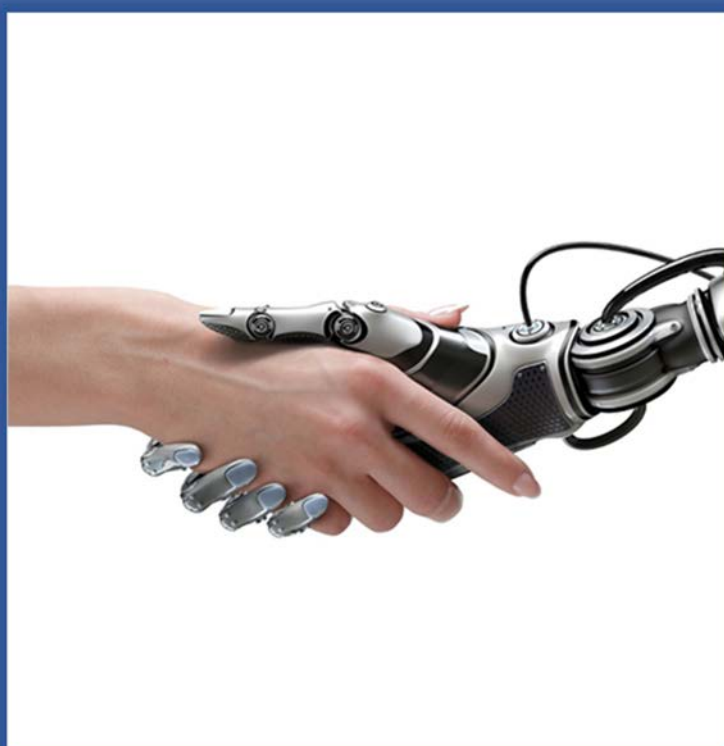




R&D&I PORTFOLIO

AGRI-FOOD SECTOR
UNIVERSIDAD DE BURGOS

BIOIND (Industrial and Environmental Biotechnology)



Presentation

The research group "Industrial and Environmental Biotechnology" (BIOIND), recognized by the University of Burgos in January 2013 and as Consolidated Research Unit of Castile and Leon (UIC 128) in July 2015, is composed by all the professors and researchers of Chemical Engineering at the University of Burgos. This group aims to apply the foundations of Chemical Engineering to address various challenges of the modern food industry, very powerful in our environment, and with a fluid relationship with the UBU, which in turn has boosted studies related to food, up to the doctoral level.

Scientific-Technical Services

Characterization of fats and oils: determination of fatty acid and neutral lipids profiles, acidity, peroxide and anisidina indexes, etc.

Determination of particle size and size distribution in the micron and submicron range by laser diffraction techniques and stability studies of emulsions and colloidal systems by measuring zeta potential.

Wastewater treatment engineering.

Optimization of filtration conditions in MBR and AnMBR

Study of industrial applications of supercritical fluid technologies (extraction, reaction, enzyme inactivation, product formulation, etc.)

Study of industrial applications of membrane technologies (pervaporation, microfiltration, ultrafiltration, etc.).

Study of industrial applications of chemical engineering basic operations: extraction, distillation, catalytic distillation, adsorption, ion exchange, etc.

Contact

Industrial and Environmental Biotechnology (BIOIND).

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Facultad de Ciencias: Departamento de Biotecnología y Ciencia de los Alimentos. Pza. Misael Bañuelos s/n. 09001. Burgos.

ELAN (Electroanalysis)



Presentation

The group's current activity is focus on the use of photolithographic and screen-printing technologies for various applications:

- Development and setting up of selective, sensitive and economical electrodes for their use in different electrochemical techniques. Its subsequent modification with materials such as: nanomaterials, enzymes , polymers and/or organic compounds, allows their use as sensors and biosensors in various fields: pharmaceutical analysis (analysis of antiepileptic drugs, antibiotics, antidepressants, etc.); development of analytical methods for the determination of drugs of different nature in complex biological matrices; environmental analysis: (heavy metal analysis, metal speciation in real samples, study of the enzymatic inhibition performed by metals using electrochemical biosensors, etc.); agro-food analysis of parameters of interest (natural pollutants, sugars, etc.) in: beverages (wine, juice, water, beer, infusions, coffee, etc.), meat, cheese, fish, honey, etc.
- Design and study of printed circuits using different printing materials for industrial applications.

Scientific-Technical Services

Applications of screen-printing technology to the industry.

