

# ACTIVITIES REPORT

2021



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



**Compiled and edited by:  
CITAB Executive Committee and Lígia Pinto**





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524

**PUBLICATIONS**

243 JCR/Scopus papers  
28 Books & Book chapters  
253 Others

67

**PROJECTS**

13 Internacional  
43 National  
11 Research contracts

314

106 Full Members  
121 Collaborators  
87 Fellows

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40% Men  
60% Women

3.26M€

**FUNDING**

with stakeholders 1.3M€  
fundamental science 1.96M€

11

**CONFERENCES**

5 International  
6 National

1

**SPECIALIZED  
LABORATORY**



The current CITAB Activity Report highlights the main actions carried out during 2021, a year still featuring periods under severe restrictions owing to the Covid-19 pandemic. Nonetheless, CITAB's performance was not impacted as initially anticipated, despite an inevitable decrease in dissemination & outreach actions that rely on face-to-face meetings or on-site activities.

The direct public funding from the Portuguese Foundation for Science & Technology (FCT) kept its previous year's amounts, planned within the framework of the CITAB Strategic Plan 2020-2023, which corresponded to 466 375€, attained through the Pluriannual funding of R&D units. The Centre was, however, able to capture very significant funding from other sources, reaching a total funding of almost 3.3 M€ in 2021. Funding from the industry and stakeholders reached 1.3 M€ in 2021. This value indeed corresponded to an increase from 35% to 40% of our private funding share, which is a remarkable milestone for the long-term sustainability of CITAB.

The strategic partnership with the R&D unit GreenUPorto, from the University of Porto, was established in 2020 and a joint application to FCT for the creation of an Associate Laboratory was eventually successful. The newly created Institute for innovation, capacity building and sustainability of agri-food production (Inov4Agro) Associate Laboratory is now part of a national network of laboratories that are effective structuring components of the Portuguese Scientific & Technological System, with explicit institutional commitments to pursue national scientific and technological policies over a temporal range of at least 10 years.

Despite the Covid-19 pandemic limitations, an important number of dissemination and outreach activities, such as the CITAB webinar's cycle, were also undertaken. These remote or hybrid meetings were the CITAB's response to overcome the pandemic restrictions and played a key role in keeping communication and knowledge exchange among researchers, students and scholarship fellows, not only from CITAB or UTAD but also from other national and international institutions. These meetings were also important to warrant a two-way knowledge flow between the CITAB members and stakeholders, decision-makers and the general public. Capacity building of the CITAB members is also of foremost relevance to us.

In summary, CITAB continues paving the ground to become a Portuguese Centre of Excellence in S&T. The strengthening of the connections to the private sector demonstrates the applicability of its R&D and I&T thematic strand lines. Furthermore, the increase in scientific productivity, with an unprecedented 2.5 SCOPUS-indexed publications per Integrated Member in 2021, hints at the international recognition of the CITAB's high scientific standards, which can also be attested by the CITAB engagement in a growing number of national and international competitive projects, such as Horizon Europe.



**CITAB has kept its way towards excellence. Its activities have been focused on both the R&D and T&I pillars, aiming at more resilient, efficient, sustainable and competitive agricultural and forestry production chains.**

The widely multidisciplinary approach of CITAB warrants a holistic viewpoint of the natural and human systems. This concept enables integrated responses and the implementation of decision-support systems for stakeholders and policy-makers, envisioning the fulfilment of the United Nation's sustainable development goals and responding to the emerging societal transitions. All these research lines are complemented by cutting-edge technological support, always seeking innovative solutions. Knowledge transfer, capacity building, dissemination and outreach are also central to CITAB's strategy.



*The decisive role that cities play in the green transition encourages them to create synergies to implement a governance model capable of integrating the public and private sectors, academia and citizens. Following these premises, the Landscape Laboratory seeks to act as a Center for Research and Environmental Education. The University of Trás-os-Montes and Alto Douro, as an associate entity, is an essential partner for achieving these objectives. The partnership with CITAB, and in particular with the Fluvial and Terrestrial Ecology Laboratory, has been proved essential to accomplish the aforementioned objectives, namely through essential support in projects that we are developing in the area of biodiversity and restoration of river ecosystems. The competence, scientific knowledge and dedication of CITAB researchers have been essential to increasing our understanding of the surrounding environment, fostering territorial resilience and promoting sustainable development.*

**Carlos Ribeiro, Associação Laboratório da Paisagem**



## MISSION

**CITAB is committed to collaborating and consulting stakeholders to understand their needs, problems and constraints. We use multidisciplinary 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 **Communication & 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.

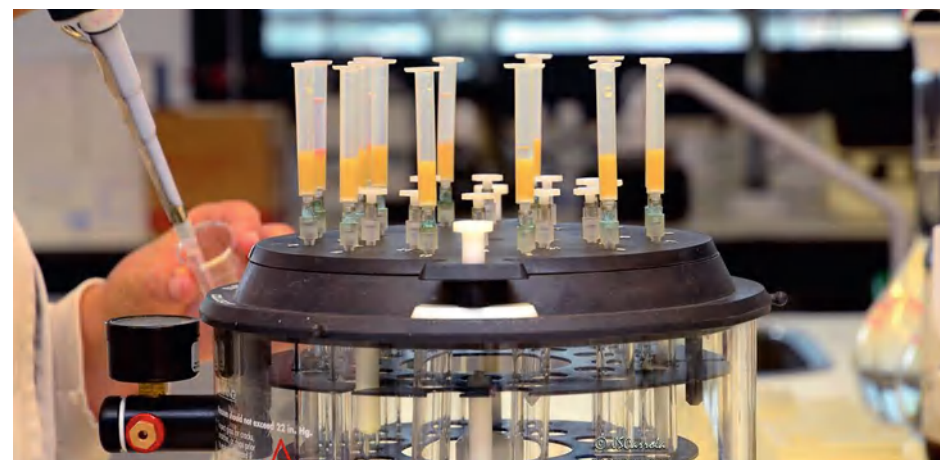


## 2 - Technology & innovation in Agri-food and Forestry chains for a more competitive bioeconomy

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.







## Executive Committee

José Lousada

Ana Paula Silva  
Simone Varandas  
João Paulo Moura  
Fábio Pereira  
Ana Coimbra  
Berta Gonçalves

## Management Office

Lígia Pinto  
Lídia Nóbrega  
Daniel Faiões

## BOARD

**Director: Ana Barros**

Vice-Diretor: Luís Ferreira    Vice-Diretor: Luís F. S. Fernandes

## 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**

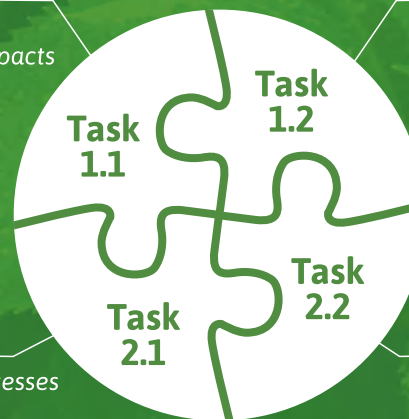
*2 - Technology & innovation in Agri-food and Forestry chains for a more competitive bioeconomy (coord: Paula A. Oliveira)*

## 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.

Projections on how changing weather/climate conditions and extreme events can impact environment, water resources, forestry and agricultural systems, were produced. To facilitate decision support systems for the major European wine regions, a framework to develop seasonal predictions for grapevine yield and wine production was investigated and a grapevine-model calibration platform was deployed. Stress mitigation strategies were tested in grapevine and other crops (eg hazelnut trees), such as deficit irrigation and foliar kaolin application, and their impacts on the metabolomics of photosynthetically active tissues were identified. The identification of the best biostimulant to improve almond trees ability to fight environmental stressors was done based on cytogenetic and molecular studies. Biomarkers of anthropogenic activity effects in trees, such as changes in wood anatomy and increased levels of some toxic chemical elements, were developed. Models for the allocation of rainwater harvesting systems on agroforestry applications, evaluating the risk of aquifer contamination, were applied and groundwater resources and their sustainable use were assessed. The toxicological effects of microplastics and waterborne copper, alone or combined, were evaluated in fish species providing novel insights regarding the environmental impacts of microplastics in freshwater and marine biota. Also in aquatic species, the effects of glyphosate-based herbicides and antilipidemic pharmaceuticals were assessed.

