteristics. There are also insufficient structures aimed at promoting, disseminating and enhancing this ancient cultural heritage closely connected to the Mediterranean diet now recognized as an intangible heritage of humanity. The primary objective of the project for the recovery, characterization, safeguarding and enhancement of legumes and cereals from GRAnella and forage in Puglia (SaVeGraINPugli) was therefore the recovery, characterization, protection and enhancement of legumes and grain and forage cereals in Puglia. The local Apulian varieties have been found in the different areas and regional habitats characterized, where possible recognized as autochthonous and safeguarded by applying Regional and International protection protocols.

The monitoring of the territory has allowed the recovery of historical information and reproductive material relating to the local varieties of legumes, cereals and forage still cultivated in specific areas of Puglia. The definition of some distinctive features of these varieties obtained thanks to the investigations carried out in the field and in the laboratory has initiated conservation programs at the seed banks and the areas of origin. Finally, the dissemination activity has made the farmers who are custodians of these varieties more aware and facilitated the creation of commercial and legislative paths as well as micro-chains of niche products.

The Catalogs collect the results of historical surveys conducted, monitoring of the territory, average morphological data collected on several samples, genera, species, subspecies or botanical varieties. An extensive photographic gallery highlights some of the main phenological phases of the collected plants and details of the seeds, flowers, fields where they are grown and some data from the laboratory investigations carried out.

Project presentation video:

https://www.outreach.cnr.it/2020/un-filmato-per-savegrainpuglia/

Fig. 3. Località di reperimento dei campioni di leguminose.

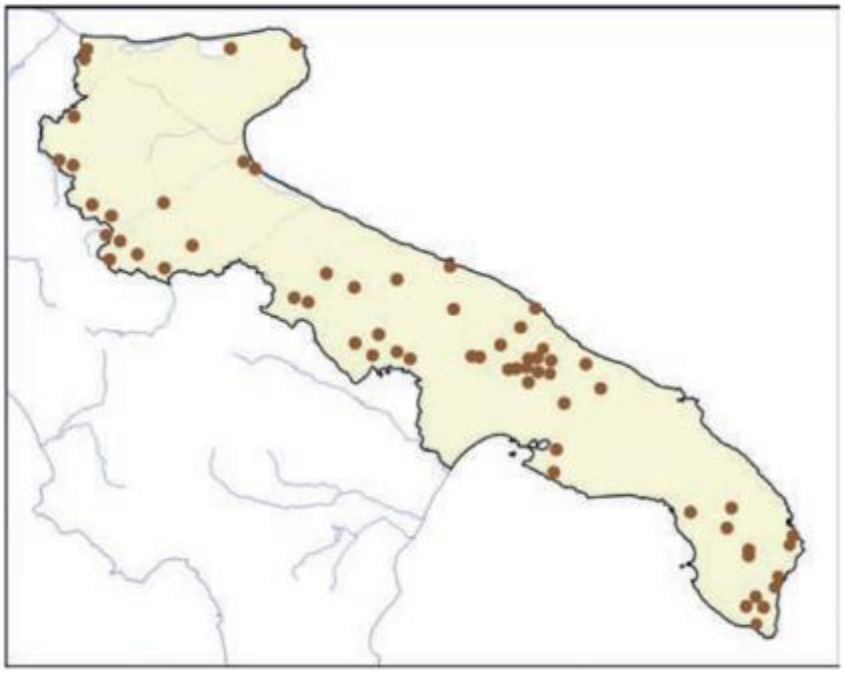


Fig. 3. Località di reperimento di varietà locali di cereali.

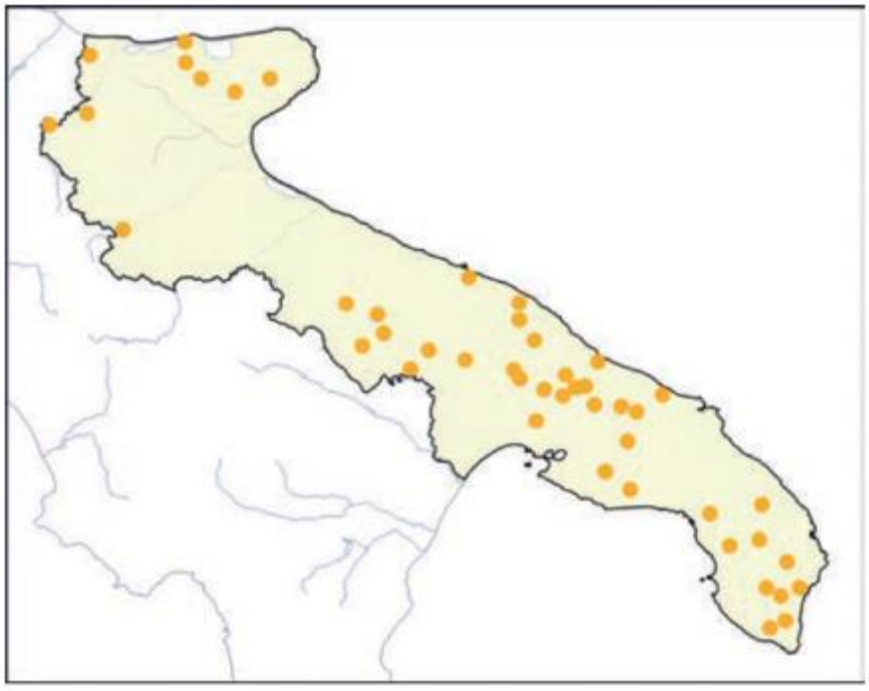
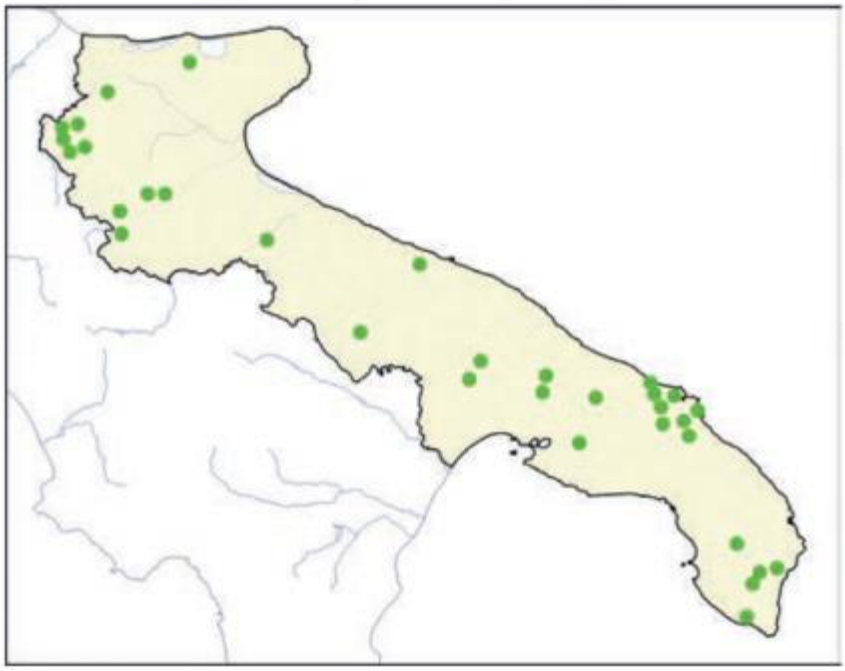


Fig. 2. Località di reperimento dei campioni di foraggere.



2.b Species of the project areas and crops common to the transboundary territory

The following lists are the result of an in-depth examination of the state of the art (historical survey, scientific literature, analysis of the results of integrated projects on Biodiversity, analysis of other projects). The above-mentioned cognitive analysis is essentially of desk type and therefore, as specified in the object of the service, only integrated with field analysis. The integration of the cognitive analysis through field visits does not constitute a census of the varieties present in the three areas, which would be possible only by extrapolating the information contained in the AGEA database of the files of the companies that own land in the areas under investigation. This type of information, however, would only give a partial idea of the current state of the agricultural species cultivated in the three areas. In order to remedy this lack of information, it would be appropriate to have available the historical information from the AGEA files in order to carry out a systematic check on the specific modifications that have affected the agricultural entrepreneurship in recent times.

The integration of the cognitive analysis therefore consisted in a reconnaissance carried out on the areas of interest in order to gather information that could be used in such a way, to develop a general description of the current agricultural and pastoral complex and to identify the actors capable of providing information on the current state and, in some cases, on the previous state (ancient agricultural entrepreneurs). At this point, regarding the surveys carried out, an essential clarification must be made: the permanence of a species in an area also depends on the intrinsic characteristics associated with its cultivation classification. To this end, it is necessary to distinguish the agricultural species under analysis into two main categories: annual crops and polyannual crops. To the former belong vegetable species, legumes, fodder crops and cereals. To the second belong the woody fruit species (olive, vine, fruit trees) and herbaceous perennial species such as artichokes. For the arboreal species it is certainly possible to find arboreal plants or individuals that remain in agricultural territories in isolated specimens. However, it must be pointed out that the certain identification of the variety can take place only after the morphological and molecular characterization (object of the next phase of the service). As far as the category of herbaceous crops is concerned, the annual and even seasonal variability that distinguishes them makes it completely impossible to establish whether they have been lost or whether their absence derives from a sort of crop rotation. The aspect of the period in which the surveys were carried out is not secondary: the autumn-winter period is often synonymous with the rest of the soil which is only prepared to host crops with a spring cycle. Therefore, it is assumed that field reconnaissance needs to be extended into the following months. A more reliable source of information comes from the analysis of the farm files in which for each parcel is indicated the crop and therefore also the species, more rarely the variety cultivated.

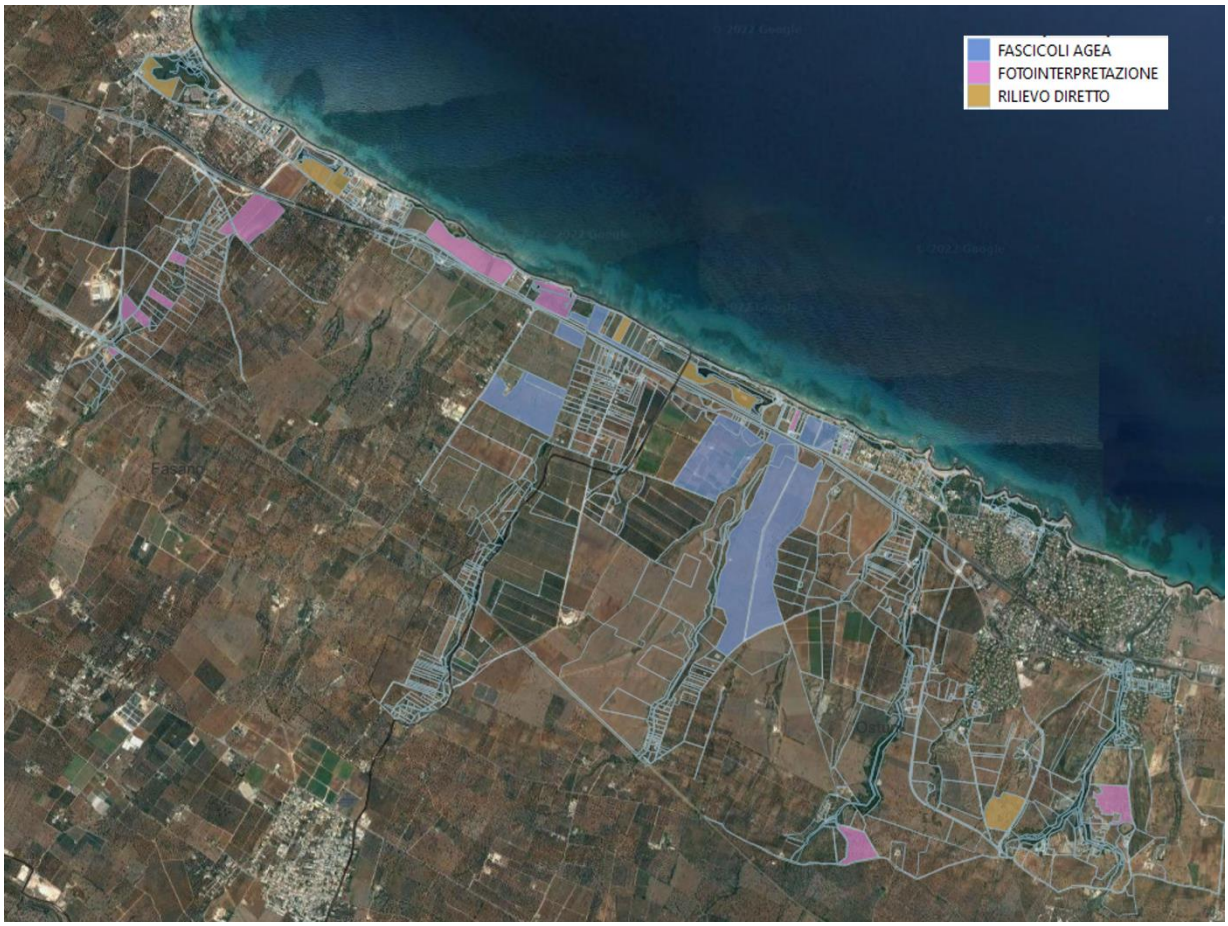


Figura 2 Sources reported in project database for crop identification

As for the species of interest for the three territories under examination, the following is a non-exhaustive list of those currently cultivated and those which could be cultivated or have been lost, on the basis of scientific literature and of the reports collected in the integrated projects of Biodiversity,

As mentioned above, the historical comparison was possible only through the collection of direct evidence from farmers of the three areas: a survey that it was appropriate to extend to neighboring territories. The reconnaissance consisted in the collection of the testimonies of some old local farmers who gave often brief and discontinuous indications about the species now lost and even less about the cultivation techniques traditionally used. The lists resulting from the bibliographical analysis carried out were substantially confirmed by the historical evidence collected. Finally, on the basis of these records, there were no additional reports with respect to those listed, or at least no certain elements about other varieties lost and no longer cultivated.

The trans-frontal territory of the westernmost regions of Greece presents considerable similarities in the spread of the most common agricultural species in these territories. The territory of the western regions of Greece (Epirus, the region of Western Greece and the Ionian Islands) is mostly hilly and is interspersed with open flat areas close to the coast where the cultivation of vines, olives, tobacco and citrus fruits has developed. In these territories the development of pastoralism has given a considerable boost to the cultivation of fodder species and the use of the most inaccessible territories for grazing and natural pasture.

The history of Mediterranean settlement, trade and cultural influence suggests the commonality of the genetic heritage of some species between the two shores of the Ionian and Adriatic seas. In fact, the Greeks colonized the southern area of Apulia and evidence of genetic flows between Greece and Apulia has been observed, especially for Grapevine and Olive, which are the most cultivated species in the two regions. Later (**par. 2.b.4**) we give an account of this genetic proximity for the two species, reporting the results of two studies that confirm this thesis and return the list of varieties of vine and olive tree with the greatest genetic proximity.

The following three paragraphs **(2.b.1, 2.b.2, 2.b.3**) list the species whose presence is documented by historical, documentary, cartographic, scientific and field reconnaissance activities. The species listed are indicated as present if their existence in the area is supported by direct surveys or documentary evidence (company files). If the documents consulted or the field visits have not allowed the unambiguous identification of the species, but only the generic indication of the crop, the possible presence in the area in question is indicated. For each of the three areas, an extract of the cartographic elaboration resulting from the above-mentioned activities is provided, in which the indication of the crop recorded in the project database is reported.

2.b.1 - "Costa Ripagnola" Natural Regional Park

Species list and map extract of the project database

Tabel 1 Costa Ripagnola Park Species List

Cultivation	Species (variety)	Presence in the area
Arboreas	Olive tree (common oil and table varieties)	Present
Arboreas	Grapevine (common varieties for wine and table)	possible presence
Arboreas	Pear tree (Pirus communis)	possible presence
Arboreas	Apricot (Prunus armeniaca)	possible presence
Arboreas	Plum tree (Prunus domestica)	possible presence
Arboreas	Fig (Ficus carica)	possible presence
Arboreas	Carob tree (Ceratonia siliqua)	possible presence
Arboreas	Prickly pear (Opuntya ficus indica)	Present
Cereals	Wheat (Triticum spp.)	Possible presence
Cereals	Barley (Hordeum vulgare)	Possible presence
Cereals (F)	Oats (Avena sativa)	Possible presence
Cereals (F)	Triticale (Tritico secale)	Possible Presence
Legumes (F)	Broad bean (Vicia faba)	Possible Presence
Legumes	Pea (Pisum sativum)	Possible presence
Legumes	Chickpea (Cicer arietinum)	Possible presence
Legumes	Chickling vetch (Lathyrus sativus)	Possible presence
Legumes	Lentil (Lens culinaris)	Possible presence
Legumes	Bean (Phaseolus vulgaris)	Possible presence
Fodder	Vetch (Vicia sativa, villosa, pannonica, narbonnensis)	Possible presence
Fodder	Fodder pea (Pisum arvense)	Possible presence
Fodder	Clover (Trifolium incarnatum, squarrose, alexandrine, pratense)	Possible presence
Fodder	Alfalfa (Medicago sativa)	Possible Presence
Vegetables	Leaf, flower or root vegetables (all)	Present

Figure 3 Extract from the map of cultivated species in Costa Ripagnola Park (North)

Figure 4 Extract from the map of cultivated species in Costa Ripagnola Park (South)

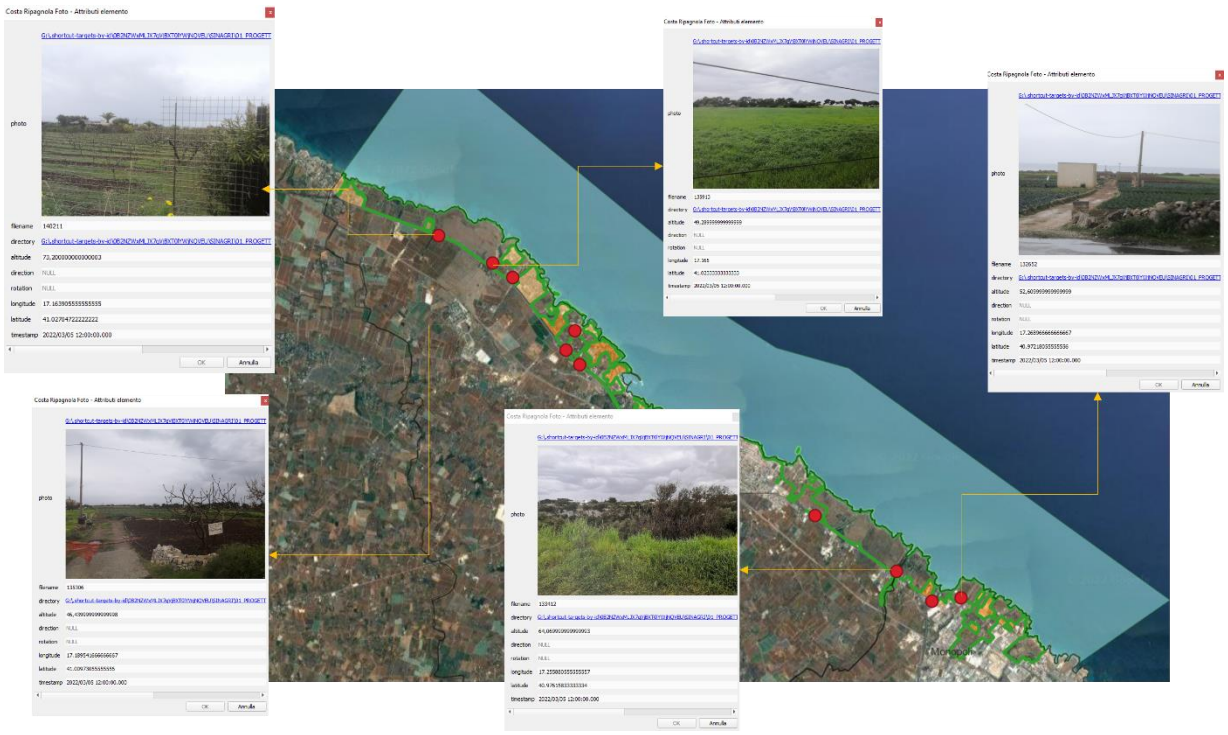


Figura 5 Geo-tagged photographs taken during field surveys conducted at Costa Ripagnola. Photographic geodatabase shot points and cards.

Agriculture in the Costa Ripagnola Park

For the areas involved in the upcoming Park of Costa Ripagnola, as a result of field investigations, it is confirmed that the territories under examination are basically cultivated with arable land, with the predominance of the varieties mentioned above, including the production of Senatore Cappelli durum wheat. It is also confirmed that the lands are currently involved in the cultivation of fodder and that farmers have almost completely neglected the cultivation of vegetables, if not inserting it in a cycle linked to the alternation of production, especially for smaller plots and for some plots close to the city of Monopoli and Polignano. On the other hand, the land in the south of Polignano a Mare, located between the urban center and the city of Monopoli, has historically been involved in the production of cereals, forage crops, and even pasture.

The main territorial matrix of Costa Ripagnola is represented by the presence of the peri-urban and coastal agricultural mosaic that strongly characterizes the coastal rural landscape of southern Bari. The climate, the pedology and the urbanization of the area have influenced the agricultural landscape and the selection of crops that have gradually come to the present day.

Along the coast, the climate is typically Mediterranean with mild winters and hot dry summers. In the area, there are periods of drought in summer. For the exercise of agriculture, however, this drought does

not imply major problems due to the rich underground aquifers fed by the runoff water of the Murgia. Irrigation is mainly used for vineyards near the area.

Soils are generally deep, only in some cases limited in depth by the presence of crust. The texture is fine or moderately fine and the gravel absent or minimally present. The soils are classified as fourth class of capacity of use due to the strong intrinsic limitations (particularly poor water retention), such as to limit the choice of crops (IVs). They do not require special conservation practices and allow for a wide range of crop choices. The tendency to an interconnection with coastal settlements together strongly threatens residual historical horticultural crops which, in addition to bearing witness to significant historical agricultural wisdom, have preserved the recognizability of coastal urban centers. Urban sprawl has also partly affected the valuable landscapes of the “lame”, both by disrupting the rural texture that circumscribed them, and by physically occupying the “lame” themselves.

The rural landscape facing the coast is often characterized by the presence of fruit and vegetable crops that alternate with uncultivated land, natural pastures and arable land. Today in non-irrigated arable land we can find wheat, cereals and forage cultivated with traditional techniques, sown on hard or ploughed soil. In dry or irrigated vineyards often cultivated under pvc sheets (awnings) it is possible to find almost exclusively table grapes of the usual commercial varieties such as Italia, Vittoria, Red globe or Crimson grapes. The permanent meadows and short areas with shrubs are generally uncultivated with spontaneous herbaceous vegetation that alternates seasonally. In some parts of the park, in addition to the predominance of natural pasture and arable land for fodder and cereals, there are vineyards, fruit trees such as almond, cherry and peach. Agricultural productivity is on average high, intensive towards the coast with olive groves and horticulture. Often there are areas with arboretums (olive, fig, cherry, apricot, peach and almond) associated with all types of vegetables, mainly brassicaceae, cucurbits, legumes and root and tuber vegetables. The gardens are mostly irrigated in open field without cover or with mobile structures of temporary cover. The prevalent olive cultivar is the "coratina", with trees of medium vigor and expanded foliage, which produce an oil with excellent chemical characteristics. Also very common is the "Ogliarola barese", called "Cima di Bitonto", with medium-high vigor and expanded-assurgent canopy, with average chemical characteristics. The agronomic techniques currently used in the area are those of conventional agriculture.

In the area of Costa Ripagnola it is possible to see the first of the three belts that make up the agrarian landscapes of Apulia, running parallel to the coastline. The first is made up of the system of coastal and peri-coastal gardens that currently only partially overlook the sea and that represent openings in the built-up areas of Polignano and Monopoli. The coastal plain (from Cozze to Punta Bufaloria) that extends to the Murgia escarpment is dominated by the landscape of ancient olive groves inland and landscapes of

arable crops associated with elements of natural or olive groves in areas interspersed with the furrows of the blades in the agricultural peri-coastal territory. Bordering the area of the park is the expanse of olive groves, the same that, starting from the coast, reaches the base of the plateau of the Murgia. In the nearby, however, consistent with what happens throughout the southeast of Bari, also olive groves are cultivated. Moving away from the coastline this complex crop, gives way to vineyards, locally associated with olive groves and orchards. It is difficult to find real monocultures of vineyards. Important are the repercussions of the industrialized and intensive agronomic techniques of tree cultivation on the rural landscapes of the bordering hinterland. In fact, the artificialization of this cultivation with greenhouses and plastic covers dominates the surrounding landscape. In particular, the large presence of vineyards for table grapes extends from the hinterland of Mola down to Polignano, cultivated with polyethylene film awnings. There is a strong intensification in dry lands and a more modest one in irrigated lands which transforms the territories once cultivated with almond and olive trees in vineyards for table grapes.

