ACTIVITIES REPORT 2020

CITAB

Centre for the Research and Technology of Agro-Environmental and Biological Sciences

Compiled and edited by:
CITAB Executive Committee and Lígia Pinto

INDEX

312
PUBLICATIONS
208 JCR/Scopus papers
14 PhD Theses
90 Others

68
PROJECTS
14 Internacional
44 National
10 Research contract

324
96 Full Members
228 Collaborators

44% Men
56% Women

3.8M€
FUNDING
with stakeholders **1.3M€**
fundamental science **2.5M€**

2
DOCTORAL PROGRAMMES

2
SPECIALIZED LABORATORIES

CITAB's 2020 Activities Report presents the main activities performed during a year marked by the COVID-19 pandemic and the beginning of the Strategic Project 2020-2023.

While the Centre's dissemination and outreach activities, as well as the field and laboratory work, suffered from the lockdown and travel limitations, the public funding from FCT increased more than double, to 466.000€ per year.

Strengthening the link between CITAB research and stakeholders needs, CITAB initiated the participation in two national mobiliser projects, “cLABEL+: Innovative natural, nutritious and consumer-oriented 'clean label' foods” and “rePLANT: Implementation of collaborative strategies for integrated forest and fire management”, which joined together a total of 40 national entities (22 industrial partners, two technological interface centres and 16 research units).

Associated with the Portuguese economic and social stabilization programme, in response to the COVID-19 pandemic, CITAB was awarded with two Summer Courses ('Verão com Ciência') which funded 33 scholarships to under- and graduated students and promoted their return to UTAD campus, for in person activities.

The capacity to develop innovative products and new methodologies by CITAB researchers was recognized by a full podium at the 2nd edition of the “NewFood - Innovative food products” competition promoted by UTAD, and through the 1st prize on the category "Partnership Innovation: Operational Groups" on the 7th edition of the Entrepreneurship and Innovation Award by Crédito Agrícola.

On the last trimester of 2020, seven new doctoral students started the 6th edition of AgriChains international doctoral programme, with six scholarships funded by FCT.

Finally, a strategic partnership with the research centre GreenUPorto, from the Faculty of Sciences of Porto University, was formalized for a joint application to become an Associate Laboratory. The Associate Laboratories are structuring components of the Portuguese Scientific and Technological System and consist of research and development (R&D) institutions or consortia of R&D institutions that make explicit institutional commitments to pursue national scientific and technological policy objectives, for a period of 10 years.

CITAB is stepping orward in research and development of agricultural sciences bringing innovation to conventional production chains in agriculture, forestry and environment.

The integration of knowledge created by a multidisciplinary team is used to analyse and define the intervention in each step of the chains in order to answer the challenges of sustainability and competitiveness. Thus, we focus our objectives on a comprehensive research of the production systems particularly on facing the climate changes, on innovation of processes, on technology development and environment sustainability.

The Unit has defined the policy of the 4 I's: Interdisciplinary activities, Internationalization, Innovative solutions and increase links to Industry.

> *CITAB is an internationally recognized research center focused on integrated agricultural and food systems, and specially on the Sustainability of Agri-food and Forestry Ecosystems using the production-chain approach as a whole.*
> *Innovative research lines will address regional and global challenges, contributing to climate change modeling and better use of resources, relying on a multidisciplinary and highly qualified team.*
> *The progressive consolidation of the Centre will be strongly supported by strategic partnerships at national and international levels, including the participation in various collaborative laboratories: Colab4Food, Forestwise and Vine and Wine*
>
> **Emídio Gomes, UTAD's Vice-Rector for Research and Innovation**

> *CITAB is one of research providers whose action is more in tune with ADVID-Associação para o Desenvolvimento da Viticultura Duriense, something reflected upon existing synergies between the two organizations, that take the form of collaborative research projects, Ph.D. thesis or services for farmers such as phenology bulletins.*
>
> **António Graça, Sogrape Vinhos S.A.**

MISSION

CITAB is committed to collaborating and consulting stakeholders to understand their needs, problems and constraints. We use multidisciplinarity and innovation to reply to those needs, resulting in more competitive value chains, a better and sustainable environment and more developed societal knowledge.

VISION

All the activities are under the driving force of the Unit's internationalization, addressing stakeholders needs beyond the national economy, and to achieve scientific excellence distinction through innovative science and technology.

Concerning its organizational structure, CITAB applies a "bottom-up" management approach. The **Directorate**, composed by one Director and two Vice-Directors, is supported by an **Executive Committee**, consisting of seven members from the different research tasks, which forms a dynamic two-way link between members and the Directorate for strategy development, progress checking and decision-making. All strategic issues are discussed and voted on by the **Scientific Council** (members with PhD and meeting regulations concerning publishing criteria), which meets a minimum of 4 times a year.

A dedicated **Management Office** handles the financial and administrative issues of the Centre, as well as the AgriChains FCT funded international doctoral programme, and supports the organization of national and international scientific events and outreach activities, liaises with UTAD administrative sections and assists the Board, Thematic Line coordinators, Tasks and the Executive Committee.

CITAB also has an **External Advisory Committee**, comprising three internationally recognized experts that make objective critical analyses of the unit's R&D activities and performance to provide recommendations. Additionally, the Centre relies on the advice of a **Stakeholders** Committee, which includes key stakeholders from the private and public sector and meets with CITAB members, the Directorate and Executive Committee periodically, to assess overall results and activities and lay down guidelines for the future.

THEMATIC RESEARCH LINES & TASKS

CITAB research activity is characterised by a streamlined approach, focused into two thematic lines that contribute to resolving societal and private sector issues in agriculture and forestry production chains and their impact on the natural environment: "Sustainability of Agri-food and Forestry Ecosystems in a Changing Environment"; and "Technology & innovation in Agri-food and Forestry chains for a more competitive bioeconomy". This structure aims to balance scientific excellence with benefits and consequences across multiple dimensions that embrace environmental sciences and socioeconomic needs.

1-Sustainability of Agri-food and Forestry Ecosystems in a Changing Environment

Thematic Line "Sustainability of Agri-food and Forestry Ecosystems in a Changing Environment" (TL1) aims to monitor and assess how different types and scales of impacts affect agri-food and forestry chains systems, biodiversity and ecosystem services. It applies multidisciplinary research to develop integrated tools and methodologies to monitor how multiple scale impacts affect ecosystems and biodiversity. Activities in TL1 are focused into two Tasks: Task 1.1. Integrated monitoring of climate and environmental impacts and Task 1.2. Sustainability in agri-food and forestry ecosystems.

Task 1.1 *is highly interdisciplinary, using field, laboratory and computational techniques, advanced analysis, scaling and modelling tools and testing novel potential indicators of change. This task aims to (i) develop and apply new analytical technologies to (ii) understand climatic and environmental forcing on target ecosystems under current conditions; (iii) assess current and future scenarios of climate and environmental change to develop, test and implement suitable mitigation and adaptation measures, such as riparian restoration or bioclimatic cultivar adaptation.*

Task 1.2 *gathers multidisciplinary researcher in multivariate analysis and modelling of impacts of habitat and land use change on terrestrial and aquatic environments, ecosystem services and characterization of agri-food and forestry systems.*

2 - Technology & innovation in Agri-food and Forestry chains for a more competitive bioeconomy

Thematic Line "Technology & innovation in Agri-food and Forestry chains for a more competitive bioeconomy " (TL2) aims to use innovation to strengthen sector competitiveness by improving and expanding the potential range of agro-food and forestry products on offer. By promoting recycling, reuse and recovery of raw materials, TL2 brings added-value to agri-forestry ecosystems, agri-food and forestry products and co-products, by boosting both regional and national economic growth. TL2 directly involves sector stakeholders throughout the 2 vertically structured Tasks applying multidisciplinary research: Task 2.1. Innovative technologies and processes and Task 2.2. Valorisation of bio-based products and co-products.

Task 2.1 *promotes the optimization and development of innovative technology to the agri-food and forestry production chains, boosting competitiveness and income by improving food and forestry crop productivity, reducing management costs and increasing profit.*

Task 2.2 *research aims to uncover the potential of agri-food and forestry products and residues, including native flora and aromatic and medicinal plants to develop new high bio-based value products.*

CITAB

BOARD

Director: Ana Barros

Vice-Diretor: Luís Ferreira Vice-Diretor: Pedro Couto

Executive Committee

José Lousada

Alfredo Aires
Ana Coimbra
Ana Sampaio
Guilhermina Marques
Maria José Saavedra
Paulo Fernandes

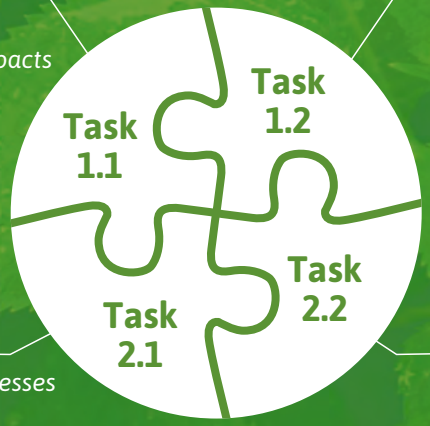
Management Office

Research Lines & Tasks

1 - Sustainability of Agri-food and Forestry Ecosystems in a changing environment **(coord: Mário Santos)**

Integrated monitoring of climate and environmental impacts
João Santos

Sustainability in agri-food and forestry ecosystems
Simone Varandas



Innovative technologies and processes
Pedro Couto

Valorisation of bio-based products and co-products
Miguel Rodrigues

2 - Technology & innovation in Agri-food and Forestry chains for a more competitive bioeconomy **(coord: Ana Barros)**

External Advisory Committee

David Lindsay
(EUROFEDA-UK)
Gregorio Antolín
(CARTIF-SP)
Isabel Pardo Gamundi
(Univ. Vigo-SP)

Stakeholders Committee

António Graça
(ADVID)
Francisco Carvalho
(Amorim Cork)
João Miranda
(Frulact Group)
Luís Rocharte Álvares
(WBCSD)

MAIN ACHIEVEMENTS

CITAB achievements are geared to meet regional and national stakeholder needs and have been oriented to fit in the four Research Tasks.

Task 1.1
Integrated monitoring of climate and environmental impacts: adaptation and mitigation strategies

Climate change projections for weather/climate conditions and extremes and their potential impacts on the environment, water resources, forestry, and agricultural systems, were produced. Seasonal predictions for wine production and grapevine yields, using climate model monthly forecasts, were developed. A grapevine-model calibration platform was deployed to facilitate applications in decision support systems. Stress mitigation strategies, such as grapevine irrigation and foliar kaolin application, and their impact on the metabolomics of photosynthetically active tissues in grapes, were identified. The interplay between light microclimate and grape berry photosynthesis and the metabolite profile of its tissues, with a potential impact on grape berry and wine composition, was studied. Groundwater resources and their sustainable use were evaluated, considering the selection of areas for artificial water infiltration, as well as the management of activities that can endanger groundwater quality, namely agriculture or forest fires. Models for the allocation of rainwater harvesting systems on agroforestry applications, evaluating the risk of aquifer contamination, were applied.

Task 1.2
Sustainability in agri-food and forestry ecosystems

Innovative studies on pre-treatments for enhancement of olive tree drought adaptability; sustained deficit irrigation of olive tree for higher water productivity and the accumulation of oil and phenolic compounds in fruits. Mycoemediation of wastes and evaluation of wastewaters toxicity from Mediterranean agro industries using a multi-organism approach. Establishment/improvement of the classification criteria for Portuguese rivers (physical-chemical and hydromorphological quality) and development of tools for hierarchical decision-support framework for dam removal. Application of new concepts of spatial planning by using multi-modelling frameworks to support decision-making from local biodiversity management to landscape planning and definition of the no go areas for protection of endangered species.

Task 2.1
Innovative technologies and processes

New formulations for administration of natural products with anti-diabetes (sucupira oil, green tea) and anti-tumoral (perillaldehyde 1,2-epoxide) activities were developed and assayed in vitro. A methodology for vegetal oil fluorescence components was developed to be used in fingerprinting identification. Cytogenomic approaches, applied for the first time *in Pinus nigra* and *Vitis vinifera* varieties allowed to identify more tolerant genotypes to drought and to copper exposure. Impacts of light microclimate in the canopy and of stress mitigation strategies in *Vitis vinifera* were evaluated. Their management importance in grape berry photosynthesis and metabolite profile with potential impact on grape berry and wine composition was shown.

Task 2.2
Valorization of bio-based products and co-products

Following the trend already implemented in the research activities of 2019, and given the relevance of the general European policies towards a common goal of "One Health", integrating the agro-food industry, main activities were aligned on the analysis of the phytochemical composition of different substrates and the evaluation of its potential application as bioactive compounds on human nutrition. Within these substrates, studies were essentially developed on common beans, grape steams, acorn flour and thymus. In addition, other matrices such as Kiwi fruit residues, chestnut, raspberries, elderberry, burnet, grain peppers, macro and microalgae extracts, almond, green tea, "Moringa", "Gingko", chaste tree, infusions of herbal blends as well as vegetable oils were also studied. *In vitro* and animal models tests showed their potential as nutraceuticals. The potential of propolis ethanol extracts on the biocontrol of apple diseases was also showed. Healthy eating and good nutrition programs started to be developed and wastage of food on schools and hospitals were evaluated on a sustainable approach.

