



Interreg

ITALIA-SLOVENIJA



AGROTUR II



UNIONE EUROPEA
EVROPSKA UNIJA

Progetto standard co-finanziato dal Fondo europeo di sviluppo regionale
Standardni projekt sofinancira Evropski sklad za regionalni razvoj

Trajnostni razvoj kmetijstva in turizma na čezmejnem Krasu

Sustainable development of agriculture and tourism in cross-border Karst



Vodilni partner / Lead Partner
Kmetijski inštitut Slovenije / Agricultural Institute of Slovenia

Projektni partner 1 / Project Partner 1
Univerza v Trstu / University of Trieste

Projektni partner 2 / Project Partner 2
Univerza v Vidmu / University of Trieste

Projektni partner 3 / Project Partner 3
Univerza v Novi Gorici / University of Nova Gorica

Projektni partner 4 / Project Partner 4
Občina Komen / The Municipality of Komen

Projektni partner 5 / Project Partner 5
Confesercenti Venezia Rovigo



Kraška planota, razpeta na meji med Italijo in Slovenijo, se ponaša z bogato naravno in kulturno dediščino.

Ohranjanje poseljenosti Krasa in tradicionalne obdelave zemlje ter zaščita značilnih lokalnih produktov, kot sta vino teran in kraški pršut, lahko spodbudi tudi razvoj turizma in kmetijstva, obogaten z najnovejšimi znanstvenimi odkritiji tamkajšnjih raziskovalnih ustanov.

Šest partnerjev projekta Agrotur II si je zadalo tri glavne cilje. Čezmejno sodelovanje je obrodilo otipljive in uporabne znanstvene in tehnološke rezultate.

The Karst, a territory straddling the border between Slovenia and Italy, boasts a rich natural and cultural heritage. The conservation of its population, the traditional use of the land and the protection of its typical products, such as Terrano wine and Carso ham, can be supported by the development of tourism and agriculture, taking advantage of the most advanced scientific knowledge present in the local research bodies.

In the Agrotur II project, six partners collaborated for three main objectives. Cross-border cooperation has led to tangible and directly applicable scientific and technological results.

Cilji

OHRANJANJE OKOLJA

DEJAVNOSTI

Raziskava: učinki namakanja na stanje voda in kakovost grozdja

Tehnologija: spremljanje in preprečevanje bolezni vinske trte

REZULTATI

e-Karst: platforma z digitalno aplikacijo za spremljanje vinogradov

Izboljšanje produktov

DEJAVNOSTI

Tehnologija: enološki standardi (barva, kislost, odsotnost strupenih snovi)

Raziskava: pigmenti in zdravje

Tehnologija: prašičjereja

REZULTATI

Pravilnik o pridelavi vina in pršuta

Razvoj turizma na kmetiji

DEJAVNOSTI

Promocija kraškega turizma

REZULTATI

Center za promocijo lokalnih produktov z regionalno vinoteko

Objectives

TAKING CARE OF THE ENVIRONMENT

ACTIONS

Research: effect of irrigation on water status and grape quality
Technology: monitoring and prevention of vine diseases

RESULTS

e-Karst: digital platform for vineyard management

IMPROVING TRADITIONAL PRODUCTS

ACTIONS

Technology: Oenological standards (color, acidity, absence of toxic substances)
Research: pigments and human health

Technology: pig breeding

RESULTS

Rules for the production of wine and ham

DEVELOPING AGROTOURISM

ACTIONS

Touristic promotion of the territory

RESULTS

Center for the promotion of local products with regional wine shop



ph Marijan Močivnik

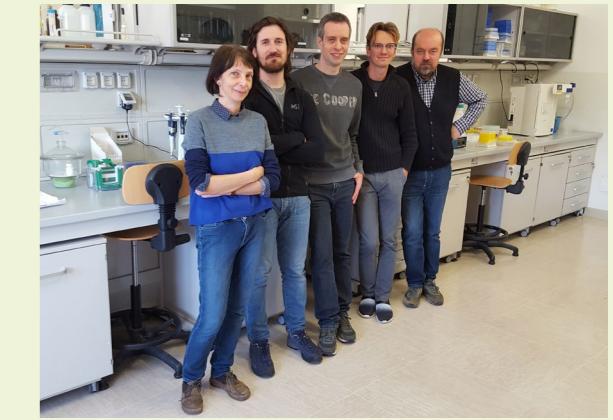
Trajnostno vinogradništvo na Krasu: uporaba vode za namakanje

Upravljanje z vodo v vinogradu je pomembno orodje za optimizacijo kakovosti grozja in vina. Za vsako posamezno sorto grozja na določeni legi je ključna ocena pomanjkanja vode, ki jo je potrebno nadomestiti z namakanjem.

Polifenolne spojine so pomembne za kakovost rdečega grozja in vina. Njihovo vsebnost lahko povečamo, če izpostavimo trto razmeram zmernega vodnega primanjkljaja (zmeren vodni stres). Da bi preučili vpliv različnih stopenj vodnega stresa na pridelek in kakovost grozja, smo izvedli različne vinogradniške poskuse. Glede polifenolnih spojin smo ugotovili, da se je zaradi vodnega stresa povečala vsebnost rdečih barvil antocianinov, medtem ko se je zmanjšala vsebnost taninov. Stem se je izboljšala kakovost grozja in posledično vina. Ta zanimiv rezultat nakazuje, da je mogoče izboljšati kakovost grozja sorte refošk z zmanjšano uporabo vode za namakanje. Smotrna uporaba vode je pomemben faktor pri reševanju okoljske problematike.

Karst sustainable viticulture: use of water for irrigation

Water management in the vineyard represents an important issue in order to maximise yields while optimizing grape and wine quality. The evaluation of the level of water deficit to apply in the field is crucial, changing among varieties. Red grapes are characterised by an important content of phenolic compounds, that can be improved in conditions of moderate water deficit. Field trials have been set up with the aim to evaluate the effect of different water deficit levels on yield parameters and grape quality. As regard phenolic compounds, anthocyanins were increased by water stress, while tannin concentration was reduced being their quality improved. This interesting result allowed us to understand that grape quality of Teran could be optimised minimizing the water used for irrigation, an important issue in an environment where water is a precious resource.