The agrarian landscape was historically characterized on the coast by the presence of the irrigated garden, today unfortunately interrupted by the state road 16, constituted by a succession parallel to the coast of windbreaks placed close to high walls of dry fencing that generates a precise design to which is superimposed the system of capture of groundwater, the “norie” (ancient wells), today no longer usable. The coastal strip presents a variable thickness that goes reducing toward south up to Monopoli where it begins the scarp on which Conversano is attested. The agrarian landscape is still characterized by the grid of the irrigated gardens, despite the strong impact due to the routes. This system is characterized by roads perpendicular to the coast, known as "capodieci", which divide in a regular way the whole countryside and that date back to the Angevin period. Here ancient farmers struggled to transform into fertile fields a territory mostly sterile because stony, scarce water resources and too close to the sea.

The result is a rural area characterized by a peculiar articulation of the agrarian mosaic and artifacts, built through the wise use of vegetation and consisting of a succession parallel to the coast of windbreaks (rows of olive trees or fig trees or prickly pears, even alternating) placed close to high dry stone walls of fence. The felling of trees related to the introduction of irrigated crops and awnings for table grapes, the widening of the Adriatic highway and the wild urbanization of the coast, have radically transformed the rural landscape of coastal gardens. Only a few fragments remain. The agroecosystem is sufficiently diversified and complex. Important value for the conservation of biodiversity is the extensive system of dry stone walls that separate the different crops.

2.b.2 - "Dune costiere da Torre Canne a Torre S.Leonardo" Regional Natural Park.

Species list and map extract of the project database

Tabel 2 List of Species of the Dune costiere park

Cultivation	Species (variety)	Presence in the area
Arboreas	Olive tree (common oil and table varieties)	Present
Arboreas	Grapevine (common varieties for wine and table)	Possible presence
Arboreas	Pear tree (Pirus communis)	Possible Presence
Arboreas	Plum (Prunus domestica)	Possible Presence
Arboreal	Fig (Ficus carica)	Present
Arboreal	Carob tree (Ceratonia siliqua)	Present
Arboreal	Prickly pear (Opuntya ficus indica)	Present
Herbaceous	Cotton (Gossypium)	Possible Presence
Cereals	Wheat (Triticum spp.)	Present
Cereals	Barley (Hordeum vulgare)	Present
Cereals (F)	Oats (Avena sativa)	Possible Presence
Cereals (F)	Triticale (Tritico secale) ????	Possible Presence
Legumes (F)	Broad bean (Vicia faba)	Present
Legumes	Chickpea (Cicer arietinum)	Possible Presence
Legumes	Chickling vetch (Lathyrus sativus)	Possible Presence
Legumes	Lentil (Lens culinaris)	Possible Presence
Legumes	Bean (Phaseolus vulgaris)	Possible Presence
Fodder	Vetch (Vicia sativa, villosa, pannonica, narbonnensis)	Present
Fodder	Fodder pea (Pisum arvense)	Present
Fodder	Clover (Trifolium incarnatum, squarrose, alexandrine, pratense)	Possible Presence
Fodder	Alfalfa (Medicago sativa)	Possible Presence
Vegetables	Leaf, flower or root vegetables (all)	Possible Presence

Figure 6 Extract from the map of cultivated species in the Dune Costiere park

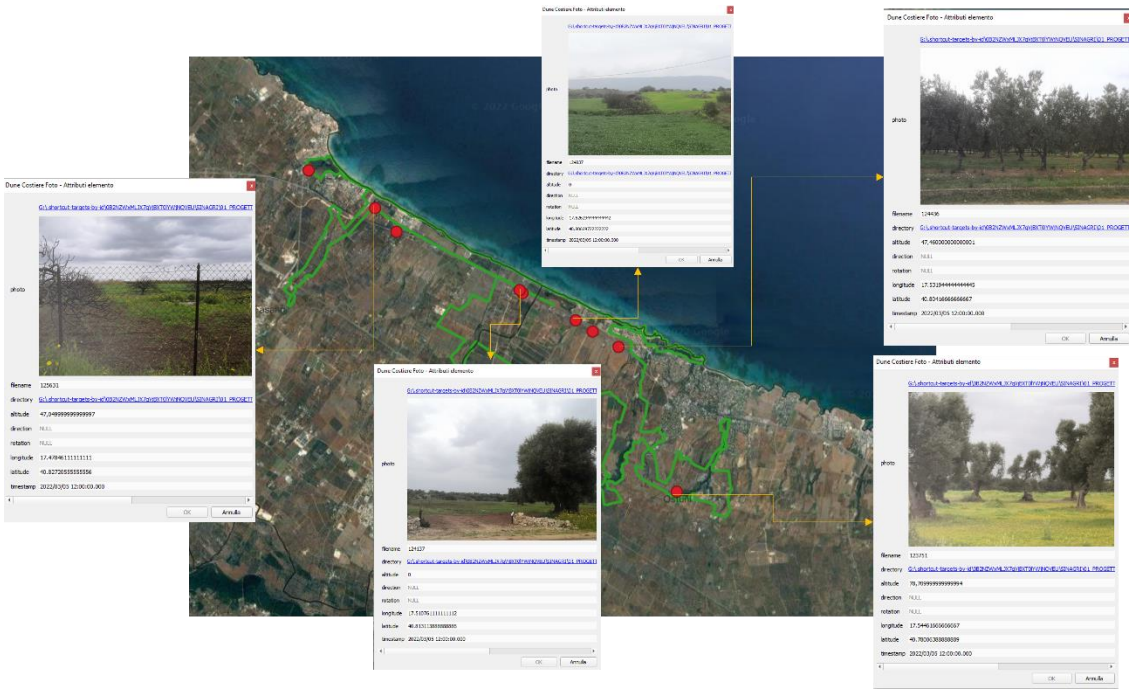


Figura 7 Geo-tagged photographs taken during field surveys conducted at Costa Ripagnola. Photographic geodatabase shot points and cards.

Agriculture in the Coastal Dunes Park

In the perimeter of the Dune Costiere Park on the upstream land of State Road 379, cereals and fodder have always been a very common and widespread cultivation. Thanks also to the presence of numerous Masserie (Parco di Mare, Difesa di Malta, Masseria Gravinella, Masseria L'Ovile, Masseria Pezza Caldaia and Masseria Fontevecchia) it was very common the pastoralism linked to the breeding of sheep and goats, especially on lands not particularly suitable for cultivation. In more recent times, a particular development the cultivation of early figs and figs is registered in order to meet the need for products with high energy value. This is distributed especially on the coastal land and close to the State Road 379 in the countryside of Fasano. In the early twentieth century, it was also widespread the cultivation of cotton. The fiber obtained was used, also to produce the cords used to weave the bunches of tomatoes for storage (ramasole packed with varieties of Regina tomato).

The territorial context of the Park is partly cultivated, partly uncultivated and inhabited by hygrophite vegetation. In the background, dunes and Mediterranean maquis, is occasionally interrupted by artificial openings practiced by summer bathers. In this context, climate, pedology and urbanization due to the development of tourist settlements have influenced the agricultural landscape of the area and have

contributed to the selection and permanence of only some agricultural species. In the coastal area, the vegetation is now confined in an increasingly narrow strip by a strong anthropization.

The coastline enclosed between Alta Murgia and the Adriatic Sea, has a typical Mediterranean climate with mild winters and hot summers. The depth of the soils varies according to the area considered: moving from the hinterland towards the coast there is a change of soils from thin or moderately deep, often limited in depth by the presence of crust, to deep or very deep, especially in the valley floor areas (lame). These are certainly the most fertile areas of the subsystem where the cultivation of trees or herbaceous species is possible, consistent with climatic requirements. The coastal strip also boasts a rural landscape designed by a very dense system of lame. Along the coast, the agroecosystem is generally diversified and complex. With the exception of the imposing Murgia step, the elements of naturalness are strongly reduced to the detriment of agriculture and urbanization. The agricultural areas are heterogeneous but mainly olive groves, with century old olive trees. The olive trees are not infrequently associated with the almond or carob trees or herbaceous plants. Woody crops, mainly olives and vines, but also almonds and other fruit trees, alternate with dry arable land, uncultivated areas or pasture and shrubland. Non-irrigated arable land is found both on the coast and in the innermost part of the park. Cereals and forages are mostly varieties commonly used in contemporary agriculture. Olive groves are dominated by the Cellina and Ogliarola varieties. There are also figs and early figs (Fiorone di Torre Canne) already known and used in the nearby restaurants.

In many areas of the coastal plains are common extensive forms of land use and, even olive tree in the area are commonly very large planting distances (more than 14 meters) interspersed by groves refreshed with a modern and intensive setting. The agricultural transformation here has produced a simplification of the landscape where the trees are "far apart, often distributed as in an arboreal pasture", randomly. The olive groves, in fact, are mainly monumental, with very large planting distances and exceptional dimensions of both trunks and foliage. The vineyard, as a specialized crop, was concentrated mainly along the lame, which have abundant layers of fertile red soil. At the same time, high productivity cereals and fodder crops are alternated along the coast. The irrigated crops are located along the coast and are mostly fruit, vegetables and olive groves. In Fiume Piccolo, between Torre Canne and Torre San Leonardo, as a natural parenthesis between pastures, arable land and arboretums, survives a basin, also fed by a resurgence and connected to the sea by a small waterway. The lake surface has a significant size; once used for fish farming, it is divided into two parts by an ancient wall, while close to its shores there are significant colonies of juniper, Phoenician juniper, lentisk and myrtle. Especially in the inner area, the comparison between the vegetation of the past and the plant species present today allows us to reconstruct the dynamics of the vegetation of the area: there has been a gradual transition from the oak

forest to the bush due to human intervention; this degrading trend has continued until a gradual and irreversible reduction of the bush in favor of olive groves and arable land.

2.b.3 - Mar Piccolo Natural Park

Species list and map extract of the project database

Tabel 3 List of Species of Mar Piccolo Park

Cultivation	Species (variety)	Presence in the area
Arboreas	Olive tree (common oil and table varieties)	Present
Arboreas	Grapevine (common varieties for wine and table)	Present
Arboreas	Orange (Citrus sinensis)	Possible Presence
Arboreas	Mandarin (Citrus reticulata)	Possible Presence
Arboreal	Pear (Pirus communis)	Possible Presence
Arboreal	Apricot (Prunus armeniaca)	Possible Presence
Arboreal	Plum (Prunus domestica)	Possible Presence
Arboreal	Fig (Ficus carica)	Possible presence
Arboreal	Pomegranate (Punica granatum)	Possible presence
Arboreal	Carob tree (Ceratonia siliqua)	Possible presence
Arboreal	Prickly pear (Opuntya ficus indica)	Possible presence
Cereals	Wheat (Triticum spp.)	Possible presence
Cereals	Barley (Hordeum vulgare)	Possible presence
Cereals (F)	Oats (Avena sativa)	Possible presence
Cereals (F)	Triticale (Tritico secale)	Possible presence
Legumes (F)	Broad bean (Vicia faba)	Possible presence
Legumes	Pea (Pisum sativum)	Possible presence
Legumes	Chickpea (Cicer arietinum)	Possible presence
Legumes	Chickling vetch (Lathyrus sativus)	Possible presence
Legumes	Lentil (Lens culinaris)	Possible presence
Legumes	Bean (Phaseolus vulgaris)	Possible presence
Fodder	Vetch (Vicia sativa, villosa, pannonica, narbonnensis)	Possible presence
Fodder	Fodder pea (Pisum arvense)	Possible presence
Fodder	Clover (Trifolium incarnatum, squarrose, alexandrine, pratense)	Possible presence
Forage	Alfalfa (Medicago sativa)	Possible presence
Vegetables	Leaf, flower or root vegetables (all)	Possible presence

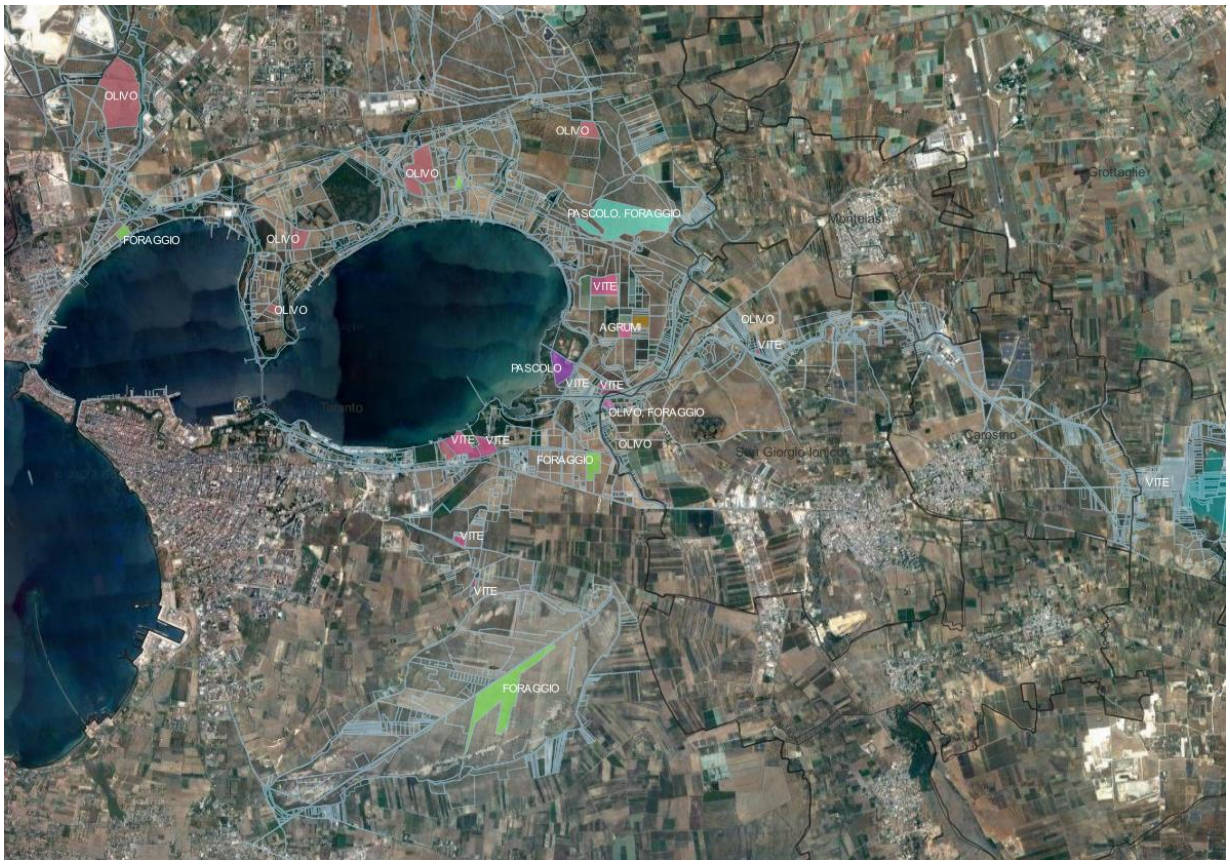


Figura 8 Extract from the map of cultivated species in the Mar Piccolo park

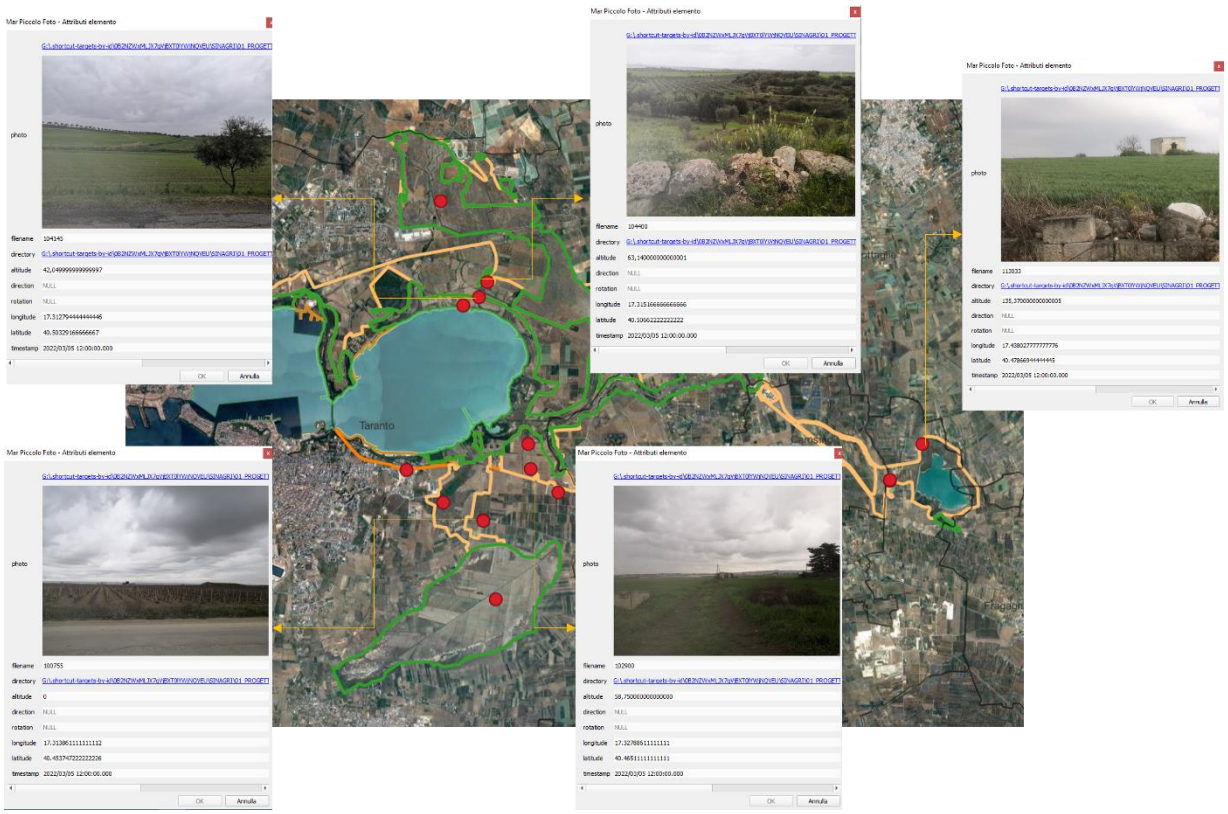


Figura 9 Geo-tagged photographs taken during field surveys conducted in Mar Piccolo Park. Photographic geodatabase shooting points and cards..

Agriculture in the Mar Piccolo Park

The prevailing rural morphotype consists of arable land, olive groves and pastures, interspersed with frequent natural elements like woods and bushes. In the area, the main pressures that have conditioned the current crop species and the use of current agronomic techniques are recognized in the soil and climate conditions and industrial pressure of the adjacent areas. As follows, some climate and pedologic aspect that have, over time, deeply influenced the choice of cultivated species, their distribution and the choice of the most suitable cultivation techniques to face these limitations. The climate is typically Mediterranean with mild winters and hot and dry summers. As far as windiness, the Arco Jonico of Taranto does not suffer from big problems, since it is protected to the North by the Murgia system, which moderates the action of cold winds. Precipitations are scarce, in fact the annual value is below the regional average. The depth of the soils is extremely variable: in some areas, after a few centimeters of useful soil, the substrate is generally calcareous or pebbly, in other cases the depth is moderate, in others the soils are very deep. Drainage is almost always optimal, rarely moderate. The texture changes considerably from coarse to moderately fine until it becomes fine, with soils rich in inorganic colloids. A fundamental aspect concerns the presence of skeleton, absent or present in minimum quantities in some areas,

abundant enough to make cultivation difficult in others. The superficial stoniness is absent in some areas, in others abundant. Another serious problem of pedological nature found along the shores of the Mar Piccolo is also represented by the reclamation of salt steppes for cultivation and housing.

The agrarian landscape began to take shape in the Neolithic age, especially in the area of Taranto, in the areas around the Mar Piccolo, in the territory immediately north-west of the city and in the whole south-eastern coast of the Ionian province. These areas are characterized by fertile soils and easy access to water sources, while the inland areas were involved in these transformations only later. In these inland areas, sheep-breeding and animal husbandry were probably more important than in the coastal areas, where cereal cultivation developed. The introduction of viticultural practices in Taranto is probably due to the Greek colonists who founded the city. The great geomorphological variety of the area is reflected in a complex articulation of rural landscapes. There is an alternation of arable monoculture, characterized by variations in the plot that becomes increasingly dense as the slopes increase, and a series of agricultural mosaics and agro-sylvo-pastoral mosaics near the karst incisions. The rural mosaic is interspersed with islands of pasture and new naturalness, with a barren and little artificial character. The agriculture of the area has been progressively marginalized: the industrialization of the area (since the fifties of the twentieth century) has led to the disappearance of the system of farms and pastures in the area closest to Taranto. The natural and rural historical landscape has been systematically simplified and trivialized also through the realization of drainage canals, the cementing of river beds and banks and the inappropriate hydraulic-forestry systems upstream.

The predominant agricultural uses include dry and irrigated arable land and permanent crops that cover a large portion of the area. Permanent crops include vineyards, olive groves and orchards (mainly table grapes and citrus).

In the territory, it is worth to mention the permanence of gardens (orti) of Mediterranean type, defined as "terre per ortalizi" of the Tara Marshes, vegetable gardens and "terre paduli", whose location was carefully chosen both according to the possibility of access to the water resource and to the quality and exposure of the soil. Given the continuous cycle of cultivation, in order to meet the need for water throughout the year, in the gardens were always present storage facilities, such as wells and cisterns (aquariums and pools). In some, where the water table was superficial, there were also complex systems of water lifting (ingegne or norie). Where it grew spontaneously, a part of the garden was reserved for reeds (cannito), which, in addition to acting, in turn, as a hedge or protection, also provided the raw material for a thousand other uses (from the support of horticultural plants and vines to housing). The space inside the garden, especially in that of the farms, was generally divided into functional sectors (quadrants) through walkable paths, each of which had (in rotation) a particular crop destination.

Byzantines and Arabs contributed decisively to the subsequent development of the garden, introducing techniques and new species, such as citrus, apricot trees, date palms, mulberry trees, jujubes, irrigated melons and saffron. Some of the mentioned cultivations soon became a characteristic element of the Mediterranean habitat. The agricultural plain of Taranto is characterized by the network of drainage canals: in the west the shed vineyard dominates the agricultural mosaic, while towards Barsento, on the eastern side, up to Taranto, citrus cultivations prevail. In more recent times, the intensive cultivation of orchards and vineyards have led to a strong artificialization and alteration of the traditional characteristics of the rural territory. The pervasiveness of plastic covers of tree crops, with the occasional presence of greenhouses, characterizes a landscape that is only discontinuity interrupted by the lame. Agriculture is intensive for citrus and table grapes. In fact, the use of irrigation is widespread and is conditioned by the choice of crops that ensure a high income in irrigation (citrus, vineyards and horticultural).

Along the shores of the two seas there are still several areas of high natural value, formed as a result of dynamics of spontaneous renaturalization. Many of these areas are wetlands and the coast of the two seas is crossed by the outlet of some short rivers, fed by the system of karst springs inland. The natural pasture formations ascribable to the habitats of Mediterranean pseudosteppe are extensive and widespread. The vegetation specificity of this area is also expressed by the presence of numerous species of biogeographical trans-Adriatic interest. Among the endemic species there are the orchids Oprhys tarantina, Arum apulum, Anthemis hydruntina; there are many rare species of biogeographical importance, including Scrophularia lucida, Campanula versicolor, Stipa austroitalica, Triticum uniaristatum, Asyneuma limonifolium, Salvia triloba, Phlomis fruticosa, Linum tomasinii, Paeonia mascula subsp. Mascula, Aubrieta columnae, Carum multiflorum, Biscutella incana, Helianthemum sessiflorum.

2.b.4 - Varieties common to cross-border territories: in-depth study of Vine (1) and Olive (2).