COMPETITIVE FUNDING & RESEARCH PROJECTS

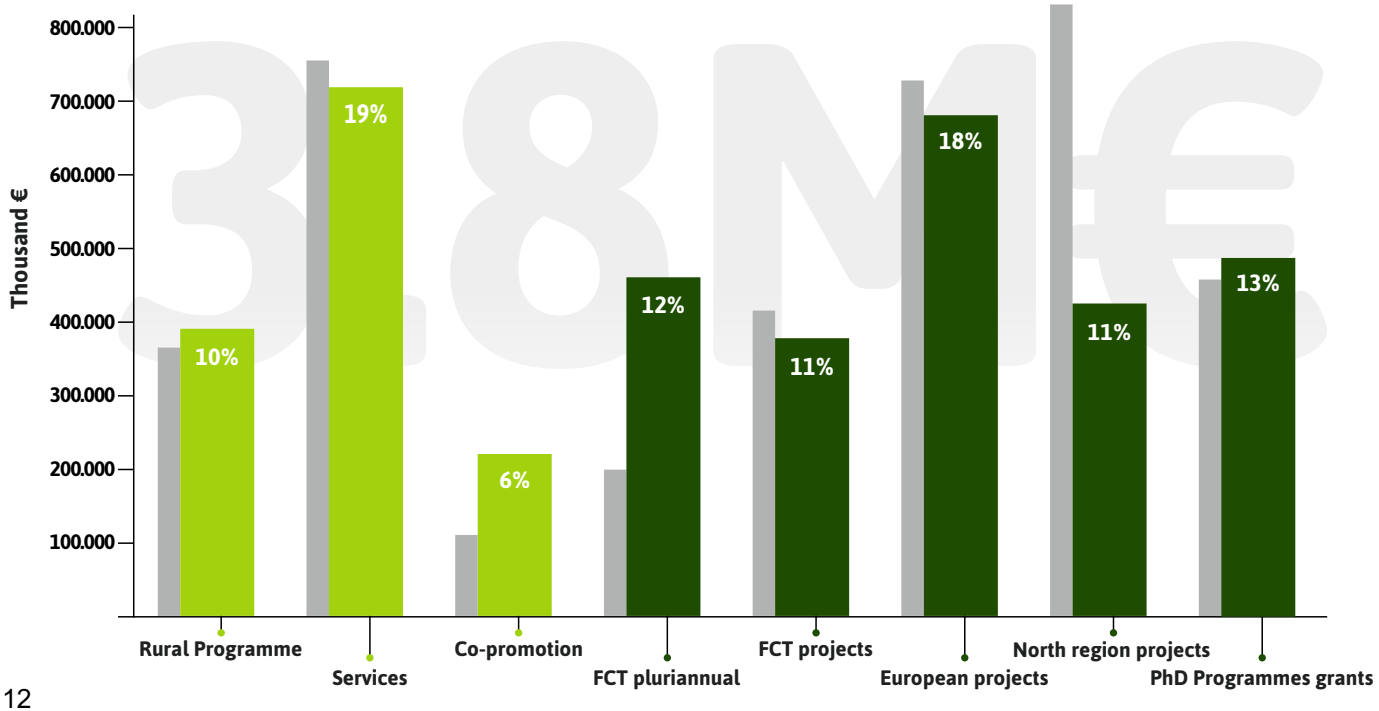
COMPETITIVE FUNDING

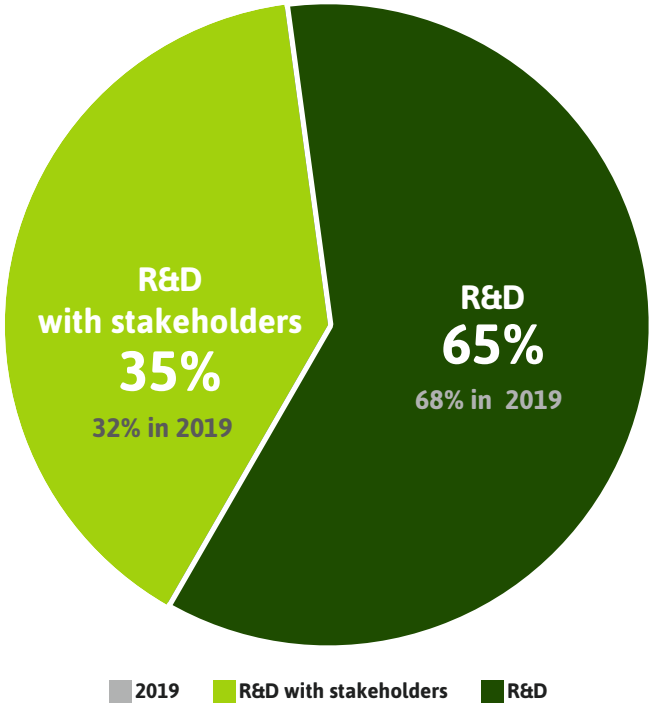
The year 2020 marked the beginning of CITAB's new strategic project for the period 2020-2023, with a total funding of 1.865.500 € from FCT, the Portuguese Foundation for Science and Technology. This amount represents more than twice the previous strategic project, which ran from 2015 to 2018.

In this year, the Centre strengthened its position as a research provider for private and public stakeholders, with a share of 35% of the total funding (more 3% than 2019). The contracts achieved by CITAB's Laboratories of Applied Ecology (LEA) and Fluvial Ecology (LEF) represented almost half of this value, and the other half was accomplished by the mobiliser projects with the industry (Clean Label + and rePlant) and the Operational Group projects, funded by the Rural Development Programme.

The European funded projects, comprising HORIZON 2020 and INTERREG programmes, represented 18% of the competitive funding (same percentage of last year) and the North region projects registered the most significant decrease in relation to 2019, falling from 24% to 11% in 2020, even though a new project "Atlantida - Platform for the monitoring of the North Atlantic Ocean and tools for the sustainable exploitation of the marine resources" was approved under this regional programme and begun in October.

In total, CITAB researchers were awarded a sum of **3.8M€** from national and European funding entities in 2020.





Conservation of Atlantic pollination services and control of the invasive species *Vespa velutina*

Start date: May 2019 *Duration:* 36 months

The main objective of the project is to prevent any further expansion of the invasive alien species *Vespa velutina* and minimise its impact not only on ecosystems but also on socio-economic development in the Atlantic Area. The plan is to achieve this through the establishment of a transnational cooperation network between scientists and technologists from various disciplines to help curb the spread of this pest in the territory, especially, in natural ecosystems most sensitive to changes caused by it and the consequent reduction of pollinators. Partnership members have extensive experience in the knowledge areas linked to the proposed activities, such as pollination biology, conservation, veterinary science, beekeeping, chemistry, epidemiology, genetics and radio systems (Universities of Vigo, Santiago and Trás-os-Montes; the Basque Institute of Agricultural Research and Development, the Institut Nacional de la Recherche Agronomique, University of Exeter and University College Cork. The aim is to devise new control methods and a Strategic Atlantic Plan to protect biodiversity and ecosystem services against this scourge.

ATLANTIC POSITIVE

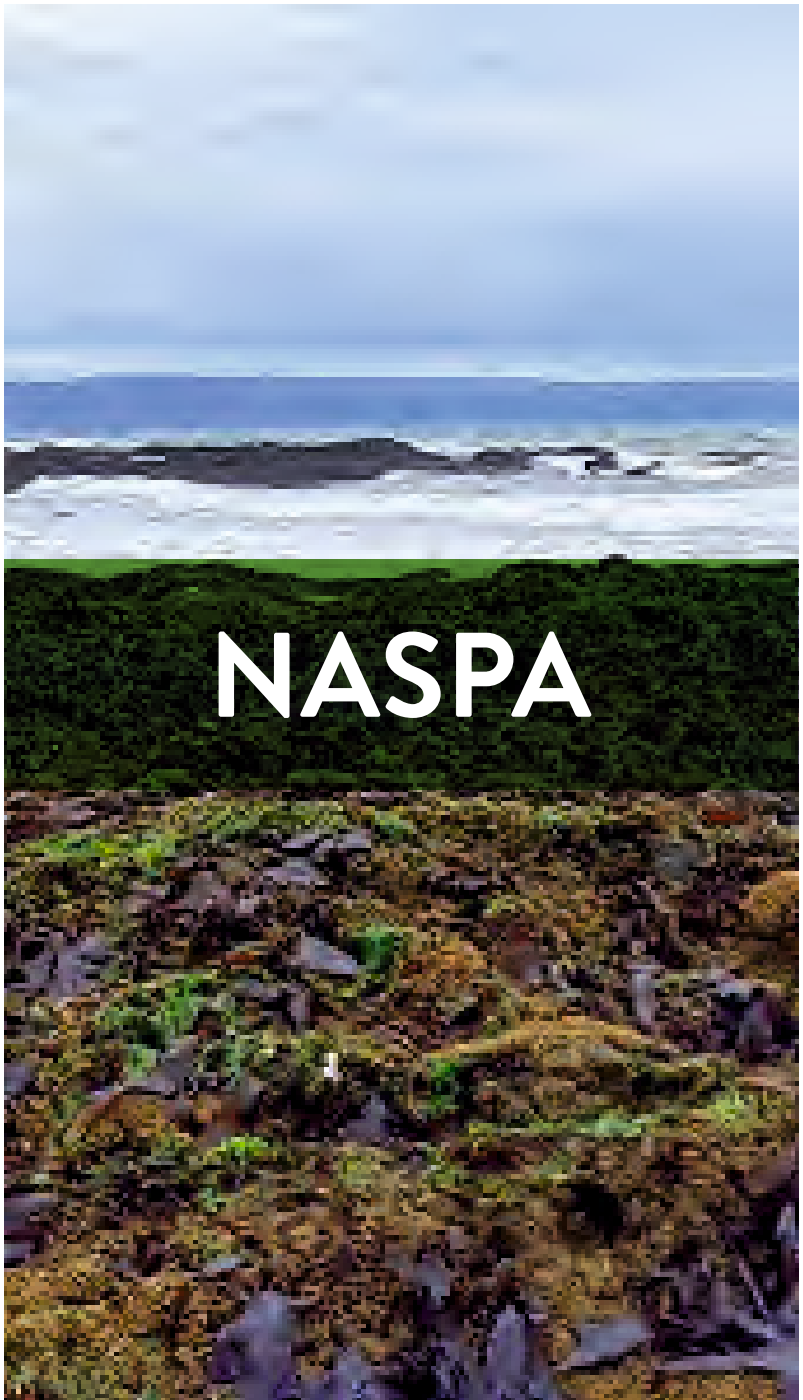
Principal Investigator at CITAB: ***José Aranha***
Leader Institution: ***Fundación Centro de Estudos Eurorrexionais Galicia - Norte de Portugal (ES)***
Web site: ***http://www.atlanticpositive.eu/***
Funded under: ***INTERREG Atlantic Area programme (EAPA_800/2018)***

Natural fungicides against air & soil borne pathogens in the Atlantic Area

Start date: December 2017 *Duration:* 30 months

The Atlantic Area is characterised by high rainfall and high humidity, which increase crop fungal infection and leaching of inputs from soil. Crop growers counter these problems by applying high levels of synthetic fungicides and fertilizers. However, heavy rainfall can render these applications ineffective and leach these chemicals into waterways, resulting in increased emissions of the powerful greenhouse gas, nitrous oxide. The problem is compounded as many fungicides are toxic due to residue accumulation in food, which affects growers and retailer alike. NASPA project aims to develop a new generation of products based on bioactive compounds from seaweed/fish waste/aquatic plants combined with key plant micronutrients. These can induce crops to produce protective substances against fungal pathogens or improve plant health making crops less prone to diseases via better nutrition and biostimulation.

A total of 15 partners are part of this project: Bangor University, Emerald Crop Sciences, Universidade de Trás-os-Montes e Alto Douro, Biobab R&D, S.L., Vegenov, CATE-Comité d'Action Technique et Economique, IPMA, Symington Vinhos SA, Waitrose, BioAtlantis Ltd, Universidade de Coimbra, Aberystwyth University, Instituto Superior de Agronomia, Vivagro and Pevesa Biotech SA.