Delovna skupina / the team

Iz leve / from left: Elisa Petrucca, Marco Vuerich, Alberto Calderan, Antonio Filippi, Paolo Sivilotti





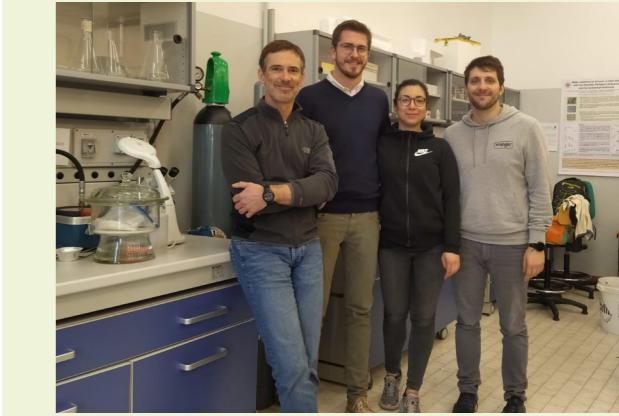
Spremljanje stanja vodnega stresa v vinogradih na Krasu

Spremljanje vodnega statusa predstavlja pomembno orodje za določanje jakosti vodnega stresa vinske trte in vrednotenje njene sposobnosti preživetja v sušnih obdobjih. V rastnih sezona 2018 in 2019 smo merili vodni potencial pred zoro (Ψ_{pd} , kazalnik vsebnosti vode v tleh), najmanjši vodni potencial (Ψ_{min} , kazalnik vodnega stresa vinske trte) in vodni potencial debla (Ψ_{stem} , kazalnik vpliva suše). V dveh letnikih smo ugotovili, da so trte na Krasu utrpele srednje močan vodni stres, ki pa se v desetih analiziranih vinogradih spreminja. Zaradi različne izpostavljenosti vodnemu stresu se razlikujejo tudi fizikalno-kemijske značilnosti grozda, kar priča o tem, da vodni stres neposredno vpliva na fiziologijo vinske trte in posledično na kakovost vina. Zato sta preverjanje in uravnavanje vodnega stresa v kraških vinogradih obetavni strategiji za izboljšanje kakovosti pridelanega grozda in vina na čezmejnem Krasu.

Refotošk - ph Marijan Močivnik, Studio Ajd

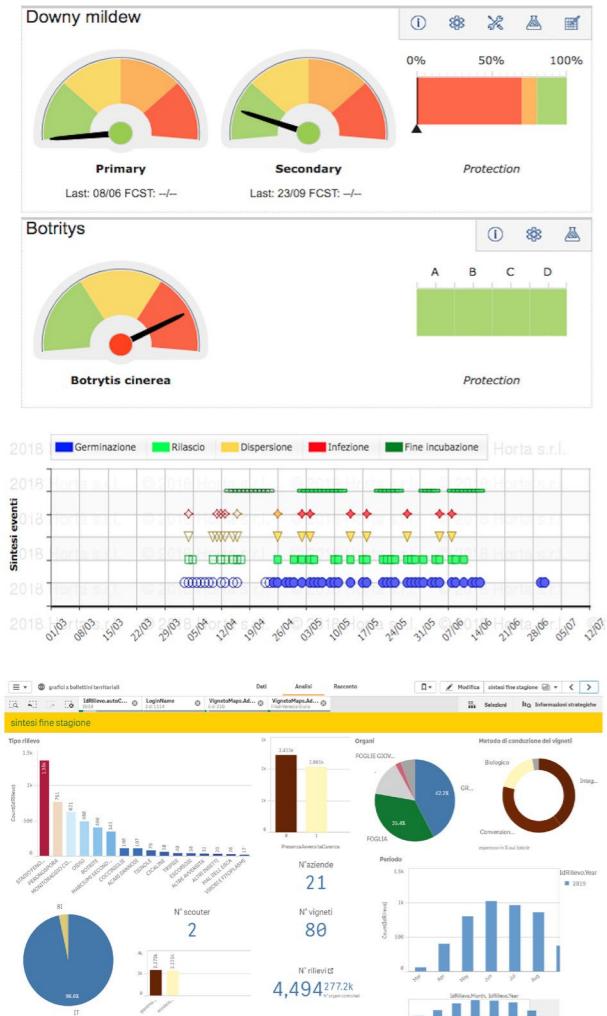
Monitoring the water status of the vineyards in the karst

Monitoring plant water status is fundamental to quantify the maximum water stress levels reached by vines and to evaluate their ability to resist to drought periods. During the growing seasons of 2018 and 2019, we measured the pre-dawn water potential (Ψ_{pd} , proxy of soil water availability), the minimum water potential (Ψ_{min} , proxy of the maximum water stress level reached by vines), and the water potential at turgor loss point (Ψ_{tlp} , proxy of the ability to resist to drought periods). During the two monitoring seasons, vines in Karst reached medium-to-high water stress levels, which resulted heterogeneous between the ten vineyards included in the monitoring. This heterogeneity influenced the structural and chemical-physical properties of berries and wine, suggesting that the water status of vineyards has a direct effect on the productivity of vines and on wine's quality. Hence, monitoring and modulating the water stress of Karst vineyards emerges as a promising strategy for improvement of quantity and quality of wine production at a trans-border level.



Delovna skupina / the team
Iz leve / from left: Andrea Nardini,
Luca Bariviera, Sara Natale,
Francesco Petruzzellis





Trajnostno vinogradništvo na Krasu: zaščita pred boleznimi

Trajnostno varstvo rastlin je pomembno, ker si po eni strani želimo prepoznati potrebe po zaščiti rastlin pred patogeni, istočasno pa moramo omejiti ostanke aktivnih snovi v okolju in vinu. Direktiva 128/09 / CE podrobno določa orodja, ki jih lahko koristimo za trajnostno uporabo zaščitnih sredstev. Vite.net® je sistem za podporo odločanju o uporabi zaščitnih sredstev. Zasnovan je z namenom napovedovati okužbe in načrtovati strategije ravnanja s patogeni, ki temeljijo na meteoroloških pogojih in fenologiji rastlin. V projektu smo spremljali kraške vinograde in ocenjevali pojav okužb. Ocene tveganja z okužbami s pomočjo Vite.net® so omogočile zatiranje bolezni z uporabo manjših odmerkov kontaktnih aktivnih snovi, kar pomeni boljše ohranjanje narave. Dodatno je ta strategija zaščite predvidevala manjše število tretiranj na terenu, saj so bila le-ta določena glede na realne potrebe po fitopatogeni zaščiti vinogradov.