Marginal Grapevine Germplasm from Apulia (Southern Italy) Represents an Unexplored Source of Genetic Diversity

Abstract (full text in the Italian version)

The investigation on the genetic diversity of grapevine germplasm is crucial for a more efficient use of grapevine genetic resources in light of changing environmental conditions. Here, we used simple sequence repeats (SSRs) coupled with single nucleotide polymorphism (SNP) markers to disclose grapevine genetic diversity of a collection of Apulian minor/neglected genotypes. Their relationships with national or international cultivars were also examined. Genetic diversity was investigated using 10 SSR markers and 1,178 SNPs generated by genotyping by sequencing (GBS). Based on the SSR data, the 128 genotypes were classified into six main genetic clusters. Twenty-four putative cases of synonymy and 2 of misnaming were detected. Ten "unknown" autochthonous genotypes did not show high similarity to Apulian, national, or international varieties. We took advantage of available GBS-derived SNP data points for only forty genotypes to better investigate the genetic distance among them, identify private SNP alleles, and divergent loci putatively under selection. Based on SNP alleles, two interesting gene pools of minor/neglected Apulian samples were identified. Genetic divergence was investigated by FST and allowed the detection of loci capable of differentiating the gene pools. Overall, this work emphasizes the need for recovering the untapped genetic variability that characterizes minor/neglected grapevine Apulian genotypes and the requirement to preserve and use more efficiently grapevine genetic resources in breeding programs.

GBS-derived SNP catalogue unveiled wide genetic variability and geographical relationships of Italian olive cultivars

Abstract (full text in the Italian version)

Information on the distribution of genetic variation is essential to preserve olive germplasm from erosion and to recover alleles lost through selective breeding. In addition, knowledge on population structure and genotype–phenotype associations is crucial to support modern olive breeding programs that must respond to new environmental conditions imposed by climate change and novel biotic/abiotic stressors. To further our understanding of genetic variation in the olive, we performed genotype-bysequencing on a panel of

94 Italian olive cultivars. A reference-based and a reference-independent SNP calling pipeline generated 22,088 and 8,088 high-quality SNPs, respectively. Both datasets were used to model population structure via parametric and non parametric clustering. Although the two pipelines yielded a 3-fold difference in the number of SNPs, both described wide genetic variability among our study panel and allowed individuals to be grouped based on fruit weight and the geographical area of cultivation. Multidimensional scaling analysis on identity-by-state allele-sharing values as well as inference of population mixtures from genome-wide allele frequency data corroborated the clustering pattern we observed. These findings allowed us to formulate hypotheses about geographical relationships of Italian olive cultivars and to confirm known and uncover novel cases of synonymy.

2.c Identification of local ancient varieties of interest for the BEST project

The identification of a first macro-group of varieties took place, thanks also to the systematization of the data on the GIS, based on the localization of the findings and of the reports occurred in the past within the municipalities of the park areas under investigation. For each of the park areas, a preliminary list of genetic resources is proposed, distinguished by type, eligible for the subsequent selection of the final varieties on which the analysis and investigations of the subsequent phases will be carried. For a clearer identification of the varietal characteristics, please refer to the results of the integrated projects of biodiversity that include the result of morphological, physiological, molecular, phytosanitary and technological analysis from which is possible to extrapolate differences between the varieties taken into consideration.

Ripagnola " Regional Natural Park

List of agricultural varieties subject to attention since they were found and reported in the Municipalities of Polignano and Monopoli. Due to the scarce territorial detail of the sources consulted for certain plant genetic resources, it was decided to extend the list of varieties, such as those of cereals, legumes and forage crops, to all those included in the district of central Puglia and the Murgia dei Trulli.

Olive trees

Uccellina: report of Bellino farm in Castellana Grotte.

Limongella: report of the Laghezza farm in Polignano a Mare.

Di Canna: report of the farm Di Lorenzo in the territory of Polignano a Mare.

Vines

Giulia Ciola: report of Di Lorenzo farm of Castellana Grotte

Marchione: report of Di Lorenzo's farm in Castellana Grotte. The first citations of Marchione in literature date back to the second half of 1800. In the study about musts of Terra d'Otranto (Licci, 1877), are reported data about the analysis of "Maricchione" grapes, cultivated in the countryside of Martina Franca (TA). Some years later a first description is published in the Studi ampelografici della provincia di Lecce (Licci e Frojo, 1881).

Notardomenico: report of Totaro farm in Conversano. Notardomenico variety has relevant historical information. Notardomenico is mentioned by some authors of the end of the 19th century (Perelli, 1874; De Rovasenda, 1997; Fonseca, 1892). According to Perelli (1874) it is a "vine that provides alcoholic and colored wine, is found cultivated on a small scale in Martina, Gioia del Colle, etc." The same grape variety was present with other appellations in different wine-growing areas of the Puglia region, such as Guara Domenico, Nero Domenico, Pier Domenico, So' Nicola, Gallioppo (Frojo, 1878; Frojo 1883). The most known alternative denomination in the Province of Lecce appears to be San Nicola which Frojo (1875) reports as Sor Nicola, outlining the main morphological characters of Notardomenico vine. The name Notardomenico is mentioned by some authors after the middle of the 19th century (Perelli, 1874; De Rovasenda 1887; Fonseca 1892) and probably the same variety was known in the Bari area also with the synonyms Guara Domenico, Nero Domenico or Gallioppo (Frojo, 1878; Frojo 1883). Domenico Frojo and Vincenzo Licci (1881) described the Pier Domenico of Martina Franca (TA), whose characteristics well correspond to the vine we are talking about here. Giuseppe Frojo (1875) and Frojo and Licci (1881) outline the main characters of the vine called Sò Nicola in Faggiano and San Giorgio Ionico (TA) and whose morphology seems to correspond to Notar Domenico. The synonym San Nicola, with which it has been recently identified, is reported by Fonseca (1892a) in Gallipolino (LE).

Unknown vine (Az. Di Lorenzo)

Sagrone rosso: reported by the Laghezza winery in Polignano. Sagrone rosso or Barbarossa is mentioned in the Statistica del Reame di Napoli of 1811 (Ricchioni, 1942), indicated as a table grape with large bunches and good keeping qualities.

Piccola nera (small black): report of Longo winery in Monopoli.

Pizzutella: report of Longo winery in Monopoli. Pizzutello bianco (or Cornichon dei Francesi) is often confused with ua longa, historical name with which this vine with elongated berries was indicated in the Lecce area (Fonseca, 1892a; Licci and Frojo, 1881).

Unknown vine (Az. Longo)

Fruits

Arancio Piccolo tardivo (Small Late Orange): report of the Garrappa farm in the territory of Monopoli.

Arancia Sanguigna: report of the Petrarolo farm in the territory of Monopoli. The varietal group of the so-called "sanguine", has in common the characteristic pigmentation of the pulp. It is an ancient group, already described by classical taxonomists, historically linked also to the citrus groves of Gargano. It is mentioned by Del Viscio (1900), the tree is described "with thorns, the fruits have a fine skin, always orange-yellow and never reddened, intensely colored is instead its pulp. In the List of the Italian autochthonous cultivars (Baldini et al., 1994) only one type is reported as "Sanguigno": "Sanguigno vaccaro" present in the Province of Catania; five, instead, are reported as "Sanguinelli". Marzano A., 1882; Del Viscio G., 1900; Miglietta R., 1913; Biscotti N., 1990; Biscotti N., 1997; Biscotti N., Biondi E.,2008; Biscotti N. et al., 2010; Biscotti N. 2017.

Arancia Vaniglia: report of the Garrappa farm in the territory of Monopoli and Arancia Vaniglia tonda: report of the Longo farm in Monopoli. In the List of Italian autochthonous cultivars (Baldini et al., 1994) there are at least 4 different types of so called "Vanilla" Oranges. There are no certainties about the origin of this ancient Italian cultivar; the most credited hypothesis is that it could be the result of spontaneous crossings and subsequent agamic reproductions occurred in the area where this cultivar is currently still common (Ribera in the province of Agrigento). Among vulgar names there are forms such as Portugal dolce, Portugal vanilla (Naples, Monopoli, Salerno, Amali). It is also called Maltese. The "vainiglia" oranges have always been sought after and appreciated by children for their very sweet taste which is mainly due to their low acidity. Not widespread, there are few specimens in several citrus groves in Puglia, on the Gargano, but also in citrus groves on the coast of Bari, Taranto, and Salento. Stella G., 1857; Marzano A., 1882; Del Viscio G., 1900; Pantanelli E., 1936; Miglietta R., 1913. Biscotti N., 1990; Biscotti N., 1997; Biscotti N.,Biondi E.,2008; Biscotti N. et al., 2010; Nardone D. et al., 2012; Biscotti N., 2017. Minonne F., 2017.

Carrubo San Michele: report of the farm San Michele di Polignano a Mare from which it takes its name.

Carrubo Silvese: anonymous report in the territory of Monopoli.

Carob tree Montagnulo: report of the Montanaro farm in the territory of Monopoli.

Muscardella cherry tree: Report of the company Di Lorenzo of Polignano a Mare. Unknown, widespread mainly in the municipalities of Southeast Barese. Synonyms Moscarella or Moscardella. Miglietta R., 1913, Scorcia C., 1967; Maldarelli D., 1967.

Ciliegia Tosta: Report of the Bellqanova (Cegle Messapica) and Laghezza (Polignano a Mare) farms. In chapter ten of F.S. La Notte (1930) the author describes the cultivars defined as "widespread since time immemorial" (Fuciletta and Tosta). Tosta is often used as a synonym for Durona di Bisceglie. Donno G. 1966, Godini A., 1968 Ferrara E. 1973, Baldini E 1973.

Ciliegio Francia: reported by the company Carenza of Turi, Laghezza of Polignano a Mare and contained in the collection of the company Martucci of Valenzano. Fanelli L., (1938) among the 13 cultivars described also appears France. Widespread mainly in the countryside of Conversano. Brandonisio et al. 1931, Fanelli L. 1938. Del Gaudio S. 1965 Donno G. 1966 Carrante V. 1966 Godini A. 1968, Baldini E., 1973.

Quince of Monopoli: report from the Laghezza farm in Monopoli. Unknown variety.Fig: Black, unknown (Long spot)

Fico Nero: among the black figs present in the territory of Polignano, Monopoli, Ostuni, Fasano we remember the Borsamele Nero (Donno 1952, 1959; Brunetti P., 1989., Grazssi G., 1982, Summa F., Venerito P., 2008., Trotta L., 2013).Fico Nero Frecazzano - more widespread in the Taranto area (Gugliemini 1908., Vallese F., 1909., De Rosa F., 1911:; Donno G., 1948 - 1951. ,Ferrara E., Vendola 1991. The Black Fig Natalegna (Vallese 1909, De Rosa F., 1911, Donno G. 1952. Brunetti 1989, Occhiobianco 1992 Minnone 2012 Trotta 2013) Fico Petrelli Nero (Minnone 2012). Fico Nero Santa Croce (Vallese 1909). Black Zingarello (Pantanelli 1936., Ferrara 1991, Pace 1997, Pellegrino 2001, Minnone 2012 Trotta 2013)

Fico Macchia Lunga: anonymous report in contrada Macchia lunga.

Mandarin Havana: report of the company Garappa of Monopoli. Originated in Italy between 1810 and 1818 (Chapot 1962) from a mandarin of Chinese origin. Used for the production of rosolio because of its very aromatic skin (Pantanelli E., 1936; Russo 1975).

Mandorlo Montranese or Montrone, contained in the collection of the Martucci company of Valenzano and found in the Calderaro company of Monopoli. Biasco 1908, Vivarelli Marchio 1920., Pastore 1934, Fanelli 1939., Pastore 1954., Di Prima 1962 Del Gaudio 1967.

Almond tree Di Sabato: anonymous report in the territory of Monopoli.

Sciulisciata almond tree: anonymous report in the territory of Monopoli.

Red Apple of Castellana: report of Di Lorenzo company in Polignano a Mare. Unknown variety.

Aspro or Acre Pomegranate: reports in the area of Monopoli (Azienda Calderaro) Azienda Chionna in Ceglie Messapica and Polvanera (Cassano delle Murge). Jannone Lodispoto 1934, Angelicchio 1993, Nardone 2012, Minnone 2017.

Dente di Cavallo pomegranate: found in Monopooli in the farms Longo and Pagliarulo. It is the most interesting biotype among the Apulian ones. Described in the "Agricultural Botanical Study of the varieties of Pomegranate cultivated in the province of Bari by Dr. Jannone Lodispoto 1934.

Zio Sante Pomegranate. 2 different biotypes found in the company Calderaro in Monopoli. Never described before.

Pero Recchia falsa, widespread in many areas of Bari and Brindisi, but also in Taranto and Lecce. The reports collected belong to the territories of Locorotondo, Conversano and Polignano a Mare. Being a very ancient pear tree, many cases of synonymy have developed. Pantanelli 1936. Scaramuzzi 1949, Lococciolo 1964., Martellotta., 1964., Branzanti Sansavini 1964 Reina 1974 Minnone 2017.

Pero a sole: the reports collected are those of the municipalities of Conversano and Polignano, respectively of the companies Intini and Laghezza. It is so called because of the bright red coloration assumed by the skin in the portion most exposed to the sun. Stella N., 1927, 1932, Pantanelli E., 1936, Donno G., 1959 E, . 1970 Reina 1974.

Pero S. Cosimo: it takes origin from the festivity of SS Cosma and Damiano (period of maturation) Found in the company Giancola of Polignano a Mare. Pellegrino N., 2001

Pear tree of villa Hantos. Unknown variety.

Pero Agostinello or Pera Agostina: very common in the province of Bari, it ripens in August. Reported in the territory of Polignano, Giancola farm. Scaramuzzi mentions it in 1949 Trotta 2013.

Pero Genio or Argenio: widespread in the Brindisi area and in the South East of Bari is known as Pera Masciagne (Mesagne). Reported in Polignano in the farm Giancola. Pantanelli 1936 and Donno G., 1959.

Sorbo rosso (red sorb): reported from the Di Lorenzo farm in Polignano a Mare. Not characterized

Susino sconosiuto (Macchia lunga). Uncharacterized variety in the farm Macchia Lunga of Polignano a Mare.

Vegetables

Polignano's Carosello: Source Almanac BiodiverSO (2018). Carosello (half-long) from Polignano a Mare is highly valued in the Bari area. It has a pronounced tomentosity, with shaggy trichomes when the fruit is fresh.

Polignano Carrot: Source BiodiverSO Almanac (2018). It is also known as the yellow-purple carrot of Polignano and Bastinaca of San Vito. It is mainly grown in the hamlet of San Vito where it finds the best conditions to express its potential. It has obtained the recognition of the Slow Food presidia as an example of a new model of agriculture, based on quality, recovery of knowledge and traditional production techniques. It forms yellow, orange or purple roots. Included in Annex 8 of the PSR Puglia 2007-2013 among the regional indigenous genetic resources at risk of extinction today is an example of how local varieties can establish themselves and give great satisfaction.

Cicoria di Polignano: Source Almanac BiodiverSO (2018). Report of the farm Company: Chiarella Vito

Cima di Cola: Source Almanac BiodiverSO (2018). In Italy there are numerous local varieties of cauliflower, in fact our country has been, over the centuries, one of the most important centers of diversification of this species. Among the ancient varieties with green inflorescence, the Cima di cola whose color is more precisely lemon green is particularly renowned. This variety was included in the attachment 8 of the PSR Puglia 2007-2013 concerning the regional autochthonous genetic resources at risk of extinction. The edible part of Cima di cola is more spongy than the cauliflower varieties on the market and gives off a strong odor during cooking. DISAAT characterized this local variety by detecting the morphological descriptors defined by

GIBA and determining in the laboratory the following characters: dry matter, ash, calcium, magnesium, potassium, sodium, boron, copper, iron, manganese, zinc, protein, fiber, water-soluble vitamins, liposoluble vitamins and glucosinolate profile. This local variety has been agronomically, morphologically and molecularly characterized using SNP (single nucleotide variation in DNA) markers by the Institute of Biosciences and Biorisources of the CNR in Bari. In June 2015, Cima di cola was included in the national list of Traditional Food Products (PAT) thanks to the BiodiverSO project. It is now also preserved in situ.

Pinto Bean: BiodiverSO Almanac Source (2018). Fagiolino pinto a metro is so called ("by the meter") because of the unusual length of the pod, which can be up to one meter. Once widespread in the province of Bari and probably in other provinces of Puglia, it is distinguished mainly by the climbing habit of the plant that allows the pods to extend in length. The kidney shaped seed is usually red-brick colored, however it has also been described black colored metre bean seeds. Culinary preparations used in Apulia are the same as the other non climbing varieties of pinti beans. Today very rare, it is cultivated almost exclusively in small plots of land or in family gardens. The plant of Fagiolino pinto a metro shows indeterminate growth and climbing habit, narrow and very long pods (up to 100 cm), green in color and with an average production. The seeds, kidney-shaped and elongated, are brick red while the flower is white. This local variety has been characterized from an agronomic, morphological and molecular point of view by means of SSR (single sequence repeat) and SNP (variation of single nucleotides of DNA) markers by the Institute of Biosciences and Bioresources of the CNR of Bari.

Eyed Beans: Source BiodiverSO Almanac (2018). Fagiolino dall'occhio, known in the Barese region under the local name of Fagiolino pinto and Occhiopinto, is a typical Apulian crop, almost not at all widespread in other regions. The species is of African origin, already known and consumed since the times of ancient Romans, who called it "Phaseolus". It is a plant cultivated as a fresh vegetable only in some regions of central-southern Italy. The most common type has cream colored seeds with a spot, "eye", around the hilum, but there are other local varieties with seeds of different colors, or with mixtures of seeds of different shape and color. It has been found in the province of Bari, in Conversano, Putignano and Locorotondo. The plant, with determined development, presents an erect growth habitus. The flower is white, while the pods are narrow and long, of medium size, green with a purple tip. The production is medium-low. Seeds are ovoid to rhomboidal in shape with a rough to wrinkled, cream-colored integument with a small

black area around the hilum. This local variety has been characterized from an agronomic, morphological and molecular point of view by means of SSR (single sequence repeat) and SNP (single nucleotide variation in DNA) markers by the Institute of Biosciences and Bioresources of the CNR in Bari. DISAAT enrolled the "Fagiolino dall'occhio" in the national list of PAT and determined the following characters: dry matter, ash, calcium, magnesium, potassium, sodium, boron, copper, iron, manganese, zinc, protein, fiber, water-soluble vitamins and fat-soluble vitamins.

Regina Tomato (from Serbian): Source BiodiverSO Almanac (2018). Originally widespread in the land of Egnatia today it is cultivated between Monopoli, Fasano and Ostuni, especially in coastal agricultural areas. The name is inspired by the characteristics of the crown-shaped stalk. It has a double attitude: from table and from serbo. The plant, which has a determined growth but tends to form a considerable leaf mass and to cover the space between the rows, can carry 4-5 flower palms. It forms uniparous inflorescences and bears 4-6 fruits per cluster. The berries tend to be spherical in shape, they are deep red on the outside with a persistent yellow shoulder and orange in the flesh. They are bilocular. Peculiarity of this variety, in addition to the organoleptic perception primarily savory, is the thick skin that allows you to store the berries until winter by tying the stalks with cotton thread to make clusters called "ramasole". These are a traditional type of packaging followed by a commercialization which makes use of the Slow Food Presidium Tomato Queen.

Leafy Curly Cabbage: Source BiodiverSO Almanac (2018). It is also known as leafy kale or Cole rizze. In general, the youngest leaves, the main inflorescence accompanied by the most tender leaves, and the shoots that form at the axil of the leaves are used of Curly Cabbage. The leaf margin has a very high variability: more or less incised, torn or septate; moreover, the leaf can assume a range of colors from green to purple. It is widely spread in Apulia in the province of Bari and in Fasano. In the past there was the custom of eating broad beans and curly kale during Christmas lunch and the same dish was also eaten, cold, as a snack during work in the fields. In some countries, such as Putignano (Ba), only the leaves are consumed, exclusively as a condiment (accompaniment) for mashed broad beans. This variety was included in Annex 8 of PSR Puglia 2007-2013 among the regional autochthonous genetic resources at risk of extinction.

Novantina turnip top: Source BiodiverSO Almanac (2018). The name indicates that it takes, on average, 90 days after planting to be able to harvest the main inflorescence. It is later than the Quarantina and Sessantina varieties, with larger main inflorescence. The size of the inflorescence varies according to pedoclimatic conditions and cultivation technique. In Apulia there are many selections of Novantina. In Minervino Murge inflorescences are definitely smaller than those cultivated in the province of Bari and in the rest of Apulia. Turnip top is included in the national list of traditional food products (PAT).

Barattiere melon: Source BiodiverSO Almanac (2018). It is a cucurbit belonging to the species Cucumis melo L., whose fruits are consumed unripe, raw in salads or to accompany first courses in the same way as the cucumber. Cucumber, belonging to a different species (Cucumis sativus L.), is different from cucumber because of its higher digestibility and the absence of bitter compounds. In Apulia are present many different populations which take their name from the areas of cultivation, color and shape of fruits.

Bari coast chard: Source BiodiverSO Almanac (2018). Its cultivation is ideal in the environmental and growing conditions characteristic of the Bari countryside; it is considered "vernine" because it is grown mainly in the cold period. The plants of Bari Chard do not reach the size in height of other varieties of the same species, in compensation the leaves and ribs are rather fleshy. The cultivation of Bari beet can be done by direct seeding or by transplanting. In both cases, the seed used is self produced by farmers themselves or bought from specialized companies which commercialize seeds.

Herbaceous

Grano buono di Rutigliano: (Leguminous, cereal and forage crops: a catalog of Apulian biodiversity, 2018). The "Good Wheat of Rutigliano" or "chosen wheat", as it was once called by local conta- dins, has always been cultivated in Rutigliano (BA), considering the discovery of a clay con- tainer with residues of cooked wheat, brought to light by an archaeological excavation carried out in 1979. was known in the Kingdom of the two Sicilies between the 17th and 18th centuries for the production of valuable grains cultivated to be cooked as whole caryopses. The testimonies collected by the elderly of the place have confirmed the primary role that once had this crop and enriched the wealth of information relating to the operations of harvesting, threshing and storage of the grain traditionally performed by hand.

Cappelli durum wheat, (Leguminous, cereal and forage crops: a catalog of Apulian biodiversity, 2018). Cappelli durum wheat, also known as Senatore Cappelli, Strampelli, Cappello, or in the Foggia area as Cappellone, corresponds to type no. 231-1915 of the genealogical selections made on Jeanh-Rhetifah durum wheat in Foggia by scientist Nazareno Strampelli. The "wizard of wheat", as he was called, over a period of fifty years (1891-1942), with his work of hybridization and selection and his varieties revolutionized the world's graniculture. The breeding of his "chosen breeds", including Cappelli durum wheat, ready for use in his laboratory in Rieti 15 years before the establishment of the Standing Committee on Wheat (Decree Law of July 4, 1925), of which he was a member, and the start of the "Battle of Wheat" (June 11, 1925), contributed significantly to the increase in Italian cereal production between the two wars. The Cappelli, selected in 1915, was delivered to farmers in 1923, after the birth in 1919 of two important agricultural institutions such as the National Institute of Genetics for Crop Growing in Rome and the Phytotechnical Station for Apulia, to the design of which Nazareno Strampelli contributed.

Soft wheat Bianchetta, (Legumes, cereals and fodder crops: a catalog of Apulian biodiversity, 2018). Bianchetta is undoubtedly among the local varieties of soft wheat the most widespread in Apulia. Its cultivation is widely documented in texts of agronomy since 1784 (A. Ginori) and in monographs of the '20s, '30s of the last century written by agronomists and technicians of the Experimental Stations of Agriculture in the provinces of Bari and Foggia. From what has been reported (De Cillis, 1927) it has been and is often confused with other soft grains with very similar characteristics, in fact synonyms are French Majorca, Francesella, White Majorca, Carosella. The complexity of the identification of specific characters is largely due to the ancient cultivation practice of the "mixture" in which the presence of hard and soft wheat, aristati and mutici, red ear and white ear made difficult the selection of the prevailing "race". Widespread especially since the '20s in the areas of Foggia, Bari, Taranto, in those close to Basilicata and in Calabria and Molise, often confused with the Carosella because similar, its cultivation adapted well in the plains and hills, succeeded well to durum wheat and endured the ringrani.