### Task 1.2 - Sustainability in agri-food and forestry ecosystems

Assuring the provision of critical ecosystem services and the sustainable development of the Atlantic region, an integrative landscape management approach was developed to support biodiversity conservation. This new participatory approach allowed to improve the characterization and harmonization of biodiversity and ecosystem services assessment methods across terrestrial and aquatic Atlantic landscapes. Based on the One Health concept, a novel holistic approach has been applied to studies of antimicrobial resistance (AMR) in aquatic environments. The evaluation of grain legumes and old vineyards prospections and genotyping allowed to identify the most drought tolerant genotypes to face climate change in several species. Cytogenomic assays in cereals biofortified with micronutrients

revealed effects of seed priming. A system dynamic approach to model the population dynamics of the invasive alien plant *Hakea sericea*, including combinations of wildfire risk and control scenarios allowed to develop a dynamic modeling framework versatile and instructive that can support decision-making regarding the effective management of *Hakea sericea*.

### Task 2.1 - Innovative technologies and processes.

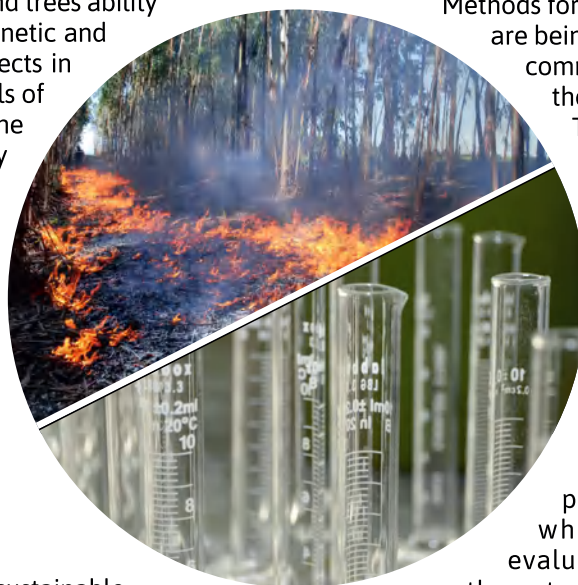
A methodology to infer the higher tolerance of *Vitis vinifera* varieties from the North of Portugal to iron and zinc excess was developed by integrating cellular, molecular, and morpho-anatomic traits.

Methods for the identification of mechanical properties in vegetal tissues are being developed. The apple was chosen for this purpose, as it is a common and highly important product for the region, as well as for the Portuguese agricultural economy.

The eco-cytotoxicity of several forms of nanomaterials, such as nano-CuO, nano-TiO<sub>2</sub>, nano-SiO<sub>2</sub> and nano-ZnO, on different aquatic species and on human cell lines (Caco-2, SV-80, HepG2 and HaCaT) was determined and evidence was found of the potential risks of both nano-CuO and nano-ZnO against aquatic organisms and on public health.

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

Using circular economy issues towards a zero waste policy and aiming One Health goals, different substrates were analyzed for phytochemical composition and evaluated for potential application as bioactive compounds in the nutraceutical industry. Within these substrates, studies were essentially developed on craft beers, broccoli by-products, grape stems, thymus, and red seaweeds. In addition, other matrices such as pomegranate leaves, essential oils, raspberries, macro and microalgae extracts, almonds, hazelnut and hazelnut by-products and infusions of herbal blends as well as vegetable oils were also studied. *In vitro* and *in vivo* test showed their potential as nutraceuticals. Furthermore, the promotion of healthy eating and good nutrition programs continued to be developed and wastage of food on schools and hospitals were evaluated on a sustainable approach.





**ASSOCIATED  
LABORATORY**



### Institute for innovation, capacity building and sustainability of agri-food production - Inov4Agro

CITAB is the lead Research and Development (R&D) unit of the Associated Laboratory (AL) “Institute for innovation, capacity building and sustainability of agri-food production- Inov4Agro”. Inov4Agro is a strategic consortium of two R&D units, CITAB and GreenUPorto, which have a track record of a successful long-lasting cooperation, and represent the highest scientific productivity in agriculture within the Northern of Portugal.

A 10-year strategic plan has been developed, focused on four intervention areas: 1) Resources use efficiency and product quality, aiming to increase plant food production, improve its quality and reduce the environmental impact of the agri-food sector; 2) Water resources, soil health & food, targeted to provide the society with contributions to improve water resources management, soil health while increasing the production of high quality food; 3) Leverage local food systems, focused on fostering local food production systems and the respective short-supply chains, supported by the novel concept of “food hubs”; 4) Technological development & innovation, envisaging to develop and foster the digitalization of agriculture (e.g., big data, internet of things, augmented reality, robotics, sensors, system integration, ubiquitous connectivity, artificial intelligence).

The mission of Inov4Agro will be to support the Government during the next crucial decade of transition to sustainability with the application of public policies in a multilayer approach, aiming to promote smart and conservation agriculture (in particular of the horticulture sector), to foster the adaptation to climate changes, to mitigate the territorial dissimilarities by increasing the attractiveness of low density territories and by fitting the primary sector to the regional diversity of endogenous resources. This will be done by acting as an actor of capacitation to the youngest generations of growers and farmers, providing scientific and technological know-how required for future agriculture paradigms.