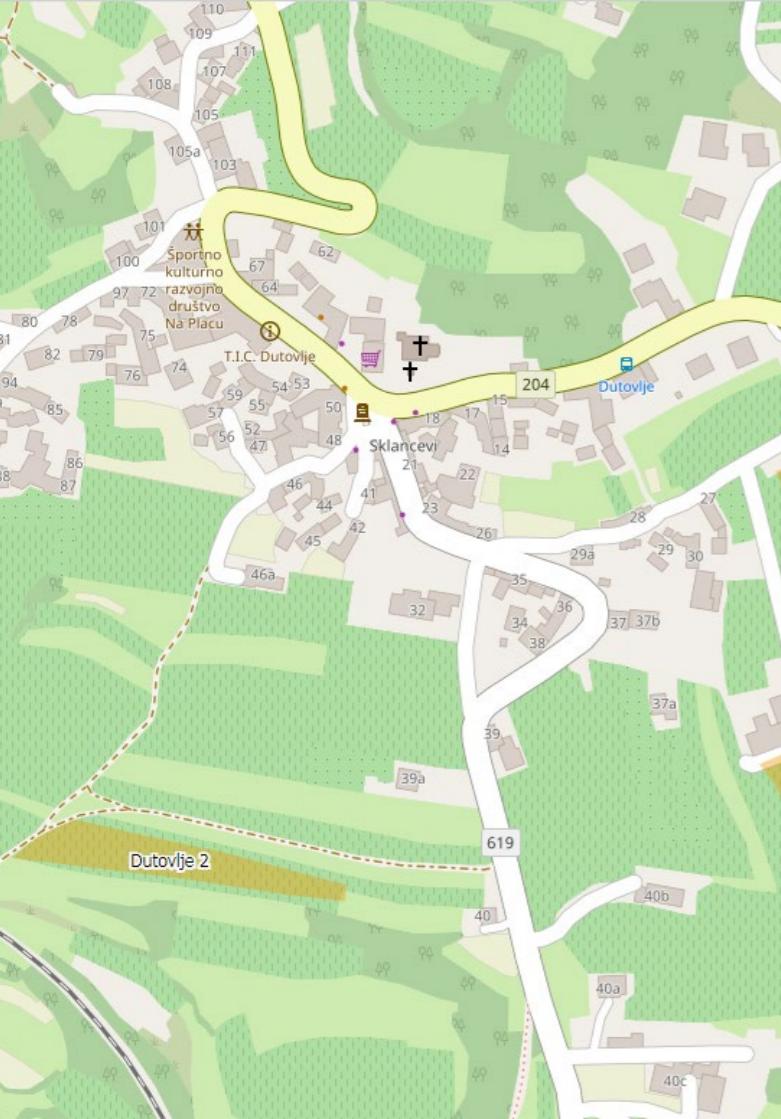
Karst sustainable viticulture: defense from diseases

Sustainable plant defence is an issue of great interest, since by one side we would like to know the need of intervention against plant pathogens, but on the other side active substances residues should be minimised. The regulation 128/09/CE details tools to be used for the sustainable use of pesticides, and among them forecasting models and monitoring tools are reported. Vite.net® is a decision support system projected with the aim to forecast infections and plan pest management strategies based on meteorological conditions and plant phenology. In 2-years-project, Karst vineyards have been monitored evaluating the occurrence of infections. The infection risk evaluated with Vite.net® allowed to set up a low-input pest management using contact active substances and low dosages, therefore preserving nature. Moreover, a reduced number of sprayings was adopted in fields, advised based on the real need of vineyard pest management.



Delovna skupina / the team
Iz leve / from left: Giovanni Bigot,
Giacomo Nunin, Paolo Sivilotti





e-Karst platform

V sklopu projekta smo vzpostavili spletno aplikacijo e-Karst, preko katere sledimo stanju v vinogradih posameznih vinogradnikov na Krasu, meteorološkim pogojem, vodnemu statusu vinogradov, razvoju bolezni in škodljivcev ter dozorevanju grozja.

Orodje omogoča hiter prenos informacij vinogradniku, z namenom pridelati boljše grozdje na trajnostni način in z nižjimi stroški.

1. OPTIMIZACIJA PORABE VODE

(kdaj je trta v vodnem stresu, kdaj in koliko namakati, kdaj je vodni stres koristen ...)

2. OPTIMIZACIJA VINOGRADNIŠKIH DEL

(profil in sledenje stanju v posameznem vinogradu, zelena dela, redčenje, pravilen čas trgatve, analize grozja ...)

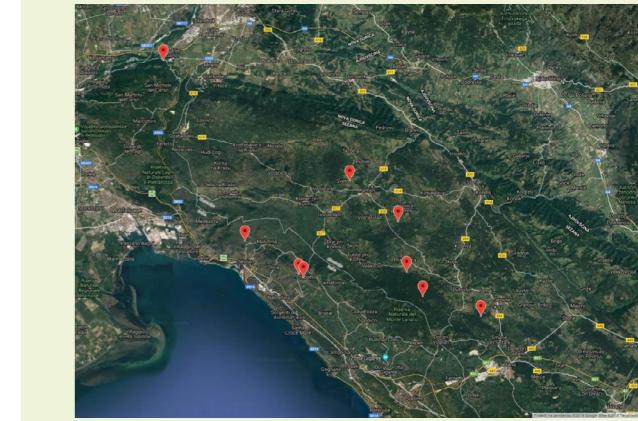
3. PRAVILNA RABA FITOFARMACEVTSKIH SREDSTEV

(sledenje razvoju bolezni in škodljivcev, nasveti za zaščito, zmanjševanje vnosa FFS ...)

e-Karst platform

A new e-Karst platform was set up. It is used for better monitoring of vineyards in the cross-border Karst regions. A platform is used to show meteorological conditions, water status of vineyards, development of diseases and pests, the ripening of grapes and vineyards of individual winegrower. The web tool is used for fast transfer of information to the winemaker in order to produce better grapes, in a sustainable way and at a lower cost.

1. **OPTIMIZATION OF WATER USE** (when the vine is in water stress, when and how much to irrigate, when water stress is beneficial,...)
2. **OPTIMIZATION OF VINEYARD WORKS** (evaluation and tracking of individual vineyard, green works, grape thinning, proper time of harvest, grape analyses,...)
3. **PROPER USE OF PHYTOPHARMACEUTICALS** (weekly reports on scouting of disease and pests developments in Karst vineyards, advices for proper use and reduction of plant protection products,...)



e-karst.eu



Optimizacija in poenotenje tehnologij pridelave terana

Vino teran se prideluje na Krasu iz vinske trte refošk, na specifičnih rdečih tleh, imenovanih jerina ali terra rossa. V okviru projekta smo razvili programsko opremo Moj vinograd, ki deluje na portalu e-Karst. S pomočjo aplikacije in tablice lahko že na terenu sledimo vinogradom v GIS-sistemu. S sodelovanjem 10 vinogradnikov smo v dveh letih preskušali nove vinogradniške standarde, ki se v svetu uporabljajo za pridelavo visokokakovostnih vin. Parametri, ki smo jih optimizirali, se nanašajo na obremenitev trsa, vinogradniške tehnologije (zelena dela), čas trgatve in fizikalno-kemijske lastnosti grozdja ob trgatvi. Z vinarji smo sledili poteku biološkega razkisa in zorenja vina. Nove smernice smo objavili v dokumentu Pravilnik o pridelavi in predelavi konzorcijskega terana.

ph Marijan Močivnik

Optimisation and unification of Teran wine technologies

Teran wine is produced on Karst (Karst Plateau) from the Refošk (*Vitis vinifera L.*) grown on specific red soils called 'jerina' or 'terra rossa'. In the frame of project, we developed the software 'My Vineyard', which works on the e-Karst portal. With the help of an application and a tablet, we can track the vineyards in the GIS system already in the field. In last years, we got support from 10 winegrowers and tested new vine growing standards used for the production of high quality wines. We have focused to optimise parameters related to the crop load, vineyard techniques (green works), the harvest time and physico-chemical properties of grapes at harvest time. We have focused also to improve the malo-lactic fermentation and maturation of Teran wine. New directions were published in the document 'Rules for the production and vilification of consortium Teran wine'.