The use of screen printing techniques shows great versatility for the development of electronic components that can be used in circuits and other electronic devices. The possibility of modifying silkscreen inks with nanomaterials and other products offers important alternatives in various fields.

- Example: Direct “in situ” determination of ascorbic acid (Vitamin C) using a device formed by three disposable screen-printed electrodes

Contact

Electroanalysis (ELAN).

Coordinator: Maria Julia Arcos Martínez (jarcos@ubu.es); Tel.: +34 947 258 818.

Facultad de Ciencias: Departamento de Biotecnología y Ciencia de los Alimentos. Pza. Misael Bañuelos s/n. 09001. Burgos.

MIEL (Quality, Typification and Ageing of the Honey)



Presentation

Research group with extensive experience in beekeeping research, with more than 20 years of work in the analysis, characterization of honeys, and study of the aging of this food. We have collaborated with different food companies and foreign universities in the analysis of immediate principles and vitamins in various foods, such as meat products, nuts and cereal products, as well as aromas in alcoholic beverages.

We have the equipment and experience necessary for other collaborations, such as analysis of fatty acids, sterols and volatile and semi-volatile natural substances in foods.

Scientific-Technical Services

- Analysis of the parameters included in the European Legislation for honey.
- Analysis of immediate principles and other components of foods such as dietary fiber.
- Characterization of honey by its chemical composition, melisopalinology and profile of volatile and semi-volatile natural substances.
- Study of the aging and freshness of pastry products.

Contact

Quality, Typification and Ageing of the Honey (MIEL).

Coordinator: M^a Teresa Sancho Ortiz (mtsanche@ubu.es); Tel.: +34 947 258 813.

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NUTRITION (Nutrition and Dietetics)



Presentation

The Nutrition and Dietetics Research Group is a multidisciplinary team capable of deal with different areas of research within the field of nutrition. Mainly, his studies cover three lines of research: food analysis, study of the nutritional status of various groups and the study of the physiological action of different functional components of food in cell cultures.

Scientific-Technical Services

- Analysis of immediate principles and other components of food such as dietary fiber and vitamins.
- Determination of nutritional status by anthropometry and bioimpedance.
- Elaboration of personal and collective diets.
- Evaluation of personal and collective diets.
- Analysis of the physiological action of different components of food in cell lines: Implications in health.

Contact

Nutrition and Dietetics (NUTRITION).

Coordinator: Sara Raquel Alonso De La Torre (salonso@ubu.es); Tel.: +34 947 259 003.

Facultad de Ciencias: Departamento de Biotecnología y Ciencia de los Alimentos. Pza. Misael Bañuelos s/n. 09001. Burgos.

OHM (One Health Microbiology)



Presentation

The OHM Research Group is composed of researchers from the Microbiology Area of the University of Burgos and national and international experts in this area, who develop an integrated approach "One Health" (Una Medicina, Una Salud) for the study of fundamental aspects in the control of pathogenic agents of zoonotic character, from the primary production, the elaboration and distribution of the food to the hospital environment.

Scientific-Technical Services

- Development and implementation of rapid methods of microbiological analysis.
- Microbiological characterization of food and clinical samples
- Genetic characterization (sequencing) of isolates or microbial populations in food or food and sanitary facilities.
- Shelf life studies of food products.
- Modelling risk associated with pathogenic microorganisms in different areas.
- Characterization of microbial contamination in food or sanitary facilities.

Contact

One Health Microbiology (OHM).

Coordinator: Alfonso David Rodríguez Lázaro (drlazaro@ubu.es); Tel.: +34 947 258 800.

Facultad de Ciencias: Departamento de Biotecnología y Ciencia de los Alimentos. Pza. Misael Bañuelos s/n. 09001. Burgos.

POLYMERS (Polymers)



Presentation

The research of the Group is directed fundamentally towards the design, development and study of new high-value-added polymeric materials for application in advanced technologies:

- a) fibers and materials with high mechanical and thermal resistance for personal protective apparels and for high-performance composite materials
- b) smart textiles and intelligent polymers as sensors for the detection of molecules of special interest (biomolecules, contaminants, explosives, chemical warfare agents, etc.), both in water and in the environment, for industrial, biomedical, environmental and security (civil protection) applications.