**COMPETITIVE FUNDING  
& RESEARCH PROJECTS**



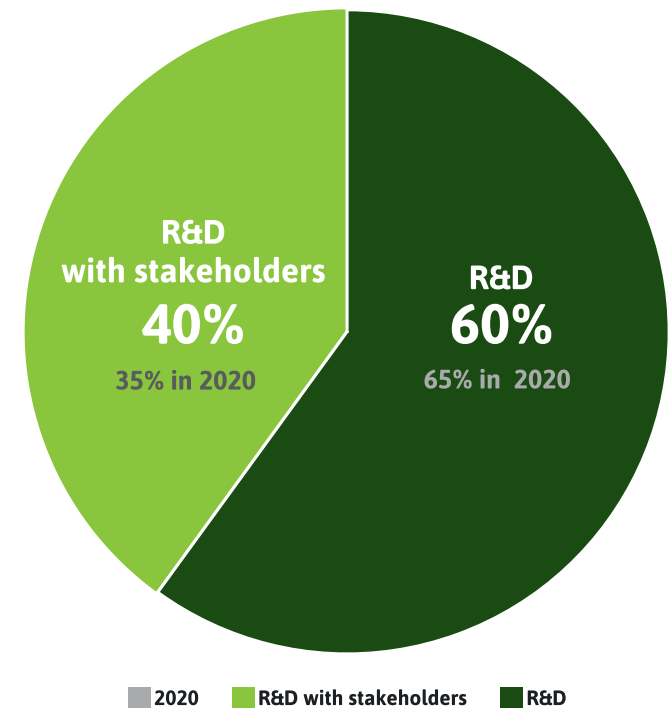
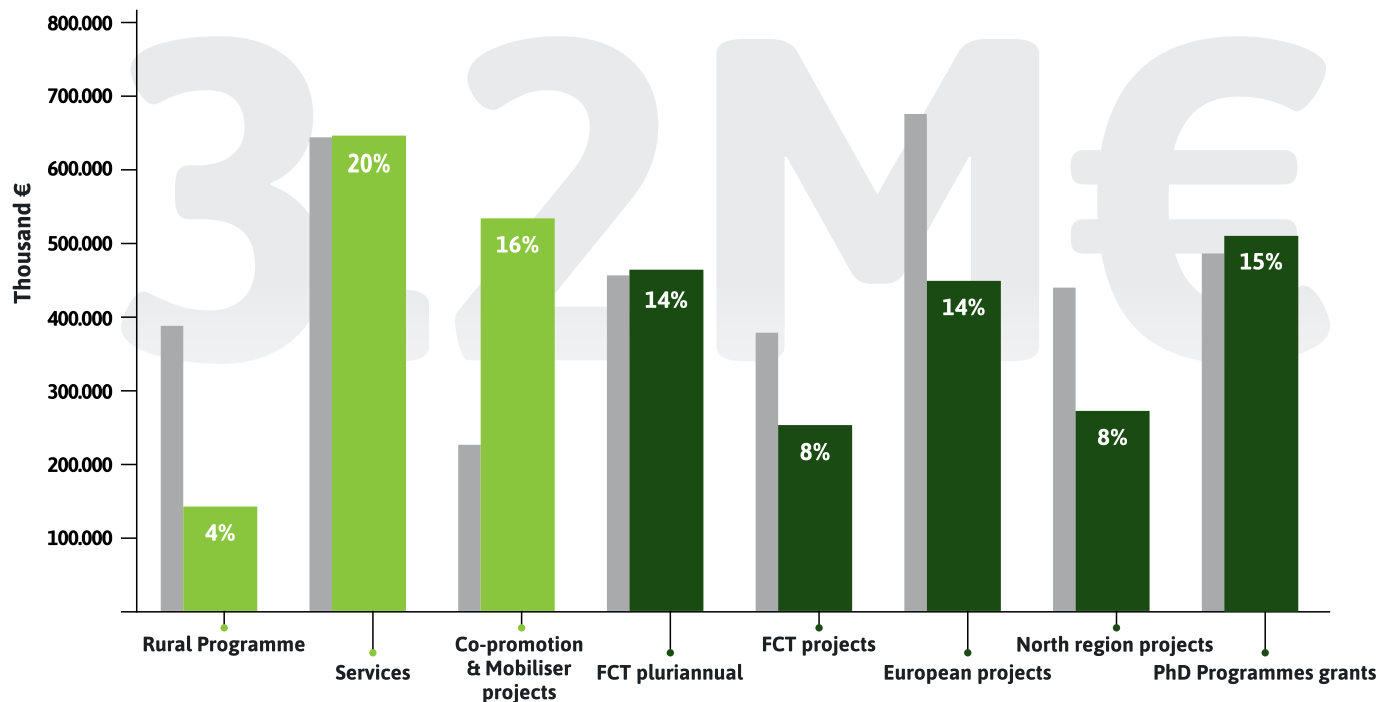
## COMPETITIVE FUNDING

In 2021, CITAB researchers were awarded a sum of **3.26 M€** from national and European funding entities.

Private funding from a wide range of stakeholders and the industry reached 1.3 M€ this year, representing 40% of the total. Consulting services to private companies corresponded to nearly half of this value, whilst the remaining was obtained through an increasing number of co-promotion projects (Fungi4Health, Multicam & TraDaCa) with the private sector as well as several Rural Development Projects (PDR 2020).

The merging of two previous laboratories (Laboratory of Applied Ecology & Fluvial Ecology Lab) into the new Laboratory of Fluvial and Terrestrial Ecology (LEFT) was also a major development in 2021. The LEFT is a key Service Provider Unit of CITAB, acting in the areas of Ecology, Conservation Biology and Environment, but also supporting scientific research, namely in the fields of monitoring river and terrestrial ecosystems, conservation, ecological and environmental assessment, environmental impact studies, environmental audits and inspections, restoration and re-naturation of degraded habitats and ecological modelling. The LEFT promotes close connection with partners from the private and public sectors, with more than 100 funded projects with more than 30 entities, enhancing its societal impact.

For the remaining 60% of the total funding (almost 2.0 M€), it is also noteworthy that the share of European projects already represented nearly 1/4 of this R&D funding, a value still modest but that represents a sharp increase compared to previous years. This value will significantly increase in 2022 due to the recent approval of several Horizon Europe projects with CITAB's coordination or participation.





## Digital Agriculture Technologies for Irrigation Efficiency

*Start date:* June 2021    *Duration:* 36 months

The DATI project aims to design and develop new Digital Agriculture technologies and procedures crop and soil monitoring finalized at the optimization of irrigation management by improving farm-scale irrigation equipment and water release scheduling for crop needs.

The project will take advantage of innovative low-cost technologies such as Wireless Sensors Networks for agrometeorological monitoring, Unmanned Aerial Vehicles coupled with different sensors, free satellite imagery, open source Geographic Information Systems, decision support systems and web interfaces associated with data-driven soil and plants models.

The project's main innovation is to demonstrate the feasibility to adopt a pool of TS in crop monitoring and in irrigation system in the Mediterranean area, more resilient to environmental constraints, low cost and able to cope with the global climate change and fluctuations, while simultaneously offering ecosystem services such as soil fertility and biodiversity thanks to an optimization in water use that allow an increase in crop yields and quality.



**Principal Investigator at CITAB:** Joaquim João Sousa

**Leader Institution:** Italian National Research Council –Institute of BioeconomyCNR-IBE (IT)

**Web site:** <http://www.datiproject.eu/>

**Funded under:** PRIMA – Partnership for Research & innovation in the Mediterranean area (Section II)

## Valorization of agro-industrial residues in the production of mushrooms and in the development of functional foods and value-added products

*Start date:* January 2021    *Duration:* 30 months

Mushroom cultivation is currently the most efficient biotechnological process for the valorisation of agroindustrial wastes rich in lignin and cellulose, transforming them into very appreciated and nutritional food. Thus, in addition to contributing to food security and healthy eating, mushroom production is an environmentally friendly activity, based on the principles of circular economy. Edible mushrooms have a diversity of biomolecules with nutritional value and/or medicinal properties. They have been recognized as functional foods and as a source of compounds that exhibit anti-cancer, anti-diabetic, anti-obesity, immunomodulatory, anti-aging, etc., properties. These bioactivities have been reported for various extracts and isolated compounds, such as polysaccharides, polysaccharide-protein complexes, proteoglycans and proteins. The objectives of the present project are the development of innovative alternative substrates for mushroom production, to increase the scientific knowledge on beneficial bioactivities in mushroom species and evaluate the use of the spent substrate as a feed ingredient. Another important goal is the development of new functional foods, nutraceutical products and natural cosmetics based in mushroom.



**Principal Investigator at CITAB:** Guilhermina Marques

**Leader Institution:** CHIKIOSHIRA SAG, Lda

**Web site:** NA

**Funded under:** NORTE 2020 ( NORTE-01-0247-FEDER-070171)





## Low Cost Multispectral Camera

*Start date:* February 2021    *Duration:* 28 months

The present project aims to develop a new low-cost multispectral camera that can be left in the field, sending images regularly to a user. The multispectral camera will be formed by an array of cameras each with a transparent optical filter at a certain wavelength of light. Two uses of multispectral technology will be developed: 1) Automatic identification system for fish in fishing vessels; 2) Non-destructive measurement of sugars in grapes. This will be done using artificial intelligence algorithms and machine learning. Fish identification will be done by collecting image data at equally spaced wavelengths. The identification of fish species will aim to estimate the amount of fish caught by species. For measuring sugars in grapes we will make a selection of the most suitable wavelengths and we will use these wavelengths to create a spectral index that has a high correlation with the amount of sugar.