Enološki standardi za teran: bioaktivne spojine

VINO TERAN - KRALJ RDEČE BARVE

Edinstvena kombinacija nadmorske višine, bogate mineralne rdeče zemlje (jerine), prepleta sredozemske in celinske klime ter dobro opredeljeni vinogradniški in vinarski tehnološki postopki se izražajo v posebnostih vina teran.

Sorta grozja refošk, iz katere na slovenskem in italijanskem Krasu pridelujemo vino teran, je posebna zaradi velike vsebnosti rdečih barvil – antocianinov. Z večletnimi raziskavami grozdja in vina (polifenolni potencial različnih letnikov ter vinogradov) smo ugotovili, da je vsebnost rdečih barvil v tej sorti nadpovprečna v primerjavi z ostalimi rdečimi sortami v tem delu Evrope, medtem ko je vsebnost taninov povprečna. Antocianinom znanstveniki pripisujejo številne pozitivne učinke na človekovo zdravje, kar je odlična novica za ljubitelje terana. Maceracija drozge grozja traja 5-10 dni v odprtih leseni posodah (kadeh). Med njo se rdeča barvila in tanini izlužijo v vino. Zaradi večje vsebnosti skupnih kislin vino zori v sodih, kjer po alkoholni fermentaciji obvezno poteče mlečnokislinska fermentacija oziroma biološki razkis. Za teran je, poleg izrazite barve, značilen vonj po jagodičju in gozdnih sadežih, bogata mineralnost, večja vsebnost ekstrakta in prijetna kislost. Vina v povprečju vsebujejo okrog 12 vol% etanola, kar ga uvršča med manj alkoholna vina.

Photo: Marijan Močivnik, Studio Ajdi

Ker ima blage tanine, ga pretežno uživamo kot mlado in pitno vino. Teran vsebuje veliko antocianinov, njihova vsebnost pa je v mladih rdečih vinih dokazano večja kot v staranih, zato lahko že zmerno uživanje terana predstavlja dober vir teh biološko aktivnih spojin v človekovi prehrani.

Standards of Teran oenology: bioactive polyphenols

TERAN WINE – THE KING OF RED COLOR

The unique combination of altitude, red soil rich in minerals (Jerina), Mediterranean and continental climates and well-defined viticultural and winemaking technological processes are reflected in the special features of Teran wine. The grape variety Refošk, from which Teran is produced in Slovenian and Italian Karst, is unique because of its high content of red pigments - anthocyanins. Through several years of grape and wine research (polyphenolic potential of different vintages and vineyards) we have found that the content of red pigments in this variety was above the average in comparison to other red varieties from this part of Europe, while the content of tannins was in the medium. Scientists proved that anthocyanins exert positive effects to human health which is great news for Teran wine lovers.

Grape maceration lasts 5-10 days in open wooden containers. During maceration, anthocyanins and tannins are extracted into the wine. Due to the high content of total acids malolactic fermentation after alcoholic fermentation is obligatory for Teran wines.

Besides its distinctive color, Teran is characterized by aroma of berries and forest fruits, minerality, high extract and pleasant acidity. Wines contain about 12 vol% ethanol, which places Teran among low alcohol wines. It has mild tannins and we mostly enjoy it as a young, light and drinkable wine. Teran contains a lot of anthocyanins, and since the content of anthocyanins in young red wines was proven to be higher than in aged, moderate intake of Teran represents a good source of these biologically active compounds in the human diet.



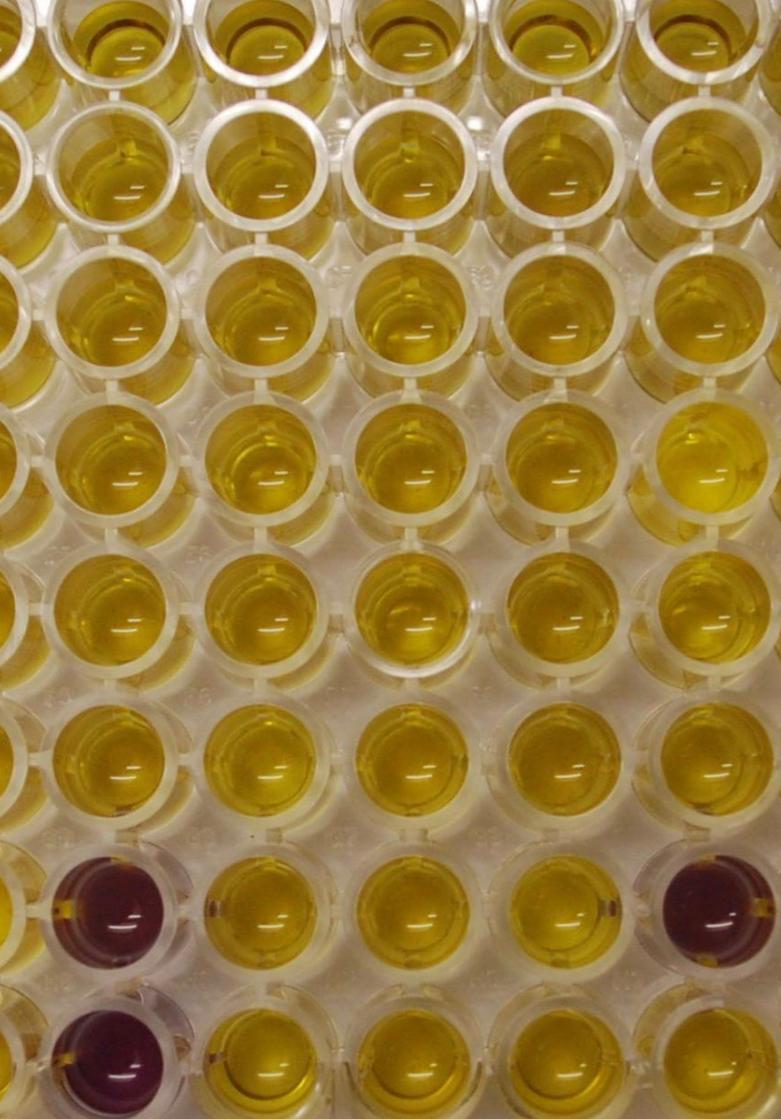
Delovna skupina / the team

Iz leve / from left: Friderik Vodopivec, Klemen Lisjak, Gašper Žerjal, Andreja Vanzo, Dejan Bavčar, Alenka Mihelčič.