Gentil Rosso soft wheat, (Leguminous, cereal and forage crops: a catalog of Apulian biodiversity, 2018). The local variety Gentil Rosso, widely cultivated in central and northern Italy in the nineteenth century and then spread to the southern provinces, was used by the geneticist Francesco Todaro in 1911 as the progenitor of "chosen breeds", in particular selection

48 characterized by the presence on the spikelets, especially apical, of arists. The two forms identified at that time, the mutica also known as Gentil rosso originario, comune, Garagolla, Carosella, Siciliano, Tosella rossa, Mutico or Muco and the semi-aristata Gentil rosso 48 also known as Todaro, Todaro 48, Semiaristato, Calbigia rossa, were introduced in Apulia around 1920 and especially the selection 48 had a good success from the productive point of view and it was very appreciated for the quality flours considered excellent for bread-making. The monitoring of the territory within the project allowed to detect the presence of this variety in the Dauno sub-Apennines, central Apulia and Salento delle Serre and to record the presence within the same population of the mutica and aristata forms. Gentil rosso is an autumn soft wheat also suitable for spring sowing. It prefers medium-fertile soils of plain, but it can also be grown in hills and therefore in different climatic and pedological situations. The production is good even if it varies according to the places, it is moderately resistant to allurement and rusts. Plants are between 100 and 150 cm high, the spike is fusiform, both in the mutic and semi-aristed form. The caryopses are in most cases elongated, of reddish color. The white flour is of good bread-making quality, but not very suitable for industrial processing.

Incarnate clover (forages), (Legumes, cereals and forages: a catalog of Apulian biodiversity, 2018). Incarnate clover has been part of that group of species traditionally cultivated in Apulia for about a century. Extensive historical documentation describes its ranges, cultivation methods, and use in livestock. It is a forage plant well adapted to the Mediterranean climate, interesting for loose, dry and poor in limestone soils. The fast and abundant development makes it a typical leguminous herb with a single mow. The plant is of medium size with an erect habit and taproot. Flowers are gathered in purple red heads. The product obtained is a very palatable and digestible zootechnical food, provided the harvesting is done with plants in blooming. Late harvests can cause problems to animals because of the numerous bristly hairs in the flower calyx.

Subterranean clover (forage), (Legumes, cereals and forage crops: a catalog of Apulian biodiversity, 2018). Native to the Mediterranean environment, Subterranean clover is a self-seeding annual species characterized by strong geocarpism (ability to grow downward). The plant has numerous prostrate stems, 20 - 25 cm long, creeping and forming a dense vegetative tra- but. Within the T. subterraneum, there are three botanical varieties or subspecies: subterraneum, suitable for soils tending to acid, characterized by pubescent plants, black seeds and weight of 1000 seeds between 5 and 7 g, very resistant to cold; brachycalycinum, suitable

for neutral soils or tending to alkaline, with glabrous plants and with the calyx of the flower shorter than that of the other subspecies, large seeds (weight of 1000 seeds: 8-10 g), black or reddish-black; yanninicum, growing well in moist, marshy soils, not very hairy, with medium-sized cream-colored seeds (1000-seed weight 7-10 g).

Regional Natural Park "Coastal dunes from Torre Canne to Torre S.Leonardo "

List of agricultural varieties subject to attention since they were found and reported in the Municipalities of Fasano and Ostuni. Due to the scarce territorial detail of the sources consulted for certain plant genetic resources, it was decided to extend the list of varieties, such as those of cereals, legumes and forage crops, to all those included in the district of the province of Brindisi and Valle d'Itria

Olive trees

Grappa: signaling of the farm of Le Grottaglie Giacomo of Fasano

Grappa: report of Verardi's farm in Ostuni

Pasola: report of Montanaro winery in Ostuni. Called by the Romans "Pausia", Pliny asserts that it is an early ripening variety. The name derives from the Latin verb "pavire" (to crush, to pound), but despite this suggesting that it was destined for the production of oil, by the end of the 1700s, there was already a greater aptitude for use as a table olive. Moreover, according to the characteristics of the drupes and the oil, two types of pasola were identified: round and oval and sweet and bitter (Moschettini, 1796; Columella, 1804; Presta, 1855).

Sessana, Tonda di Ostuni, reports from the Montanaro farm in Ostuni.

Sperone Grossa Sessana, reports from the Montanaro farm of Ostuni. According to Catanea (1938) the variety "oliva grosa" would correspond to the cultivars "S.Agostino or of Andria". It is also defined by Cazzarola and Cassano (1935) vulgarly calls it "alìa grossa".

Vines

Chiobbica. Also known as Francavilla in the province of Brindisi (Ricchioni, 1940) and as Uva di Chiobbica in Martina Franca (TA). Recent studies have shown its presence in Croatia (under the synonym Zlatarica vrgorska) and Bosnia-Herzegovina (Schneider et al., 2014). Traditionally, Francavidda was cultivated in the province of Brindisi, in the municipalities of Cisternino, Fasano, Francavilla Fontana and Ostuni. AGEA data from 2015 show a current presence limited to about 3 hectares in the Brindisi area. According to Del Gaudio and Giusto (1952-60a), the particular sensitivity to cryptogamic diseases and frost, due to early budding,

were determining factors for the low diffusion of this grape variety. Currently Francavidda is a variety suitable for cultivation and recommended in all provinces of Salento, and is included in the production regulations of Ostuni white PDO wine and in the PGI Puglia, Salento, Tarantino, Valle d'Itria. It is used together with Impigno, Verdeca and Bianco d'Alessano for the production of Bianco di Ostuni (Garoglio, 1973).

Ottavianello. Also known as Uva ottaviana in Vico del Gargano (FG), it is identical to Cinsaut cultivated in France. Typical cultivar of the Midi of this nation, it was once also destined for fresh consumption. In colonial times it expanded in Morocco, Algeria, South Africa and other hot climate areas. In Apulia it has also been recovered under the misleading name of Impigno rosso and in Sicily as Grecaù (Schneider et al., 2014). There does not seem to be any mention of Ottavianello in the Ampelographic Bulletins or lists from the late 1800s. Only in the following century it aroused the interest of the scholar Giuseppe Musci (1933), who reported its cultivation in the Brindisi area, precisely in the hilly territories of Ostuni, from where it was imported to S. Vito dei Normanni. Other authors claim the vine was named after the town of Ottaviano, in the province of Naples, and that the Marquis of Bugnano was responsible for its introduction in the countryside of S. Vito dei Normanni (Del Gaudio and Giusto, 1952-60). The synthetic description published by Musci (1933) outlines the main features of this grape with large berries and slightly crunchy flesh. It was considered a valuable variety because it gave wine a lot of color (Ricchioni, 1940).

White Malvasia. It is the white Malvasia of Chianti, present not only in central Italy, but in many other regions of the Italian peninsula and of the Balkans. In Apulia it has also been found as Scannapecora at Vico del Gargano (FG), Plaus bianca and Malvasia antica at Vieste (FG), but the generic name of Malvasia bianca is perhaps the one most used for this cultivar in most of southern Italy. It also corresponds to the Pavlos of the Greek Ionian Islands, to Maraština and Rukatac from Dalmatia (Šimon et al., 2007) and it reaches the northern Adriatic hinterland as Malvasia trevigiana, giving birth to Vitouska in union with Glera (Crespan et al., 2007). Just in Apulia it gave origin to Malvasia nera di Lecce (or Malvasia nera di Brindisi) with Negro amaro (Crespan et al., 2008b).

Impigno. This is the only appellation currently known in Apulia for this grape variety. The pedigree suggested by Cipriani and collaborators (2010), who would point to Bombino bianco and Quagliano as the two parents, is confirmed by genetic data. Research has also indicated that

Quagliano, a grape variety found on a very limited area in Piedmont, actually corresponds to Bouteillan (aka Cayau and Sigoyer) from the Midi of France. This is a grape variety that must have been well present in the central Mediterranean regions in the past, considering that traditional Apulian grape varieties descend from it, including, in addition to Impigno, Bombino nero (Bergamini et al., 2016) and Uva di Troia (Lacombe et al., 2013Unknown white

Ciminnita: century-old plant reported by the Pirro company in the municipality of Fasano.

Lattuario: Frojo (1875) describes the Lattuario di Barletta with a large, dark green, pentalobed leaf with deep sinuses and other incisions that make the leaf appear further subdivided; the lower page is rough, with large, deep and rounded teeth; the bunch is short and sparse; the berries are large and long, blue in color; the skin is fragile and the pulp is succulent and sugary. Jatta (1889) quoting the description of Frojo (1875) reports the synonym of Uva di tre volte l'anno (three times a year grape) in Ruvo di Puglia (BA), a wrong synonym or at least that generates confusion with Agresta or Trifera. The description of Frojo (1875) well corresponds to the Black Lactuary listed in the National Register and identified in Mesagne (BR).

Fruits

Arancia Sanguigna: signaling of the Petrarolo farm in the territory of Monopoli. The varietal group of the so-called "sanguine", has in common the characteristic pigmentation of the pulp. It is an ancient group, already described by classical taxonomists, historically linked also to the citrus groves of Gargano. It is mentioned by Del Viscio (1900), the tree is described "with thorns, the fruits have a fine skin, always orange-yellow and never reddened, intensely colored is instead its pulp. In the List of Italian autochthonous cultivars (Baldini et al., 1994) only one type is reported as "Sanguigno": "Sanguigno vaccaro" present in the Province of Catania; five, instead, are reported as "Sanguinelli". Marzano A., 1882; Del Viscio G., 1900; Miglietta R., 1913; Biscotti N., 1990; Biscotti N., 1997; Biscotti N., Biondi E.,2008; Biscotti N. et al., 2010; Biscotti N. 2017.

Carob Lama: report from the Amati farm in the municipality of Fasano.

Lama fig or Lamacoppa. Cultivar widespread in the countryside of Ostuni (BR), limited to the district from which it takes its name. Cultivar used for the production of supplies for fresh consumption.

Pero Campanello rosso di Ottobre: very ancient variety, widely spread throughout Puglia. There are, however, several cases of homonymy. It's generally distinguished a green Campanello from a red Campanello that has the same shape, but with a reddish overcolour on the part exposed to the Sun. In this sheet we describe the red bell. Briganti G., 1910; Donno G., 1959; Trotta L. et al., 2013; Minonne, 2017.

Pero Gentile reale, Antichissima, è presente in quasi tutta la Regione, soprattutto nel Barese e nel tarantino, ma anche sul Gargano. Era una delle varietà adatte per l'esportazione. Briganti G., 1910. Stella N., 1932; Donno G., 1959. Brazanti E., Sansavini S., 1964; Maldarelli D., 1969; Ferrara E., 1970; Reina A., 1974; Biscotti N., Biondi E.,2008; Biscotti N. et al., 2010.

Pero San Giovanni, Varietà molto antica, dalla maturazione precoce, che però trova tantissimi casi di omonimia. Nel Salento è conosciuto con questo nome la varietà Bella di giugno, nella Daunia e sul Gargano come San Giovanni è chiamata una varietà che è identica al San Giovanni difuso in Molise e Abruzzo. Il San Giovanni descritto in questa scheda è quello difuso soprattutto nei comuni di Fasano, Ostuni (Br), ma anche nelle province di Bari e Taranto. Pantanelli E., 1936; Donno G., 1959; Scorcia C., 1967; Maldarelli D., 1969; Ferrara E., 1970; Reina A., 1974; A.A.V.V., 1994; Suma F., Venerito P., 2008; Minonne F., 2017.

Pero Giugno di Fasano: segnalazione dell'azienda Speziale nel territorio comunale di Fasano.

Pero Genio o Argenio: diffusa nel brindisino e nel Sud Est Barese è conosciuta come Pera Masciagne (Mesagne). Segnalazione a Polignano nell'azienda Giancola. Ne parlano Pantanelli 1936 e Donno G., 1959.

Susino: tipo Goccia d'Oro segnalato nelle aziende Amati di Fasano e Giangrande di Conversano. Non è possibile stabilire se si tratti di una varietà differente rispetto alla più conosciuta.

Susino S. Anna Ovale. Sconosciuta ma antichissima, rinvenuta in agro di Ostuni (Br), chiamata con questo nome per l'epoca di maturazione che avviene a ine luglio. Dalla forma caratteristica, presenta l'apice del frutto appuntito. Suma F. e Venerito P., 2008.

Vegetables

Racalino Tomato: BiodiverSO Almanac Source (2018). The Racalino Tomato is a typical variety of southern Salento. Its center of differentiation seems to have been the district of Racale and Ugento, but its qualities have made it so well known that in past times it was adopted in

municipalities of the Capo di Leuca; however, commercial varieties have caused its almost complete abandonment. The peasants who have preserved it praise the consistency, the color and the pulp of the berry, appreciate it for its yield in the production of passata to be bottled (600-700 L/t) and for its long shelf life. The growth of the plant is determined; the stem is erect and powerful, single up to 20-30 cm and then divides into 2-3 main branches. The height of the plant varies from 70 to 100 cm. The fruit is a rounded but slightly flattened berry, with an almost quadrangular section, with ribbed bumps in the part of the peduncle insertion. The color of the pulp is deep red and the number of loci that can be counted in cross section varies from 3 to 4.

Regina Tomato (from Serbian): Source BiodiverSO Almanac (2018). Originally widespread in the land of Egnatia today it is cultivated between Monopoli, Fasano and Ostuni, especially in coastal agricultural areas. The name is inspired by the characteristics of the crown-shaped stalk. It has a double attitude: from table and from serbo. The plant, which has a determined growth but tends to form a considerable leaf mass and to cover the space between the rows, can carry 4-5 flower palms. It forms uniparous inflorescences and bears 4-6 fruits per cluster. The berries tend to be spherical in shape, they are deep red on the outside with a persistent yellow shoulder and orange in the flesh. They are bilocular. Peculiarity of this variety, in addition to the organoleptic perception primarily savory, is the thick skin that allows you to store the berries until winter by tying the stalks with cotton thread to make clusters called "ramasole". These are a traditional type of packaging followed by a commercialization that makes use of the Slow Food Presidium Pomodoro regina.

Melon Barattiere: Source Almanac BiodiverSO (2018). It is a cucurbit belonging to the species Cucumis melo L., whose fruits are consumed unripe, raw in salads or to accompany pasta dishes in the same way as cucumbers. Cucumber, belonging to a different species (Cucumis sativus L.), is different from cucumber because of its higher digestibility and the absence of bitter compounds. In Apulia are present different populations which take their name from the areas of cultivation, color and shape of the fruits.

White Artichoke of Fasano or Ostuni. Source BiodiverSO Almanac (2018). The white artichoke of Ostuni is a local variety typical of the area of Ostuni and neighboring towns. Once quite widespread because of its connection to the territory and rural traditions, today it has become very rare. There are very few specimens and it risks extinction. This local variety of artichoke has high height plants (about 130 cm including the main head), with a diameter of about 120 cm

and a high attitude to produce lateral shoots. The leaves are greyish green, semi-erect, 80 cm long on average. The main flower head has a wide/elliptical-ovate shape and a medium/poor compactness. At commercial maturity, the outer bracts are entirely green in color and have a recessed apex with a small spine. The inner bracts are greenish-white with sparse density. The plant produces 6-8 flower heads and has a lifespan greater than three years.

Fasano chard. Source BiodiverSO Almanac (2018). This is a variety closely associated with the environmental and growing conditions of the Fasano countryside. Plants have an erect habit; they are lower and more compact than other types of chard. The leaves are characterized by an oval-lanceolate, bright green blade and by the presence of a whitish petiole, less fleshy and pronounced compared to the most common types of chard on the market. Chard of Fasano can be cultivated by direct seeding or by transplanting. In both cases, the seed used can be self-produced by the farmers themselves or purchased from specialized companies that sell seeds of Chard "selezione di Fasano".

Black artichoke of Ostuni. Source BiodiverSO Almanac (2018). It is a late local variety, scarcely spread, cultivated essentially in the Ostuni area. The plant has a medium-high height, diameter of about 1.3 m, high suckering attitude. The leaves are dark green, semi-erect and 80 cm long on average. The flower head is oval-shaped, averagely compact. At maturity, the outer bracts of the flower head are entirely purple and have a recessed apex with a small spine. The inner bracts are white-purple in color and have an average density. It produces 6-8 heads per plant of good compactness and has a duration of the productive cycle longer than three years, which in some cases can reach eight to ten years when it is cultivated in family gardens.

Heart of Bean melon. Source BiodiverSO Almanac (2018). The Fior di fava melon variety belongs to the type of melons known as 'winter' melons. Traditionally, after harvesting, it is stored in the cellar to be consumed in the winter period. The fruit of this variety, having a shape similar to a rugby ball, is characterized by greenish plates, more intense at the distal apex, which fade towards a light green color at the point of attachment of the stalk. The fruit is slightly reticulated at the distal apex (if this character should be more evident, it is probable that there has been a spontaneous crossing with other reticulated varieties). The taste is good, and it is possible to find it sometimes in commerce in local markets.

Herbaceous

Wrinkled Red Chickpea (Legumes, cereals, and forages: a catalog of Apulian biodiversity, 2018). Red wrinkled chickpea is a legume characterized by plants of medium height but slightly lower than those of the smooth-seeded type. The seeds are small and very hard. Generally the number of pods per plant is conspicuous, and each pod can contain one or two seeds. From the oral testimonies collected, the cultivation of this chickpea has been practiced for more than 50 years in the territories of the Alta Murgia. The SaVeGraINPuglia Project has allowed the recovery of red wrinkled chickpea samples in the territory of Ruvo di Puglia and Cassano delle Murge. However, the monitoring of the regional territory has highlighted the cultivation of similar types in Valle d'Itria and in particular in the territories of Locorotondo and Martina Franca. The use is exclusively alimentary for the preparation of first courses such as homemade cava- telli and chickpeas cooked in pignatta, soups with other legumes.

Fava Viola, (Leguminous, cereal and forage plants: a catalog of Apulian biodiversity, 2018). This fava bean has as characteristic traits large seeds and purple integument with different shades of color. Tender and sweet, it is grown in small family gardens or in association with olive groves and orchards. The use of whole seeds is exclusively alimentary, while the waste is used in animal husbandry. During the monitoring of the regional territory conducted as part of the project SaVeGraINPuglia the cultivation of this bean was found only in small plots in Valle d'Itria with the exception of a similar sample found in Ceglie Messapica (BR).

Avena Locale o Nostrana, (Leguminous, cereal, and forage crops: a catalog of Apulian biodiversity, 2018). In Apulia, the historical importance of barley is closely associated with that of oats, preva- lently used for livestock feed and long produced and cultivated in large regional areas. Although it was widely cultivated in particular in Capitanata, Murgia and Terra d'Otranto, since XX century it was also imported from abroad and selected by the many agrarian stations of Apulia. From the seventeenth to the nineteenth century, the Province of Ter- ra d'Otranto recorded high production of cereals, including oats, which were exported from the port of Gallipoli to France, Spain and throughout the Mediterranean. In the historical document "L'esposizione provinciale di Capitanata del 1864" (1864 provincial exhibition of Capitanata), among the local products exhibited, we find oats, which, although considered at the time as a poor cereal from the alimentary point of view, were still produced in abundant quantities, since they were used as the last crop in the three-year rotation (fallow land, wheat, oats). From 1918

to 1922, several authors report the extensive cultivation of oats "without fertilization or care" in various areas of the region where this crop proved to have excellent conditions for development. In 1916, in Spinazzola, in the spring herbage with reference to oats, the Marzuole varieties were recommended and various mixtures were reported, including those with vetch or field beans or with clover and barley.

Cappelli durum wheat, (Legumes, cereals and fodder crops: a catalog of Apulian biodiversity, 2018). Cappelli durum wheat, also known as Senatore Cappelli, Strampelli, Cappello, or in the Foggia area as Cappellone, corresponds to type no. 231-1915 of the genealogical selections performed on Jeanh-Rhetifah durum wheat in Foggia by scientist Nazareno Strampelli. The "wizard of wheat", as he was called, over a period of fifty years (1891-1942), with his work of hybridization and selection and his varieties revolutionized the world's graniculture. The breeding of his "chosen breeds", including Cappelli durum wheat, ready for use in his laboratory in Rieti 15 years before the establishment of the Standing Committee on Wheat (Decree Law of July 4, 1925), of which he was a member, and the start of the "Battle of Wheat" (June 11, 1925), contributed significantly to the increase in Italian cereal production between the two wars. Cappelli, selected in 1915, was delivered to farmers in 1923, after the birth in 1919 of two important agricultural institutions such as the National Institute of Genetics for Crop Growing in Rome and the Phytotechnical Station for Apulia, to the design of which Nazareno Strampelli contributed.

Rossia durum wheat. (Legumes, cereals, and forages: a catalog of Apulian biodiversity, 2018). Rossia is a late autumn durum wheat widely cultivated in the past in southern Italy, particularly in Basilicata, Calabria and Apulia especially in the Altamura area. Because of the geographical extension of its cultivation, this variety is known with the synonyms of Ruscia, Rossino, Russello. Rossia durum wheat is suitable for both plains and hills, even though it prefers the latter, especially if the soil is fertile and deep. It has a particular vegetative vigor in the initial phase and a good tillering power. The plant has a high culm and the ear has parallel edges, rectangular with regular profiles, from glabrous to slightly pruinose and long. The rests are long, not divided, cinnamon-colored or slightly red. The glumes are oval with truncated ends, the keel is pronounced and equipped with a rostrum, the veining is marked. The caryopses are gibbous and semi-elongated, amber-yellow to redish in color, and the apical hairs are not very visible. Within the project, at the germplasm bank of the CNR IBBR of Bari and at the CREA CER of

Foggia, populations with variable characters of the caryopsis have been identified. They correspond to what has been reported since 1920 by the Stazione Agraria Sperimentale of Bari and by the numerous orientation fields spread all over Puglia. From these locations, after careful selections lasted about seven years, the Rossia durum wheat, like other typical southern grains, spread among the Apulian farmers who, as indicated by various authors, cultivated it with "full satisfaction".

Soft wheat Bianchetta, (Legumes, cereals and fodder crops: a catalog of Apulian biodiversity, 2018). Bianchetta is undoubtedly among the local varieties of soft wheat the most widespread in Apulia. Its cultivation is widely documented in texts of agronomy since 1784 (A. Ginori) and in monographs of the '20s, '30s of the last century written by agronomists and technicians of the Experimental Stations of Agriculture in the provinces of Bari and Foggia. From what has been reported (De Cillis, 1927) it has been and is often confused with other soft grains with very similar characteristics, in fact synonyms are French Majorca, Francesella, White Majorca, Carosella. The complexity of the identification of specific characters is largely due to the ancient cultivation practice of the "mixture" in which the presence of hard and soft wheat, aristati and mutici, red ear and white ear made difficult the selection of the prevailing "race". Widespread especially since the '20s in the areas of Foggia, Bari, Taranto, in those close to Basilicata and in Calabria and Molise, often confused with Carosella because similar, its cultivation was well suited to the plains and hills, succeeded well to durum wheat and endured the ringrani.

Carosella soft wheat (Leguminous, cereal, and forage crops: a catalog of Apulian biodiversity, 2018). Carosella is a soft wheat very susceptible to winter colds for this reason, in the past, it was not widespread in northern Italy where it was cultivated in spring while it was and is particularly appreciated in central-southern Italy where it has been cultivated since 1800. The name of this grain, as reported by Luigi Granata in Economia rustica per lo Regno di Napoli (1835), recalls in Neapolitan dialect the presence of ears without "carosate" rests, basically mutic. Azimonti in 1902 underlined how in Southern Italy this denomination was used to indicate in general soft grains cultivated without rests, while De Rosa in 1919 spoke of Carosella as a grain cultivated in Apulia also under the denomination of Bianchetta. De Cillis in 1927 reiterated it was very similar if not equal to Bianchetta and included it in the group of Maioriche. The known synonyms are numerous: Carosa, Carosello, Carosella bianca, Carosella napoletana, Carosella siciliana, Richelle blanche de Naples, Tosello, Carosellone, Bianchetta, Maiorca,

Maiorica, Caruso gentile. Among the autumnal soft grains of medium earliness described by De Cillis (1927), Carosella was ranked first on the national level as resistance to allurement and second as resistance to grip and rust. Pantanelli, always in the same year, talking about the results achieved by the Agrarian Station of Bari, included it among the soft bread wheats cultivated in the Land of Bari and coming from neighboring areas of Capitanata and also from Basilicata and Calabria. The project confirmed the presence of populations with their own morphological characteristics in limited areas of the provinces of Foggia and Bari where it is still cultivated for food and livestock use. Carosella is a variety which requires calcareous soils of medium texture, but it adapts very well also in not very fertile soils. Plants are tall and prostrate during the initial vegetative phase. The spike has a cylindrical and fusiform shape, spikelets have an average of 2 fertile flowers. Glumes are yellow-decolored whereas caryopses are yellow and ovate shaped. The unit production per hectare is very low and it is often cultivated in marginal areas of high hills and/or mountains where it still produces a "very white flour, very appreciated".