Finally, we will connect our multispectral camera to the XtraN platform for managing freight transport fleets and to the Monicap box used in the fisheries sector, which is highly innovative.

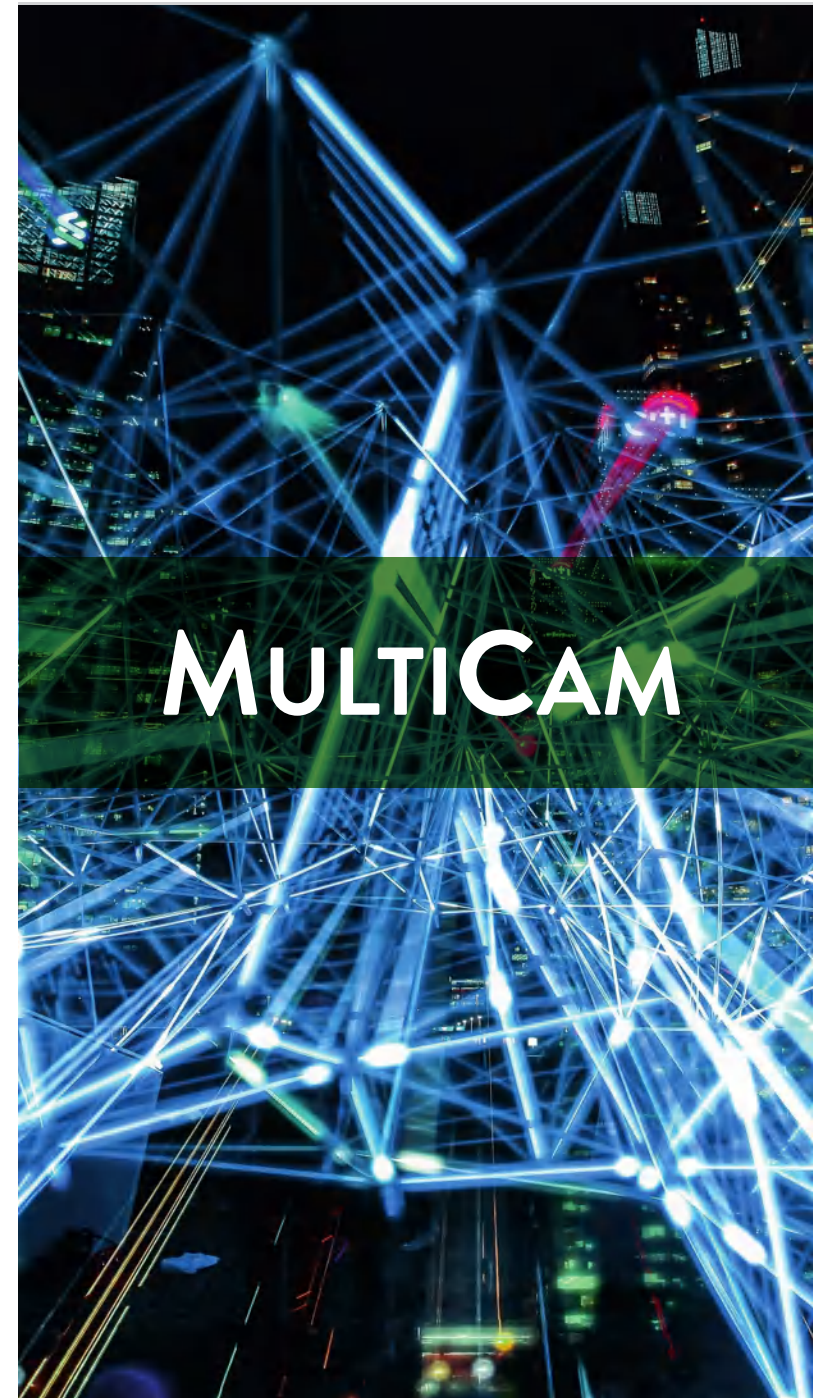


**Principal Investigator at CITAB:** Pedro Melo Pinto

**Leader Institution:** XSEALENCE - SEA TECHNOLOGIES S.A.)

**Web site:** <https://www.multicam.pt/en/>

**Funded under:** Compete – Portugal 2020 (POCI-01-0247-FEDER-69271)



## Soil recover for a healthy food and quality of life

*Start date:* April 2021    *Duration:* 24 months

The soil quality in the northern region of Portugal has been gradually decreasing, exacerbated by the effect of the climate changes, particularly the extremes on temperature and droughts, which trigger an intricate number of negative effects, which request an integrated approach to problem-solving. To face these challenges and the increased threat to the socio-economic development of agriculture in the northern region of Portugal, it was designed an overarching project, which aims to find, affordable and pragmatic solutions, to recover/improve the soil quality, adopting accessible management practices for the practitioners, mostly by using organic residues and plant-growth-promoting rhizobacteria (PGPR) and arbuscular mycorrhizal fungi (AMF) and ascertain their best combination practices, integrated with new technological supporting systems, to ensure higher yields and improve the overall quality of the food products and create added-value with the development of novel foods, from recovered traditional crops (cowpea), partly abandoned, although well adapted to the northern region of Portugal. The project encompasses several domains of the public policies and societal challenges in the various steps of the agriculture value chain, with pragmatic solutions. Indeed, the envisaged foregrounds from this project, ranking high in TRLs, and gathered from a close interaction of activities between the 3 RLs, will be used in a cornerstone objective, the wide dissemination across different type of stakeholders within the agri-food value chain, to ensure and foster sustainable growth, more and better jobs, better quality of life, as well as industrial competitiveness, overall strengthening the scientific and technological capacities of the northern region of Portugal.



**Principal Investigator at CITAB:** Ana Barros

**Leader Institution:** UTAD/CITAB

**Web site:** NA

**Funded under:** NORTE2020 (NORTE-01-0145-FEDER-000083)





## Freshwater Bivalves at the edge: Adaptation genomics under climate-change scenarios

*Start date:* March 2021 *Duration:* 36 months

EdgeOmics project, will use an integrative approach combining well-designed experiments, i.e. experimental studies of ecological performance (manipulating the abiotic environment to mimic predicted future climate) and environmental and behavioral strategies characterization in the field, with state-of-the-art population genome and transcriptome-wide techniques. More, with the main goal of assessing genomic changes and responses associated with the extreme climatic adaptations, it will be used the multidisciplinary data gathered from three freshwater mussel species along a latitudinal and temperature gradient, from the Mediterranean (*Unio delphinus* and *Unio mancus*) to Scandinavia (*Unio pictorum*).

It will be expected to obtain novel insights into the processes by which freshwater species with broad geographical ranges can adapt to local environmental conditions and gain a clearer understanding of the evolutionary history of these imperiled organisms with eventual pay-offs in future management actions devoted to the conservation of these extraordinary organisms.



**Principal Investigator at CITAB:** Simone Varandas

**Leader Institution:** Interdisciplinary Centre of Marine and Environmental Research(CIIMAR) (PT)

**Web site:** NA

**Funded under:** FCT - SR&TD Project Grants(PTDC/CTA-AMB/3065/2020)



## Controlling the quarantine pest *Drosophila suzukii* through epidemiological studies and new Green biocontrol techniques

*Start date:* March 2021    *Duration:* 36 months

*Drosophila suzukii* (Matsumura), commonly known as spotted-wing drosophila (SWD), is the most concerning menace to the chains-of-value of soft-skinned fruits and berries, being highly polyphagous and attacking undamaged ripening fruits.