Principal Investigator at CITAB: ***Berta Gonçalves***
Leader Institution: ***Bangor University (UK)***
Web site: ***https://www.bionaspa.com/naspa_projects.html***
Funded under: ***INTERREG Atlantic Area programme (EAPA_451/2016)***

Innovative natural, nutritious and consumer-oriented "clean label" foods

Start date: June 2020 *Duration:* 36 months

Clabel + is a project promoted by a consortium led by Sumol + Compal, bringing together a total of 20 entities, including companies (8) and non-business entities in the R&I system (12), with the general objective of responding to the challenges that the consumer poses to the food industry. With this project, it is intended to develop processes and products that are understood by the consumer as consistent with products with natural ingredients, with limited use of a high number of additives, and that allow, due to their physical, chemical and nutritional properties, to provide the experience expected, maintaining food security. In order for the consumer to perceive and decode the "clean label", processes and products will be developed that will result in concrete mentions on the product labels that customers and consumers will recognize as associated with a product consistent with the "clean label" concept.

cLABEL+
CLEAN LABEL FOOD

Principal Investigator at CITAB: ***Ana Novo Barros***
Leader Institution: ***Sumol+Compal Marcas SA (PT)***
Web site: ***https://cleanlabelplus.pt/***
Funded under: ***Compete – Portugal 2020 | ANI (POCI-01-0247-FEDER-046080)***

Implementation of collaborative strategies for integrated forest and fire management

Start date: *July 2020* *Duration:* *36 months*

The main purpose of this mobilizing project is to contribute to the greater appreciation of the Portuguese forest through the implementation of collaborative strategies for integrated forest and fire management. These strategies will lead to new products, processes and services, largely supported by digital technologies, contributing to the reduction of fire risk and introducing a high degree of innovation, with a view to improving forestry and energy companies' management and decision-making processes. The positive impacts will be felt throughout the chain, namely in service providers and forest producers, with enormous benefits for the economy of rural areas. rePLANT mobilizes 20 entities, including industry-leading companies (Navigator, Amorim Florestal, Sonae Arauco, AltriFlorestal, DS Smith, Whereness, EDP Labelec, Trigger Systems, Fravizel, EDP Distribuição, REN, ForestWise, Tesselo, Florecha) and research & innovation entities (UTAD, INESC TEC, U. Coimbra, INIAV, FEUP/UPorto, ISA/ULisboa).

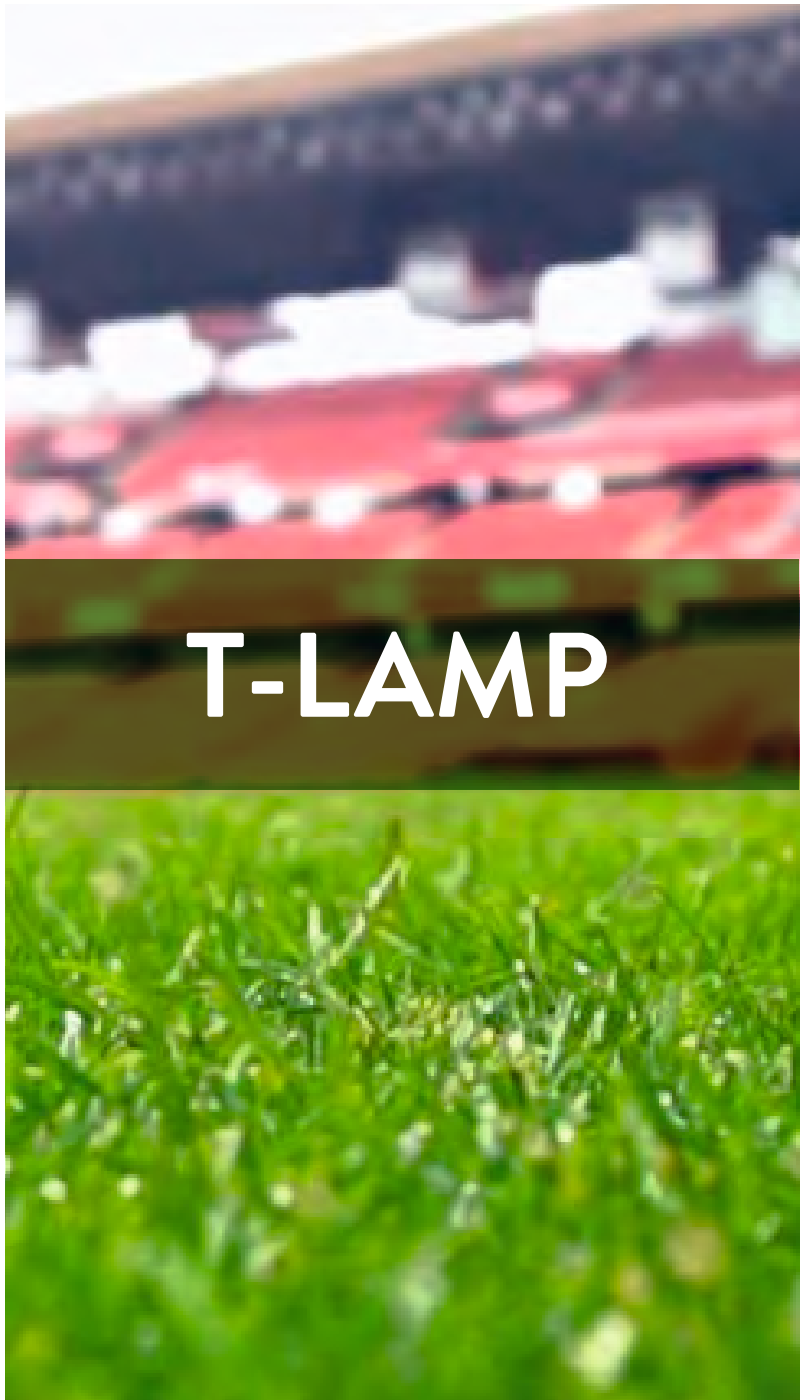
rePLANT

Principal Investigator at CITAB: ***Maria Emília Silva***
Leader Institution: ***Navigator Forest Portugal (PT)***
Web site: ***http://replant.pt/***
Funded under: ***Compete – Portugal 2020 | ANI (POCI-01-0247-FEDER-046081)***

Turf lighting advanced mobile platform

Start date: August 2020 *Duration:* 34 months

The T-LAMP project aims to develop an artificial lighting system with LED technology, intelligent, adjusted and optimized for the specific physiological parameters of plants used in lawns for high sports competition. It is expected that the LED system, once optimized, can promote significant gains in energy efficiency and at the same time ensure a more sustainable model of maintenance of the lawns. LOKI company, jointly with CITAB/UTAD and MORE Colab pretend to become pioneer in the creation of an advanced LED lighting solution for the optimal growth of natural lawns, minimizing current maintenance problems, with direct gains in economic and environmental terms.

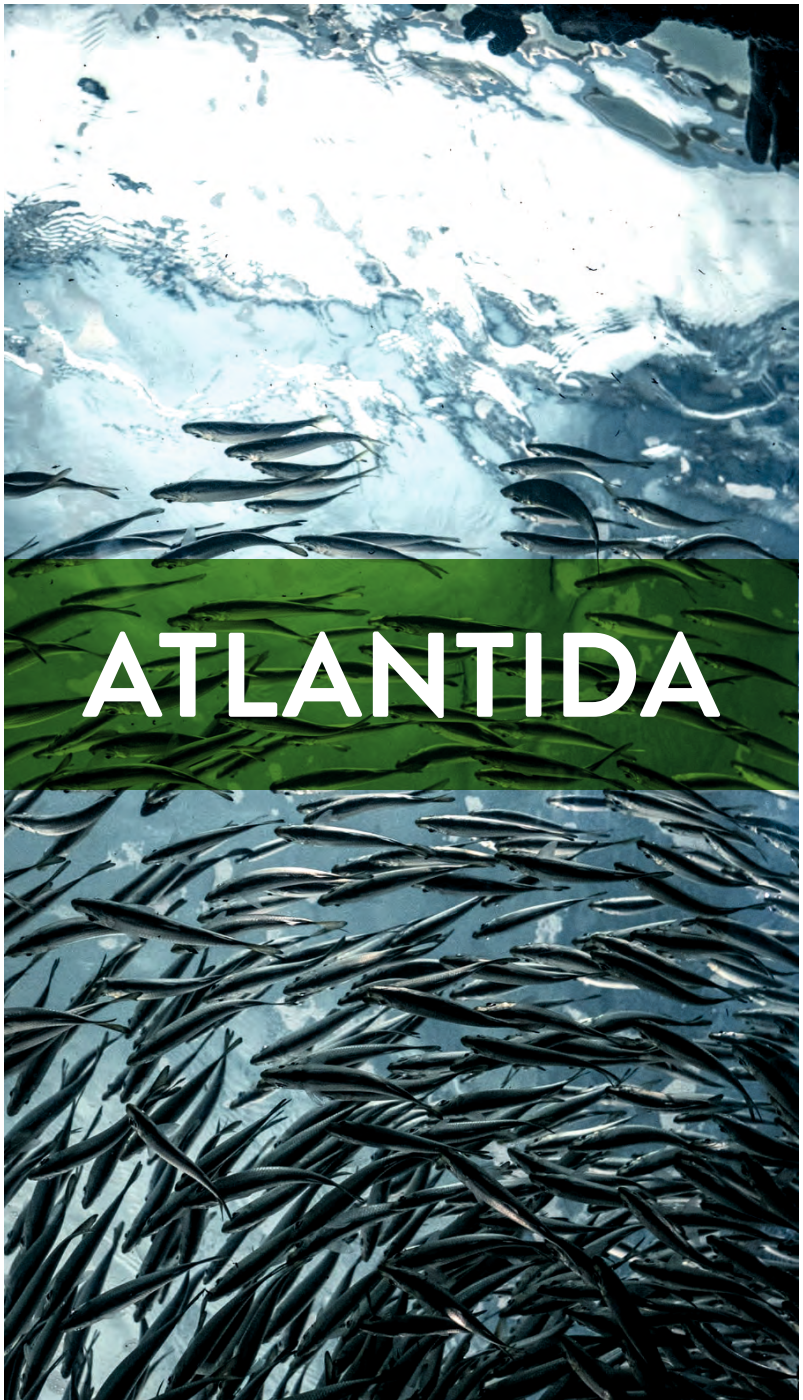


Principal Investigator at CITAB: ***José Moutinho Pereira***
Leader Institution: ***LOKI, Unipessoal Lda (PT)***
Web site: ***NA***
Funded under: ***Compete – Portugal 2020 (POCI-01-0247-FEDER-070057)***

Platform for the monitoring of the North Atlantic Ocean and tools for the sustainable exploitation of the marine resources

Start date: *October 2020* *Duration:* *36 months*

ATLANTIDA will develop a platform for the monitoring of the North Atlantic Ocean and tools for the sustainable exploitation of the marine resources, that will provide new data, information and products to identify and respond to threats to biodiversity losses and climate change, contributing for the sustainable management of natural and energetic resources. The project will focus on the study of understudied ecosystems and/or species in the Northern-Portuguese coast, as well as in the monitoring of anthropogenic impacts, including plastics and other emergent contaminants. ATLANTIDA will provide tools for the sustainable growth of aquaculture and marine biotechnology. This includes the creation of biobanks of marine organisms, allowing the valorization of marine biomass and the exploitation of the biotechnological resources for pharmaceutical, industrial and environmental applications. ATLANTIDA will increase the cohesion of UNORTE.pt institutions (U. Porto, UTAD and U. Minho) and their leadership in this matter.



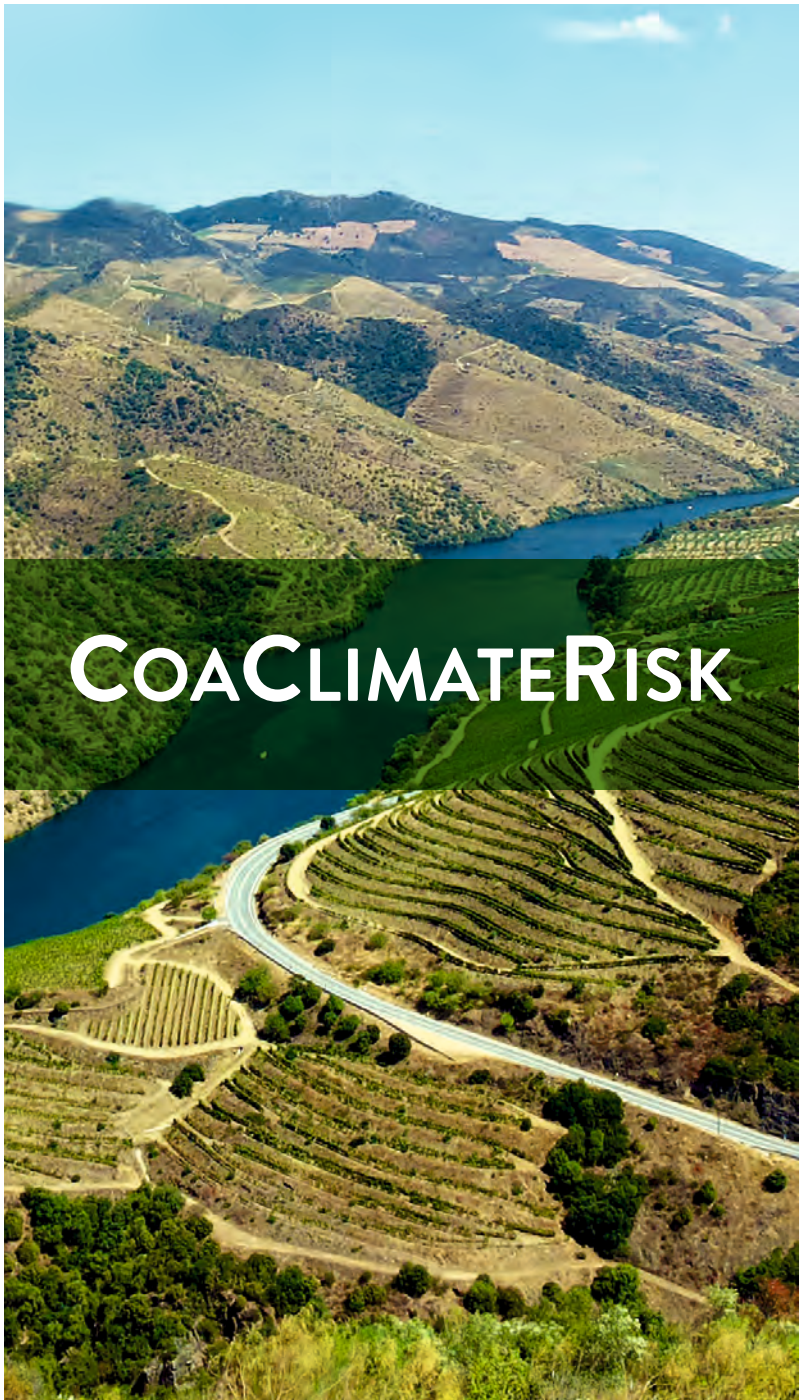
ATLANTIDA

Principal Investigator at CITAB: ***Sandra Mariza Monteiro***
Leader Institution: ***University of Porto (PT)***
Web site: ***NA***
Funded under: ***NORTE2020 programme (NORTE-01-0145-FEDER-000040)***