"Mar Piccolo Natural Park"

List of agricultural varieties subject to attention since they were found and reported in the Municipalities of Taranto, Carosino, Fragagnano, Grottaglie, Monteiasi, San Giorgio Ionico, and Statte. Due to the scarce territorial detail of the sources consulted for certain plant genetic resources, it was decided to extend the list of varieties, such as those of cereals, legumes and forage crops, to all those included in the district of the Ionic Tarantino Arch.

Olives

Dolce o Dritta: Report of Mondelli's company in Massafra. The variety Dritta has been described by different authors who attribute different origins. Presta in 1855 identifies the Taranto area as the area of major diffusion of the cultivar, but he found out its origins in Molise or Tuscany. Pastore in 1957 identifies the origin of the cultivar in the region of Basilicata and Calabria also identifying different names depending on the region: Maiatica in Basilicata and City of Rossano in Calabria. Cassano in 1935 in his treatise "L'olivicoltura e la sua industria nella provincia jonica" (Olive growing and its industry in the Ionian province), identifies the cultivar Dritta as an olive particularly suited to brine and vulgarly known as "Alìa Senza Pane" (Alìa without bread). The same name was given by Catanea in "Olivicoltura ed elaiotecnia nella provincia dello Jonio" (1938) for the sweetness of its pulp.

Cazzalora: Report of the company Pace di Avetrana According to Catanea (1938) the variety "oliva grosa" would correspond to the cultivars "S.Agostino or of Andria". Cazzarola also defines it and Cassano (1935) vulgarly calls it "alìa grossa".

Vines

Garganega, report of Prezioso winery in the territory of Grottaglie. CRESPAN M., CALÒ A., GIANNETTO S., SPARACIO A., STORCHI P., COSTACURTA A. (2008a). 'Sangiovese' and 'Garganega' are two key varieties of the Italian grapevine assortment evolution. Vitis 47 (2):97-104. Somarello is believed to derive from Garganega. Moreover, the name Montonico or Montuonico is sometimes mentioned in the historical bibliography about viticulture in Apulia (Fonseca, 1892a), but the absence of descriptions does not allow to understand if it is the Montonico we are discussing here. A further synonym of this grape variety is Greco bianco del Pollino (Schneider et al., 2009), of which Crespan and collaborators (2008a) have demonstrated

the kinship link with Garganega or Grecanico dorato, a variety widespread throughout the boot.Saint Lawrence

San Lorenzo, several reports in the territories of Sava, Manduria and Lizzano. A first brief description of Primativo or Primaticcio, cultivated in Gioia del Colle, Altamura and Trani, was written by Giuseppe Frojo on behalf of the Central Ampelographic Committee (1875). A few years later Domenico Frojo (1879) outlined in a more detailed way its main characters, defining the aroma of this particular grape. Giuseppe and Domenico Frojo also described a grape cultivated in the Tarantino area with the name of San Lorenzo, known elsewhere as Negro dolce, whose morphological characters are however very different from Primitivo. The S. Lorenzo found in Lizzano (TA), which has a genetic profile identical to Primitivo, therefore, does not correspond to the historical cultivar.

Zagarese, reported in the territory of Lizzano. As it can be deduced from the synonyms found, Malaca vine is present in other regions of Southern Italy, even if always sporadically. In Apulia, a few plants are found in polyvarietal vineyards of Leccese, in historical vineyards of the Subappennines and Gargano (FG), and it has also been identified in an old vineyard of Gravina di Puglia (BA), as well as recovered as Zagarese in Maruggio (De Palma et al., 2014b). According to Galet (1956), the wine obtained from Galicoul is ruby in color and has a bitterish taste. However, it cannot be excluded that Primitivo was also previously cultivated outside Gioia del Colle under another name. Some authors claimed it was also called Zagarese (Di Rovasenda, 1887; Molon, 1906b; Dalmasso, 1946).

Santa Teresa, reported in the Cicella district of Sava. The vine was recovered with this name in San Michele Salentino in the province of Brindisi, where its presence is moreover very sporadic. By comparison with genetic profiles, it was found to be identical to a now rare cultivar named Frmentum in Croatia (Schneider et al., 2014), probably corresponding to a white berry Fermentun mentioned in the last century by Bulić on the island of Korčula in Dalmatia (1949). Staffa (1881) reports a black berry vine, called Uva della signora Teresa, with "black grains, and fair: it is the best for the production of excellent wines". More recently Vitagliano (1985) mentions Santa Teresa white grape among the varieties which at the end of the nineteenth century "accompanied Primitivo" in the vineyards of Tarantino.

Cigliola: found in many places of Salento and in Sava. It is the name of a grape variety historically cultivated in Salento, known in Martina Franca (TA) as Uva attina. Thanks to the correspondence of genetic profiles, we know that this variety has also been recently identified in Basilicata with the synonym Agostinella (Alba et al., 2016). Bibliographic sources testify the presence of Cigliola in the Terra d'Otranto, particularly in the territories of Taranto and Lecce (Licci, 1877; Di Rovasenda, 1887); recently it has been identified with the same name in the countryside of Melendugno (LE), while in Martina Franca (TA) and in Valle d'Itria Cigliola is called Uva attina (Martelli et al., 1980). Among the manuscripts of the Di Rovasenda Fund (1856-1913), kept at the DISAFA of the University of Turin, there are unpublished descriptions of a white Cigliese from Altamura and of an Attigno or Uva di San Pietro, the latter with "early, crisp, white berry, ripening at the same time as Moscato". Both are well matched to Cigliola.

Fruits

Pear tree: Red (Carosino). Reported in the territory of Grottaglie (Azienda Abate). Ancient variety of which there are majestic specimens. Variety spread more in the provinces of Bari, Brindisi and Taranto.

Fico Petrelli: Particularly widespread in Puglia with greater concentration in the areas of Bari and Brindisi where it is present in more specialized crops, such as in the village of Torre Canne di Fasano where it represents a specialty of cultivation (they are put the characteristics envelopes around the apex of the branch to anticipate the maturation). In fact, it is also known as Culumbro fasanese, Fiorone di Torre Canne, Culumbr'. In the Brindisi area it is known as Petrale, in Salento as San Giovanni, San Pietro, Fiorone Mele or Fiorone di San Basilio in Otranto. Ferrara E. and Vendola D., 1987; Ferrara E. et al., 1991; Ferrara G. et al., 2016; Ferrara G. et al., 2017; Minonne F., 2017.

Trimone fig (Mattepinto). A seedling, the name probably comes from a certain Matteo Di Pinto who selected and defended it. It is present mainly in Valle d'Itria and southeastern Bari. Scattered trees have also been found in the agri of Altamura and Gravina in Puglia. In Martina Franca (TA) it is called Trimone. (Reina A., 1974; Suma F., Venerito P., 2008; Trotta L. et al., 2013.)

Fico Di Carosino, Reported on the Nigro farm in Carosino.

Fico Nero di San Marzano and Fico Verde di Natale San Marzano: reported in the Antonazzo farm of San Marzano.

Varnea Fig, found in Francevilla Fontana. A very ancient variety, present in many areas of Puglia with different names. It is also called Di Natale, Natale nera, Varnea nera in Francavilla Fontana (Br).

Fico Verdesca, Variety known especially in the areas of Brindisi and Taranto, as reported by Vallese in his work in 1909. The towns where it was more widespread are Martina Franca, Cisternino, Francavilla Fontana, where it was also cultivated for the production of dried figs. It is also called in some areas Verdescone. On the Daunian Mountains, with the name Verdesca is known a completely different variety, with an elongated pyriform shape, dark green skin and very large and white lenticels, dark red flesh. Gasparini G., 1845; Vallese F., 1909; Mazzilli F., 1927; Condit I.J., 1955; Donno G., 1959. Grassi G., 1984; AA.VV., 1999; Minonne et al, 2012; Trotta L. et al., 2013; Minonne F., 2017.

White Zingarello Fig. An ancient variety, present in many areas of the Region, from Daunia to Salento, known with different names. In Alto Salento it is known as Culumm Tunn, in Barese as Stravasciul, in Valle d'Itria as Culumbr Zingaridd. Pace N., 1997. Pellegrino N., 2001. Pantanelli E., 1936. Minonne et al, 2012; Trotta L. et al., 2013.

Vegetables

Regina Tomato (from Serbian): Source BiodiverSO Almanac (2018). Originally widespread in the land of Egnatia today it is cultivated between Monopoli, Fasano and Ostuni, especially in coastal agricultural areas. The name is inspired by the characteristics of the crown-shaped stalk. It has a double attitude: from table and from serbo. The plant, which has a determined growth but tends to form a considerable leaf mass and to cover the space between the rows, can carry 4-5 flower palms. It forms uniparous inflorescences and bears 4-6 fruits per cluster. The berries tend to be spherical in shape, they are deep red on the outside with a persistent yellow shoulder and orange in the flesh. They are bilocular. Peculiarity of this variety, in addition to the organoleptic perception primarily savory, is the thick skin that allows you to store the berries until winter by tying the stalks with cotton thread to make clusters called "ramasole". These are a traditional type of packaging followed by a commercialization which makes use of the Slow Food Presidium Pomodoro regina.

Arugula, Source BiodiverSO Almanac (2018). Arugula is a plant of Mediterranean origin known and used since time immemorial. It is currently undergoing severe genetic erosion due to the increasing attention that is being paid to it by another species of arugula, Diplotaxis tenuifolia, currently the most widely used in so many culinary preparations. The plant has elongated stems with lateral ramifications ending with pre-flowering apices, wavy leaf margin and dark green leaves. n Apulia, especially in the area of Bari, but also in the other provinces, the species Eruca vesicaria is still cultivated, even if in small gardens and with rare cases of commercialization. This local variety has been characterized from an agronomic and morphological point of view by the Institute of Biosciences and Bioresources of the CNR of Bari. DISAAT, thanks to an international collaboration, has characterized the composition of glucosinolates of this species.

Fagiolino dall'occhio Occhiopinto: Source BiodiverSO Almanac (2018). The Fagiolino dall'occhio, known in the Barese with the local name of Fagiolino pinto and Occhiopinto, is a typical Apulian crop, almost not at all widespread in other regions. The species is of African origin, already known and consumed since the times of ancient Romans, who called it "Phaseolus". It is a plant cultivated as a fresh vegetable only in some regions of central-southern Italy. The most common type has cream colored seeds with a spot, "eye", around the hilum, but there are other local varieties with seeds of different colors, or with mixtures of seeds of different shape and color. It has been found in the province of Bari, in Conversano, Putignano and Locorotondo. The plant, with determined development, presents an erect growth habitus. The flower is white, while the pods are narrow and long, of medium size, green with a purple tip. The production is medium-low. Seeds are ovoid to rhomboidal in shape with a rough to wrinkled, cream-colored integument with a small black area around the hilum. This local variety has been characterized from an agronomic, morphological and molecular point of view by means of SSR (single sequence repeat) and SNP (single nucleotide variation in DNA) markers by the Institute of Biosciences and Bioresources of the CNR in Bari. DISAAT enrolled the "Fagiolino dall'occhio" in the national list of PAT and determined the following characters: dry matter, ash, calcium, magnesium, potassium, sodium, boron, copper, iron, manganese, zinc, protein, fiber, water-soluble vitamins and fat-soluble vitamins.

Turnip Top Centoventina, BiodiverSO Almanac Source (2018). Turnip top populations are widespread throughout Apulia and are classified according to the length of the growing cycle, location of cultivation, and month of harvest. Other times the name also contains some adjective

('large', 'late', etc.). In the almanac is considered the classification which indicates the duration of the cultivation cycle, from sowing to harvesting. The term Centoventina indicates that must pass, on average, 120 days after sowing in order to harvest the main inflorescence. Cima di rapa is included in the national list of traditional food products (PAT).

White Artichoke of Taranto, Source BiodiverSO Almanac (2018). This variety is now rarely found in the Taranto area. The plants are of average height (about 95 cm with the main head), have an average diameter of about 120 cm and average suckering attitude. The leaves are greyish green, 75 cm long on average, with a semi-erect habit. The main flower head is broad/elliptical-ovate in shape and has medium to poor compactness. The outer bracts are entirely green in color and have a recessed apex with a small spine. The inner bracts are greenish-white in color and exhibit sparse density. The plant produces 5-6 flower heads and can be productive for more than three years. A high morphological similarity has been found with Il Bianco di Ostuni and Verde di Putignano. With the BiodiverSO project, thanks to the contribution of Prof. Donato Gallitelli, this variety has been rehabilitated from fungi and viruses through micropropagation and thermotherapy. The DISAAT, starting from vegetative apices of young growing carducci, taken from the mother plants specifically identified, is currently preserving in minimum growth for the in vitro maintenance of this genetic resource, which has also been characterized after micropropagation. This local variety, conserved ex situ in the catalog field of the IBBR of the CNR of Bari, has been characterized from an agronomic, morphological and molecular point of view by means of SNP markers (variation of single nucleotides of DNA) by the IBBR-CNR

Herbaceous

Grano duro Cappelli, (Leguminose, cereali e foraggere: un catalogo della biodiversità pugliese, 2018). Il grano duro Cappelli, noto anche come Senatore Cappelli, Strampelli, Cappello, o nel foggiano come Cappellone, corrisponde al tipo n. 231-1915 delle selezioni genealogiche eseguite sul grano duro Jeanh-Rhetifah a Foggia dallo scienziato Nazareno Strampelli. Il «mago del grano», così come fu definito, nell'arco di un cinquantennio (1891-1942), con il suo lavoro di ibridazione e selezione e le sue varietà rivoluzionò la granicoltura mondiale. L'allevamento delle sue "razze elette", fra cui il grano duro Cappelli, pronte all'uso nel suo laboratorio di Rieti già da 15 anni prima della istituzione del Comitato permanente del grano (decreto legge del 4 luglio 1925), di cui fece parte, e dell'avvio della "Battaglia del grano" (11 giugno 1925), contribuì notevolmente all'incremento della produzione cerealicola italiana a cavallo tra le due guerre. Il Cappelli, selezionato nel 1915, fu consegnato agli agricoltori nel

1923, dopo la nascita nel 1919 di due importanti enti agrari quali l'Istituto Nazionale di Genetica per la Ce- realicoltura di Roma e la Stazione Fitotecnica per le Puglie, alla cui progettazione Nazareno Strampelli contribuì.

Grano tenero Bianchetta, (Leguminose, cereali e foraggere: un catalogo della biodiversità pugliese, 2018). La Bianchetta è senza dubbio tra le varietà locali di grano tenero quella più diffusa in Puglia. La sua coltivazione risulta ampiamente documentata in testi di agronomia a partire dal 1784 (A. Ginori) e in monografie degli anni '20, '30 del secolo scorso redatte ad opera di agronomi e tecnici delle Stazioni Sperimentali di Agraria delle province di Bari e di Foggia. Da quanto segnalato (De Cillis, 1927) è stata ed è spesso confusa con altri grani teneri con caratteristiche molto simili, infatti sinonimi sono la Maiorca francese, Francesella, Maiorca bianca, Carosella. La complessità della identificazione di caratteri specifici è in gran parte dovuta all'antica pratica colturale del "miscuglio" in cui la presenza di frumenti duri e teneri, aristati e mutici, a spiga rossa e spiga bianca rendevano arduo il lavoro di selezione della "razza" prevalente. Diffusissima soprattutto a partire dagli anni '20 negli areali di Foggia, Bari, Taranto, in quelli a ridosso della Basilicata ed in Calabria e Molise, spesso confusa con la Carosella per- ché simile, la sua coltivazione ben si adattava in pianura e collina, succedeva bene al grano duro e sopportava i ringrani.

Grano duro Ricco, (Leguminosae, cereals and forage crops: un catalogo della biodiversità pugliese, 2018) synonymous with Grano, Grano forte, Ricco, and according to Conti also of Policoro 54 turns out to be present in Apulia in particular in the Alta Murgia since 1845, when with other local varieties it was used for bread making or given to bakers like other grains under the heading of "grano carnale" or in any case considered as wheat of inferior quality obtained from unripe ears or affected by some pathology for the production of bread for wage earners. The cultivation of "grano ricco" (rich wheat), as reported by several authors including Pantanelli, since 1927 was widespread especially in Spinazzola. The Agrarian Station of Bari, which was entrusted with the selection of some strains, was responsible for its further spread on the territories surrounding the current provinces of Foggia, Lecce, Taranto, Potenza and Salerno. It is a durum wheat with a very high culm and a standing from erect to semi-erect. It has a high resistance to rusts and an excellent tillering. The spikes are fusiform and the spikelets, on average with 3 fertile flowers, are absent at the apical level and not very frequent at the base. The rests are long, yellow-decolored, with a glabrous surface and the glumes are also yellow-decolored, long and wide with an accentuated curvature. The caryopses are medium-large, yellow-amber in color with a semi-elongated shape and trigonal section. The monitoring of the farms, carried out within the project, has highlighted the presence of this crop in very limited areas of the regional territory.

Grano duro San Pasquale (Leguminose, cereali e foraggere: un catalogo della biodiversità pugliese, 2018). Il grano duro San Pasquale è noto anche come “duro San Pasquale” o “San Pasquale”. Fra i grani duri risalenti come costituzione a più di novanta anni fa, quantunque inizialmente coltivato su vasti territori dell’Italia Meridionale, ed in particolare sul litorale ionico, oggi è quel- lo meno diffuso in quanto coltivato e conservato solo presso Enti pubblici. Agli inizi del XX secolo si diceva fosse coltivato in collina ed in montagna con scarsa produttività, sebbene apprezzato a livello familiare per la produzione di paste. La pianta di altezza compresa tra 95 e 110 cm, mostra a differenza di altri grani di antica costituzione, un portamento eretto. La spiga di colore biancastro e forma fusiforme presenta una densità media e cariossidi semi-al- lungate. Il monitoraggio del territorio effettuato nell’ambito del progetto SaVeGraINPuglia ha confermato il suo declino negli areali di coltivazione dove un tempo era presente. Al fine di ampliare le conoscenze su questa varietà un campione di semi è stato recuperato presso la banca del germoplasma del CNR IBBR di Bari e affidato per la conservazione in campo presso l’Azienda del Centro Didattico Sperimentale “P. Martucci” al Dipartimento di Scienze del Suolo della Pianta e degli Alimenti, Università degli Studi “Aldo Moro” di Bari. L’utilizzo segnalato del grano duro San pasquale è prevalentemente alimentare

Grano duro Saragolla di Puglia (Leguminose, cereali e foraggere: un catalogo della biodiversità pugliese, 2018). Il grano duro Saragolla, noto e diffuso in tutta l’Italia centro-meridionale, è da tempo incluso nel gruppo delle così dette “Saragolle” al quale appartengono secondo molti documenti storici non soltanto grani duri. Nel “Delle cose rustiche” tomo secondo, di P. Niccola Onorati del 1793, si menziona un grano con “acini lunghetti, sodi e di color biondo al quale appartengono il gran turchesco che ha acini più lunghi e la calabrese che riesce bene in Puglia”. Numerosi altri autori, tra cui il De Cillis nel 1927, hanno successivamente sottolineato l’attribuzione di questo nome a varietà differenti da quella originaria i cui centri di diffusione potrebbero es- sere le province di Avellino e Benevento. Nel medesimo anno Giuseppe Conti descrivendo il lavoro svolto dalla Stazione Agraria di Bari nel cuore di una regione eminentemente agricola parla del Duro di Puglia e del Granoro raccolto in Calabria e posto in prova presso le aziende pugliesi al fine di definirne i caratteri morfologici principali. Conosciuto all’estero già dal 1800 non solo come Saragolla ma anche come grano di Xeres, si è diffuso in Puglia anche con il sinonimo di Duro di Puglia spesso presente in miscuglio con il grano turanico, così come ri- levato in altre regioni italiane. Il grano duro Saragolla di portamento eretto anche se alto più di 140 cm, spiga mediamente compatta con reste leggermente colorate, cariossidi di forma allungata, è anche noto per essere un grano di pregio e di interesse per i genetisti. In partico- lare quello di produzione pugliese era apprezzato per il raffinato sapore che conferiva alla pasta così come segnalato dal Dipartimento

dell'Agricoltura americano nel 1903. Questo grano predilige quale areale di coltivazione la pianura, la collina, in particolare nel Lazio, Abruzzo, Molise, Campania, Basilicata, Puglia, Calabria e Sicilia e soprattutto le regioni calde.

Carosella soft wheat (Legumes, cereals and fodder crops: a catalog of Apulian biodiversity, 2018). Carosella is a soft wheat very susceptible to winter colds for this reason, in the past, it was not widespread in northern Italy where it was cultivated in spring while it was and is particularly appreciated in central-southern Italy where it has been cultivated since 1800. The name of this grain, as reported by Luigi Granata in Economia rustica per lo Regno di Napoli (1835), recalls in Neapolitan dialect the presence of ears without "carosate" rests, basically mutic. Azimonti in 1902 underlined how in Southern Italy this denomination was used to indicate in general soft grains cultivated without rests, while De Rosa in 1919 spoke of Carosella as a grain cultivated in Apulia also under the denomination of Bianchetta. De Cillis in 1927 reiterated it was very similar if not equal to Bianchetta and included it in the group of Maioriche. The known synonyms are numerous: Carosa, Carosello, Carosella bianca, Carosella napoletana, Carosella siciliana, Richelle blanche de Naples, Tosello, Carosellone, Bianchetta, Maiorca, Maiorica, Caruso gentile. Among the autumnal soft grains of medium earliness described by De Cillis (1927), Carosella was ranked first on the national level as resistance to allurement and second as resistance to grip and rust. Pantanelli, always in the same year, talking about the results achieved by the Agrarian Station of Bari, included it among the soft bread wheats cultivated in the Land of Bari and coming from neighboring areas of Capitanata and also from Basilicata and Calabria. The project confirmed the presence of populations with their own morphological characteristics in limited areas of the provinces of Foggia and Bari where it is still cultivated for food and livestock use. Carosella is a variety which requires calcareous soils of medium texture, but it adapts very well also in not very fertile soils. Plants are tall and prostrate during the initial vegetative phase. The spike has a cylindrical and fusiform shape, spikelets have an average of 2 fertile flowers. Glumes are yellow-decolored whereas caryopses are yellow and ovate shaped. The unit production per hectare is very low and it is often cultivated in marginal areas of high hills and/or mountains where it still produces a "very white flour, very appreciated".

2.d Proposal for a list of the varieties to be analyzed

In order to proceed with the analysis activities envisaged within the BEST project, it is necessary to select the varieties that are considered most promising for cultivation within the territories included or adjacent to the protected areas. On the basis of the territorial surveys and the collected literature, 28 varieties were selected including herbaceous, fruit-bearing, vegetable, vine and olive tree. The choice has been further refined by taking into consideration what has been found in the literature and integrating, where possible, the document examination with surveys on the territories and in those nearby. Therefore, the following list is a proposal that derives substantially from the proximity of the species' reports to the BEST project park areas and from the availability of historical and scientific information in order to assure their effective reintroduction.

However, in selecting the final list, the spreading of the Xylella epidemic must be taken into account, which sees the territories of the three protected areas fully affected by the emergency. In particular, the area of the Mar Piccolo and the area of the coastal dunes are located in the heart of the infected area, close to the containment area, while the area of Costa Ripagnola is located in the buffer zone. The productive use of olive varieties would therefore be excluded in the start-up phase, suggesting a precautionary exclusion of the same in the continuation of the analysis activities. Below is a summary of the 16 varieties proposed and an indication of the relevant protected areas.