DrosuGreen project addresses multiple unsolved questions that will contribute to better understand SWD population/biology and develop innovative strategies of biocontrol by 3 pillars of approach: 1) Disclose SWD populations genomes to understand invasion routes and epidemiological profiles; 2) Identify SWD and the SWD-microbiome responses to adverse conditions; 3) Develop new biocontrol strategies using entomopathogenic fungi (EF) and spider venom peptides (SVPs), reducing the risk of SWD-resistance to insecticides.

DrosuGreen is being developed by a consortium of three teams, namely, FCUP-LAQV/REQUIMTE, BIOPOLIS-CIBIO/InBIO, and CITAB/UTAD. CITAB team participates in the use of EF as a sustainable biological alternative to agrochemicals to control SWD.

**Principal Investigator at CITAB:** Guilhermina Marques

**Leader Institution:** Faculty of Sciences – University of Porto (PT)

**Web site:** NA

**Funded under:** FCT - SR&TD Project Grants (PTDC/ASP-PLA/4477/2020)





## Enantioselective ecotoxicity and bioaccumulation of psychoactive substances

*Start date:* March 2021    *Duration:* 36 months

Environmental contaminants are known to adversely affect non-target organisms even at sublethal concentrations. In the last decades, pharmaceuticals (PHAR) and illicit drugs emerged as a new group of environmental contaminants, due to their high consumption, continuous discharge and consequently awareness of their harmful effects to both wild organisms and human health. Several works reported the presence of these biological active substances in sewage water, river water, drinking water, soil, air and even in biota at levels of ng/L and µg/L. The potential contamination of the environment by these substances may result from a complex interconnected map of sources that include many routes to the environment and various links between ecosystems. The aim of this project is to evaluate the ecotoxicological effects and bioaccumulation of psychoactive substances as amphetamine like substances and synthetic cathinones, using aquatic and terrestrial ecological relevant organisms. Target organisms will be the crustacean *Daphnia magna*, the fish *Danio rerio*, and the earthworm *Eisenia fetida*. Data will contribute to the development of environmental policy on risk assessment.



**Principal Investigator at CITAB:** João Soares Carrola

**Leader Institution:** Faculty of Sciences – University of Porto (FCUP/UP) (PT)

**Web site:** NA

**Funded under:** FCT - SR&TD Project Grants(PTDC/CTA-AMB/6686/2020)



## New strategies to value honey from the Montesinho Natural Park: a bioindicator of environmental quality and its therapeutic potential

*Start date:* August 2021    *Duration:* 36 months

Honey+ seeks to add value to a traditional food product by exploring new potentialities far beyond its nutritional value. The project aims to generate new knowledge on the potential of honey produced in the Natural Park of Montesinho (NPM) to serve as a bioindicator for environmental quality and to investigate its pharmacological properties.

A multidisciplinary team composed of experts with strong skills in analytical chemistry, molecular biology, food science and technology, pharmacology and microbiology will intensely collaborate to accomplish the main goal of the project: the valorization of the honey from the NPM and, consequently, enhance the regional economy.

By integrating the knowledge generated during this interdisciplinary project the possibility to valorize honey as a bioindicator of environmental quality will be assessed, as well as the contribution to valorize the Protected Denomination of Origin (PDO) honey produced in the NPM in terms of their chemical and biological properties.

**Principal Investigator at CITAB:** Irene Gouvinhas

**Leader Institution:** Rede de Química e Tecnologia - Associação (REQUIMTE-P)(PT)

**Web site:** NA

**Funded under:** FCT - SR&TD Project Grants(MTS/SAS/0077/2020)





**DATI - Digital Agriculture Technologies for Irrigation efficiency.** CITAB Coordinator : Joaquim João Sousa. Starting date: June 2021, duration : 36 months (PRIMA/0007/2020). CITAB funding: 148.440,00€. <https://datiproject.eu/>

**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/>

**ALICE - Improving the management of Atlantic Landscapes: accounting for biodiversity and eCcosystem 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/>

**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.integrate.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/>





**HONEY+** - *New strategies to value honey from the Montesinho Natural Park: a bioindicator of environmental quality and its therapeutic potential.* CITAB Coordinator: Irene Gouvinhas. Starting date: August 2021. Duration: 36 months (MTS/SAS/0077/2020). CITAB/UTAD: 49.982,12€.

**SoilRec4+Health** - *Soil recover for a healthy food and quality of life.* Project Coordinator: Ana Barros. Starting date: April 2021. Duration: 24 months (NORTE-01-0145-FEDER-000083). CITAB/UTAD: 499.999,00€.

**TraDACa** - *Diagnosis and preventive treatment of hip dysplasia in dogs.* CITAB Coordinator: Mário Ginja. Starting date: April 2021. Duration: 26 months (POCI-01-0247-FEDER-072229). CITAB/UTAD: 216.782,61€.

**EdgeOmics** - *Freshwater Bivalves at the edge: Adaptation genomics under climate-change scenarios.* CITAB Coordinator: Simone Varandas. Starting date: March 2021. Duration: 36 months (PTDC/CTA-AMB/3065/2020). CITAB/UTAD: 10.625,00€.

**DrosuGreen** - *Controlling the quarantine pest Drosophila suzukii through epidemiological studies and new Green biocontrol techniques.* CITAB Coordinator: Guilhermina Miguel Marques. Starting date: March 2021. Duration: 36 months (PTDC/ASP-PLA/4477/2020). CITAB/UTAD: 39.194,74€.

**EnantioTox** - *Enantioselective ecotoxicity and bioaccumulation of psychoactive substances.* CITAB Coordinator: João Carrola. Starting date: March 2021. Duration: 36 months (PTDC/CTA-AMB/6686/2020). CITAB/UTAD: 56.845,00€.

**MultiCam** - *Low Cost Multispectral Camera.* CITAB Coordinator: Pedro Pinto. Starting date: February 2021. Duration: 28 months (POCI-01-0247-FEDER-69271). CITAB/UTAD: 87.130,83€.

**Fungi4Health** - *Valorization of agro-industrial residues in the production of mushrooms and in the development of functional foods and value-added products.* CITAB Coordinator: Guilhermina Marques. Starting date: January 2021. Duration: 30 months (NORTE-01-0247-FEDER-070171). CITAB/UTAD: 276.778,71€.

**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 Coa 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: Jos Moutinho Pereira. Starting date: Aug 2020. duration: 34 months (POCI-01-0247-FEDER-070057). CITAB/UTAD funding: 342179,17€

**rePlant** - *Implementation of collaborative strategies for integrated forest and fire management.* CITAB coordinator: Maria Emlia 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: Joo Paulo F. Carvalho. Starting date: Jun 2020. duration: 31 months (PDR2020-785-063781). CITAB/UTAD funding: 75.901,25€

**INFRAVINI** - *Spatial data infrastructure for the management of climate change in the vineyard.* CITAB Coordinator: Joo 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: Joo Santos. Starting date: July 2019. Duration: 36 months (PCIF/MOG/0083/2017). CITAB/UTAD funding: 30.742,50€

**SCAPEFIRE** - *A sustainable landSCAPE planning model for rural FIREs prevention.* CITAB Coordinator: Joo P. Carvalho. Starting date: March 2019. Duration: 48 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-promoo). 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. Aragons and Vitis rupestris berries upon infection with Erysiphe necator.** CITAB coordinator: Hernni Gers. Starting date: October 2018. Duration: 36 months (POCI-01-0145-FEDER). CITAB/UTAD funding: NA

**Safe'NPest: Synthesis and Environmental Safety of Nanopesticides.** CITAB coordinator: Tatiana Andreani / Amlia 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: Jos 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. Starting 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€

**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€

**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 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: 52 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: 47 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 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 / José Aranha. 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€



**Penha Mountain Local Protected Landscape Management Plan".** Contractor: Guimarães Municipal Council. Execution period: December 2021 to September 2022. CITAB/UTAD funding: 25,075.00€.