Climate change impact assessment and adaptation measures for the main crops in the Côa Valley region

Start date: *September 2020* *Duration:* *36 months*

The CoaClimateRisk project aims to assess the climate change forcing on the main crops in the Côa Valley. For this purpose, an ensemble of state-of-the-art regional climate models, driven by newly developed greenhouse gas emission scenarios, combined with innovative downscaling and bias correction techniques, will be used to develop high-quality projections. Adaptation measures will be simulated under future climates, such as irrigation, cover crops, mulching and varietal selection Furthermore, an economic impact analysis will establish a link between the economic activities that contribute to regional GDP, by defining direct and indirect indicators of climate influence (e.g. sales volumes and cost levels). The information delivered by this project is of utmost relevance for stakeholders from the agricultural sector of the Côa Valley, as it will allow to develop and promote suitable measures to mitigate climate change risks. These stakeholders are already in close cooperation with the project and with the project partners: ADVID, SOGRAPE, the Côa Parque foundation and the University of Minho.



CoaClimateRisk

Principal Investigator at CITAB: ***Helder Fraga (Consortium Coordinator)***
Leader Institution: ***University of Trás-os-Montes and Alto Douro (PT)***
Web site: ***http://coaclimaterisk.utad.pt***
Funded under: ***FCT - SR&TD Project Grants (COA/CAC/0030/2019)***

Nature-based solutions for preventive fire management and sustained supply of ecosystem services

Start date: March 2019 *Duration:* 36 months

This project aims to bring together multidisciplinary state-of-the-art knowledge on ecosystem services models, wildfire simulation, landscape management planning methods, forest policy and economics, and stakeholder engagement and research dissemination, to develop scientifically sound methods and design tools that may help forest policy and decision-makers address the challenge of integrating wildfire concerns in landscape-level management planning. This will encompass the development, integration, and utilization of a landcape management planning and wildfire behavior model, tools to support decision making under scenarios of climate change, spatial optimization, and multiple criteria approach. FirESmart project will be implemented in two test transboundary systems: i) the Biosphere Reserve Gerês-Xurés (G-X) and ii) the Biosphere Reserve Meseta Ibérica (MI). These regions represent two mountain rural areas between Portugal and Spain with unique cultural, socio-economic and natural values, but also largely affected by wildfires and rural exodus.

Principal Investigator at CITAB: ***João Santos***
Leader Institution: ***ICETA – UPorto (PT)***
Web site: ***https://firesmartproject.wordpress.com/***
Animation: ***https://youtu.be/x7ouTIBp__E***
Funded under: ***FCT - Prevention and Fighting of Forest Fires Project Grants (PCIF/MOG/0083/2017)***

ResinPro: Understanding resin production in *Pinus pinaster* to maximize yield in a more sustainable way

Start date: *September 2018* *Duration:* *36 months*

ResinPro project aims combine knowledge of wood anatomy and plant physiology in order to improve pine oleoresins exploration in Portugal. It will be identified the anatomical traits with the highest value for resin production, determine the environmental conditions under which resin yield can be improved, understand seasonality of resin quality and to investigate alternative practices to reduce tapping footprint on pines' fitness.

To address these issues, we will study resin production and duct performance of *P. pinaster* in the most valuable regions for resin extraction in Portugal.

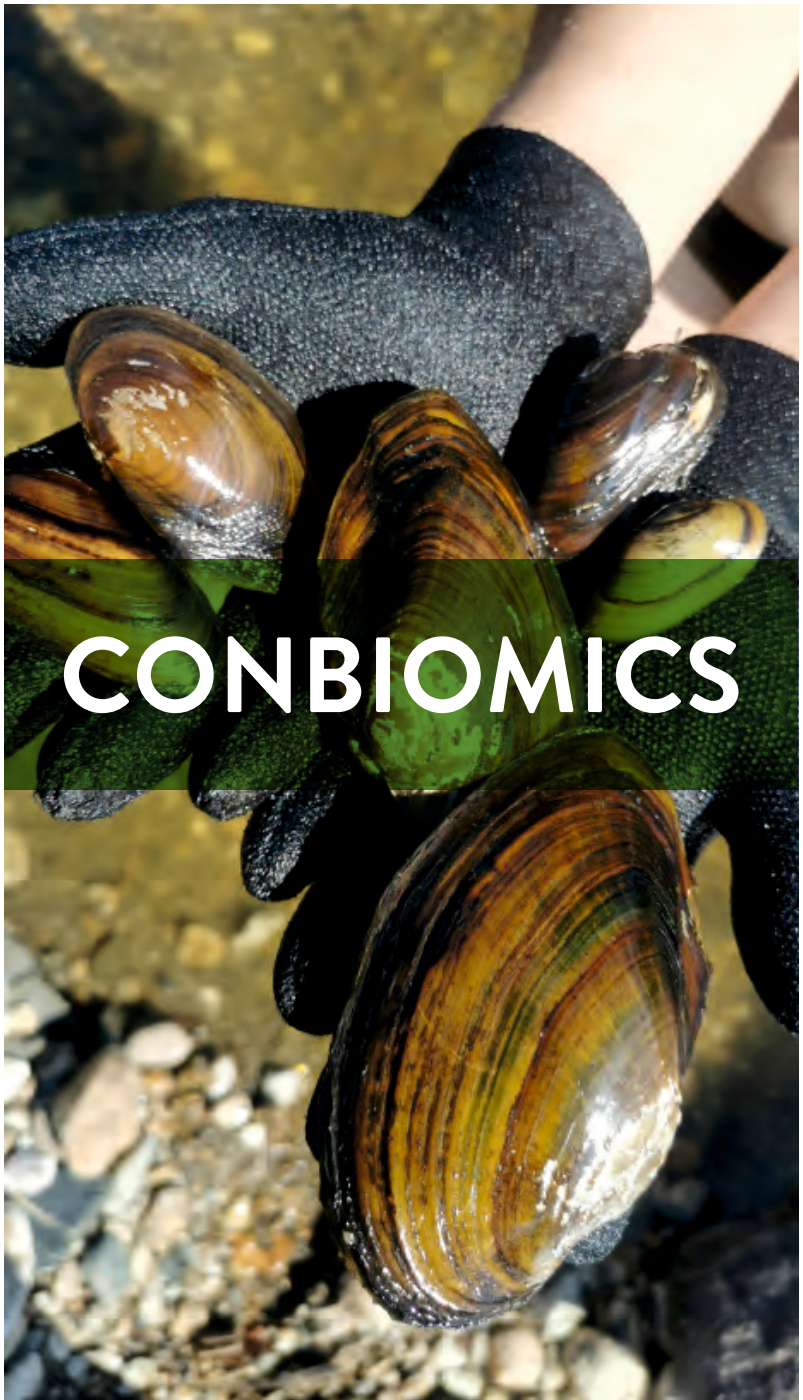
In the 1st phase of ResinPro, we will identify the main duct traits that distinguish excellent from average tree producers to provide a list of traits for future breeding programs. The 2nd phase involves a dendrochronological study to improve our understanding of the edaphoclimatic role on resin production from an anatomical approach. This study will contribute to clarify the climatic conditions under which pine forests may increase resin production. The 3rd phase is an experimental study to understand if, when and to what extend trade-offs between growth and defense affect resin production. We will test to see whether decreasing the impact of tapping on trees (i.e. reducing tradeoffs) by shortening the harvest period will compromise resin yield.

Principal Investigator at CITAB: ***José Luís Lousada***
Leader Institution: ***University of Coimbra (PT)***
Web site: ***NA***
Funded under: ***FCT - SR&TD Project Grants (POCI-01-0145-FEDER-031231)***

Approach for the conservation of freshwater bivalves

Start date: *January 2018* *Duration:* *36 months*

The decline of freshwater biodiversity has reached alarming proportions. The extinction rate of freshwater biodiversity is predicted to be five times faster than all other groups of species. ConBiomics project intendeds to define the most important freshwater mussel taxa and areas of critical importance for conservation, at European and global levels, to inform the most relevant policy makers. This was reached by joining a genomics approach with scattered available distribution data, to determine and map global species richness, weighted endemism, phylogenetic diversity and endemism. Additionally, as these animals have an extraordinary unusual pattern of mtDNA inheritance, they will be used as model-taxa to tackle several issues related with mtDNA evolution. The project is led by the Aquatic Ecology and Evolution Laboratory (CIIMAR-UP) and has the collaboration of the following institutions: UTAD-CITAB; IPBragança; CIBIO-University of Porto; Deakin University; Université de Montréal; Muséum National d'Histoire; University of Nottingham; North Carolina Museum of Natural Sciences; Federal Center for Integrated Arctic Research and Northern Arctic Federal University.



Principal Investigator at CITAB: ***Simone Varandas***
Leader Institution: ***CIIMAR – UP (PT)***
Web site: ***NA***
Funded under: ***FCT - SR&TD Project Grants (POCI-01-0145-FEDER-030286)***

Synthesis and environmental safety of nanopesticides

Start date: July 2018 *Duration:* 42 months

Over the past decade, the application of nanotechnology has attracted considerable attention to revolutionize the agricultural scenario and food industry, mainly in the development of smart delivery systems to promote an efficient and safe release of agrochemicals, such as nanopesticides (NPest). NPest have the ability to overcome some limitations presented by conventional pesticides, including pathogen and pest resistance, decrease in soil quality, biodiversity and in its services. However, the health and environmental impact associated to long-term exposure to NPest are now the focus of scientific community and of regulatory agencies. This project proposes to develop and characterize new NPest formulations (pesticide-loaded hybrid silica-lipid nanoparticles), while providing in parallel their efficacy in pest models and scientific cyto/ecotoxicological information in human cell lines, as well as in aquatic and terrestrial nontarget organisms.

Principal Investigator at CITAB: **Amélia M. Silva**
Leader Institution: **University of Porto (PT)**
Web site: **NA**
Funded under: **FCT - SR&TD Project Grants (POCI-01-0145-FEDER-029343)**

The optimal challenges in irrigation

Start date: *June 2018* *Duration:* *36 months*

In this project we intend to use and develop knowledge of several scientific areas such as: Agronomy, Optimum Control, Statistics, Electronics, Informatics and Mathematical Modeling to be applied in irrigation systems for any type of crop, anywhere in the world. The use of adequate mathematical modeling using optimum control tools and agronomic knowledge in irrigation systems allows: - an efficient use of water, that implies savings in water and energy; - a greater adequacy of the plant water requirement according to different stages of its growth, allowing a sustainable and healthy growth of the crop. – to detect faults in the irrigation system, - estimate the water need to the irrigation during one year for different scenarios: medium year, drought year, severe drought year. The use of advanced technologies like informatics and electronic are fundamental not only to run a pilot installation on field conditions, but also to develop an efficient and userfriendly prototype. The multidiscipnary research team is composed of members from different instititutions and research centres: UM/CMAT, UTAD/CITAB, FEUP/SYSTEC, UA/CIDMA.