Scientific-Technical Services

- The work of our Research Group is devoted to the analysis, modification, design and complete synthesis of polymeric materials with the aim of 'a la carte' improving their properties. As an example of collaboration with different companies, we can mention:
 - o Development of polyurethane foams
 - o Analyses and development of glues and resins of urea/formaldehyde and melamine/formaldehyde, adhesives, etc.
- Design, synthesis and characterization of polymeric materials with specific properties for special applications. Design of polymers as sensory materials, conducting polymers, and high performance fibers (thermally and mechanically resistance yarns).

Contact

Polymers (POLYMERS).

Coordinator: Jose Miguel Garcia Perez (jmiguel@ubu.es); Tel.: +34 947 258 085.

Facultad de Ciencias: Departamento de Biotecnología y Ciencia de los Alimentos. Pza. Misael Bañuelos s/n. 09001. Burgos.

Q&C (Chemometrics and Qualimetrics)



Presentation

The 'Chemometrics and Qualimetrics' research group is a consolidated group with research activity since 1988. Its members are professionals of Statistics and O.R. and Analytical Chemistry and this transversal character is reflected in the research activities devoted to develop, validate and implement models capable of 'translating' data into information, information into knowledge and knowledge into decision-making. Specifically, the research focuses on:

- The design and selection of optimal experimental procedures, for chemical laboratories and in the context of Process Analytical Technology (PAT).
- Building predictive models based on multivariate and/or multiway techniques.
- Typification and multivariate characterization of products (food, pharmaceuticals, etc.)

Scientific-Technical Services

Design of strategies and methodologies that address the changing needs in optimization and process control, in improving product quality, and in the environmental and food safety.

Analysis of multivariate/multiway information. Specifically:

- Construction and validation of models from experimental data (multiple variables and responses) with predictive ability; artificial intelligence (neural networks, genetic algorithms) and custom software.
- Planning of optimal experimental strategies for obtaining reliable information at the lowest cost.
- Process Analytical Technology (PAT) and Quality by Design (QbD).
- Multivariate typification of food, pharmaceutical products, depending on physical, chemical and/or sensory variables. Fraud detection.
- Calibration models for instrumental Multi-way techniques (molecular fluorescence spectroscopy, NIR, MIR, liquid and gas chromatography with mass spectrometry, electronic nose).
- Univariate and multivariate control charts. Process capability.
- Postgraduate permanent education ('ad-hoc' courses).

Contact

Chemometrics and Qualimetrics (Q&C).

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Facultad de Ciencias: Departamento de Biotecnología y Ciencia de los Alimentos. Pza. Misael Bañuelos s/n. 09001. Burgos.

TECNOFOOD (Food Technology)



Presentation

It is an interdisciplinary research group working in the field of Food Technology. Meat products, wine, beer, cereal products and dairy products are the main foods with the research group works with. In general the research topics of the group are focused in the characterization of traditional foods, optimization of processing and formulation of both traditional and new food products, especially regarding the improvement of their nutritional properties and maintaining their sensory quality. Furthermore, the group pays great attention to the application of new preservation methods, such as high pressure processing, food safety, food aroma compounds and sensory analysis and the study of the functional properties of various food components, such as antioxidant and/or heart-healthy properties of natural compounds.

Scientific-Technical Services

Studies of different food product development and production.

Studies of environmental microbial ecology in food processing plants.

Studies of challenge test and shelf-life of food products.

Sensory food analysis.

Evaluation of the antioxidant capacity of natural compounds in food matrices.

Characterization and typification of food.

Development of new products and optimization of manufacturing processes. Development of functional foods.

Study of the sensory properties of food- Evaluation of the effectiveness of different methods of food preservation. Microbiology of food spoilage microorganisms.

Food safety along the food chain (environmental microbiology in processing plants) with special attention to the genus *Campylobacter* and *Listeria monocytogenes*.

Winemaking technology.

Contact

Food Technology (TECNOFOOD).

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UBUCOMP (Composting)



Presentation

Economic development in industrial societies is responsible for the genesis of important amounts of wastes. Many of these wastes have important percentages of biomass, and their decomposition produces serious environmental problems in terms of malodours, emission of gases which have a greenhouse effect, leaching of toxic compounds and the necessity for large investments in building dumping places for their final deposit.

This residual biomass, of urban, agricultural, livestock or industrial origin, after the elimination of its non-desirable components and later its thermal, chemical or biological transformation, could be used to produce energy or added to soil to improve crops.

The Composting Research Group was established in 2003 bringing together the research experience of the Soil Science and Agrochemistry Section of the University of Burgos and scientists from other Sections such as Organic Chemistry or Chemical Engineering, in order to form a multidisciplinary and opened team that now forms part of the Composting Spanish Network.