**Studies on Characterisation and Strategic and Prospective Diagnosis within the Côa Archaeological Park Special Programme (PEPA-CÔA)".** Financing entity: Côa Parque - Fundação Para A Salvaguarda e Valorização do Vale Do Côa. Execution period: December 2021 to September 2022. CITAB/UTAD funding: 25.000€.

**Monitoring of biological elements and characterisation of mesohabitats in the Vilariça Stream - Baixo Sabor Hydroelectric Plant (AHBS).** Financing entity: LABELEC - Estudos, Desenvolvimento e Atividades Laboratoriais, S.A. Execution period: Spring 2022 (awarded in 2021). CITAB/UTAD funding: 4.040€.

**Monitoring the elimination and eradication of invasive plants, in particular *Hakea sericea*".** Financing entity: ICNF/DRCNF under POSEUR-03-2215-FC-000124-RestAlvão. Execution period: December 2021 to December 2022. CITAB/UTAD funding: 8.122,11€

**Assessment of the impacts of *Hakea sericea* on vegetation and soil".** Financing entity: ICNF/DRCNF under POSEUR-03-2215-FC-000124-RestAlvão. Execution period: December 2021 to December 2022. CITAB/UTAD funding: 12.193,75€

**Procurement of services under the "Guimarães Biodiversity Action Plan" (3-AQS-2021).** Financing entity: Laboratório Da Paisagem De Guimarães - Associação Para A Promoção Do Desenvolvimento Sustentável. Execution period: November 2021 to February 2023. CITAB/UTAD funding: 12.907,50€

**Characterisation of the Vineyard Ecosystem - Quinta do Seixo - Descriptors birds and bats.** Financing entity: Association for the Development of Duriense Viticulture - ADVID. Execution period: May 2021 to November 2021. CITAB/UTAD funding: 4.988,13€.

**Survey of mortality of avifauna and chiropterans in the context of the over-equipment project of the Fonte da Mesa II Wind Farm - Pre-Construction Phase.** Financing entity: Eólica do Alto Douro, S.A. Execution period: November 2021 to December 2022. CITAB/UTAD funding: 8.541,25€.

**Biologist monitoring within the scope of the execution of MC12M. 1 of the Integrated Programme for Environmental Monitoring (PIMA) of the Foz do Tua Hydroelectric Plant (AHFT) - Exploration Phase.** Financing entity: Movhera,

Hydroelétricas do Norte, SA Execution period: April 2021 to April 2022. CITAB/UTAD funding: 3.750,00€.

**Hydroelectric exploitation of Foz Tua River Valey (AHFT) - Integrated Environmental Monitoring Programme (PIMA).** Financing entity: EDP - Gestão da Produção de Energia, S.A. Execution period: year 2021. CITAB/UTAD funding: 161.127,01€.

**Baixo Sabor Hydroelectric Dam (AHBS) - Integrated Environmental Monitoring Program (PIMA), Exploitation Phase.** Financing entity: EDP - Gestão da Produção de Energia, S.A. Execution period: year 2021. CITAB/UTAD funding: 378.796,22€.





**SPECIALIZED LABORATORY  
WITH INNOVATION**



### LABORATORY OF FLUVIAL AND TERRESTRIAL ECOLOGY

The Laboratory of Fluvial and Terrestrial Ecology (LEFT) is a Service Provider Unit whose foundation resulted from the fusion of the Fluvial Ecology and Applied Ecology laboratories, previously operating at UTAD. LEFT's mission is to contribute to applied and innovative scientific knowledge in the areas of Ecology, Conservation Biology and Environment, supporting scientific research that contributes to the advancement of the state of the art, namely in the fields of monitoring river and terrestrial ecosystems, conservation, ecological and environmental assessment, environmental impact studies, environmental audits and inspections, restoration and renaturation of degraded habitats and ecological modelling. The LEFT promotes close connection with partners from the private and public sectors, more than 100 funded projects, involving more than 30 different entities, in order to better adapt research results to stakeholder requests, enhancing the impact on society of the knowledge produced.





# **ORGANIZATION OF CONFERENCES**





## Cycle of Webinars Nutri@UTAD

A set of four webinars dedicated to different aspects of nutrition took place during the month of May. These were organized by Ana Barros, in collaboration with Sandra Fonseca (CIDESD) and the UTAD Nutrition Sciences graduation course.

At Nutri@UTAD first webinar the invited speaker Cecília Morais (FCNAUP) presented "Meeting Nutritional Requirements – challenges for different age group populations". The second webinar by Fernando Realista Carvalho, from the Nestlé Infant Nutrition Iberia, focused "Marketing Nutricional: do Campo até à Mesa". Maria do Carmo Faria (IP-RAM), the third invited speaker, talked about "Iodo – importância para a saúde e o papel da nutrição". The webinar cycle ended with the presentation of "Nutrição na Doença" by Edgar Guedes (CHTMAD).



## CITAB Webinars

CITAB Webinars were three multidisciplinary conferences given by international and national researchers that focused current hot-topic subjects.

The first webinar, on the 21st of April was given by Dr. Ewan Harrison from the Wellcome Sanger Institute and University of Cambridge (UK). Dr Harrison talk "Genomic surveillance of SARS-CoV2" presented the frontline research on SARS-CoV2 evolution using top-of-the art molecular tools and how results are important to predict and prevent the evolution of the Covid pandemic.

In collaboration with the CoLab4Food, on the 19th of May took place the webinar "Food Processing Technologies: an overview". The speakers Nuno Oliveira, Ana Guimarães and José Gonçalves showed how collaborative strategies between the academy and industrial stakeholders of the agri-food are increasing the sector competitiveness and know-how, particularly on the development and dissemination of new emerging technologies.

On the 29th of May, a joint organization of CITAB Applied Ecology Laboratory and the association "Povo e Natureza do Barroso" promoted the webinar "Que future para a região do Barroso". The all-day event dedicated to the Barroso region (Northern of Portugal) focused the region socio-economic and culture aspects, presented its ecological and environmental characterization and reflected on future actions combining nature and ecosystem sustainability with economical and social development for the Barroso region.





## Clim4Vitis Days

The H2020 Twinning project Clim4Vitis - Climate change impact mitigation for European viticulture: knowledge transfer for an integrated approach, organized its final event in the end of 2021.

The three days event included: an open day conference; an international workshop “Viticulture & Climate Change: Research Outcomes from Clim4vitis” and a short course “Enhancing Climate Resilience in Viticulture”.

The open day conference was dedicated to the main project results and the discussion of future funding opportunities on the duo Climate-Viticulture.

During the workshop “Viticulture & Climate Change: Research Outcomes from Clim4vitis” the different project partners presented most relevant outcomes of the project to an audience that included researchers and stakeholders from the wine and winery sector.

The “Enhancing Climate Resilience in Viticulture” short courses, given by the Clim4Vitis partners was devoted to climate change adaptation for European Viticulture and aimed to present to the audience (students, researchers and stakeholders) the final recommendations to mitigate climate changes and future challenges to the viticulture sector.



## Webinar “Combate ao Desperdício Alimentar - Da Investigação à Indústria”

The webinar “Combate ao Desperdício Alimentar - Da Investigação à Indústria” held on the 9th of June, was promoted by CITAB and IAPMEI.