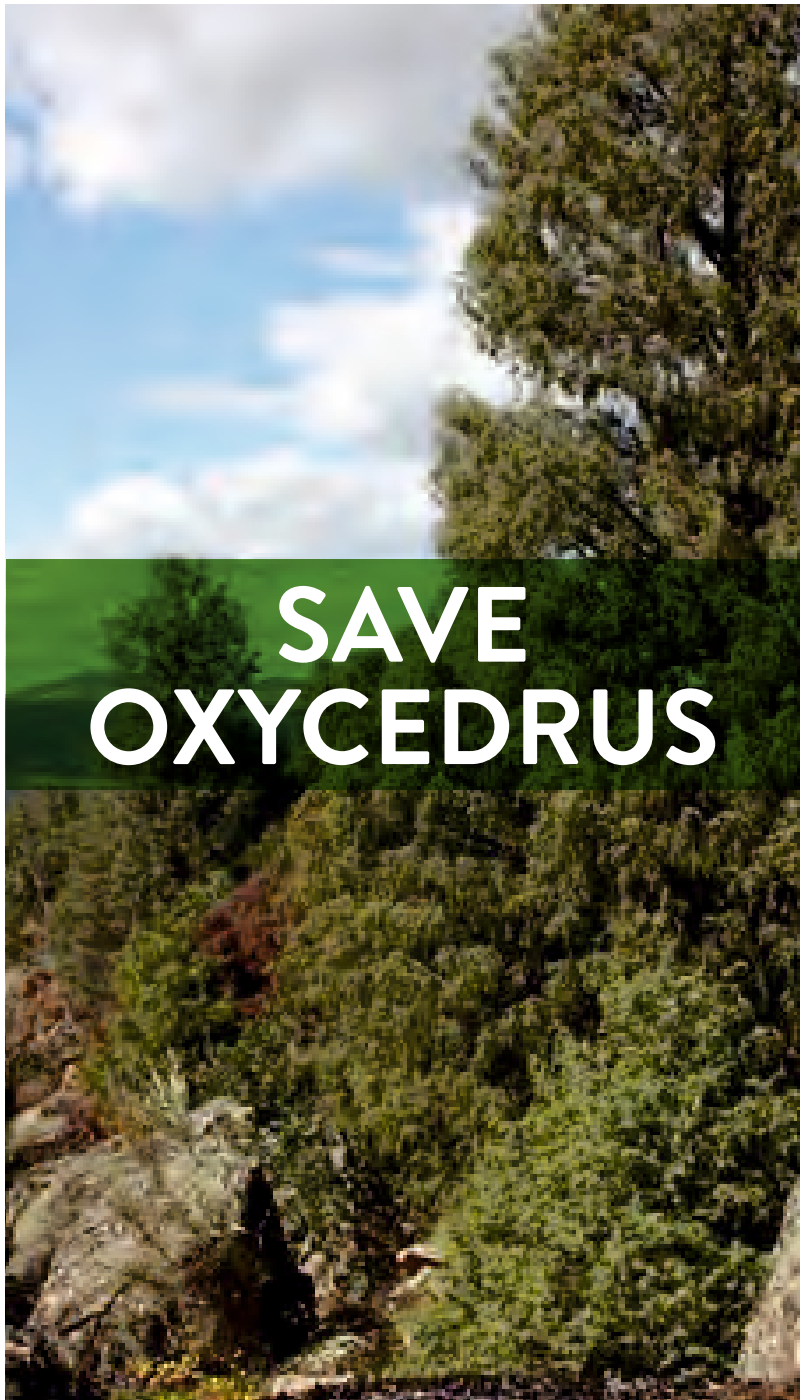
To Chair

Principal Investigator at CITAB: ***Aureliano Malheiro***
Leader Institution: ***University of Minho***
Web site: ***https://systec.fe.up.pt/projects/FCT-TOCHAIR/***
Funded under: ***FCT - SR&TD Project Grants (POCI-01-0145-FEDER-028247)***

Conservation and reproduction of threatened and high-value *Juniperus oxycedrus* populations

Start date: *June 2020* *Duration:* *31 months*

The project intends to develop a set of actions with a view to promoting the conservation of genetic resources in situ of populations of *Juniperus oxycedrus* L. Proceed to the identification, characterization, improvement and establishment of conservation units, taking the methodology consolidated by EUFGIS. Identify geographic areas of occurrence and the greatest risk of conservation, identify the threat factors, allow the improvement of the condition of the populations, the selection and reproduction of basic materials with the installation of units, as well as, promote information, dissemination and training in order to promote the conservation and status of populations. Species populations are at a high degree of threat and are classified as having a high degree of conservation priority. The project intends to determine the most important areas for conservation, identifying habitats considered of priority, considering different criteria and types of threat also important in the viability and maintenance of the populations. The project seeks to enhance the knowledge acquired to promote the conservation of the species and its environmental and social interest. This project involves a consortium between CITAB/UTAD and ICNF - Institute for Nature Conservation and Forests.



Principal Investigator at CITAB: ***João Paulo F. Carvalho (Consortium Coordinator)***
Leader Institution: ***University of Trás-os-Montes and Alto Douro (PT)***
Web site: ***NA***
Funded under: ***PDR 2020 programme (PDR2020-785-063781)***

Operational Group - Valorisation of the production of Cherry from Resende and positioning in the markets

Start date: March 2017 *Duration:* 47 months

Cherry production in Resende region represents about 30% of the production in the Northern Region of Portugal. The harvest begins in the middle of April, when beginning of the first cherry harvests across Europe. This constitutes an opportunity for Resende as it allows for an anticipation of production in about 3 weeks compared to those coming from other regions and countries. However, the low levels of specialization of the sub-row do not allow to take full advantage of this fruit.

In this context, the main objectives of this project are the characterization of the functioning of the sweet cherry sub-row in the Resende region, the selection of the best rootstock x variety combinations with high impact on the yield and fruit quality and also the adoption of innovative crop strategies for a sustainable sweet cherry production.

This project is based on a close relationship between the scientific community, companies and producers. Indeed, the following entities are involved in the Operational Group: University of Trás-os-Montes e Alto Douro, the companies MULTIPLOSFRUTOS and CERMOUROS, the cooperative DOLMEN, the Municipality of Resende and two cherry producers Armindo Barbosa and Fernando Pinto.

GRUPO OPERACIONAL CEREJA RESENDE

Principal Investigator at CITAB: ***Berta Gonçalves (Consortium Coordinator)***
Leader Institution: ***University of Trás-os-Montes and Alto Douro (PT)***
Web site: ***https://gocerejaresende.pt/***
Funded under: ***PDR2020 programme (PDR2020-101-031272)***

Operational Group - New management practices in rainfed olive orchards: strategies for mitigation and adaptation to climate change

Start date: *September 2017* *Duration:* *52 months*

This initiative aims to develop and disseminate innovative soil and canopy agronomic practices that achieve both climate change mitigation, by reducing greenhouse gases emissions and by increasing carbon sequestration, and adaptation of rainfed olive groves to adverse conditions. Field and laboratory methodologies will be implemented to assess health soil indicators, as well plant responses including water, mineral and photosynthesis dynamics, growth, crop yield and composition of olives and olive oil. A plan for demonstration and dissemination of results will be established, including the use of the Portuguese Rural Network platform and the websites of the consortium entities, the organization of conferences, seminars and webinars, the promotion of focus group, the publication of scientific and technical articles, as well the publication of a "Manual of Good Practices" for mitigation and adaptation to climate change.

NOVAS PRÁTICAS EM OLIVAIS DE SEQUEIRO
adaptação às alterações climáticas

Principal Investigator at CITAB: ***Carlos Correia***
Leader Institution: ***APPITAD - Associação de Produtores em Proteção Integrada de Trás-os-Montes (PT)***
Web site: ***NA***
Funded under: ***PDR2020 programme (PDR2020-101-032119)***

Operational Group - Livestock effluents: strategic approach towards agronomic and energetic valorization of flows in the farming activity

Start date: *January 2018* *Duration:* *37 months*

GOEfluentes' project started in 2018 as an EIP-AGRI Operational Group bringing together four research/educational institutions, three farmer associations and six agricultural enterprises. The project aims to evaluate the environmental and economic impact of emerging solutions for nutrient flow management at farm level. It is developing a methodology for mapping and geo-referencing the production, collection, storage, recovery and re-use facilities of animal nutrient flows. The mapping will provide a systematic overview and help forecast production scenarios. The data collected about nutrient flow management feeds into Portugal's Emissions Inventory used to track progress against its emission targets. Importantly, this project also includes the installation of demonstration units for effluent management and valorisation as fertilisers and will develop biogas production models based on animal flows.
The project is also informing and involving different stakeholders through emission estimations, benchmarking, identification of specific mitigation options in each region and studies of different scenarios.

GO EFLUENTES

Principal Investigator at CITAB: ***Henrique Trindade***
Leader Institution: ***INIAV - National Institute for Agricultural Research (PT)***
Web site: ***https://projects.iniav.pt/goefluents/***
Funded under: ***PDR2020 programme (PDR2020-101-031850)***

PYROLIFE - Training the next generation of integrated fire management experts. CITAB coordinator: Paulo Fernandes. Starting date: October 2019, duration: 48 months (H2020-MSCA-ITN - GA 860787). CITAB/UTAD funding: 237.720,24€.
https://pyrolife.lessonsonfire.eu/.

Atlantic-Positive - Conservation of Atlantic pollination services and control of the invasive species Vespa velutina. CITAB coordinator: José Aranha. Starting date: May 2019, duration: 36 months (INTERREG Atlantic Area). CITAB/UTAD funding: 136.500,00€
http://www.atlanticpositive.eu/

TRIPLE-C: Capitalising climate change projects in risk management for a better AA resilience. CITAB coordinator: Ronaldo Gabriel. Starting date: April 2019, duration: 36 months (INTERREG EAPA_772/2018). CITAB/UTAD funding: 170.000,00€
https://www.triplecproject.eu/

Clim4Vitis - Climate change impact mitigation for European viticulture: knowledge transfer for an integrated approach. Consortium coordinator: João Santos. Starting date: August 2018, duration: 36 months (WIDESPREAD-GA 810176). CITAB/UTAD funding: 374.163,75€
https://clim4vitis.eu/

BRESOV - Breeding for Resilient, Efficient and Sustainable Organic Vegetable production. CITAB coordinator: Eduardo Rosa. Starting date: May 2018, duration: 48 months (H2020-SFS -GA 774244). CITAB/UTAD funding: 100.000,00€
https://bresov.eu

Dairy-4-Future - Propagating innovations for more resilient dairy farming in the Atlantic area. CITAB coordinator: Henrique Trindade. Starting date: March 2018, duration: 36 months (INTERREG EAPA_304/2016). CITAB/UTAD funding: 281.975,00€
https://dairy4future.eu/

NASPA - Natural fungicides against air & soil borne pathogens in the Atlantic Area. CITAB coordinator: Berta Gonçalves. Starting date: December 2017, duration: 30 months (INTERREG EAPA_451/2016). CITAB/UTAD funding: 274.029,64€
https://keep.eu/projects/19361/

ALICE - Improving the management of Atlantic Landscapes: accounting for bIodiversity and eCosystem sErvices. CITAB coordinator: Edna Cabecinha. Starting date: November 2017, duration: 36 months (INTERREG EAPA_261/2016). CITAB/UTAD funding: 264.483,38€
https://project-alice.com/

IBERPHENOL- Cooperative research network in the field of polyphenols and their industrial applications. CITAB coordinator: Eduardo Rosa. Starting date: October 2015, duration: 51 months (INTERREG 0377_Iberphenol_6_E). CITAB/UTAD funding: 181.888,00€
https://iberphenol.eu/

FLUMEN DURIUS - Promotion and valorization of the tourist resources of Douro river. CITAB coordinator: Helena Moreira. Starting date: July 2017, duration: 51 months (INTERREG POCTEP 0067_Flumen_Durius_2_E) CITAB/UTAD funding: 140.062,50€
http://www.flumendurius.eu.

CONFREMU - Conservation of freshwater mussels: a pan-European approach. CITAB coordinator: Simone Varandas. Starting date: October 2019, duration: 48 months (COST Action CA18239). CITAB/UTAD funding: N/A

FIRElinks - Fire in the Earth System: Science & Society. CITAB coordinator: Mário G. Pereira. Starting date: April 2019, duration: 48 months (COST Action CA18135). CITAB/UTAD funding: N/A
https://firelinks.eu/.

INTEGRAPE – Data integration to maximise the power of omics for grapevine improvement. CITAB coordinator: Hernâni Gerós. Starting date: September 2018. Duration: 48 months (COST Action CA17111). CITAB/UTAD funding: N/A
http://www.integrape.eu/index.php

OPEN2PRESERVE – Sustainable Management Model for Mountain Open Spaces with High Environmental Value. CITAB Coordinator: Paulo Fernandes. Starting date: March 2018. Duration: 45 months (INTERREG SOE2/P5/E0804). CITAB/UTAD funding: 15.129,06€
https://open2preserve.eu/

TOTAL **14** INTERNATIONAL PROJECTS

NATIONAL PROJECTS

ATLANTIDA - Platform for the monitoring of the North Atlantic Ocean and tools for the sustainable exploitation of the marine resources. CITAB Coordinator: Sandra Mariza Monteiro. Starting date: Oct 2020. duration: 36 months (NORTE-01-0145-FEDER-000040). CITAB/UTAD funding: 117.642,17€

CoaClimateRisk - Climate change impact assessment and adaptation measures for the main crops in the Côa Valley region. Project coordinator: Helder Fraga. Starting date: Sept 2020. duration: 36 months (COA/CAC/0030/2019). CITAB/UTAD funding: 150.000€ http://coaclimaterisk.utad.pt

AgriFood XXI – Development and consolidation of research in the agrifood sector in Northern Portugal. CITAB coordinator: Carlos Correia. Starting date: September 2020. Duration: 36 months (NORTE-01-0145-FEDER-000041). CITAB/UTAD funding: 180.000€

T-Lamp - Turf Lighting Advanced Mobile Platform. CITAB coordinator: José Moutinho Pereira. Staring date: Aug 2020. duration: 34 months (POCI-01-0247-FEDER-070057). CITAB/UTAD funding: 342.179,17€

rePlant - Implementation of collaborative strategies for integrated forest and fire management. CITAB coordinator: Maria Emília Silva. Starting date: Jul 2020. duration: 36 months (POCI-01-0247-FEDER-046081). CITAB/UTAD funding: 215.255,41€ https://replant.pt/

cLabel Plus - Innovative natural, nutritious and consumer-oriented "clean label" foods. CITAB Coordinator: Ana Barros. Starting date: Jun 2020. duration: 36 months (POCI-01-0247-FEDER-046080). CITAB/UTAD funding: 173.844,10€ https://cleanlabelplus.pt/