Scientific-Technical Services

- Experimental design for the optimization of agricultural and forestry organic wastes and agro-industrial products.
- Recovery of degraded /contaminated soils by the use of organic amendments.
- Prevention of environmental pollution by leaching of nutrients and heavy metals in soil by application of organic waste.
- Physicochemical and biological characterization of residual organic materials.
- Composting assays of agricultural, livestock, urban and industrial wastes.
- Optimization of new biological processes through the combination of aerobic and anaerobic technology in organic waste treatment.
- Biological control of plant diseases.
- Control of plant parasitic nematodes (biodesinfestation).
- Biological control of plant pathogens with compost: genesis of suppressive soils.
- New molecular techniques for the diagnosis of plant pathogens.

Contact

Composting (UBUCOMP).

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Facultad de Ciencias: Departamento de Biotecnología y Ciencia de los Alimentos. Pza. Misael Bañuelos s/n. 09001. Burgos.

BBT (Biochemistry and Biotechnology)



Presentation

The research group “Biochemistry and Biotechnology” (BBT) consists of professors of Biochemistry and Molecular Biology at the University of Burgos. This group has extensive experience in enzyme biotechnology for application in the food industry and environmental. The research conducted covers aspects such as the microbial production of enzymes, biochemical characterization, and stabilization of biocatalysts (enzymes and cells) using different immobilization techniques. The scientific and technical research is also directed towards food authentication by using molecular biology techniques, study of food allergens, immunodetection of proteins and development of nanoencapsulation processes for the design of therapeutic enzymes.

Scientific-Technical Services

Determination of enzyme activities and biochemical characterization.

Extraction, isolation and purification of proteins.

Immobilization of enzymes and microbial cells.

Identification and quantification of animal and vegetable species by PCR and qPCR.

Analysis of the effect of processing on allergens.

Quantitative and qualitative immunodetection of protein.

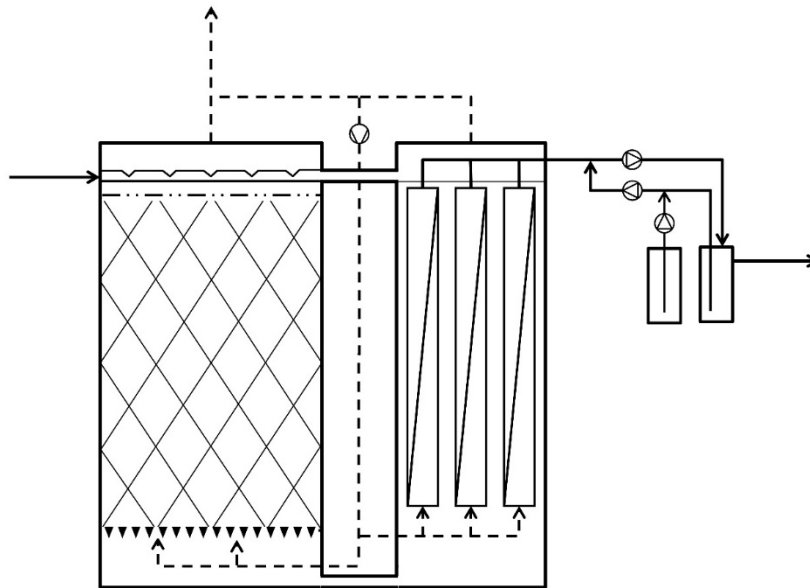
Contact

Industrial and Environmental Biotechnology (BIOIND).

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Facultad de Ciencias: Departamento de Biotecnología y Ciencia de los Alimentos. Pza. Misael Bañuelos s/n. 09001. Burgos.

Anaerobic treatment of biodegradable waste flow.



TECHNOLOGY SUMMARY

Bioreactor formed by two communicated closed tanks (anaerobic digestion tank and filtration tank) for the anaerobic treatment of complex wastewater with biogas production.

Filling material is used, in a disorganized way, increasing the active biomass accumulation capacity and allowing working with down flow in the digestion tank.

CONTEXT

Anaerobic membrane bioreactor technology are currently used with good purifying efficacy, but it presents high installation and operation costs.

This new technology uses plastic filling material for the biomass retention in the anaerobic digestion tank and gas-lift recirculation in the filtration tank, reducing the damage caused to the biomass in the pumping.