Based on the goal Reduction of Food Waste, the webinar joined the academy with enterprises to present new practices of food processing and new ways to (re)use products.

During the event the National Plan to Reduction of Food Waste, three projects dedicated to the agrifood sector and a plan for best practices to reduce food waste were presented. A discussion panel with representatives of entities that are examples of food waste reduction, valorization of products and products reuse finalized the occasion.





### GO Cereja

The Cherry Operational Group, coordinated by CITAB, organized the annual Resende Cherry meeting, this time online. The event that occurred on the 31st of March joined researchers with Cherry stakeholders.

During the event the participants were presented with talks on cherry orchard installations, high quality cherry varieties, fertilization practices and zero waste management in this crop production.

A state of play regarding the project outcomes on Resende cherry production was also introduced to the participants.



### Symposium Agriculture and Food Sustainability

CITAB joined the organization of the “Symposium Agriculture and Food Sustainability – new climate change scenarios” that took place in Funchal (Madeira, Portugal) on the 11-13th of October.

The symposium aimed to gather national and international researchers in Climate Change and Food Sustainability to address questions like how future Climate scenarios will impact agriculture, agrosystems and crop productivity. Global and local involvement to promote strategies to cope with future climate scenarios were also subject of discussion.







**PRIZES, AWARDS  
& DISTINCTIONS**



**Luis Félix** was selected in the national FCT's "Concurso Estímulo ao Emprego Científico – Individual (CEEC)" competition for a Junior Researcher contract.



**Sara Bernardo** thesis "Understanding vine response to Mediterranean summer stress for the development of rationale adaptation strategies: the kaolin case" was awarded by the Agronomy Journal with the "Agronomy 2021 Best PhD Thesis Awards".



**João Fidalgo Carvalho** joined a list of experts of the European Commission within the framework of the European Union's Biodiversity Strategy for the next decade.



**Luís Pádua** received the Soldera Case Base International Young Researchers Award, in the viticulture category, from the Accademia dei Georgofili (Italy), with the journal article "Individual Grapevine Analysis in a Multi-Temporal Context Using UAV-Based Multi-Sensor Imagery".



**Rita Martins** was awarded by ReadyToPub - Author Services Provider with the best communication presented by students at the XV Encontro de Química dos Alimentos, held in Funchal.

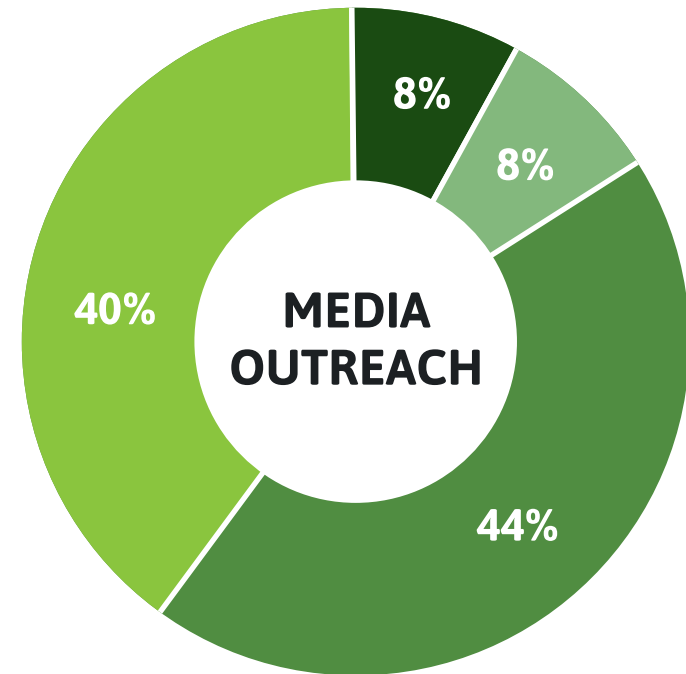


**João Santos** was distinguished as one of the top 1000 climate scientists at Thomson Reuters, being one of the only six Portuguese researchers in the list.



**OUTREACH**





■ Online 
 ■ Tv 
 ■ Radio 
 ■ Newspaper

In 2021, despite the restrictions owing to the Covid-19 pandemic, several dissemination and outreach activities were promoted by CITAB. The CITAB participation in the FICA – International Science Festival, the Science and Technology Week at UTAD, the “Ciência Viva no Verão – OCJ”, visits to several schools and open laboratorial activities were organized.

Concerning media outreach, the CITAB activities were reported in more than 100 social media (newspapers, radio, television and web news). 44% of them were in online media, while 40% were in newspapers. It is still worth mentioning that 5% of these mentions of CITAB were made by international media.









**20 ANOS PATRIMÓNIO MUNDIAL**

# DOURO

**IX Conferência**

Convite - TEAMS

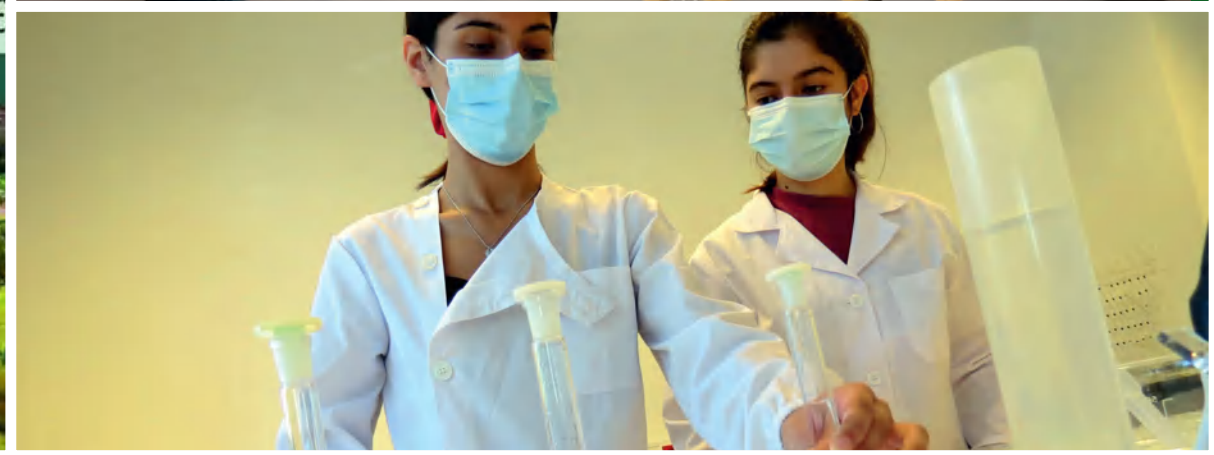
Atividade integrada da programação: a importância do envolvimento das comunidades locais em prol de uma abordagem sistémica