Save Oxycedrus - Conservation and reproduction of threatened and high-value Juniperus oxycedrus populations. Project Coordinator: João Paulo F. Carvalho. Starting date: Jun 2020. duration: 31 months (PDR2020-785-063781). CITAB/UTAD funding: 75.901,25€

FORESTWISE - Collaborative Laboratory for Integrated Forest & Fire Wise Management. CITAB delegate: Maria Emília Silva. Starting date: September 2019. Duration: 36 months. CITAB/UTAD funding: N/A http://www.forestwise.pt/

VINES & WINES - Competitiveness and sustainability of Portuguese vineyards and wines. CITAB delegate: João Santos & José Moutinho. Starting date: July 2019. Duration: 36 months. CITAB/UTAD funding: N/A
https://www.advid.pt/vinhaevinho

INFRAVINI -Spatial data infrastructure for the management of climate change in the vineyard. CITAB Coordinator: João Santos. Starting date: July 2019. Duration: 24 months. Promotor: Geodouro Lda (AAC 31/SI/2017/039739). CITAB/UTAD funding: 53.426,77€ http://www.infravini.pt/

FireSmart: Nature-based solutions for fire risk management and sustained provision of ecosystem services. CITAB Coordinator: João Santos. Starting date: July 2019. Duration: 36 months (PCIF/MOG/0083/2017). CITAB/UTAD funding: 30.742,50€

CoLab4FOODS - Collaborative Laboratory for Innovation in the Food Industry. CITAB delegate: Ana Barros. Starting date: April 2019. Duration: 36 months. CITAB/UTAD funding: N/A https://colab4food.com/

SCAPEFIRE - A sustainable landSCAPE planning model for rural FIREs prevention. CITAB Coordinator: João P. Carvalho. Starting date: March 2019. Duration: 36 months (PCIF/MOS/0046/2017). CITAB/UTAD funding: 25.965,00€

ModFire - A multiple criteria approach to integrate wildfire behaviour in forest management planning. CITAB Coordinator: Paulo Fernandes. Starting date: March 2019. Duration: 36 months (PCIF/MOS/0217/2017). CITAB/UTAD funding: 24.115,00€ https://www.modfire.net/

FungiTech - Technology and innovation in the shiitake and other nutraceutical and medicinal mushrooms production chain. (CO-promoção). CITAB Coordinator: Guilhermina Marques. Starting date: July 2018. Duration: 36 months. Promotor: Chikioshira Lda (NORTE-01-0247-FEDER-033788). CITAB/UTAD funding: 233.488,77€
http://fungitech.pt/

MitiVineDrought - Combining "omics" with molecular, biochemical and physiological analyses as an integrated effort to validate novel and easy-to-implement drought mitigation strategies in grapevine while reducing water use. Consortium coordinator: Artur Conde. Starting date: October 2018. Duration: 36 months (POCI-01-0145-FEDER-030341). CITAB/UTAD funding: 197.476,60€

Transcriptome and metabolome reprogramming in Vitis vinifera cv. Aragonês and Vitis rupestris berries upon infection with Erysiphe necator. CITAB coordinator: Hernâni Gerós. Starting date: October 2018. Duration: 36 months (POCI-01-0145-FEDER). CITAB/UTAD funding: 71.171,94€

BerryPlastid - "Biosynthesis of secondary compounds in the grape berry: unlocking the role of the plastid". CITAB coordinator: Hernâni Gerós. Starting date: October 2018. Duration: 36 months (POCI-01-0145-FEDER-028165). CITAB/UTAD funding: 191.726,43€

EOIS-CropProt - Essential oils, infusions, and silicon in crop protection. A study using tomato plants, as a model, to disclose the biopesticides induced defense mechanisms of plants, through an omics approach. Consortium coordinator: Manuel Ferreira. Starting date: August 2018. Duration: 36 months (POCI-01-0145-FEDER-031131). CITAB/UTAD funding:N/A

ZEBREFINE: Optimization of anesthesia in zebrafish: economic, clinical and animal welfare implications. CITAB coordinator: Luis Antunes. Starting date: July 2018. Duration: 36 months (POCI-01-0145-FEDER-029542). CITAB/UTAD funding: 63.600,00€

BoFraPla: Development of an innovative composite system for stabilization of comminuted bone fractures. CITAB coordinator: José Morais. Starting date: July 2018. Duration: 36 months (POCI-01-0145-FEDER-028225). CITAB/UTAD funding: 6.781,25€

Safe'NPest: Synthesis and Environmental Safety of Nanopesticides. CITAB coordinator: Tatiana Andreani / Amélia Silva. Starting date: July 2018. Duration: 36 months (POCI-01-0145-FEDER-029343). CITAB/UTAD funding: 67.175,00€

ResinPro: How to increase resin production in Pinus pinaster more sustainably. CITAB coordinator: José Lousada. Starting date: July 2018. Duration: 36 months (POCI-01-0145-FEDER-031231). CITAB/UTAD funding: 12.689,25€

VALORIZEBYPRODUCTS: Preclinical efficacy of sulforaphane or Brassica whole extract: a strategy to fight obesity and valorize Brassica byproduct. Consortium coordinator: Eduardo Rosa. Staring date: June 2018. Duration: 36 months (POCI-01-0145-FEDER-029152). CITAB/UTAD funding: 194.423,90€

TO CHAIR: The Optimal Challenges in Irrigation. CITAB coordinator: Aureliano Malheiro. Starting date: June 2018. Duration: 36 months (POCI-01-0145-FEDER-028247). CITAB/UTAD funding: 32.537,50€

ConBiomics: Approach for the Conservation of Freshwater Bivalves. CITAB coordinator: Simone Varandas. Starting date: January 2018, duration: 36 months (POCI-01-0145-FEDER-030286). CITAB/UTAD funding: 6.250,00€

GO +PrevCRP - Development of integrated strategies for the prevention of pine pitch canker. CITAB coordinator: Luís Martins. Starting date: April 2017, duration: 48 months (Operational Group). CITAB/UTAD funding: 62.506,27€

GO BioPest - Integrated strategies to fight against key pests in nut species. CITAB coordinator: Luís Martins. Starting date: April 2017, duration: 45 months (Operational Group). CITAB/UTAD funding: 30.226,65€

GO Preserve the quality of Arouquesa meat. CITAB coordinator: Carlos Venâncio. Starting date: April 2017, duration: 48 months (Operational Group). CITAB/UTAD funding: 227.178,66€

GO Efluentes - Livestock effluents: strategic approach towards agronomic and energetic valorization of flows in the farming activity. CITAB coordinator: Henrique Trindade. Starting date: June 2017, duration: 48 months (Operational Group). CITAB/UTAD funding: 48.725,73€

GO VITISHIDRI – Strategies for the management of water stress of the Douro Superior vineyards. CITAB coordinator: Aureliano Malheiro. Starting date: March 2017, duration: 48 months (Operational Group). CITAB/UTAD funding: 100.603,83€

GO Control and minimization of damages caused by invasive species Vespa velutina nigrithorax (Vespa velutina) in beekeeping. CITAB coordinator: José Aranha. Starting date: January 2018, duration: 48 months. Promotor: Dolmen CRL (Operational Group). CITAB/UTAD funding: 98.021,09€ https://www.go-vespa.pt/

GO New management practices in rainfed olive orchards - strategies for mitigation and adaptation to climate change. CITAB coordinator: Carlos Correia. Starting date: January 2017, duration: 48 months (Operational Group). CITAB/UTAD funding: 103.513,41€

GO ClimCast - The new challenges for the chestnut orchards in the context of climate change. CITAB coordinator: Mário Pereira. Starting date: September 2017, duration: 43 months (Operational Group). CITAB/UTAD funding: 74.650,85€

GO Valorization of the Resende cherry production and market positioning of the chain. CITAB coordinator: Berta Gonçalves. Starting date: March 2017, duration: 43 months (Operational Group). CITAB/UTAD funding: 166.850,59€

GO SustentOlive - Improvement of irrigation and fertilization practices at olive farms in Trás-os-Montes for its sustainability. Project coordinator: Anabela Silva. Starting date: October 2017, duration: 51 months (Operational Group). CITAB/UTAD funding: 193.496,98€ https://sustentolive.utad.pt/

GO ValorCast - Chestnut valorisation and optimization of its commercialization. CITAB Coordinator: Jorge Ventura. Starting date: September 2017. Duration: 48 months (PDR2020-101-032036). Promotor: RefCast (Operational Group). CITAB/UTAD funding: 67.250,00€

GO EGIS: Strategies for integrated soil and water management in nut species. CITAB coordinator: Carlos Correia. Starting date: April 2017. Duration: 45 month. Promotor: UTAD (PDR2020-101-030994) (Operational Group). CITAB/UTAD funding: 47.857,95€

GO Phytosanitary protection strategies for sustainable apple production. CITAB coordinator: Maria Isabel Cortez. Starting date: January 2018. Duration: 48 months. Promotor: UTAD (PDR2020-101-031962) (Operational Group). CITAB/UTAD funding: 48.454,77€

GO CSinDouro - Sexual Confusion against grape moth, Lobesia botrana (Denn. & Schiff.) in mountain viticulture: the particular case of the Douro Demarcated Region (RDD). CITAB coordinator: Laura Torres. Starting date: October 2017, duration: 39 months. Promotor: ADVID. (Operational Group). CITAB/UTAD funding: 118.377,23€ http://www.advid.pt/CSinDouro

GO BioChestnut- IPM - Implement effective control strategies against the chestnut and almond diseases. CITAB coordinator: Luís Martins. Starting date: April 2017. Duration: 42 month. Promotor: CENTRO NACIONAL DE COMPETÊNCIAS DOS FRUTOS SECOS - ASSOCIAÇÃO CNCFS (PDR2020-101-030947) (Operational Group). CITAB/UTAD funding: 50.000,00€

INTERACT - Integrative Research in Environment, Agro-Chains and Technology. CITAB coordinator: Rui Cortes. Starting date: May 2016, duration: 48 months (ON.2 – NORTE-01-0145-FEDER-000017). CITAB/UTAD funding: 3.508.607,48€

INNOVINE&WINE – Vineyard and Wine Innovation Platform. CITAB coordinators: João Santos & Aureliano Malheiro. Starting date: April 2016, duration: 36 months. (NORTE-01-0145-FEDER-000038). CITAB/UTAD funding: 1.124.971,76€

SPLICETHER - Application of splicing approaches to exploit alternative therapies for Lysosomal Storage Diseases: in vitro and in vivo studies. CITAB coordinator: Paula A. Oliveira. Starting date: May 2016, duration: 44 months. (PTDC/BBB-BMD/6301/2014). CITAB/UTAD funding: 14.400,00€

TOTAL **44** NATIONAL PROJECTS

RESEARCH CONTRACTS WITH PRIVATE AND PUBLIC STAKEHOLDERS

Survey of existing avifauna along the stretch of PR7 MCNAMT - villages and margins of rio ovelha. Coordinator: LEA. Contractor: Municipality of Marco de Canaveses. Staring date: Nov 2020. Duration: 9 months (Youth Participatory Budget 2020, Contract No. 97/2020). CITAB/UTAD funding: 4.975,00€.

Foz do Tua Hydroelectric Dam (AHFT) - Integrated Environmental Monitoring Program (PIMA). Coordinators: LEA and LEF. Contractor: EDP - Gestão da Produção de Energia, S.A. Starting date: Sept 2020. Duration: 36 months (SINERGIE Process No. 008011219). CITAB/UTAD funding: 483.381,03€.

Elaboration of forty management plans for natural habitats, wild fauna and flora, which focus on 13 Sites of Community Importance (SCI) under the Habitats Directive - Descriptor Terrestrial and Inland Water Vertebrates. Coordinators: LEA and LEF. Contractor: Florada and Território XXI. Starting date: Mar 2020. Duration: 19 months (POSEUR-03-2215-FC-000005). CITAB/UTAD funding: 23.635,00€.

Acoustic inventory, search for shelters and capture, within the scope of the review of the Red Book of Mammals of Portugal mainland. Coordinator: LEA. Contractor: FCiências.ID. Starting date: Aug 2019. Duration: 24 months (POSEUR-15-2018-17). CITAB/UTAD funding: 102.900,00€

Review of the Red Book of Birds of Portugal mainland (Action 3 (T03), Lotes I and II). Coordinator: LEA. Contractor: Sociedade Portuguesa para o Estudo das Aves. Starting date: May 2019. Duration: 12 months (POSEUR-03-2215-FC-000093). CITAB/UTAD funding: 32.520,00€

TranCastNut - Contribution to the development of the chestnut value chain in the municipality of Trancoso. Coordinator: José Laranjo. Contractor: Municipality of Trancoso. Starting date: Jan 2019. Duration: 60 months. CITAB/UTAD funding: 110.083,50€

Clogging gaps of information about the distribution and abundance of freshwater fish and migratory water (diadromous) in mainland Portugal as part of the Red Book of Birds and Freshwater and Migratory Fish. Coordinator: LEF. Contractor: FCiências.ID. Starting date: Jul 2018. Duration: 39 months (POSEUR-15-2017-33). CITAB/UTAD funding: 39.950,00€.