Active biomass fixation in the filling material allows working with down flow in the digestion tank, without the biomass dragging that would take place in suspended-culture reactors.

BENEFITS

- The active biomass accumulation capacity and its treatment capacity are increasing due to the use of the filling material.
- The frequency of the cleaning operations is reduced and its shelf life is increased as a consequence of the decrease in the deposition of solids over the membranes surface.
- The recirculation associated with bubbling, by the effect known as gas-lift, reduces the pumping costs and, specially, the mechanical stress caused by the use of electromechanical pumps that damages the biomass and deteriorates the effluent quality.

APPLICATIONS

The potential market is wide in the field of improving wastewater treatment processes. The main industries in which these technologies are used are:

- Biofuels; Breweries; Dairy industry
- Distilleries and wine cellars;
- Slaughterhouses and meat by-products
- Fishing industry; Canned food
- Convenience food; Pulp and paper industry
- Pharmaceutical and cosmetics industry
- Chemical industry

Anaerobic treatment of biodegradable waste flow.

IP RIGHTS

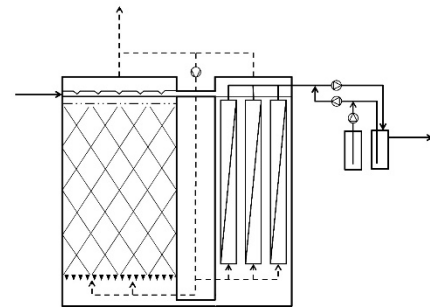
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DEVELOPMENT STAGE

Operational pilot plant set up in an industrial slaughterhouse.

KEYWORDS

Bioreactors, Treatment, Waste water, Anaerobic, Biogas, Gas-lift, Membranes, Biomass.



DEVELOPED BY

Industrial and Environmental Biotechnology group (BIOIND) of the University of Burgos.

BUSINESS OPPORTUNITY

- Agrofood Industry.
- Energy
- Protecting man and Environment.
- Other Industrial Technologies.

PARTNERSHIP

Commercial agreement, License agreement, Technical cooperation: further development, Technical Cooperation: testing new applications; Technical Cooperation: adaptation to specific needs.

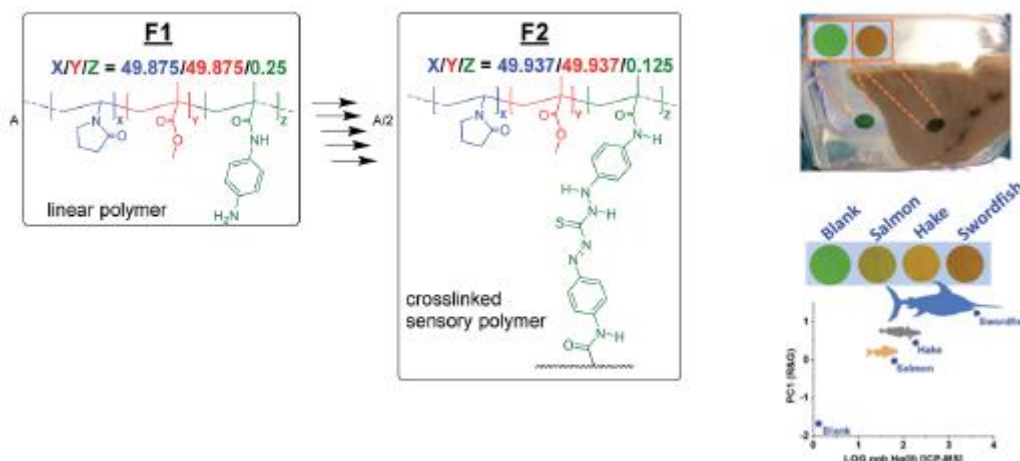
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Technology #XXXXX

Detection and quantification “in situ” of mercury, copper and nitrites in water and food products using a polymeric detector.



TECHNOLOGY SUMMARY

The method developed in this patent is based on the use of cross-linked copolymers, which act as colorimetric sensors, for the detection and / or quantification of divalent metals: mercury [Hg (II)] and copper [Cu (II)]; and anions: nitrite (NO₂⁻). It is applicable in different matrices, both aqueous mediums and food products.

BENEFITS

THIS METHOD:

Does not require the utilization of chemical reagents.

Does not require the use of extremely expensive laboratory equipment.

The results are shown quantitatively with great precision.