Prof. Doutora Edna Cabecinha

26 de março de 2021  
14h30 às 15h30

**ciência a sexta**

CCDR NORTE ALTO DOURO VINHATEIRO NORTE2020 #2020 ICNF



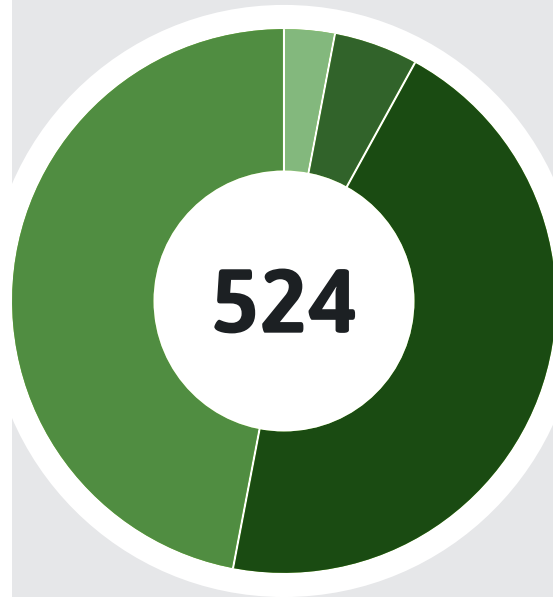




# **PRODUCTIVITY METRICS**



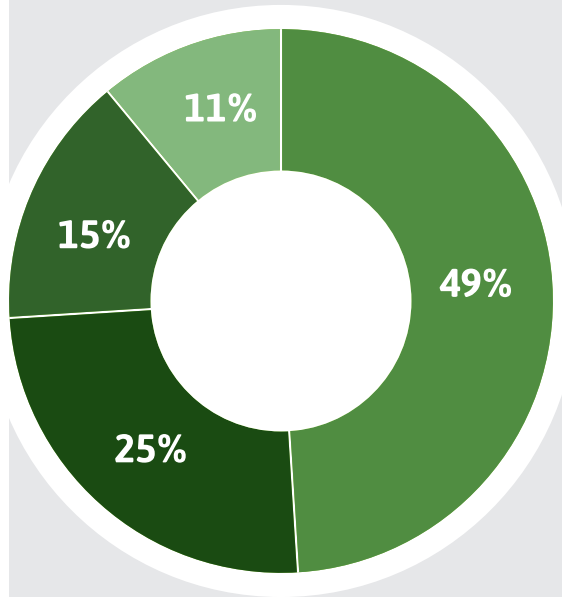
## SCIENTIFIC PUBLICATIONS



- 248 peer reviewed articles published
- 241 communications in events
- 28 books and book chapters
- 14 completed PhD theses

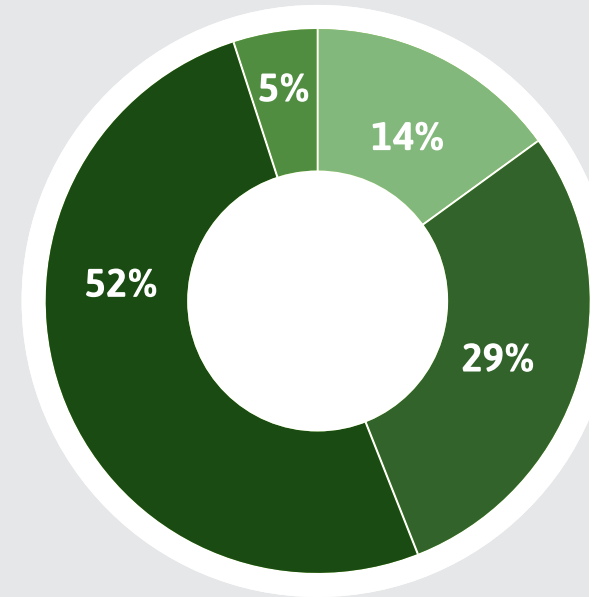
## PUBLICATIONS IN PEER REVIEWED JOURNALS

### SUBJECT AREAS DISTRIBUTION



- Agricultural and Biological Sciences
- Environmental Science
- Biochemistry, Genetics and Molecular Biology
- Others

### QUARTILE DISTRIBUTION



- Q1
- Q2
- Q3
- Q4

CITAB productivity in 2021 displays the Centre dynamics recovery after the pandemic constrains. The Centre peer reviewed articles increased to **243** and the average of publications per integrated member presents the highest value in CITAB history, reaching 2.4. Noteworthy, more than half of the peer reviewed articles were published in Q1 journals (52%) and the majority of these were on Q1 and Q2 journals (81%). Furthermore, more than 50% of the peer reviewed articles were published in journals connected to the CITAB main research areas (Source: SCOPUS).

Reflecting CITAB's recovery, the **241** communications on international and national events approached values reported to years before Covid pandemic, and 2021 productivity further includes **28** books and book chapters and **12** completed PhD thesis.



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**Almeida, Maria Naruna. Efeito do Clima nas Características e Propriedades da Madeira de um Clone de Eucalyptusurophylla.** Supervisors: José Lousada (CITAB-UTAD) and GrazielaVidaurre (UFES). Doctoral programme/degree in Forest Sciences (UFES-Brazil). Date: January 2021.

**Almeida, Mariana. Introduction of Mediterranean legume grains for rabbit and lamb feeding.** Supervisors: Severiano Rocha (UTAD), Luis Ferreira (CITAB-UTAD) and George Stilwell. Doctoral programme/degree: Animal Science. Date: June 2021.

**Barracosa, Paulo. Caracterização da Biodiversidade e Valorização dos Recursos Genéticos do Cardo (Cynaracardunculus L.).** Supervisors: Euclides Pires (UC) and Marlene de Barros (UCP). Doctoral programme/degree in BioSciences (UCoimbra). Date: July 2021.

**Bastos, Rita. SEAbirdCHANGE: How seabirds foraging patterns indicate climatic changes?** A spatially-explicit dynamic framework to forecast the Cory's shearwater distribution in the North Atlantic Ocean. Supervisors: João Cabral (CITAB-UTAD). Doctoral programme/degree: Marine Science, Technology and Management (Do\*Mar). Date: June 2021.

**Bernardo, Sara. Understanding vine response to Mediterranean summer stress for the development of rationale adaptation strategies: the kaolin case.** Supervisors: J. Moutinho Pereira (CITAB-UTAD), Lia Tânia Dinis (CITAB-UTAD) and Nelson Machado (Vines & Wines CoLab). Doctoral programme/degree: Agricultural Production Chains: from fork to farm (AgriChains). Date: November 2021.

**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: September 2021.

**Castro, Cláudia. Multidisciplinary study of wine-producing grapevine varieties treated with hydroponic solutions enriched with Zinc and Copper.** Supervisors: Ana Isabel Carvalho (CITAB-UTAD). Doctoral programme/degree: Chemical and Biological Sciences. Date: June 2021.

**Fernandes, Joana. Valorization of fungal-fermented grape stalks, bioremediation and characterization of a vinasse-induced laccase from Phlebiarufa (Pers.) M.P. Christ.** Supervisors: Rui Bezerra (CITAB-UTAD) and José Albino Dias (CITAB-UTAD). Doctoral programme/degree: Chemical and Biological Sciences. Date: July 2021.

**Flores, Diego. Towards a standard methodology for benthic assemblages monitoring across local and global scales.** Supervisors: Pedro Gomes (UMinho); GuillermoDíaz-Agrás (UVigo) and Edna Cabecinha (CITAB/UTAD). Doctoral programme/degree: Marine Science, Technology and Management (Do\*Mar). Date: March 2021.

**Gouveia, Carla. Study of drought tolerance in root and tuber crops using NIRS technology and biochemical markers model assessment.** Supervisors: M.A.A. Carvalho (CITAB-UMadeira); VicentLebot (CIRAD). Doctoral programme/degree: Biological Sciences (UMadeira). Date: January 2021.

**Jesus, Joaquim. Evaluation of the behaviour of Iberian freshwater fish species in face of acoustic and luminous stimuli and their contribution to the development of a behavioral barrier for fish.** Supervisors: Amílcar Teixeira (IPB) and Rui Cortes (CITAB-UTAD). Doctoral programme /degree: Auga, Sustentabilidade e Desenvolvimento (UVigo). Date: July 2021.

**Santana, Paula. Canine hip dysplasia: diagnosis optimization and radiographic examination without human exposure to ionizing radiation.** Supervisors: Mário Ginja (CITAB-UTAD). Doctoral programme /degree: Veterinary Sciences. Date: April 2021.

## VISIT US

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