Od raziskave k praksi: študija laboratorijske ekstrakcije in tradicionalnih metod

From research into practice: study of laboratory extraction and traditional methods



Enološki standardi za teran: kontrola jabolčno-mlečnokislinske fermentacije

KRASOVKE

Kvasovke in mlečnokislinske bakterije so glavni mikroorganizmi pri pridelavi vina. Prve so odgovorne za alkoholno, druge za jabolčno-mlečnokislinsko fermentacijo (JMKF). JMKF je zaželena, saj vodi do biološkega razkisa kislin, zagotavlja mikrobiološko stabilnost in lahko pozitivno prispeva k aromi vina. Mlečnokislinske bakterije so lahko odgovorne tudi za nastanek nezaželenih hlapnih spojin in biogenih aminov, kot je histamin. Zadnji lahko pri občutljivih posameznikih povzroča težave, kot so glavoboli in prebavne motnje. Za vsakega vinarja je primarnega pomena, da se JMKF pravočasno začne in konča ter da se vino čim prej stabilizira. Zato smo JMKF redno spremljali med pridelavo vina teran. Navkljub temu, da smo na grozdju in v vinu zaznali tudi bakterije, ki lahko tvorijo biogene amine, pa v samem vinu nismo zasledili histamina. Splošno naši rezultati kažejo, da se je kakovost in varnost vina teran izboljšala v primerjavi s prejšnjimi leti.

Ph Lorena Butinar

Standards of Teran oenology: control of malolactic fermentation

The main microorganisms in wine production are the yeasts, responsible for alcoholic fermentation, and the bacteria responsible for malolactic fermentation, which is desirable as it leads to biological de-acidification, provides microbial stability and enhance aroma complexity. However, malolactic bacteria can form also unwanted volatile compounds and biogenic amines, such as histamine, which can cause disturbances in sensitive subjects (headache, gastrointestinal disorders...). Since it is of primary importance for wine producers to end malolactic fermentation on time and to stabilize the wine as soon as possible to prevent the formation of unwanted compounds, we controlled this process during the production phases. Although biogenic amine-producing bacteria have been identified in both grapes and wine, we have not detected histamine in the wine itself. Our results show that Teran's quality and safety improved in comparison to previous years.

J. Topić, L. Butinar, M. Bergant Marušić, D. Korte, B. Mozetič Vodopivec. Characterization of lactic bacteria for biogenic amine formation. In *Understanding microbial pathogens: current knowledge and educational ideas on antimicrobial research*, ed. E. Torres-Hergueta. Badajoz: Formatec Research Center, 2018, pp. 99-107.
J. Topić, J. Reščić, M. Bergant Marušić, K. Lisjak, B. Mozetič Vodopivec, L. Butinar. Occurrence of biogenic amine-producing lactic acid bacteria in Refošk grape and wine. In *Programme and abstracts, Symposium Power of Microbes in Industry and Environment*, ed. A. Slavica, May 15-18, 2019, Sveti Martin na Muri, Croatia. Zagreb: Croatian Microbiological Society. 2019, p. 62.



Casarsa guru

Skupina Centra za raziskave vina (z leve) /
Wine Research Centre group (from the left):
Guillaume Antalick, Lorena Butinar, Maruša
Pompe Novak, Branka Mozetič Vodopivec,
Jan Reščić, Marko Lesica



Laboratorij za vede o okolju in življenju (z leve) /
Group of the Laboratory for Environmental and
Life Sciences (from the left): Mladen Franko,
Petra Makorič, Martina Bergant Marušić



Vino in zdravje

Antocianini so rdeče-modra barvila v grozdni kožici, ki ščitijo plodove pred okoljskim stresom. Ko pijemo rdeče vino, želodec¹ že absorbira majhno količino antocianinov, ki se nato razmeroma hitro porazdelijo v telesne organe². Večina antocianinov prehaja naprej v črevesje, kjer se še naprej absorbirajo. V črevesju lahko preprečujejo pretvorbo normalnih črevesnih celic v rakave³. Prisotnost antocianinov v krvi, čeprav v nizkih koncentracijah, lahko vpliva na različne spremembe v človeški fiziologiji. Raziskali smo možnost, da antocianinini vplivajo na rahlo povečanje serumskega bilirubina, rumenega barvila, ki ga najdemo v krvi in smo ga nedavno identificirali kot dejavnik zmanjševanja tveganja srčno-žilnih bolezni. V zahvalo naši novi, uspešni metodi za odkrivanje bilirubina⁴ ter sodelovanju z vodilnim partnerjem smo lahko potrdili, da rdeča barvila v vinu vplivajo na majhno, a koristno povečanje bilirubina v krvi. To je še en dokaz, da je zmerno uživanje vina dobro za naše zdravje.

ph Marijan Močivnik

Wine and health

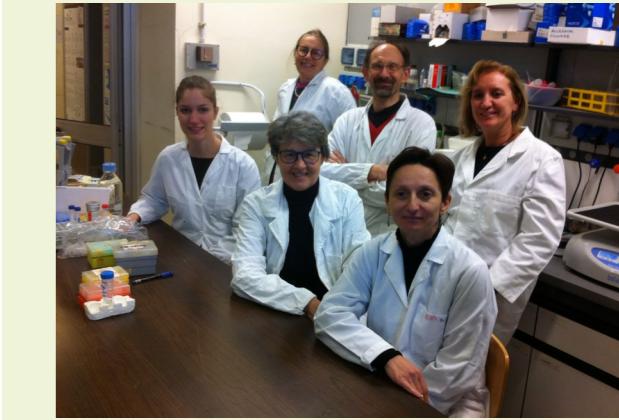
Anthocyanins are the red-blue pigments on the skin of grapes. Here they protect the fruit from environmental stress. When we drink some red wine, a small amount of anthocyanins is absorbed already from the stomach¹ and is rapidly distributed to essentially all organs². Most anthocyanins move ahead in the intestine, where they continue to be absorbed and may act to prevent the transformation of a normal intestinal cell into a cancer cell³. The presence of anthocyanins in the blood, though in very low levels, may cause a variety of small changes in the human physiology. We have explored the possibility that they cause a small and short-lasting increase in serum bilirubin, the yellow pigment found in blood and recently identified as a factor that reduces the risk of cardiovascular disease. Thanks to our new, powerful method to detect bilirubin⁴ and joint work with the Lead Partner, we have been able to confirm that wine pigments can cause a small but beneficial increase of bilirubin in the blood. This is another proof that moderate wine consumption does well to our health condition.