CONTEXT

The possibility of detecting and/or quantifying, with the same method, both divalent metals (mercury and copper) and oxidizing anions (nitrites), makes it very versatile and turn it into unique in the market. In addition, this versatility is transferred to the measurement, which can be carried out with different equipment. In addition, it does not produce colour migrations.

The developed device can be applied to any type of sample without prior treatment, in a simpler way than the other available methods.

APPLICATIONS

It presents a high responsiveness in:

- Drinking water.
- Industrial water: for example, in the gold mining industry.
- Food products: mercury can be present in different fish and, due to its toxicity in the body, it is very important to detect it before its consumption.
- Biomedical healthcare industry: urine, saliva, blood serum, etc.

Detection and quantification “in situ” of mercury, copper and nitrites in water and food products using a polymeric detector.

IP RIGHTS

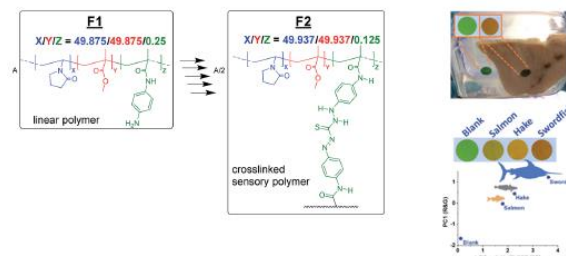
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DEVELOPMENT STAGE

Several prototypes have been manufactured in collaboration with a research centre.

KEYWORDS

Copolymers, Cross-linked, Sensors, Colorimetric, Detection, Metals, Divalents, Mercury, Copper, Anions, Oxidizing, Nitrites, Water, Fish, Food Products, Quantification.



DEVELOPED BY

Polymers group (POLYMERS) of the University of Burgos.

BUSINESS OPPORTUNITY

- Agriculture and Marine Resources.
- Agrofood Industry.
- Measurements and Standards.
- Protecting man and Environment.
- Other Industrial Technologies.

PARTNERSHIP

Commercial agreement, License agreement, Technical cooperation: further development, Technical Cooperation: testing new applications; Technical Cooperation: adaptation to specific needs.

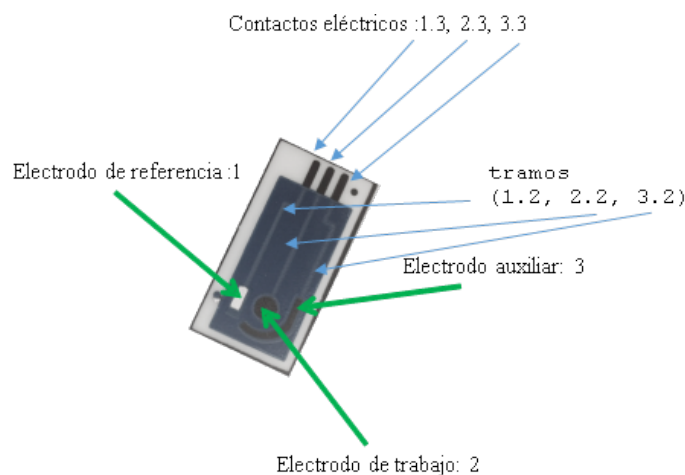
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Technology #XXXXXX

Direct “in situ” determination of ascorbic acid (Vitamin C) using a device formed by three disposable screen-printed electrodes.



TECHNOLOGY SUMMARY

New device for direct “in situ” detection of ascorbic acid in different types of liquid samples, for example biological samples or food products.

The equipment consists of an electrode system formed by three disposable electrodes, obtained by silkscreen printing.

BENEFITS

THIS LOW COST ELECTROCHEMICAL METHOD, APPLIED TO CHEMICAL ANALYSIS:

Simplifies the commonly applied techniques.

Non-qualified personnel can perform it.

Short analysis time.

Allows “in situ” detection of the analyte.

CONTEXT

Commonly employed methods present some disadvantages such as a poor selectivity and a progressive deterioration of the sensitivity of the electrode when used in complex matrices.

This new device solves these disadvantages by employing disposable electrodes that allow the determination of ascorbic acid with greater sensitivity in different types of samples, for example in biological and food samples.

APPLICATIONS

It presents a high responsiveness in sectors such as:

- Health.
- Food and beverages.

Direct “in situ” determination of ascorbic acid (Vitamin C) using a device formed by three disposable screen-printed electrodes.