Re-establishing connectivity in the River Douro Catchment: Prioritizing Dam Removal. Coordinator: LEF. Contractor: GEOTA/MAVA _Fondation pour la Natur. Starting date: Jan 2018. Duration: 36 months. CITAB/UTAD funding: 99.290,00€.

Hydroelectric exploitation of Foz Tua River Valey (AHFT) - Integrated Environmental Monitoring Programme (PIMA). Coordinator: LEA. Contractor: EDP - Gestão da Produção de Energia, S.A. Starting date: Oct 2017. Duration: 35 months (86/17/DST). CITAB/UTAD funding: 460.765,50€.

Baixo Sabor Hydroelectric Dam (AHBS) - Integrated Environmental Monitoring Program (PIMA), Exploitation Phase. Coordinators: LEA and LEF. Contractor: EDP - Gestão da Produção de Energia, S.A. Starting date: Jan 2017. Duration: 48 months (75/17/DST). CITAB/UTAD funding: 1.517.148,86€.

TOTAL **10** RESEARCH CONTRACTS


SPECIALIZED LABORATORIES
WITH INNOVATION

LABORATORY OF APPLIED ECOLOGY (LEA)

The Laboratory of Applied Ecology (www.lea-utad.pt) is a research team of CITAB, founded in 2001, with expertise in long-term ecological monitoring, biodiversity conservation, analysis of ecosystem's integrity, and ecological modelling (dynamic models and hybrid multi-model methodologies) with application in the management and conservation of ecological values and ecosystem services, driven by multiple processes of environmental, infrastructural and landscape changes with impacts on the local biodiversity. The LEA-UTAD is currently composed by 10 CITAB members and has an additional strategy of self-funding its research through the provision of specialized services to the community, with more than 90 projects/contracts implemented, whose coordination represents a financing of more than 5 million euros for UTAD.

FLUVIAL ECOLOGY LAB (LEF)

The Laboratory of Fluvial Ecology (https://lefutad.wixsite.com/lefutad) is involved in the monitorization of aquatic ecosystems, with special relevance to bio-indicators based on benthic fauna and fishes; environment impact assessment in catchments; development of hydromorphological survey systems; river rehabilitation with relevance on soil engineering techniques and restoration of riparian corridors; studies on the effects of river regulation and mitigation measures. LEF is certified in gestion procedures (ISO 9001) and water sampling (ISO 17025). LEF team integrates CITAB and contributes to the research in water resources as well as on multiple outreach activities for private companies and public organizations.

SPIN-OFFs

SPAWNFOAM

The UTAD's *spin-off* Spawnfoam (https://www.spawnfoam.pt), founded in 2017 by Guilhermina Marques (CITAB) and Pedro Mendes, is a company that develops biomaterials using forestry and agro-food by-products, aiming to promote environmental sustainability and efficient resource use, supporting the transition for a circular economy. This spin-off continues to win prizes in start-ups competitions.

Spawmfoam biodegradable pots for horticulture and forestry won the Big Impact competition, on late 2019. This contest in the Circular Economy area received 55 entrepreneurs participants that were encouraged to present their projects around recycling and prevention of waste for a better environment. The promoters were Vodafone Portugal, the Municipality of Cascais and the Visão/Trust in News review and looked for innovative projects that use technology to positively impact society in technological, economic and environmental sectors.

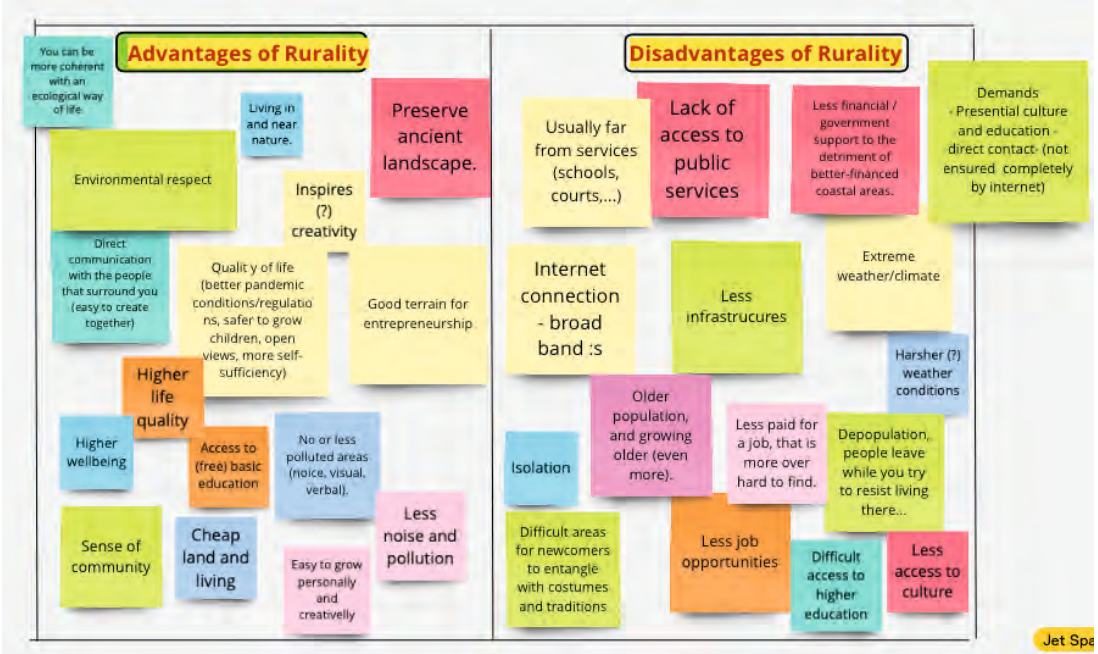
This spin-off also won, on October 2020, the StartUP competition in the second edition of the Prize Start&Go, between companies that launched recently innovative products in the market.

RURALIDADE VERDE

Ruralidade Verde (RV), a *spin-off* company in the area of agricultural and farming systems, created in 2017 by CITAB researcher Ana Sofia Santos and Luís Lopes (UTAD) continued its collaboration in the international Interreg project Open2Preserve. This project joins guided herbivory with prescribed burning to prevent rural and forest fires. In cooperation with UTAD, RV supported the management and controlled the welfare of the Garrano horses that are grazing in the pilot experience area in Marão mountain.

Throughout 2020, RV proceeded with the recently initiated international project CultRural which gathers rural SMEs, public research institutes, universities and NGOs that work in their territories to create a fertile cultural and innovative environment in rural areas.

RV started in October INTEGRURAL, a project for rural resilience. INTEGRUPAL aims to support small farmers and microentrepreneurs of remote areas of Europe to access training for innovation and strategic thinking, combining agriculture and heritage management. The project team includes cultural entrepreneurs, universities, rural municipalities, social labs, digital experts, and researchers from Portugal, Spain, France, Italy, and Greece.



PRIZES, AWARDS & DISTINCTIONS

Márcia Carvalho was selected, at national level, in the 2020 edition of FCT's "Stimulus for Scientific Employment - Individual" Competition. Márcia's research focuses on the use of genetic diversity for the identification of drought tolerant legumes genotypes in organic farming, more specifically in cowpea. She was a student of AgriChains PhD programme, having defended her thesis in 2018. In her research path, she has already completed a 3-month internship at the University of California-Riverside (USA), with one of the world specialists in molecular analysis of cowpeas, Prof. Timothy Close, and 3 more months at the University of BOKU (Austria), in root phenotyping, using the latest technology in hyperspectral imaging.

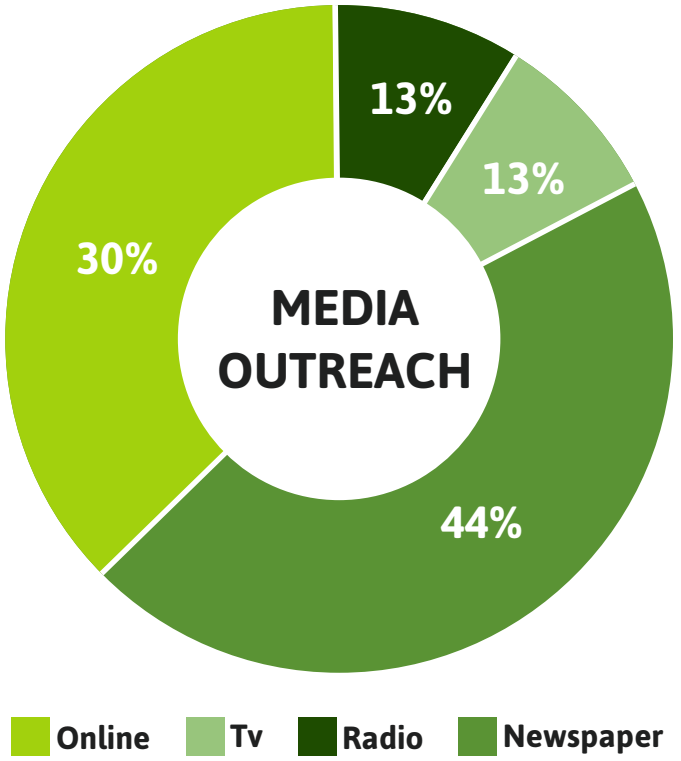
Ana Sofia Santos was elected Vice-President of the Animal Task Force (ATF), on July 2020, representing the research and knowledge providers. The Animal Task Force is a European Public-Private Partnership, aiming to promote a sustainable and competitive livestock sector in Europe. On October she also assumed the position as Executive Director of FeedInov Colaborative Laboratory, which aims to enhance safety along the food chain, increasing consumer confidence in the national production and promoting the role of the animal feed industry in the production of healthy, sustainable and environmentally friendly products.

CITAB researchers won the first three places in the 2020 edition of the NewFood - Innovative food products contest, promoted by UTAD. The 1st prize was awarded to the Mousse D'Oliva project (mousse composed of traditional varieties of olives incorporating other traditional products - dry fig, honey and aromatic herbs), developed by **S. Gomes**, **I. Gouvinhas** and **A. Barros**. The 2nd prize, rewarded the Healthy Gums project (sugar-free gums made of sweet potatoes, cherovia, banana, avocado, pineapple, cherry and citrus) developed by **I. Gouvinhas**, **A. Barros** and **R. Martins**. The 3rd prize, was awarded to the Broa Shiitake project (cornbread with smoked shiitake), developed by **S. Reis**, **G. Marques** and **J. Garcia**

Henrique Trindade is the coordinator at CITAB/UTAD of the "GO Efluentes" project - Livestock effluents: strategic approach towards agronomic and energetic valorization of flows in the farming activity, which won the 1st prize on the category "Partnership Innovation: Operational Groups" on the 7th edition of the Entrepreneurship and Innovation Award by Crédito Agrícola, with a monetary prize of 5.000€. There were 12 finalist projects out of a total of 238 applications at national level, and CITAB was also present with the EcoBeewax project, proposed by Ana Barros, Irene Gouvinhas and Juliana Garcia.


OUTREACH

OUTREACH



In a year severely affected by the COVID-19 health crises many outreach and outdoor activities have been cancelled or postponed due to safety reasons. Nevertheless, CITAB still managed to promote and participate in some dissemination activities oriented mainly for high school and university students, either in person or by remote communication tools. The most relevant and impact initiatives were the summer courses “Verão com Ciência”, the “OCJ-Ciência Viva no Verão” and the Science and Technology Week.

Regarding media outreach, CITAB research outcomes were highlighted in national and European television, newspapers, radio, and web news.