1. S. Passamonti, in Anthocyanins from Natural Sources: Exploiting Targeted Delivery for Improved Health, eds. M. Su-Ling Brooks and G. B. Celli, The Royal Society of Chemistry, 2019, pp. 216–246.

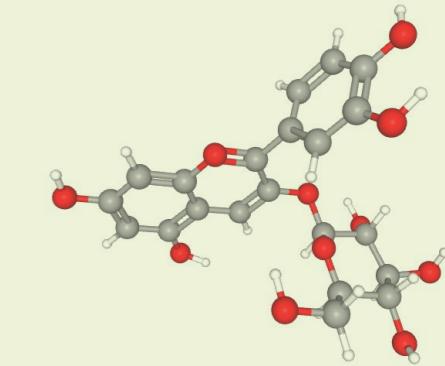
2. V. Bendokas, K. Skemienė, S. Trumbeckaitė, V. Stanyš, S. Passamonti, V. Borutaite and J. Liobikas, Crit. Rev. Food Sci. Nutr., 2019, 1–14; in press.

3. N. Medic, F. Tramer and S. Passamonti, Front. Pharmacol., 2019, 10, 675.

4. A. Bandiera, L. Corich, S. Tommasi, M. De Bortoli, P. Pelizzo, M. Stebel, D. Paladin and S. Passamonti, Biotechnol. Bioeng., 2019, 1–8; in press.



Delovna skupina / the team
Sedute / sitting: Paola Pelizzo,
Sabina Passamonti, Nevenka Medic
Po koncu / standing: Federica Tramer,
Marco Stebel, Antonella Bandiera





Reja prašičev za predelavo kakovostnega pršuta

Tradicionalni izdelki iz prašičjega mesa, proizvedeni na območju slovenskega Krasa, predstavljajo kulinarico dediščino regije in dosegajo poseben ugled pri potrošnikih. Vrhunsko kakovost sušenih mesnin je praktično nemogoče zagotoviti s standardnim pitancem iz intenzivne reje, zato je treba ustrezno prilagoditi tehnologijo reje prašičev. Na kakovost surovine vplivamo z izbiro primerenega genotipa in načina reje, vključno s krmljenjem. Na kakovost pršuta močno vplivamo tudi s primernimi predklavnimi postopki in obdelavo trupa ter pogoji v času predelave. V okviru projekta smo sodelovali pri vzpostavitvi treh primerov vzorčne reje na področju Krasa, kjer smo preučevali vplive pasme (klasični križanci modernih pasem, avtohtoni krškopoljski prašič), spola in prehrane na kakovost mesa in njegovo primernost za predelavo v kakovostni pršut. Na podlagi teoretičnega znanja in pridobljenih rezultatov smo pripravili praktična navodila za pitanje prašičev in predelavo v pršut s poudarkom na prehrani prašičev v zadnjih fazah pitanja.

Raising of pigs for high quality dry-cured ham

Traditional pork products, manufactured in the area of Slovenian Karst, represent the culinary heritage of the region and have a special reputation among consumers. Since the superior quality of the dry cured products cannot be guaranteed with conventional intensively bred fatteners, the technology for rearing pigs must be adapted accordingly. The quality of the raw material is influenced by the choice of the appropriate genotype and breeding methods, including feeding. The quality of dry cured ham is also strongly influenced by pre-slaughter procedures, as well as by carcass treatment and the conditions during processing. In the scope of the project, we participated in the establishment of three model rearing in the Karst region, where we studied the effects of the breed (classic crosses of conventional modern breeds, autochthonous Krškopolje pig), sex, and diet on quality of meat and its suitability for processing into high-quality dry cured ham. On the basis of the theoretical knowledge and the results obtained, we have prepared practical instructions for fattening pigs and processing into dry cured hams, with an emphasis on pigs' nutrition in the final stages of fattening.



Delovna skupina / the team
Iz leve / from left: Martin Škrlep;
Marjeta Čandek Potokar; Urška Tomažin





ph Silvia Camporesi

Promocija produktov, narave in kulture Krasa

Confesercenti Metropolitana Venezia Rovigo se lahko pohvali s tridesetletnimi izkušnjami na področju poklicnega združenja. Poleg značilne vloge posrednika med politično sfero in sindikalnimi združenji ter varuha poklicnih interesov združuje tudi inovativne storitve, ki pomagajo učvrstiti in posodabljati gospodarske subjekte, storitvene dejavnosti ter podjetja na področju turizma. Prav pri zadnji panogi Confesercenti sodeluje z lokalnimi organi za upravljanje destinacij, prek katerih želijo tako javne ustanove kot predstavniki zasebnega sektorja opredeliti smernice na področju gostinstva in turizma, razvoja storitev, namenjenih obiskovalcem, in določiti načine za izboljšanje celostne turistične izkušnje. S svojimi sedemnajstimi lokacijami ponuja združenje razvejano mrežo priložnosti na območju Benetk in Roviga.

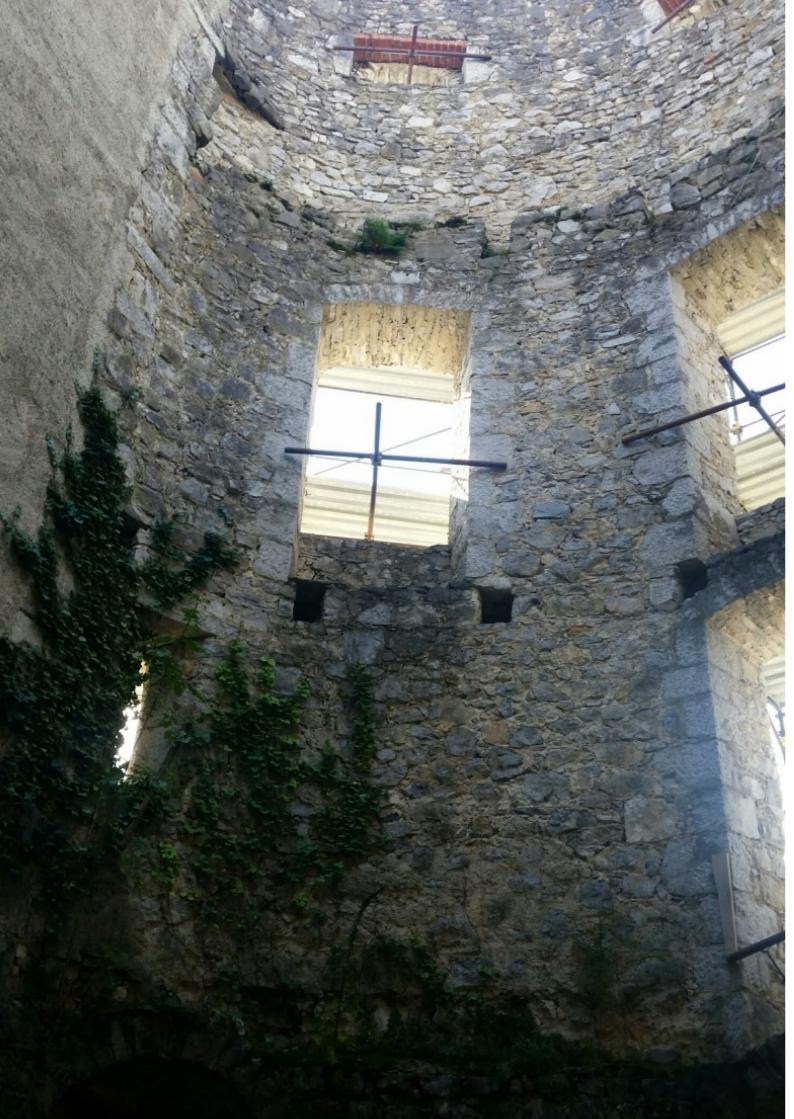
Promotion of products, nature and culture of Karst