IP RIGHTS

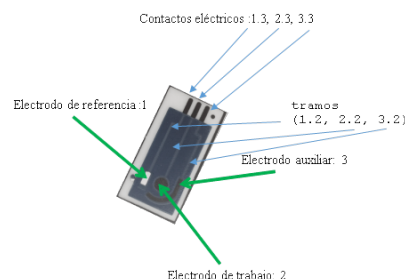
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DEVELOPMENT STAGE

Currently, the device is in prototype phase, validated in laboratory.

KEYWORDS

Vitamin C, ascorbic acid, analysis, detection, electrode, screen-printed, electrochemistry, disposable.



DEVELOPED BY

Electroanalysis group (ELAN) of the University of Burgos.

BUSINESS OPPORTUNITY

- Electronics, IT and Telecomms.
- Biological Sciences.
- Agrofood Industry.
- Measurements and Standards.

PARTNERSHIP

Commercial agreement, License agreement, Technical cooperation: further development, Technical Cooperation: testing new applications; Technical Cooperation: adaptation to specific needs.

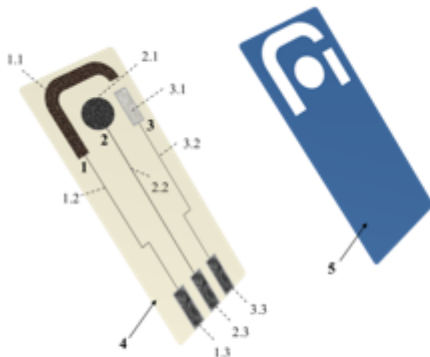
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Technology #XXXXXX

Electrochemical sensor for the “in situ” detection and measurement of chloride ion in fluid samples.



Partes del sensor:

- | | |
|------------------|---------------------------------|
| (1.1, 1.2, 1.3). | Contraelectrodo. |
| (2.1, 2.2, 2.3). | Electrodo de trabajo. |
| (3.1, 3.2, 3.3). | Electrodo de referencia. |
| (4) | Lámina de poliéster. |
| (5) | Material aislante serigrafiado. |

Figura. 1. Sensor detección ion cloruro

TECHNOLOGY SUMMARY

This patented technology is focused on the development of a sensor for the detection and determination of the chloride ion content in fluid samples. This determination is of interest in the diagnosis of diseases, like for example cystic fibrosis, and in the analysis of samples, both food, pharmaceutical and environmental.

BENEFITS

- The developed sensor, which solves the disadvantages of already known sensors, (complex preparation and limit of application), is characterized by being very simple, easy to use, economical and with more sensitivity and versatility. As it presents a low cost, it is possible using it only once as well as being re-used more than 100 times without affecting its operation.
- Regarding to the sensors based on potentiometric methods, the sensor developed in this patent needs less reaction time, only 20 seconds. It can be used in a greater number of matrixes and of more complexity. The addition of electrolytes is not needed, process that requires more preparation in the analysis.

CONTEXT

This new technology allows carrying out the chloride ion measurement without the need to add any reagent, without producing interference and increasing the range of its possible applications, such as: cystic fibrosis diagnosis, analysis of food and pharmaceutical samples, etc.

APPLICATIONS

It presents a high responsiveness in:

- Diagnosis of diseases related to low or high concentration of chloride ion in different biofluids, such as cystic fibrosis, etc.
- Food and beverages industry, like for example, the determination of sodium chloride (salt).
- Pharmaceutical industry.
- Environment, such as studies of water pollution.

Electrochemical sensor for the “in situ” detection and measurement of chloride ion in fluid samples.

IP RIGHTS

Protected by patent P201830271

DEVELOPMENT STAGE

The sensor is developed and ready for being used when connected to a potentiostat.

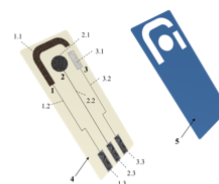


Figura. 1. Sensor detección ion cloruro

Partes del sensor:

- | | |
|------------------|---------------------------------|
| (1.1, 1.2, 1.3). | Contraelectrodo. |
| (2.1, 2.2, 2.3). | Electrodo de trabajo. |
| (3.1, 3.2, 3.3). | Electrodo de referencia. |
| (4) | Lámina de poliéster. |
| (5) | Material aislante serigrafiado. |

KEYWORDS

Sensor, Screen-printed, Electrodes, Electrochemistry, Detection, Analysis, Disposable, Reusable, Chloride, Fibrosis, Cystic, Diagnosis, Diseases, Sweat, Food, Water.