RGV		VARIETY NAME	COSTA RIPAGNOLA	COASTAL DUNES	SMALL SEA	*SOURCE*
HERBACEOUS	1	Purple Bean		X		*Leguminose, cereali e foraggere: un catalogo della biodiversità pugliese, 2018*
HERBACEOUS	2	San Pasquale durum wheat			X	*Leguminose, cereali e foraggere: un catalogo della biodiversità pugliese, 2018*
HERBACEOUS	3	Soft wheat Bianchetta	X	X	X	*A. Ginori, 1784; De Cillis, 1927*
FODDER	4	Underground clover	X			*Leguminose, cereali e foraggere: un catalogo della biodiversità pugliese, 2018*
FODDER	5	Incarnato clover	X			*Leguminose, cereali e foraggere: un catalogo della biodiversità pugliese, 2018*
FRUIT	6	Petrelli fig			X	*Ferrara E. e Vendola D., 1987; Ferrara E. et al., 1991; Ferrara G. et al., 2016; Ferrara G. et al., 2017; Minonne F., 2017 + segnalazione*
FRUIT	7	Verdesca fig			X	*Gasparini G.,1845; Vallese F., 1909; Mazzilli F., 1927; Condit*

					I.J., 1955; Donno G., 1959. Grassi G., 1984; AA.VV., 1999; Minonne et al, 2012; Trotta L. et al., 2013; Minonne F., 2017 + segnalazione
FRUIT	8 Real Gentile Pear		X		*Briganti G., 1910. Stella N., 1932; Donno G., 1959. Brazanti E., Sansavini S., 1964; Maldarelli D., 1969; Ferrara E., 1970; Reina A., 1974; Biscotti N., Biondi E.,2008; Biscotti N. et al., 2010 + segnalazione*
FRUIT	9 But false Recchia	X			*Pantanelli 1936. Scaramuzzi 1949, Lococciolo 1964., Martellotta., 1964., Branzanti Sansavini 1964 Reina 1974 Minnone 2017 + segnalazione*
FRUIT	10 Plum tree S. Anna Ovale		X		*Suma F. e Venerito P., 2008 + segnalazione*
ORTIVE	11 Taranto White Artichoke			X	*Almanacco BiodiverSO, 2018*
ORTIVE	12 Top of Cola	X			*Prodotti Agroalimentari Tradizionali (PAT), Almanacco BiodiverSO, 2018*
ORTIVE	13 Occhiopinto black-eyed green bean	X		X	*Prodotti Agroalimentari Tradizionali (PAT), Almanacco BiodiverSO, 2018*
ORTIVE	14 Pinto green bean	X			*Almanacco BiodiverSO, 2018*
VINES	15 Cigliola			X	*Alba et al., 2016; Licci, 1877; Di Rovasenda, 1887; Martelli et al., 1980; manoscritti del Fondo Di Rovasenda , 1856-1913 + segnalazione*
VINES	16 Sunday night	X			*Perelli, 1874; De Rovasenda, 1997; Fonseca, 1892; Frojo, 1878; Frojo 1883; Frojo, 1875; Vincenzo Licci, 1881 + segnalazione*
VINES	17 Santa Teresa			X	*Schneider et al., 2014; Bulić, 1949; Vitagliano, 1985 + segnalazione*

2.d.1 HISTORY AND TRADITIONAL TECHNIQUES

This section provides a summary of the information deriving from the historical-documentary and scientific survey consulted regarding the presence of the selected varieties in the respective cultivation areas and, where possible, an indication of the production techniques and traditions connected to them.

1. PURPLE BEAN

The presence of broad bean crops in the Itria valley is reported in writings from the 18th and 19th centuries. However, these sources do not report information on the types grown. The farmers interviewed in the Savegrainpuglia sector stated that the purple bean is an old variety in the past typical of the area in which the project activities have found its presence. It is currently grown on small areas for the exclusive self-consumption by producers. The seed has been handed down in the company, passing from father to son. The Purple Bean is grown in small family gardens or in association with olive groves and orchards. The use of whole seeds is exclusively for food, while the waste is used in animal husbandry.

2. SAN PASQUALE DURUM WHEAT

San Pasquale durum wheat around the 1920s was said to be widespread in southern Puglia, especially on the Ionian coast. In particular at that time in the areas around Fasano, it was known as the San Pasquale N.50 line which some considered very similar to the Valais durum wheat present in the same period in the region.

It is also known as "hard San Pasquale" or "San Pasquale". Among the durum wheat dating back as a constitution to more than ninety years ago, although initially cultivated on vast territories of Southern Italy, and in particular on the Ionian coast, today it is the least widespread as it is cultivated and preserved only by public bodies. This durum wheat was said to be cultivated in the hills as well as in the mountains with low productivity although some authors in the 1930s reported it as being appreciated for the production of pasta in the areas where it was present. The monitoring of the territory has confirmed its decline in the cultivation areas where it was once present. The reported use of San Pasquale durum wheat is mainly for food.

3. SOFT WHEAT BIANCHETTA

Bianchetta is undoubtedly among the local varieties of soft wheat the most widespread in Puglia. Its cultivation is widely documented in agronomic texts starting from 1784 (A. Ginori) and in monographs especially in the 1920s and 1930s written by agronomists and technicians of the Experimental Agricultural Stations of the provinces of Bari and Foggia. From what has been reported (De Cillis , 1927) it has been and is often confused with other soft grains with very similar characteristics, in fact synonyms are French Majorca, Francesella , white Majorca, Carosella. The monitoring of the Apulian areas allowed to confirm their presence in the areas of Foggia, Bari, Barletta, Andria, Trani, Brindisi and Taranto, in some cases mixed with other local varieties such as Rossetta and Maiorica aristata bianca, as defined more than seventy years ago by Giuseppe Conti (1927). The spread throughout the territory and its appreciation is still associated with the preparation of a dish known as "grain of the dead" based on cooked wheat, variously seasoned with cooked wine, chocolate flakes, walnuts, almonds and pomegranate grains, a fruit of Phoenician origin symbol of rebirth and life. Prepared in honor of the dead on the evening between All Saints' Day and the Commemoration of the dead, in various towns in the provinces of Foggia and Bari and in particular in Orsara, Sant'Agata di Puglia where it is known as " ciccecuotte " and Bisceglie as " colva ", such dish was considered typical of the territory and therefore included among the vegetable products in the " National List of Traditional Agri-food Products" and in the "Atlas of typical agri-food products of Puglia". The use of Bianchetta is also of the zootechnical type as recently detected in the farms where it was found.

The complexity of identifying specific characters is largely due to the ancient cultivation practice of the "mixture" in which the presence of aristati and mutic, red and white wheat made the selection of the prevailing "breed" difficult. Widespread especially since the 1920s in the areas of Foggia, Bari, Taranto, in those close to Basilicata and in Calabria and Molise, often confused with the Carosella because similar, its prevalent cultivation was well suited to the plains and hills, it happened good for durum wheat and tolerated the ringrani. Plants with a mainly semi-erect habit can reach 140 cm in height and are on average resistant to lodging. The ears with parallel edges with very short to short barbs or beards are white when ripe

4. UNDERGROUND CLOVER

Native to the Mediterranean environment, the underground clover is an annual self-seeding species characterized by a strong geocarpism (ability to grow downwards). The plant has numerous prostrate stems, 20-25 cm long, creeping and forming a dense vegetative web. As part of the underground T., there are three botanical varieties or subspecies: subterraneum , suitable for basically acid soils , characterized by pubescent plants, black seeds and a weight of 1000 seeds between 5 and 7 g, very resistant to cold;

brachycalycinum , suitable for neutral or basically alkaline soils, with glabrous plants and with the flower calyx shorter than that of the other subspecies, large seeds (1000 seeds weight: 8-10 g), black or reddish-black; yanninicum , which grows well in humid and marshy soils, not very hairy, with medium sized cream colored seeds (1000 seeds weight 7-10 g).

The underground clover adapts to all types of soil and, depending on the pH and the degree of humidity, the most suitable subspecies for the particular edaphic situation can be chosen. For the Apulian environments, where the soils are neutral or basically alkaline, the most suitable subspecies is brachycalycinum . Due to its precious characteristic of self- sowing , this subspecies, if well used, becomes perennial and can be very useful for the improvement of the turf of natural pastures and arable land, where it is difficult to operate quickly with mechanical means. Moreover, due to the speed of growth and the prostrate posture, it is able to rapidly cover the surface of the ground, forming an excellent turf , useful for grazing livestock of all kinds. The thick and compact grass cover plays an effective defense against water erosion and, due to its aggressiveness, tends to overwhelm other species and is therefore often used as a grassing plant in olive groves, vineyards and orchards.

5. INCARNATO CLOVER

Incarnato clover belongs to the group of species traditionally cultivated in Apulia for about a century. A wide historical documentation describes its areas, cultivation methods and use in animal husbandry. It is a forage plant well adapted to the Mediterranean climate, interesting for loose, dry and poor in limestone soils. The fast and abundant development makes it a typical leguminous herb with a single mow. The plant is of medium size with an erect habit and taproot. Flowers are gathered in purple red heads. The product obtained is a very palatable and digestible zootechnical food, if the harvesting is done with plants in blooming. Late harvests can cause problems to animals because of the many bristly hairs of the flowers' calyx. Starting from the 60's of the last century in Apulia Squarroso clover has partially substituted incarnato clover.

6. FIG PETRELLI

There is a high intravarietal variability within this cultivar, being a very ancient variety and strongly present in the regional territory. It is in fact particularly widespread in Puglia with greater concentration in the areas of Bari and Brindisi where it is present in more specialized crops, such as in the hamlet of Torre Canne di Fasano where it represents a cultivation specialty (the characteristic envelopes are placed around the apex of the branch to anticipate maturation). It is in fact also known as Culumbro Fasanese,

Fiorone di Torre Canne, Culumbr '. In the Brindisi area it is known as Petrale , in Salento as Culummara bianca, San Giovanni, San Pietro, Fiorone Mele or Fiorone di San Basilio in Otranto, Fiorone di Mola or di Polignano in the south east of Bari. It seems that its origin is made to fall in Salento as evidenced by the bibliographic citations of Guglielmi, De Rosa and Vallese where this variety is described under the names of Colummara bianca and San Giovanni. Instead, it seems that the name Petrelli can be traced back to a farmer from the province of Bari who selected a particular earlier clone of these Salento selections, and spread it on the Bari coasts up to Fasano. The most important production area includes, in the countryside of Fasano, the hamlets of Torre Canne, Savelleri and Pozzo Faceto. Every year in Pezze di Greco di Fasano the Fiorone Festival is held where the various producers display their fruits. To anticipate the maturation of both the fioroni and the supplied ones, an inoleation was practiced in ancient times which consisted of anointing with a needle with olive oil in the area around the ostiol to promote the production of ethylene inside the fruit and anticipate it. maturation. For the caprification of those supplied, instead, necklaces of honeysuckle fruit were placed on the plants (usually 3 or 4 per plant), or in Fasano pots with ripe fruit inside were placed under each plant to attract pollinating insects (Blastophaga psenes). Plant appreciated above all for the florets, but also for the supplied ones as they are precocious. Poor resistance to manipulation.

7. GREEN FIG

Variety known above all in the areas of Brindisi and Tarantino, as Vallese reported in his work in 1909. The countries where it was most widespread are Martina Franca, Cisternino, Francavilla Fontana, where it was also cultivated for the production of dried figs. It is also called Verdescone in some areas . On the Dauni Mountains, with the name Verdesca a completely different variety is known, with an elongated pyriform shape, with dark green skin and very large and white lenticels, dark red pulp. Medium-high resistance to manipulation and splitting of the ostiole.

8. REAL PEAR

It is a very ancient variety, present in almost the whole Region, especially in the Berese and Tarantino, but also in the Dauno Subappennino and on the Gargano. The name seems to lead back to its noble origin, perhaps brought to Puglia by the Angevins. The Director of the Itinerant Chair of Agriculture for the province of Bari, Gaetano Briganti, mentions it in 1910, in the publication "For the increase of fruit growing in the province of Bari". It is mentioned in: "Main among the best fruits for export", as a variety

exported for the Austrian market, but which should not be extended to the advantage of the Gentile and Ambrosini cultivars. good varieties of pears in the province of Bari "by Nicola Stella is described as a" variety with a very sweet fruit, but which is consumed only on internal markets because it is not very resistant to travel, good for jams. It ripens between mid-July and early August ". Scaramuzzi also talks about it in" Main varieties of peraglie grown in the Gargano "of 1949 and Branzanti and Sansavini in 1964, who also mention it in Campania, in particular in the province of Avellino. Donno speaks of it as one of the best varieties present in Puglia in his essay on the pear varieties present in Salento. Ferrara describes it among the varieties present in the province of Bari and defines it as a good table pear. It is only mentioned by Reina in his publication "Precocious and precocious pear cultivars in the province of Taranto", among the best varieties in the Region. Maldarelli in his "Giovinazzese Anthology", gives its dialectal name. Plant of high productivity, good resistance to manipulation.

9. RECCHIA LASFA PEAR

Very ancient variety, widespread throughout Puglia. However, there are several cases of synonymy. Being a very ancient variety and widespread on almost the entire regional territory, there is a high intravarietal variability . Pantanelli in "The fruit growing in the land of Bari" of 1936 on pag. 77 mentions it among the best summer pears in the Region, important because they ripen in a period when there are no foreign varieties on the market. Scaramuzzi also talks about it in "Main varieties of pear cultivated in the Gargano" of 1949 and Branzanti and Sansavini in 1964. It is also described by Reina in the "Precocious and precocious pear cultivars in the province of Taranto", both as Orecchia falsa and as pear Vetriolo , from which the evident synonymy is deduced. It is described as an excellent table variety. Highly productive, medium-low resistance to handling.

10. SUSINO SANT'ANNA

Unknown but very ancient origin, found in the countryside of Ceglie Messapica (Br), called with this name due to the ripening period which takes place at the end of July. With its characteristic shape, in fact it has a neck towards the peduncle, it seems to be the Susina Basaricatta or Collotorto described in the Pomona di Gallesio . Plant of high productivity, medium degree of ripening and medium resistance to handling. (Suma F. Venerito P. 2008).

11. TARANTINO WHITE ARTICHOKE

Ancient variety of artichoke grown sporadically, even in the past, in the gardens of the province of Taranto. Mentioned in the 1976 Atlas of Artichoke Varieties, the variety is described for its historical and productive characteristics with brief observations and two photos (on pages 76 and 77).

Previously, Felice D'Introno (1967) indicates it among the Apulian varieties in the book "Le composite superlative", a book dedicated to the production of artichoke, thistle and salad. In particular, it refers to artichoke cultivation data in the decade 1955-1966. The text reports studies on the vegetable conducted by the University of Sassari and the University of Bari under the patronage of the National Research Council, on techniques and methods of cultivation, planting and multiplication of the artichoke, fertilization and genetic improvement.

To attract our attention is a section dedicated to artichoke production in Puglia. The cultivation of the artichoke in Puglia in that period had an unexpected outcome, thanks to the ease of placing the product on the markets of northern Italy at profitable prices. The text reports that the crop was first introduced in the dry soils in the countryside of Bisceglie and that it subsequently spread to the countryside of Mola di Bari, Mesagne, Brindisi and Gallipoli. Since 1950 the artichoke has made its triumphal entry into Capitanata (San Ferdinando di Puglia, Trinitapoli, Margherita di Savoia, Cerignola and Manfredonia), revolutionizing the old system of cereal-extensive agriculture. The most widespread variety was of the "Catanese" (Niscemese) type, although it had undergone morphological variations.

The Bari artichoke production and in part also that of Brindisi and Taranto increased considerably in 1950, especially with the arrival of irrigation water, essential for forced cultivation of the vegetable. The Apulian varieties mentioned are: Artichoke of Taranto or Bianco Tarantino, Local of Mola, Local of Ostuni, Centofoglie, Precocious violet.

This variety is hardly present in the Taranto area by now. The plants are of medium height (about 95 cm with the main flower head), have an average diameter of about 120 cm and an average polloniferous attitude . The leaves are greyish green, on average 75 cm long with a semi-erect posture. The plant produces about 5-6 flower heads and can be productive for more than three years.

12. CAULIFLOWER CIMA DI COLA

Among the first reports we report that of Cesare Giulivi, 1984: Marketing of Cauliflower on national and foreign markets. The national cauliflower conference. April 5, 1964, Fano. On the price list of the Bari Wholesale Fruit and Vegetable Market of different years there is the indication "Cauliflowers C. dicola to the piece" and Cauliflowers C. dicola to the bundle ".

Local varieties of cauliflower are mentioned in the book on Horticulture (Bianco and Pimpini , 1990) which contains the following chapter: Bianco VV, 1990. Cauliflower (Brassica oleracea L. var . Botrytis). In Bianco and Pimpini , 359-380. Patron Editore, Bologna (attached photo).

13. EYE BEAN

The green-eyed bean or pinto bean is a species of African origin and has been present in Puglia since ancient times. The cream-colored seed types with the black eye (area around the hilum) are widespread especially in Salento. The pinto bean has been grown in Puglia since time immemorial and belongs to the agronomic tradition that adopts cultivation techniques consolidated over time and typical cultural references. The citations, even if with generic nomenclature of Fagiolino pinto, in the works of classical antiquity, especially Roman (works of Apicius , etc.) and of the Middle Ages (Charlemagne), do not however report precise territorial references.

14. PINTO BEAN "A METRO"

The green bean pinto per meter is a subspecies of Vigna unguiculata , of African origin. It has been present in Puglia since ancient times. The green bean pinto by the meter is so called ("by the meter") due to the unusual length of the pod, which can reach up to one meter. Once widespread in the province of Bari and probably also in other Apulian provinces, it is distinguished above all by the climbing habit of the plant which allows the pods to extend in length. The kidney seed is usually brick red in color, but black bean seeds per meter have also been described. The culinary preparations used in Puglia are the same as the other non-climbing varieties of pinti green beans. Today very rare, it is grown almost exclusively in small plots of land or in family gardens. The sample shown here was collected in the countryside of Monopoli (BA). The pinto bean has been grown in Puglia since time immemorial and belongs to the agronomic tradition that adopts cultivation techniques consolidated over time and typical cultural references.

The citations, even if with generic nomenclature of Fagiolino pinto, in the works of classical antiquity, especially Roman (works of Apicius , etc.) and of the Middle Ages (Charlemagne), do not however report precise territorial references.

The first missions carried out by explorers of the Germoplasm Institute (now the Institute of Biosciences and Bioresources) of the National Research Council, dedicated exclusively to finding varieties of pinto beans in Puglia, date back to 1986. In those explorations, the samples found, kept at the seed bank of the

then Institute of Germplasm of the CNR, presented seeds of different colors / patterns (for example black seeds, or cream-colored seeds with the eye, ie the area around the hilum, black). During the same exploration missions, samples belonging to the Vigna unguiculata were also found susp . sesquipedalis , characterized by very long pods (green bean pinto by the meter).

15. CIGLIOLA VINE

The white Cigliola is a denomination found in Salento, where associated with it numerous accessions and oral testimonies of local farmers have been identified and collected during the research operations as part of the integrated project for the Recovery of the Apulian Viticultural Germplasm (Re.Ge. Vi.P).

The knowledge in the Apulian population of the name of Cigliola bianca was the greatest followed by that of Uva Attina . The geographical area where the first denomination (Cigliola bianca) was found was also the largest.

The same vine is present with other denominations in different wine-growing areas of the Puglia region:

- Grape Attina in Valle d'Itria (Prov . Bari, Brindisi and Taranto) (Martelli et al., 1980)
- White Cigliese in Altamura (Di Rovasenda, 1856-1913)
- Attigno or grape of San Pietro delle Puglie (Di Rovasenda, 1856-1913)

16. NOTARDOMENICO VINE

Present in the province of Brindisi since ancient times, with always rather modest surfaces, the Notardomenico vine has generally been cultivated and vinified in blends with the Ottavianello , another native vine of the Brindisi area with which it enters for the production of the DOC Ostuni wine.

The vine is mainly widespread in old promiscuous vineyards of the Valle d'Itria, of the Murgia of Bari, in Salento often mixed with other white, red and black varieties. The vine is known with the name of Notardomenico in the Bari and Brindisi areas while in the Lecce area it is called San Nicola.

The Notardomenico is cited by some authors of the late 19th century (Perelli, 1874; De Rovasenda, 1997; Fonseca, 1892). According to Perelli (1874) it is a "vine that provides alcoholic and colored wine, it is grown on a small scale in Martina, Gioia del Colle, etc." The same vine was present with other denominations in different wine-growing areas of the Puglia region, such as Guara Domenico, Nero Domenico, Pier Domenico, So 'Nicola, Gallioppo (Frojo , 1878; Frojo 1883). The best known alternative

denomination in the Province of Lecce is San Nicola which Frojo (1875) refers to as Sor Nicola, outlining the main morphological characteristics of the Notardomenico grape.

The name Notardomenico is mentioned by some authors after the mid-nineteenth century (Perelli, 1874; De Rovasenda 1887; Fonseca 1892) and probably the same variety was known in the district of Bari also with the synonyms Guara Domenico, Nero Domenico or Gallioppo (Frojo , 1878; Frojo 1883). Domenico Frojo and Vincenzo Licci (1881) describe the Pier Domenico di Martina Franca (TA), whose characteristics correspond well to the grape in question here. Giuseppe Frojo (1875) and Frojo e Licci (1881) outline the salient characteristics of the vine known as Sò Nicola in Faggiano and San Giorgio Ionico (TA) and whose morphology seems to correspond to Notar Domenico. The synonym San Nicola, with which it was recently identified, is reported by Fonseca (1892a) in Gallipolino (LE).

17. SANTA TERESA VINE

Santa Teresa is a denomination found in the province of Taranto and in particular in Valle d'Itria where the vine has long been known and in the past cultivated in the old multi-variety vineyards reared in different forms (alberello, espalier), very often associated with the DOC vines Martina Franca and Locorotondo. Vitagliano (1985) mentions Santa Teresa, a white grape, among the varieties that at the end of the 19th century “accompanied the Primitivo” (p. 241) in the Tarantino vineyards. Probably the denomination is due to the quite late ripening period of the grapes, which takes place around the beginning of October, around the feast of Santa Teresa.

2.e SYSTEMATIZATION OF GIS DATA

This section reports the (provisional) results of the data systematization activity in the GIS environment. The activity consists in the selection, collection and georeferencing of geographical data capable, on the one hand, of documenting the presence of native Apulian varieties at risk of genetic erosion in the territory pertaining to the BEST project, on the other hand of contextualizing the findings under the existing agronomic, landscape, pedological and binding profile.

The field surveys were inserted into the GIS project in the form of a geodatabase made up of geotagged photos illustrating the current state of agriculture. The same procedure has been carried out for the historical documents whose most likely territorial location has been assumed and approximated, constituting a punctual geodatabase of illustrations and historical maps, in order to give a testimony of agriculture in the three project areas from about 1700 until the last century.

Finally, some cadastral parcels belonging to the three park areas were classified and included in the project database. The accompanying information visible in the cartographic layer concerns in particular the crop, the farm and the source from which it was possible to find the information. In particular, the three main sources are: direct survey, AGEA files and photo-interpretation.

The current and historical data are contextualized thanks to the superimposition of different technical cartographies of public domain and coming from the operator's own scientific researches, published on scientific journals.

To this end, extracts from the cartography created in the project information system will be shown, with particular reference to:

- contextualization (orthophotos, cadastral sheets and parcels, municipal limits, perimeter of protected areas)
- distribution of regional agricultural varieties at risk of genetic erosion found in the context of integrated projects for biodiversity
- Land Use Cartography 2006 and 2018
- Soil characteristics through the soil classification map of the Acla 2 project
- Habitat Map updated to 2018
- Constraints adopted at regional level in the context of the PPTR
- Characterization indices of the agricultural landscape (intensity of cultivation, density of elements of the agricultural landscape, crop diversity)

The overlapping of different layers has made it possible to frame the three different territories on the basis of numerous aspects related to agricultural use and the type of agriculture practiced.

The area of Costa Ripagnola is included in the landscape of the Murgia dei Trulli and more precisely in the sub-landscape of “piana degli ulivi secolari” in which it is possible to identify valuable rural landscapes and natural meadows and pastures. The territory of the park is characterized by an average sandy pedology and very thin soils. The current land use has a dominance of non-irrigated arable land classifiable among the extensive crops. Compared to the previous decade there has been a confirmation of the cultivation structure that does not present deep transformations. The determining elements of the agrarian landscape are the dry-stone walls and isolated trees, in a minor way hedges, while tree rows are absent. Cultivation differentiation is not high along the coast while it is more marked in the hinterland. Herbaceous species are cultivated with an average agricultural input, while olive groves have a more extensive character. Finally, the historical rural artifacts related to agriculture near the area are mainly related to olive production (traps and mills).