With thirty years of experience as a large business representative organisation Confesercenti Metropolitana Venezia Rovigo has joined its traditional role of political representation and protection of category interests with all innovative services necessary to foster innovation, modernisation and consolidation of commercial and tourism enterprises. As per the tourism sector, Confesercenti is partner of territorial Destination Management Organisations, which see the collaboration of public bodies and representatives of the private world for the definition of policies related to hospitality, the development of services offered to tourists and the improvement of the quality of tourist experience in its entirety. The Association guarantees a widespread presence on the territory of Venice and Rovigo through its seventeen offices.



**Na ponovno odkritih tleh - Benetke,
14. februar 2020**
Srečanje Silvie Camporesi in Angele Vettese
Poetični portret med Italijo in Slovenijo.
Sledovi rastlinstva, opuščene arhitekturne dediščine, vodnih odsegov in gmajne.
Edinstvena zgodba, ki počasi obuja spomine na pobleledo kraško pokrajino.

Rediscovered Soil – Venice, 14/02/2020
Silvia Camporesi meets Angela Vettese
A poetic portrait created between Italy and Slovenia.
Traces of vegetation, abandoned architecture, ponds, moors. A special tale of the Karst world, able to slowly resurface a memory that does not want to fade.



Center za promocijo lokalnih produktov z regionalno vinoteko

Občina Komen je v gradu Štanjel vzpostavila Center za promocijo lokalnih produktov z regionalno vinoteko. Center je hkrati obogatil ponudbo in vsebine gradu Štanjel, ki so pomembne za turistični razvoj in prepoznavnost kraja ter čezmejne kraške regije. Investicijo je izvedla Občina Komen v delu pritličja in kleti severnega dela spodnjega palacija štanjelskega gradu. Z izvedbo smo dobili središče, ki ni le obogatilo kulturne dediščine gradu Štanjel (registrirana kulturna dediščina), ampak tudi poudarilo nesnovno kulturno dediščino Krasa (kraška vina, kraški suhomesnati izdelki). Center je odslej glavna referenčna in deseminacijska točka za predstavitev, ponudbo in promocijo čezmejnih lokalnih produktov Krasa. Privabljal bo večje število turistov v Štanjel ter usmerjal turistične tokove k ponudnikom in destinacijam čezmejnega območja Krasa.

Center for promotion of local products with regional wine shop

The municipality of Komen has established a 'Center for the Promotion of Local Products with a Regional Wine Shop' in Štanjel Castle. The Center also enriched the offer and facilities of Štanjel Castle, which are important for the tourist development and visibility of the place and the cross-border Karst region. The investment was carried out by the municipality of Komen in the part of the ground floor and basement of the northern part of the lower palace of Štanjel Castle.

With the investment, we obtained a center that not only enriched the cultural heritage of Štanjel Castle, which is a registered cultural heritage, but also a non-intangible cultural heritage of the Karst (Karst wines, Karst dried meats). The Center is now the main reference and dissemination point for the presentation, offers and promotions of Karst cross-border local products. Products from both Slovenian and Italian parts of the Karst are included. The center will attract more new tourists to Štanjel and promote the flow of tourist to other providers and destinations from across the Karst cross-border area.



Nova regionalna enoteka v poslopu grada Štanjel (levo pred prenovo)
The new wine shop in Štanjel Castle (left, before its renovation)

TIC ŠTANJEL

Štanjel 1a
6222 Štanjel
T. +386 (0)5 769 00 56
M. +386 (0)41 383 986
tic.stanjel@stanjel.eu



Klemen Lisjak, Dr. Koordinator projekta Agrotur II, koordinator vinogradniških in vinarskih raziskav, e-Karst platforma

Andreja Vanzo, Dr. Analize grozja in vina

Dejan Bavčar, Dr. Analize grozja in vina

Katja Šuklje, Dr. Vinogradniški poskusi

Alenka Mihelčič, Doktorska študentka

Gašper Žerjal, Finančni vodja projekta

Friderik Vodopivec, PhD. External expert

Delovna skupina za kraški pršut

Marjeta Čandek Potokar, Dr. Koordinatorka skupine, oblikovanje in analiza eksperimentov, zbiranje materialov in meritev, analiza podatkov.

Kontakt: meta.candek-potokar@kis.si

Martin Škrlep, Dr. Oblikovanje in analiza eksperimentov, zbiranje materialov in meritev, laboratorijske analize, priprava in analiza podatkov.

Urška Tomažin, Dr. Analiza podatkov, priprava priporočil in smernic za reje

Klavdija Poklukar, Mag. Laboratorijske analize, priprava podatkov

Lead Partner
Kmetijski inštitut Slovenije

Hacquetova ulica 17 - 1000 Ljubljana (Slovenija)

www.kis.si

Oddelek za sadjarstvo, vinogradništvo in vinarstvo

Centralni laboratorij

Department of Fruit Growing and Viticulture

Central Laboratories

Klemen Lisjak, PhD. Coordinator of Agrotur II, coordinator of viticulture & oenology research, e-Karst platform

Andreja Vanzo, PhD. Grape and wine analyses.

Dejan Bavčar, PhD. Grape and wine analyses

Katja Šuklje, PhD. Vineyard experiments.

Alenka Mihelčič, PhD student.

Gašper Žerjal, Project's financial manager.

Friderik Vodopivec, PhD. External expert

Working group on Karst ham

Marjeta Čandek Potokar, PhD. Coordinator of Group, experimental design, collection of materials and measurements, data analysis. meta.candek-potokar@kis.si

Martin Škrlep, PhD. Experimental design, collection of materials and measurements, laboratory analysis, preparation and data analysis.

Urška Tomažin, PhD. Data analysis, preparation of breeding recommendations.

Klavdija Poklukar, MSc. Laboratory analysis, data preparation.