RESULTADOS TEMPORADA 2019
Montes
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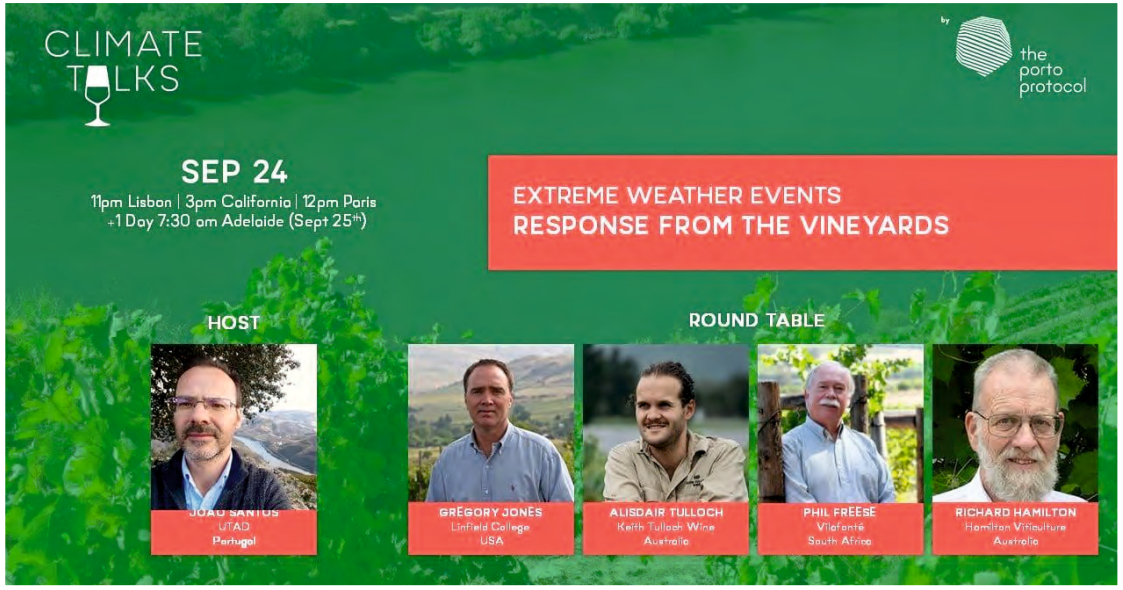

CLIMATE TALKS
by the porto protocol
SEP 24
11pm Lisbon | 3pm California | 12pm Paris
+1 Day 7:30 am Adelaide (Sept 25th)
EXTREME WEATHER EVENTS
RESPONSE FROM THE VINEYARDS
HOST
ROUND TABLE
JOÃO SANTOS
UTAD
Portugal
GREGORY JONES
Linfield College
USA
ALISDAIR TULLOCH
Keith Tulloch Wine
Australia
PHIL FREESE
Vilafonté
South Africa
RICHARD HAMILTON
Hamilton Viticulture
Australia


CoaClimateRisk
O IMPACTO DAS ALTERAÇÕES CLIMÁTICAS E MEDIDAS DE ADAPTAÇÃO PARA
AS PRINCIPAIS CULTURAS AGRÍCOLAS NA REGIÃO DO VALE DO CÔA
Investigador responsável Helder Fraga
FCT
utad
FundaçãoCôaParque
ADVID
http://coaclimaterisk.utad.pt

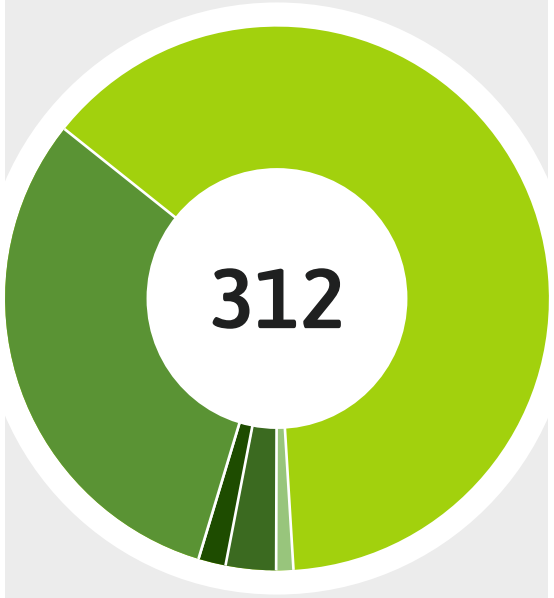

dnoticias.pt
PAIS
Aluna da UTAD estuda características do pão de bolota e de urtiga
Agência Lusa 16 mar 2020 10:53


RTP
Cátia Santos
Investigadora do laboratório de Ecologia Fluvial da UTAD


CIÊNCIA E
TECNOLOGIA
Carla Cristina da Silva Gonçalves

PRODUCTIVITY METRICS

OVERVIEW & HIGHLIGHTS



- **208 peer reviewed articles published**
- **80 communications in events**
- **4 book chapters**
- **14 completed PhD theses**
- **6 publications in magazines**

In 2020, the Centre's productivity reflected the impact of the pandemic crises, with a significant decrease of the number of communication in scientif events. Still, CITAB registered **208** peer reviewed articles published (an average of 2.17 articles/integrated member), **80** communications in international and national events, **4** book chapters, and **6** publications in specialized technical magazines. CITAB researchers also supervised/co-supervised **14** completed PhD theses.

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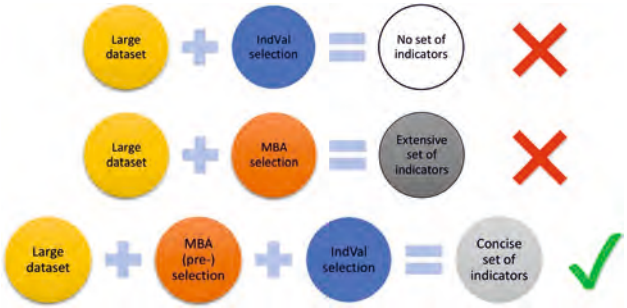
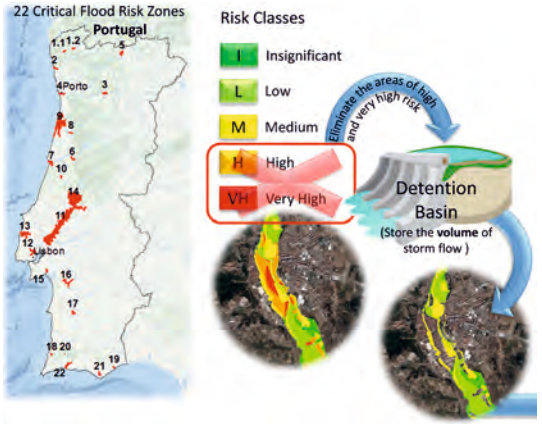
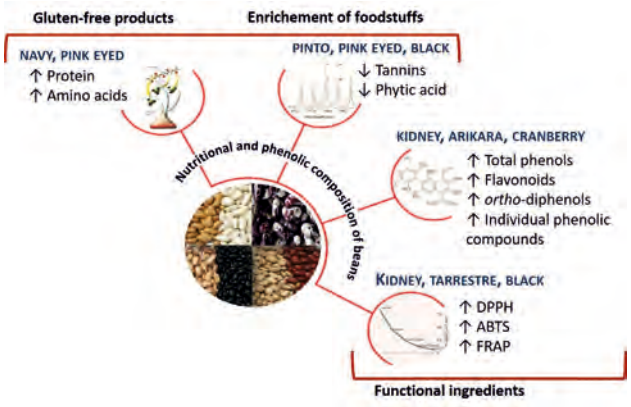


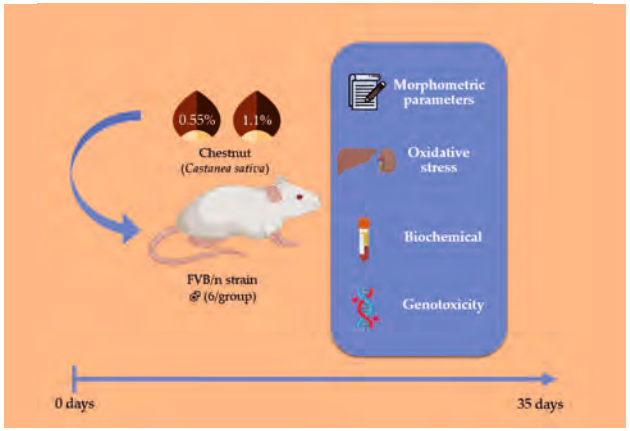
Terêncio, D. P. S.; Fernandes, L. F. S.; Cortes, R. M. V.; Moura, J. P.; Pacheco, F. A. L. (2020). **Flood risk attenuation in critical zones of continental Portugal using sustainable detention basins**. *SCIENCE OF THE TOTAL ENVIRONMENT* 721:137727. https://doi.org/10.1016/j.scitotenv.2020.137727 5



Carbas, B.; Machado, N.; Oppolzer, D.; Ferreira, L.; Brites, C.; Rosa, E.; Barros, AIRNA (2020). **Comparison of near-infrared (NIR) and mid-infrared (MIR) spectroscopy for the determination of nutritional and antinutritional parameters in common beans.** *FOOD CHEMISTRY* 306:125509. https://doi.org/10.1016/j.foodchem.2019.125509



Rodrigues, P.; Ferreira, T.; Nascimento-Gonçalves, E.; Seixas, F.; Gil da Costa, R.M.; Martins, T.; Neuparth, M.J.; Pires, M.J.; Lanzarin, G.; Félix, L.; Venâncio, C.; Ferreira, I.C.F.R.; Bastos, M.M.S.M.; Medeiros, R.; Gaivão, I.; Rosa, E.; Oliveira, P.A. (2020). **Dietary supplementation with chestnut (*Castanea sativa*) reduces abdominal adiposity in FVB/n mice: A preliminary study**. *BIOMEDICINES* 8(4): 75. https://doi.org/10.3390/biomedicines8040075



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TOTAL 208 peer reviewed articles

COMPLETED PhD THESES

Breia, Richard. **Biotic stress in grapevine – elucidation of the role of the newly identified SWEET transporters on plant-pathogen interaction.** Supervisors: Hernâni Gerós (CITAB-UMinho), Antonio Granell (UPValència) and Artur Conde (CITAB-UMinho). Doctoral programme/degree: Agricultural Production Chains: from fork to farm (AgriChains). Date: July 2020.

Cabo, Sandra. **Innovative strategies to mitigate effects of climate change for sustainable hazelnut production.** Supervisors: Berta Gonçalves (CITAB-UTAD), Ana Paula Silva (CITAB-UTAD) and Nuria Pascual Seva (UPValència). Doctoral programme/degree: Agricultural Production Chains: from fork to farm (AgriChains). Date: Sept 2020.

Carbas, Bruna. **Potential of *Phaseolus vulgaris* L.: nutritional value, functional properties and development of innovative tools for their assessment.** Supervisors: Ana Barros (CITAB-UTAD), Eduardo Rosa (CITAB-UTAD) and Nelson Machado (Vines & Wines Colab). Doctoral programme/degree: Agricultural Production Chains: from fork to farm (AgriChains). Date: May 2020.

Dias, Alexandra. **Ecology and management of *Pinus nigra* in mountain areas.** Supervisors: José Luís Lousada (CITAB-UTAD), Ana Carvalho (CITAB-UTAD) and Maria João Gaspar (UTAD). Doctoral programme/degree: Agronomic and Forestry Sciences. Date: Dec 2020.

Enes, Teresa. **Residual agroforestry biomass: quantification and characterization for energy purposes** [Biomassa Agroflorestal Residual: Quantificação e Caracterização para fins energéticos]. Supervisors: José Lousada (CITAB-UTAD), José Aranha (CITAB-UTAD) and Teresa Fonseca (UTAD). Doctoral programme/degree: Agronomic and Forestry Sciences. Date: May 2020.

Lemos, André. **Selection of 'Tinta Roriz' clones for excellence in winery industry.** Supervisors: Ana Barros (CITAB-UTAD), Marcos Egea Cortines (UPCartagena) and Nelson Machado (Vines & Wines CoLab). Doctoral programme/degree: Agricultural Production Chains: from fork to farm (AgriChains). Date: May 2020.

Nunes, Nuno. **Evaluation of the use of marine macroalgae in the industrial production of biorefinery-derived biofunctional products.** Supervisors: Miguel Carvalho (CITAB-UMadeira) and Maria do Carmo Barreto (UAçores). Doctoral programme/degree: Biological Sciences. Date: Sept 2020.

Oliveira, Miguel. **Introducing legumes in Mediterranean cropping systems: N supply, soil C sequestration and greenhouse gas emissions.** Supervisor: Henrique Trindade (CITAB-UTAD). Doctoral programme/degree: Agricultural Production Chains: from fork to farm (AgriChains). Date: Feb 2020.

Pavia, Ivo. **Enhancement of wheat establishment and drought stress resistance through seed priming and foliar fertilisation.** Supervisors: Carlos Correia (CITAB-UTAD) and José Lima-Brito (UTAD-CITAB). Doctoral programme/degree: Agricultural Production Chains: from fork to farm (AgriChains). Date: Jan 2020.

Pereira, Sandra. **Characterization and selection of microbial symbionts of faba bean (*Vicia faba* L.) and cowpea (*Vigna unguiculata*) for development of inoculants.** Supervisors: Guilhermina Marques (CITAB-UTAD), Eduardo Rosa (CITAB-UTAD). Doctoral programme/degree: Agricultural Production Chains: from fork to farm (AgriChains). Date: Jun 2020.

Pinto, Paula. **Fungal bioconversion of agro-Industrial by-products and modeling of laccase kinetics.** Supervisors: José Albino Dias (CITAB-UTAD) and Rui Bezerra (CITAB-UTAD). Doctoral programme/degree: Chemical and Biological Sciences. Date: Jun 2020.

Singh, Sweta. **Functional analysis of a gene regulatory network involved in flower zygomorphy.** Supervisors: Maria Manuela Costa (UMinho) and Jóse Pío Béltran (UPValència). Doctoral programme/degree: Agricultural Production Chains: from fork to farm (AgriChains). Date: July 2020.

Taghouti, Meriem. **Chemical composition and biological activity of a range of thyme species in Portugal under a changing environment.** Supervisors: Amélia Silva (CITAB-UTAD), Fernando Nunes (CQ-UTAD) and João Santos (CITAB-UTAD). Doctoral programme/degree: Agricultural Production Chains: from fork to farm (AgriChains). Date: May 2020.

Terêncio, Daniela. **Decision support systems for rainwater harvesting and runoff control in watersheds.** Supervisors: Luís Filipe S. Fernandes (CITAB-UTAD), Fernando Pacheco (CQ-UTAD) and Rui Cortes (CITAB-UTAD). Doctoral programme/degree: Agronomic and Forestry Sciences. Date: Jan 2020.

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BOOK CHAPTERS

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TOTAL **4** book chapters

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