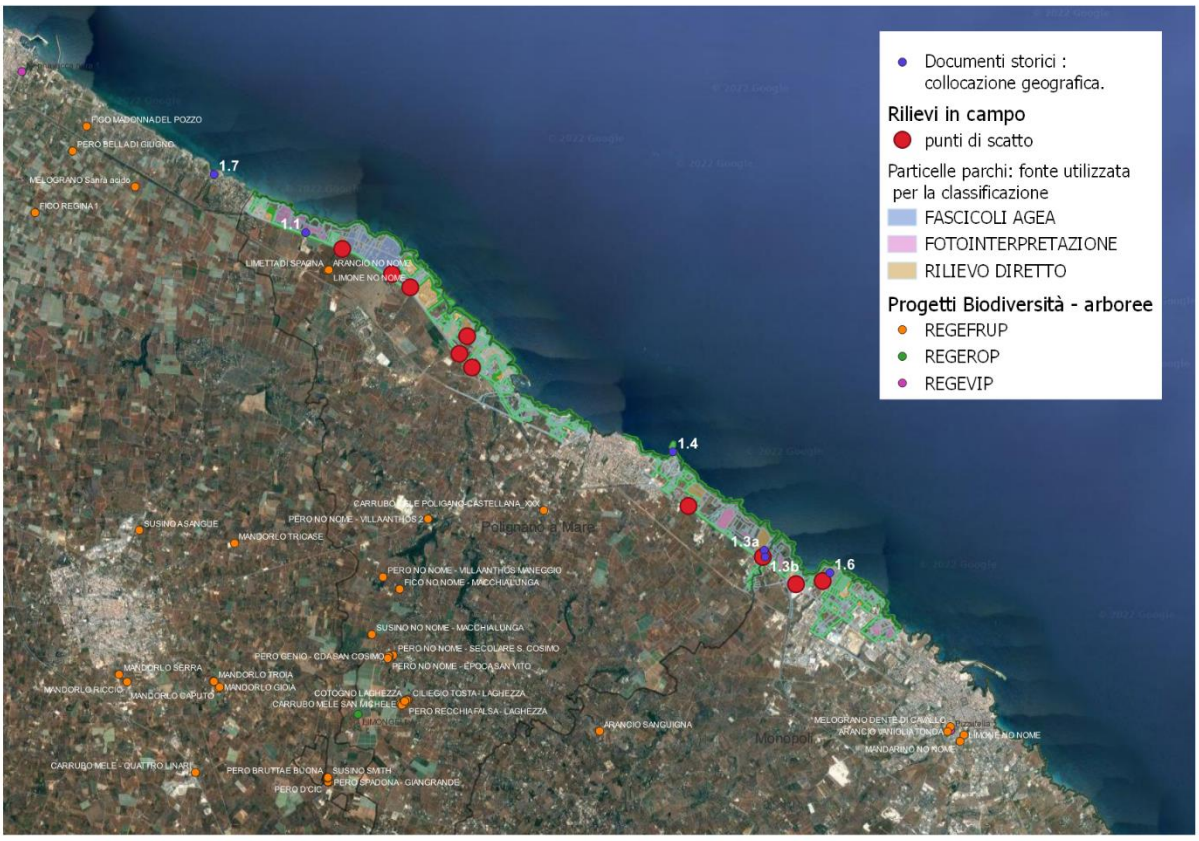


Figura 10 overlapping of the layers in the project database – Costa Ripagnola

The area of the Dune Costier Park is, like the previous one, included in the landscape of the Murgia dei Trulli and more precisely in the sub-landscape of “piana degli ulivi secolari”. Even here it can be find rural valuable landscapes and natural meadows and pastures. The territory of the park is characterized by an average sandy pedology and very thin soils. This pedological continuum is often interspersed by the

incision of lame with moderately deep soils and a more clayey texture. The current land use presents an alternation of tree crops, intensive and extensive herbaceous crops, as well as natural pastures. The cultivation structure does not show deep transformations in the last 10-20 years. The determining elements of the agrarian landscape are the dry-stone walls, the planting patterns of the arboretums so wide to be confused with isolated trees, rare windbreaking hedges, while tree lines are absent. Cultivation differentiation is moderate. Herbaceous species are cultivated with a medium-low contribution of agricultural inputs, while olive groves and vineyards have a more extensive character. Finally, even here the historical rural artifacts attributable to agriculture are mainly related to olive production (traps and mills).

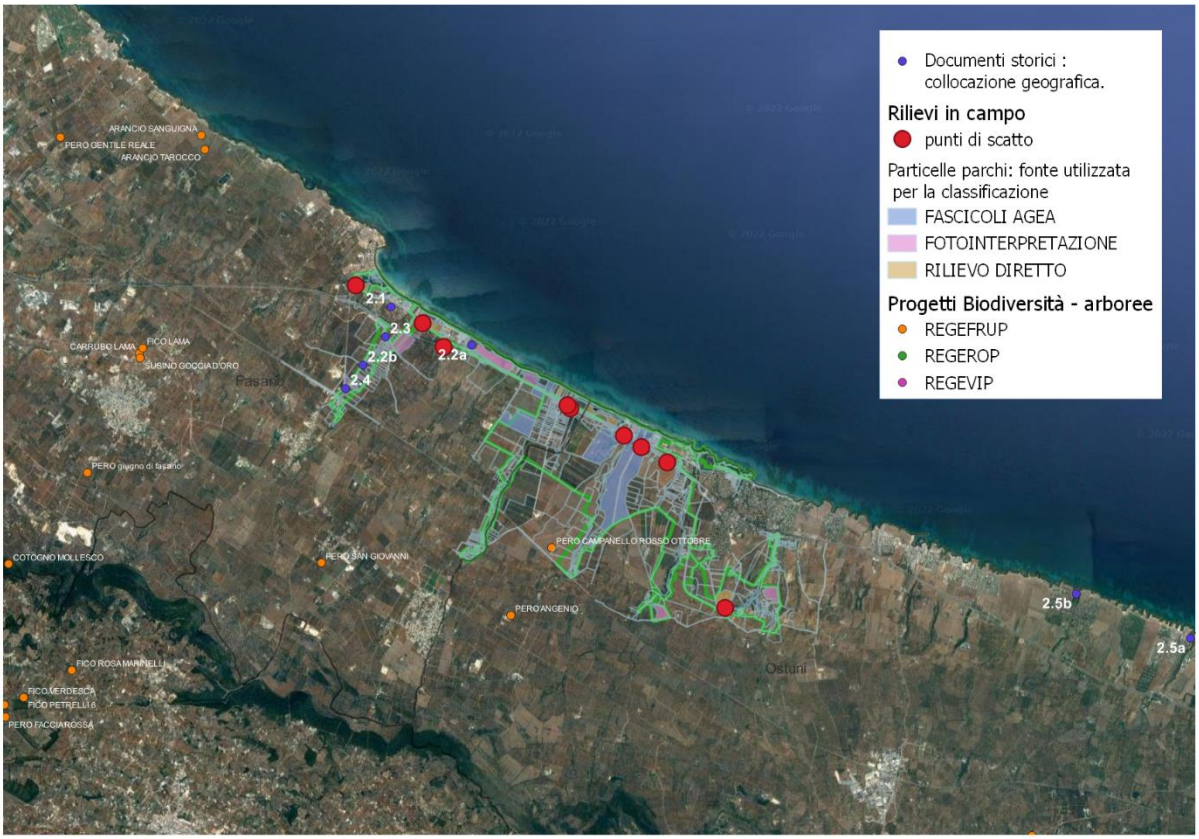


Figura 11 overlapping of the layers in the project database – Dune costiere

The area of Mar Piccolo is included in the landscape of the Arco Ionico Tarantino, more specifically, the area is part of the amphitheater and the plain of Taranto in which are clearly identifiable large spaces characterized by meadows and natural pastures. The typical pedology of the area is characterized by average soils from deep to thin. The prevailing land use is the arable lands with extensive crops and complex agricultural systems. The area has a good cultural differentiation in which the elements of the

agrarian landscape result with an average to very low frequency. The agricultural inputs used in the arboretums are higher than in the other two areas, while arable crops are much less intensive. Finally, from the point of view of the historicity of the agricultural system in relation to the presence of historical rural artifacts, it is possible to assume a significant development of olive growing and pastoralism. The rural architectural elements closest to the park are in fact mills and jazzi.

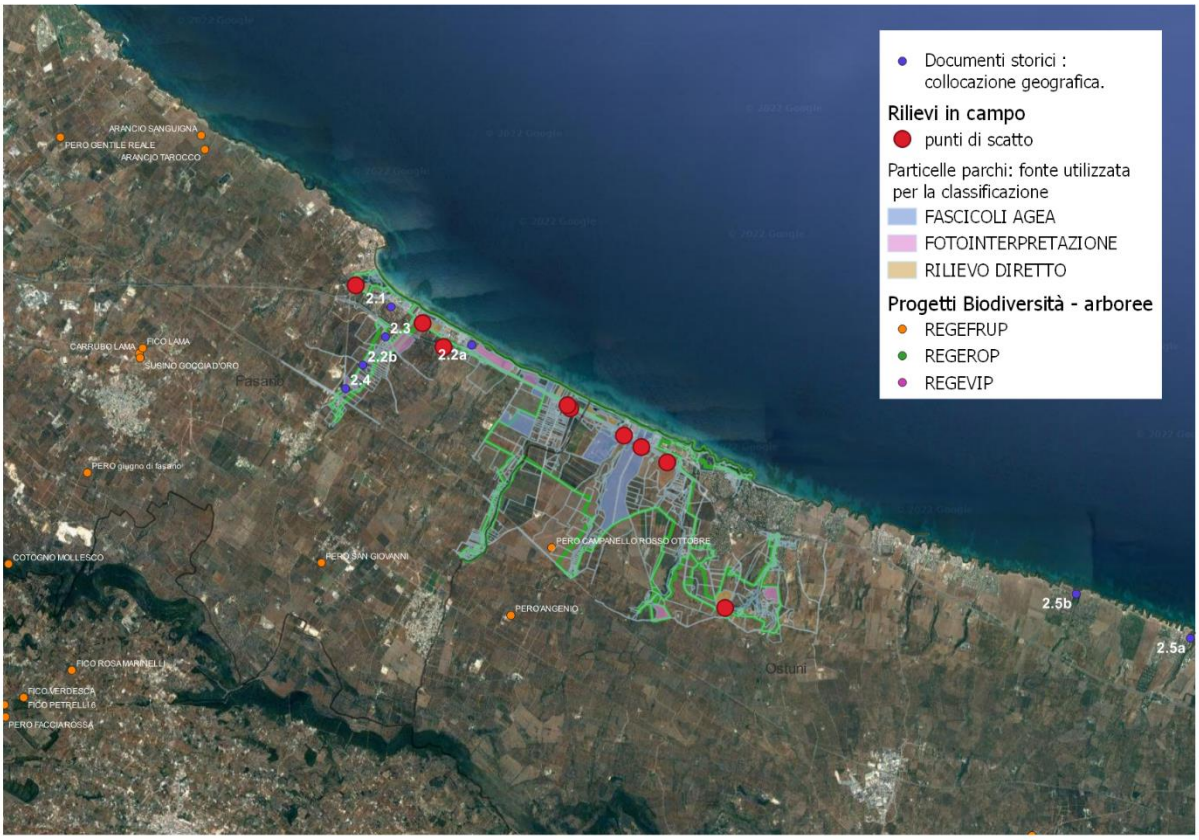


Figura 12 overlapping of the layers in the project database– Dune costiere

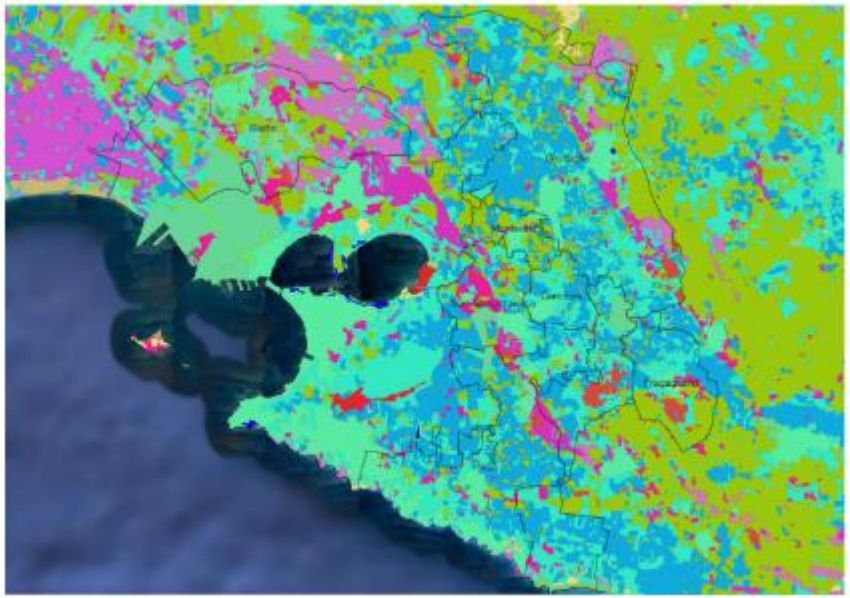
RURAL CONSTRUCTIONS

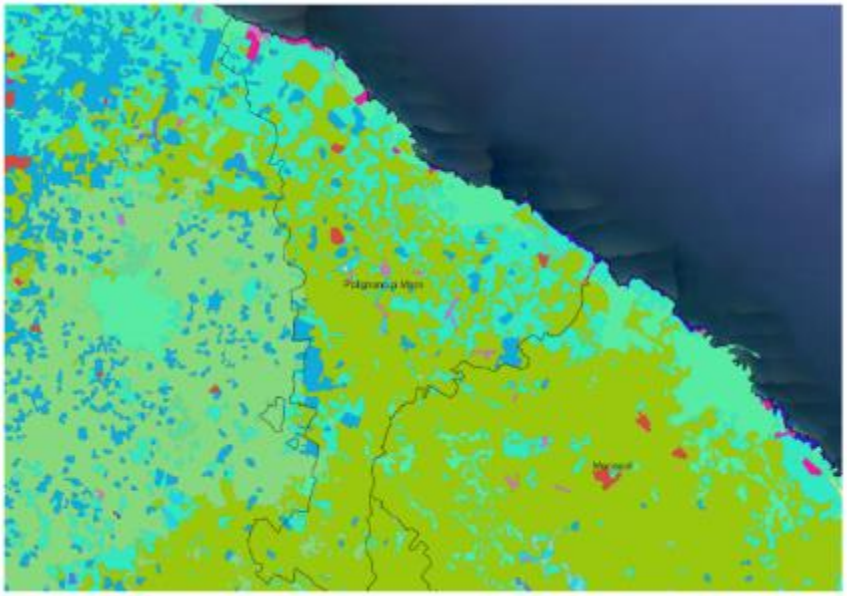
(Programma di tutela e valorizzazione degli elementi della cultura rurale in Puglia)

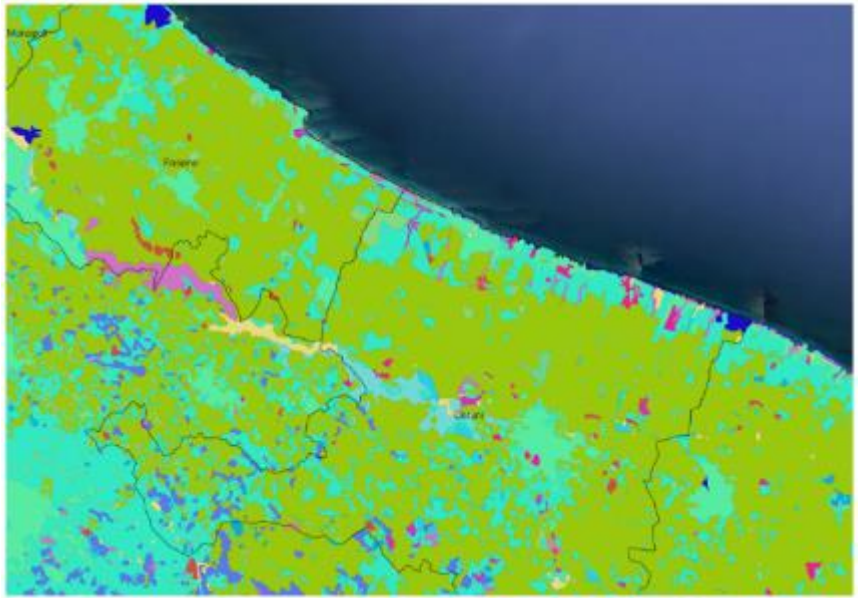
Edilizia rurale - Fabbricati di esercizio

- CANTINA
- COLOMBAIA
- FRANTOIO
- JAZZO
- LAMIA
- MOLINO
- NEVIERA
- OLEIFICIO
- OVILE
- TRAPPETO
- Fabbricati rurali residenziali e Masserie

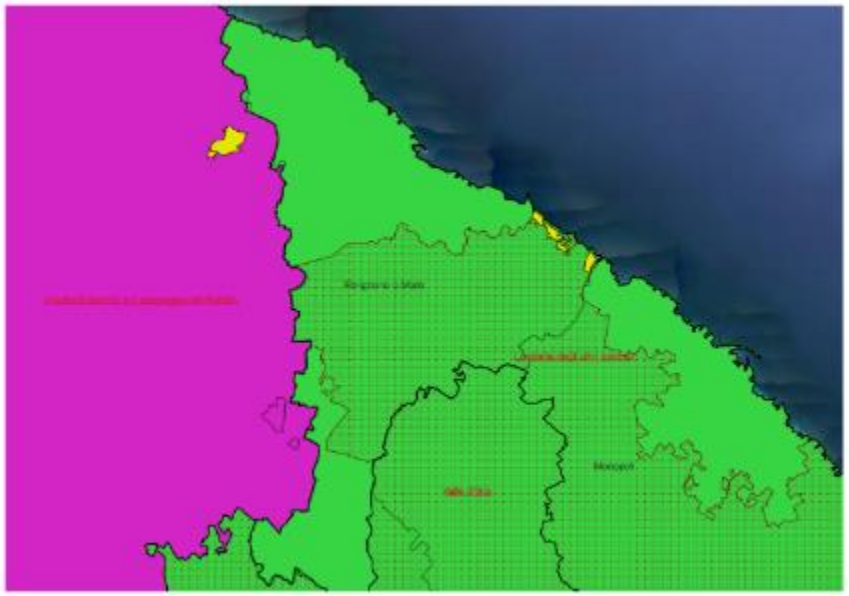
NATURE MAP (ISPRA)



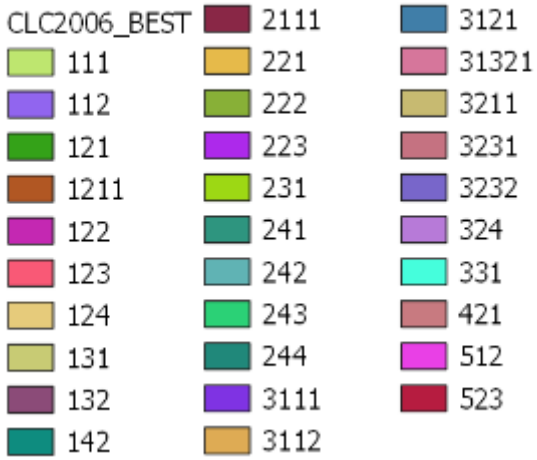


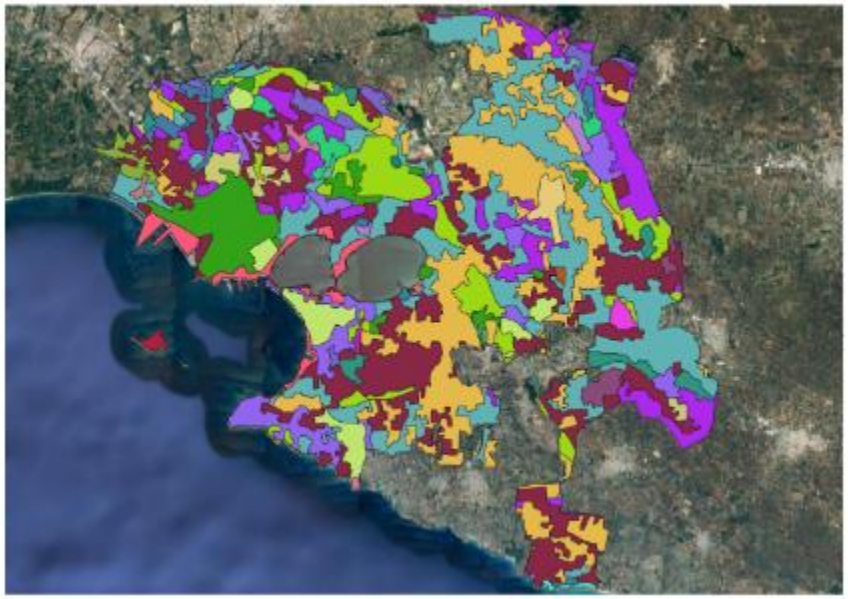


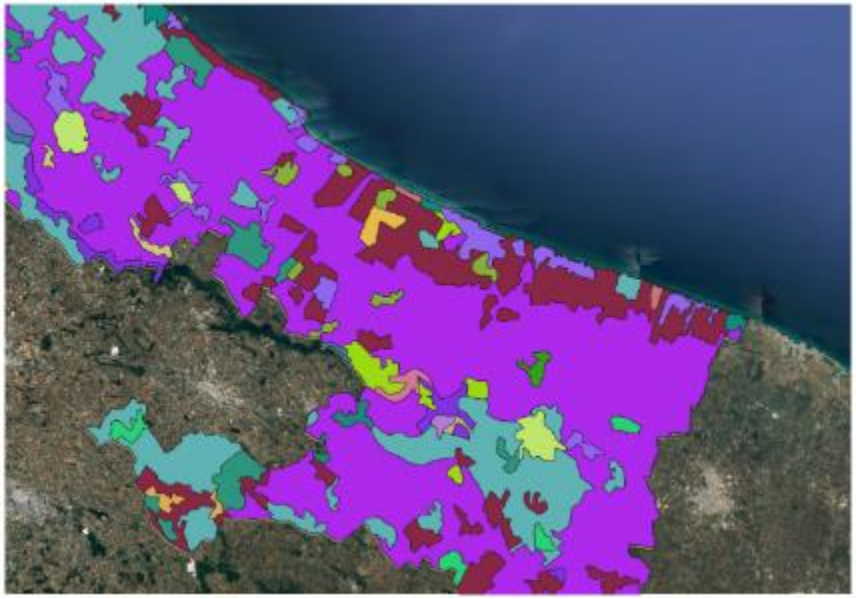
LANDSCAPE ZONING (PPTR Puglia)