**UNIVERSITÀ
DEGLI STUDI DI TRIESTE**

Project Partner 1 – UNITS
Università degli Studi di Trieste

Dipartimento di Scienze della Vita

via L. Giorgieri 1, 34127 Trieste

e-mail: spassamonti@units.it

Sabina Passamonti, Dr. Med, PhD

Group coordinator.

Experimental design and analysis of results (wine & health). Responsible for WP2.

Paola Pelizza, PhD student.

Nevenka Medic, PhD. Post-doctoral researcher.

Marco Stebel, PhD, technical support.

Federica Tramer, PhD. Biochemical analyses.

Antonella Bandiera, PhD. New analytical method.

Andrea Nardini, PhD. Experimental design and analysis of the results (water status of the vineyards).

Francesco Petruzzellis, PhD. Post-doctoral researcher.



UNIVERSITÀ DEGLI STUDI DI UDINE

Paolo Sivilotti, PhD.

Koordinator skupine, eksperimentalno načrtovanje in analiza rezultatov. Odgovoren za WP3

Elisa Petrussa, PhD.

Eksperimentalno načrtovanje, zbiranje materialov in meritev, laboratorijska analiza, priprava in analiza podatkov.

Alberto Calderan, znanstveni sodelavec, tehnik vinogradništva

Marco Vuerich, PhD student, fiziologija rastlin

Antonio Filippi, znanstveni sodelavec, fiziologija rastlin

Giovanni Bigot, Giacomo Nunin, zunanjji tehniki, fitosanitarna obramba

Project Partner 2 – UNIUD **Università di Udine**

Dipartimento di scienze agroalimentari,
ambientali e animali

Via delle Scienze 206, 33100 Udine

e-mail: paolo.sivilotti@uniud.it

Paolo Sivilotti, PhD.

Group coordinator, experimental design and results analysis.
Responsible for WP3

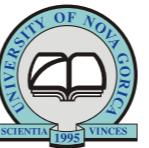
Elisa Petrussa, PhD.

Experimental design, collection of materials and measurements, laboratory analysis, preparation and analysis of data.

Alberto Calderan, research fellow, viticulture technique
Marco Vuerich, PhD student, plant physiology

Antonio Filippi, research fellow, plant physiology

Giovanni Bigot, Giacomo Nunin, external technicians, phytosanitary defense



CENTER ZA RAZISKAVE VINA

Vloga: V okviru centra smo proučevali mlečnokislinske bakterije, ki so bile prisotne na rdečem grozdu sorte 'Refošk' (*Vitis vinifera L.*) in v vinu Teran. Sodelovali smo tudi pri spremljanju vodnega stresa vinske trte in pri poskusu optimizacije namakalnega režima kraških vinogradov.

Dr. Melita Sternad Lemut, vodja centra in raziskovalka na prodročju enologije

Dr. Branka Mozetič Vodopivec, dekanja Fakultete za vinogradništvo in vinarstvo in raziskovalka na področju analizne kemije vina

Dr. Lorena Butinar, raziskovalka na področju mikrobiologije

Dr. Jan Reščič, podoktorski sodelavec na področju vinogradništva

Dr. Guillaume Antalick, raziskovalec na področju enologije in analizne kemije vina

LABORATORIJ ZA VEDE O OKOLJU IN ŽIVLJENJU

Vloga: V okviru laboratorija smo izvedli detekcijo biogenih aminov v Teranu in primerjavo različnih metod za detekcijo le-teh.

Dr. Mladen Franko, vodja laboratorija in raziskovalec na področju analizne kemije

Dr. Dorota Korte, raziskovalka na področju analizne kemije in karakterizacije materialov

Dr. Martina Bergant Marušič, raziskovalka na področju celične biologije in biotehnologije

Jelena Topić Božič, doktorska študentka

Petra Makorič, mag., strokovna sodelavka

Vodja projekta: Lorena Butinar / lorena.butinar@ung.si

Project Partner 3 – UNG **Univerza v Novi Gorici**

Vipavska cesta 13, SI-5000 Nova Gorica
e-mail: lorena.butinar@ung.si

Wine Research Centre

We studied lactic acid bacteria associated with red grape cultivar 'Refošk' (*Vitis vinifera L.*) and Teran wine.

We were involved in water stress monitoring and the irrigation optimization field experiment for Karst vineyards.

Lorena Butinar, PhD. Group coordinator

Melita Sternad Lemut, PhD. The head of the centre

Branka Mozetič Vodopivec, PhD. The dean of the Faculty for viticulture and enology

Jan Reščič, PhD. Post-doctoral researcher

Guillaume Antalick, PhD. Researcher

Laboratory for Environmental and Life Sciences

We performed the detection of biogenic amines in Teran wine and compared different methods for biogenic amine detection.

Mladen Franko, PhD. The head of the laboratory.

Dorota Korte, PhD. Researcher.

Martina Bergant Marušič, PhD. Researcher.

Jelena Topić Božič, PhD student

Petra Makorič, MSc, technical support



Občina Komen

Boštjan Frančeškin

Koordinator in vodja projektne skupine

Teja Savelli u.d.i.a.

Odgovorni vodja projekta

Tinkara Kodelja u.d.i.a.

Odgovorni arhitekt

**Project Partner 4
Občina Komen**

Komen 86
6223 Komen
e-mail: obcina@komen.si

Boštjan Frančeškin

Coordinator of the working group and supervision

Teja Savelli u.d.i.a.

Project manager and Lead Architect

Tinkara Kodelja u.d.i.a.

Architect

**Project Partner 5
Confesercenti Venezia Rovigo**

Via A. Da Mestre 36
30174 Mestre (VE)
e-mail: confesercenti.vero@confve.it

Michele Lacchin

Vloga: koordinator in vodja projektne skupine

Annalisa Arru

Vloga: tehnična podpora na področju projektiranja in organizacije promocijskih dejavnosti, srečanj, Educ Tour

Danilo Lunardelli

Vloga: spremljanje dejavnosti

Raffaella De Zuani

Vloga: tehnična podpora na področju organizacije dogodkov, Educ Tour, stiki z mediji

Michele Lacchin

Coordinator of the working group and supervision

Annalisa Arru

Technical support for the planning and organization of promotional activities, meetings, Educ Tours

Danilo Lunardelli

Monitoring of activities

Raffaella De Zuani

Technical support for the organization of events, Educ Tour, relationship with the media



V vinogradu
In the vineyard

Na trgu
On the market

Na ozemlju
On the territory

Za vsebino pričajoče publikacije so odgovorni izključno projektni partnerji. Vsebina publikacije ne odraža nujno stališča Evropske unije.

The content of the present publication is under the sole responsibility of the project Partners and does not necessarily reflect the opinion or position of the European Union.

Edited by Sabina Passamonti, University of Trieste (PP2). Design Divulgando - Trieste

www.ita-slo.eu/AGROTURII

www.agrotur2.si