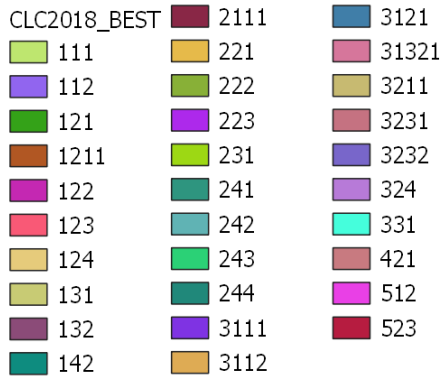
CORINE LAND COVER 2006

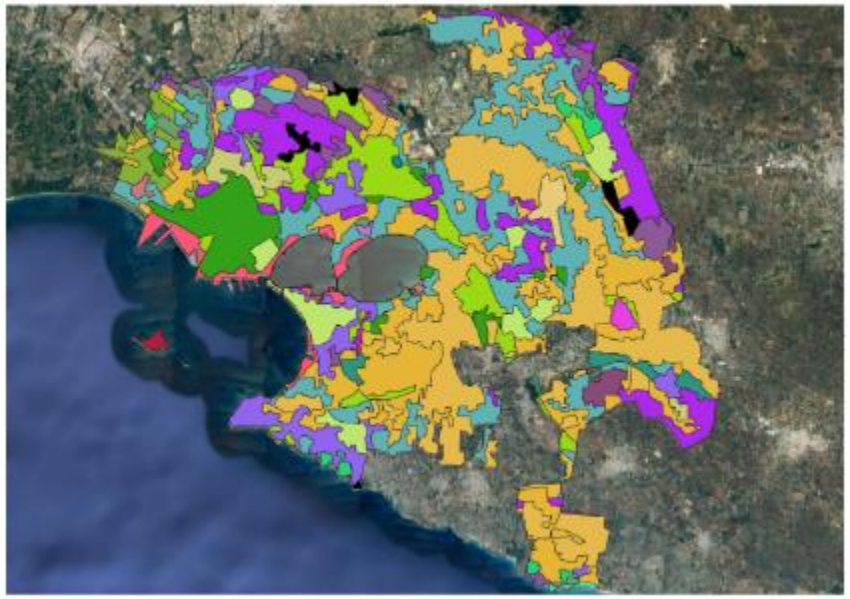


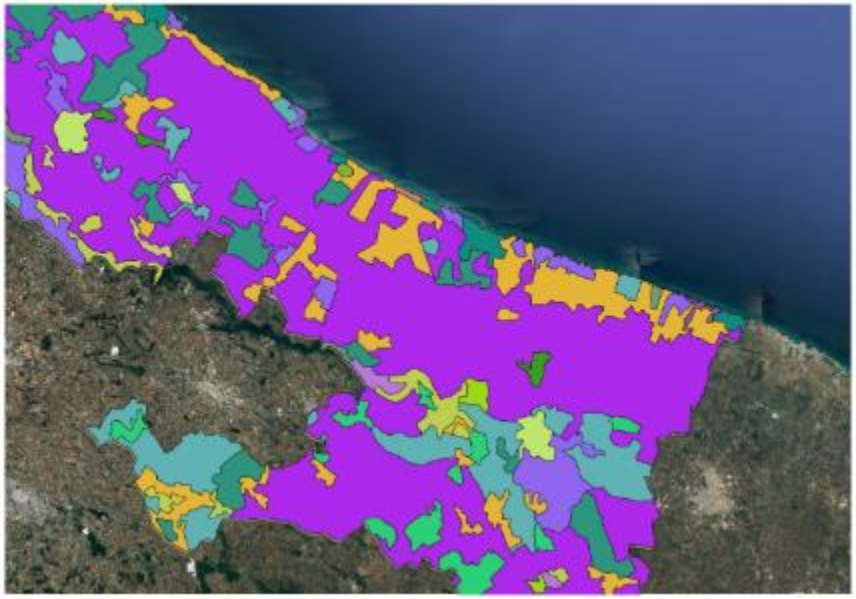




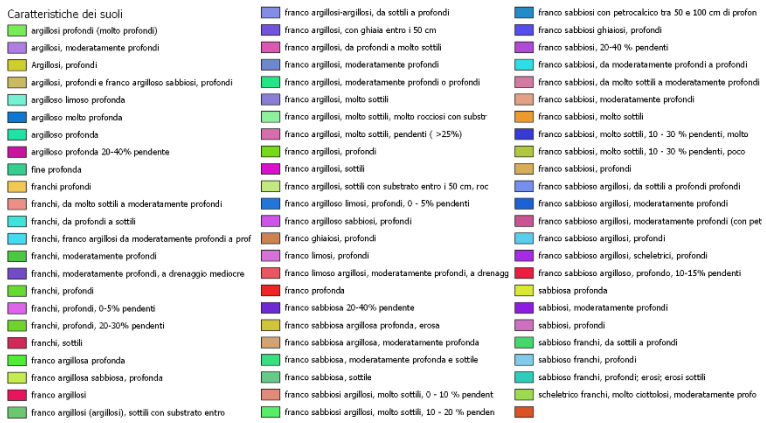
CORINE LAND COVER 2018

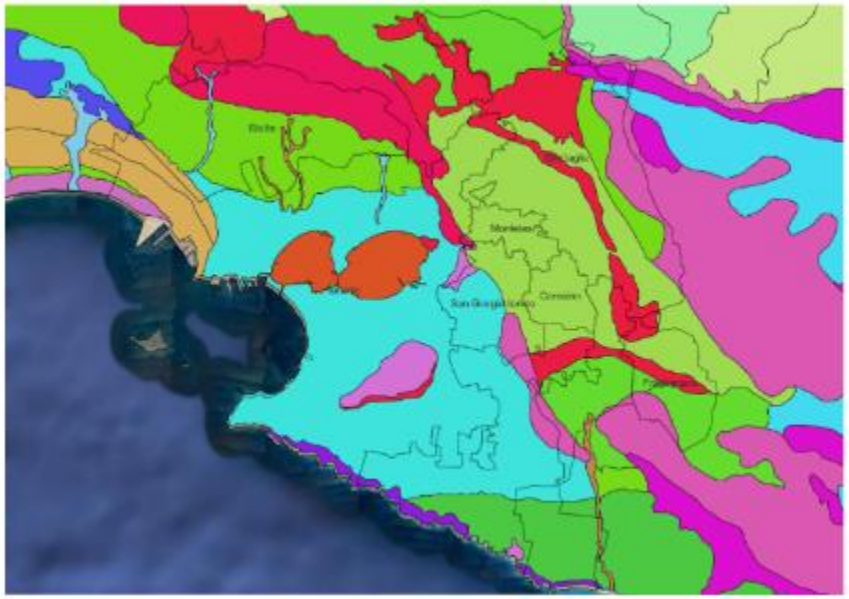


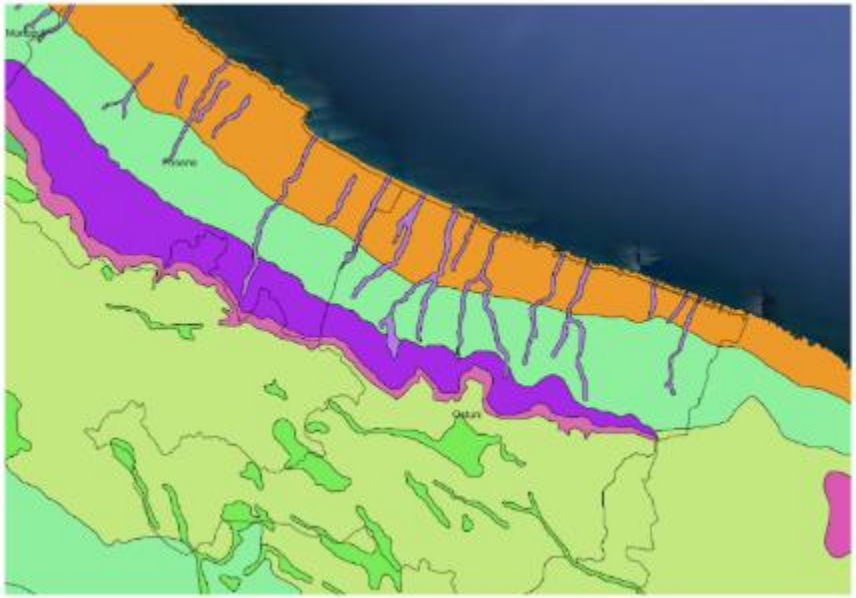




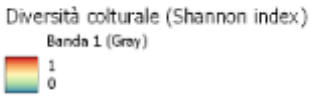
PEDOLOGICAL MAP (ACLA 2)

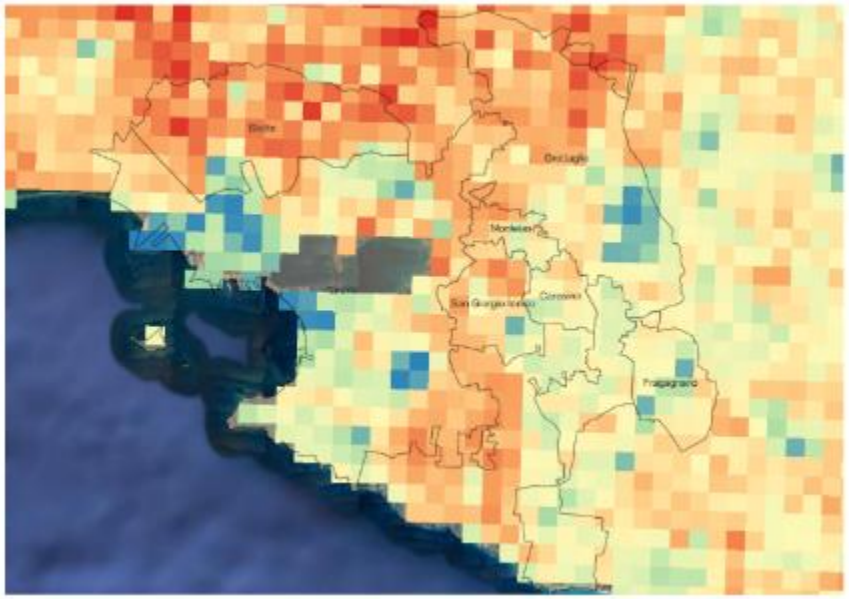


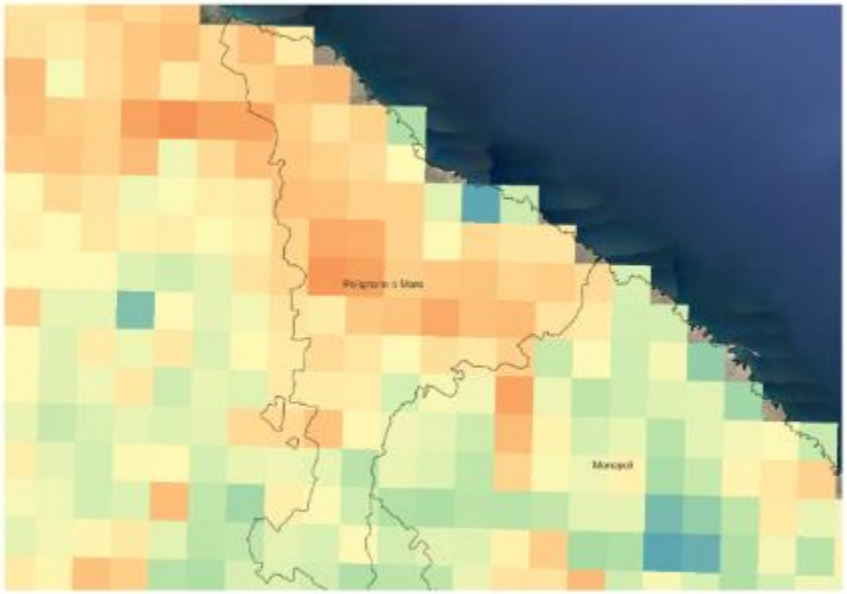




Coltivation diversity (Shannon Index su cella di 1 km da elaborazioni dati Sentinel 2017)





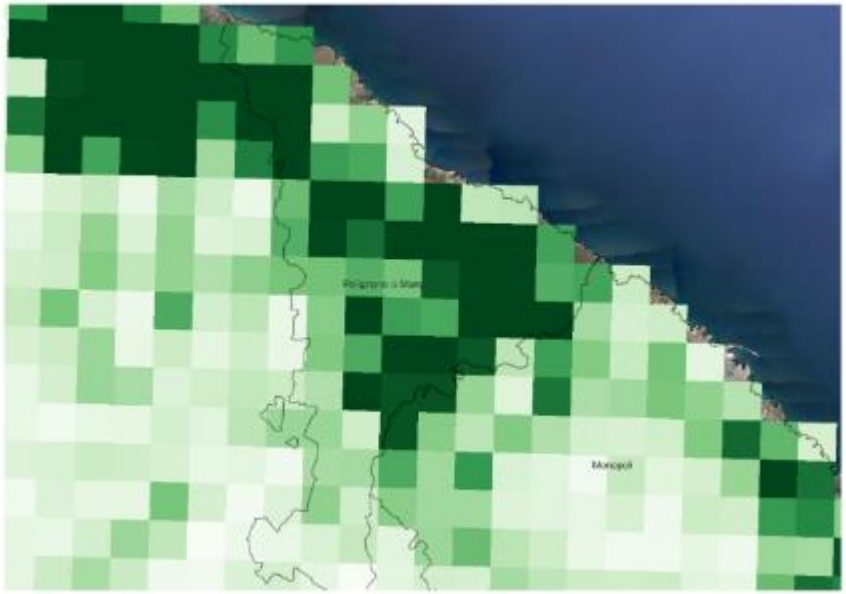


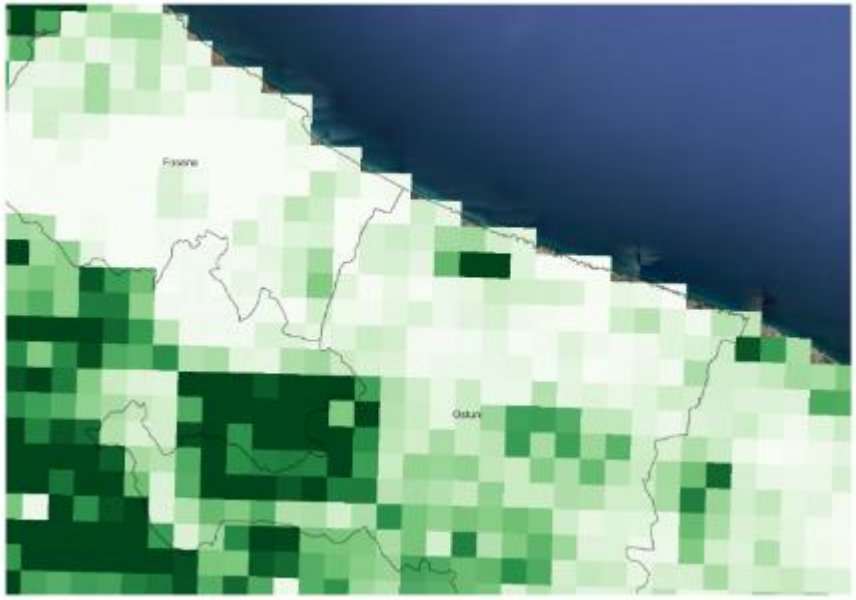
Agro-biodiversity of tree species (fruits, olives, vines)

Variety surveyed in REGEROP, REGEVIP e REGEFRUP projects

Agricultural landscape elements (CTR Puglia spatialization)

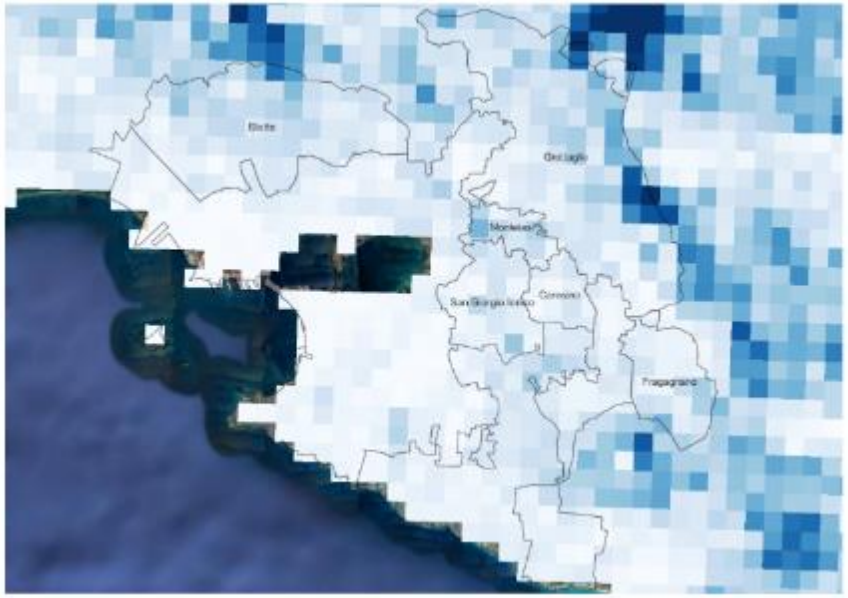
Isolated trees

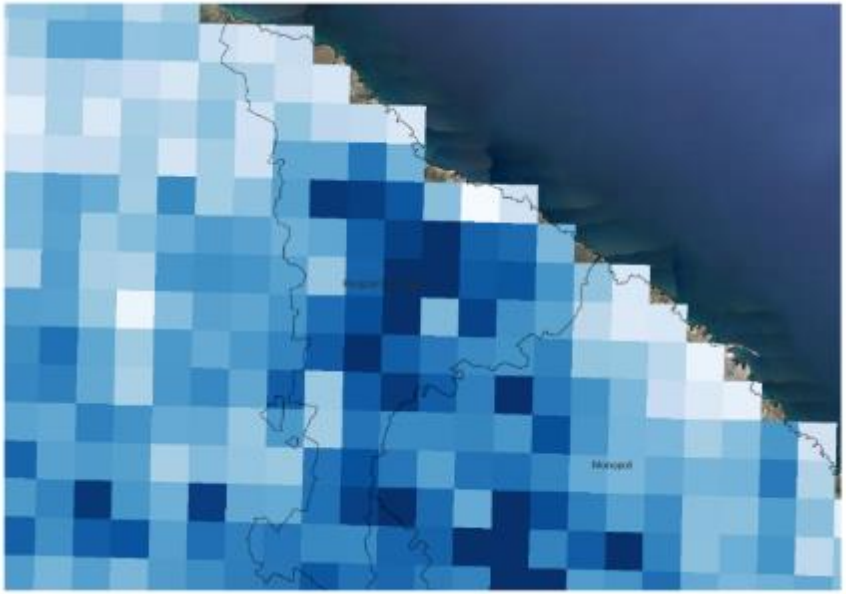


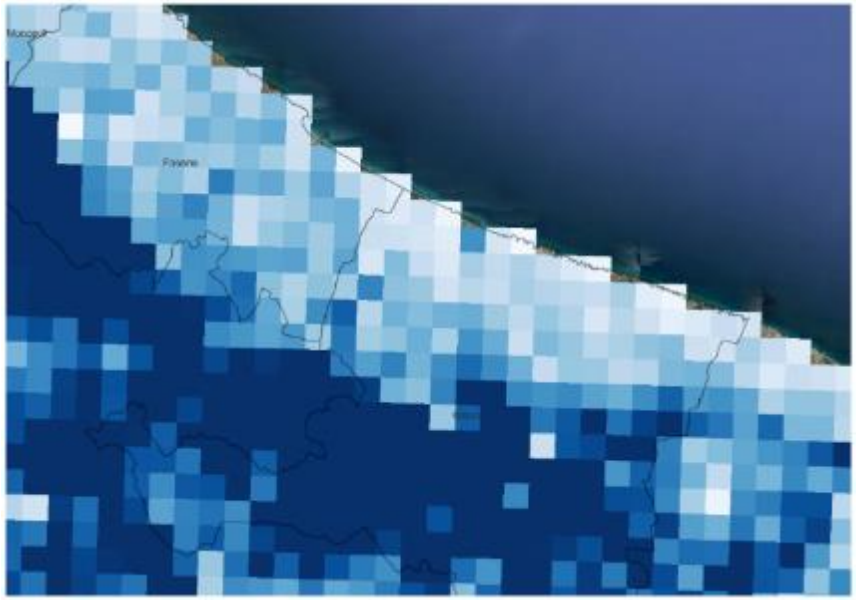


Agricultural landscape elements (CTR Puglia spatialization)

Linear elementa





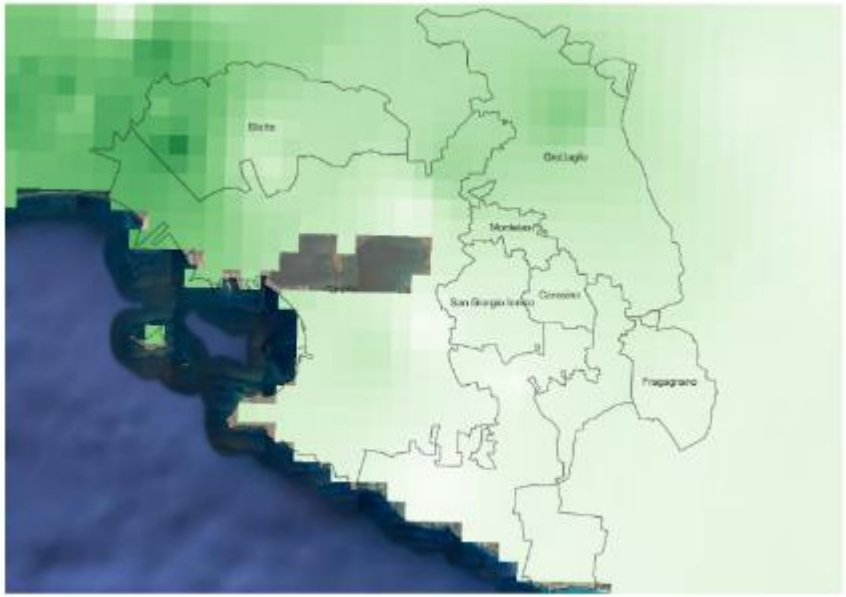


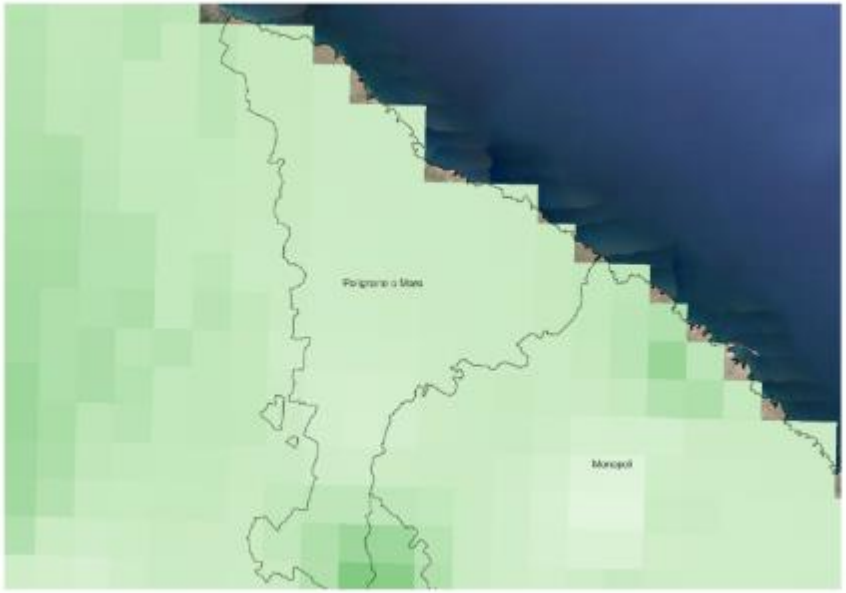
Cultivation intensity (FADN 2015-2016-2017)

Indice di intensità coltivazione seminativi
Banda 1 (Gray)
2,707481
0,022432

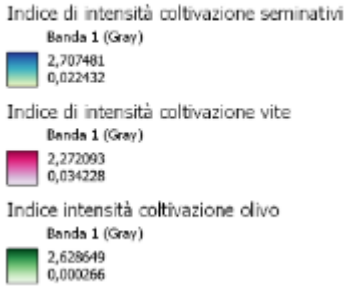
Indice di intensità coltivazione vite
Banda 1 (Gray)
2,272093
0,034228

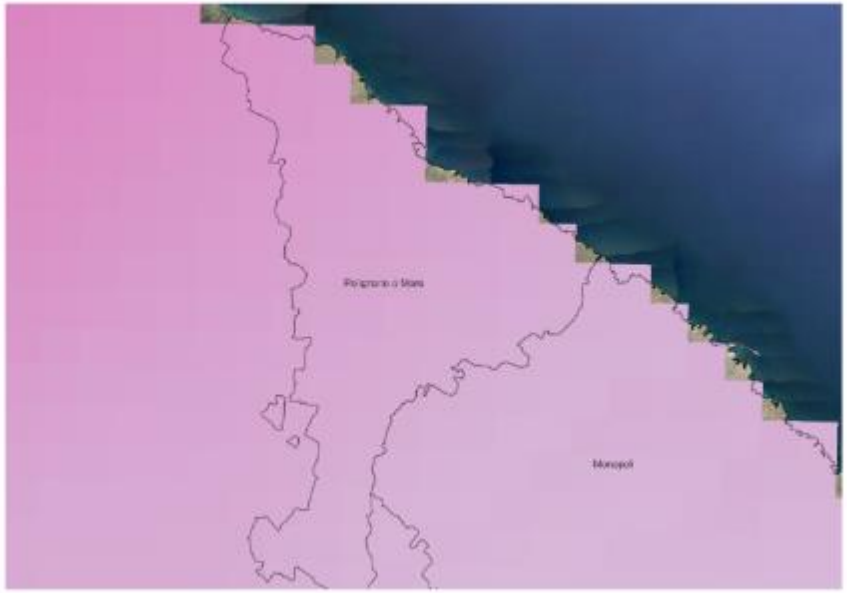
Indice intensità coltivazione olivo
Banda 1 (Gray)
2,628649
0,000266





Cultivation intensity (FADN 2015-2016-2017)





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