DEVELOPED BY

Electroanalysis group (ELAN) of the University of Burgos.

BUSINESS OPPORTUNITY

- Agrofood Industry.
- Energy
- Biological Sciences
- Agriculture and Marine Resources
- Measurements and Standards
- Protecting man and Environment.
- Other Industrial Technologies.

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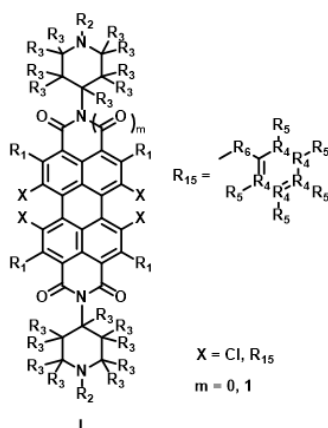
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Technology #XXXXX

PARTNERSHIP

Commercial agreement, License agreement, Technical cooperation: further development, Technical Cooperation: testing new applications; Technical Cooperation: adaptation to specific needs.

Method of preparation and use of derivatives of perylene-diimide (PDI) in different applications such as bioimage or biomarker.



TECHNOLOGY SUMMARY

The present invention provides a methodology for the synthesis of derivatives of perylene-diimide (PDI), perylene-3,4:9,10-tetracarboxidiimide substituted in positions 1, 6, 7 and / or 12, of formula I, asymmetric in the bay positions, for which there was no procurement process, and its use in different applications such as bioimage or biomarker.

BENEFITS

- The available market alternatives show low photo stabilities, are very sensitive to pH or to ionic strength and their fluorescent emission intensities are low. In addition, they usually have low emission wavelengths, so no desirable phenomena such as energy self-absorption or scattering may take place.
- The perylene-diimide (PDI) obtained by this invention have many desirable characteristics that solve the market deficiencies, such as: high fluorescence, high chemical and optical stability, stability against radiation, different wavelengths of fluorescent emission depending on the substituents in that positions and the possibility of an easy functionalization in N and N' positions. In addition, they exhibit high quantum efficiency, which can even reach one unit.

CONTEXT

The large versatility of the developed methodology allows to obtain compounds with two positions of functionalization, allowing to interact with different targets and in this way controlling the biological specificity (what will be detected and to what parts of the cell will it go), and choosing the emission colour in the bay positions for the modulation of the fluorescent emission.

The bioconjugation, chemical strategy to form stable links between different biomolecules, presents some disadvantages, solved using this new proposed methodology. In addition, it avoids having to develop specific systems for each application, which suppose a great cost saving and increases its field of action in multiple sectors.

APPLICATIONS

The potential market is relatively wide due to the versatility of this technology.

- Development of individual kits for bioconjugation.
- Detection of biological contaminating species of high interest in agrofood industry such as enterotoxins or avidin (PDI-Biotin systems).
- Study of epithelial cells (PDI- Mupirocin systems).
- Marking, monitoring or determination of protein biodistribution.
- Monitoring of cell events such as drug administration to target cells and the study of enzymatic functions among others.

Method of preparation and use of derivatives of perylene-diimide (PDI) in different applications such as bioimage or biomarker.

IP RIGHTS

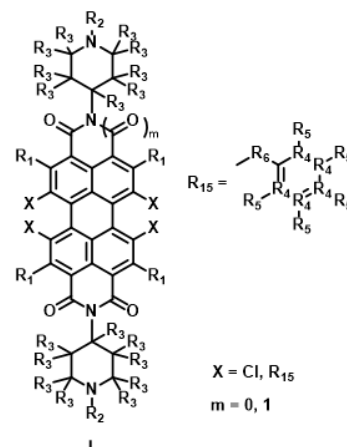
Protected by patent P201830029.

DEVELOPMENT STAGE

The technology related to the synthesis method is developed.

KEYWORDS

Fluorophores, Perylene, Diimides, Method, Bio-conjugation, Biomarkers, Bioimage, Diagnosis, Medicine, Contaminants, Materials, Agrofood, Drugs.



DEVELOPED BY

New Heterocyclic Materials and Supramolecular Chemistry group (SUPRABUR) of the University of Burgos.

BUSINESS OPPORTUNITY

- Agrofood Industry.
- Biological Sciences
- Protecting man and Environment.
- Other Industrial Technologies.

PARTNERSHIP

Commercial agreement, License agreement, Technical cooperation: further development, Technical Cooperation: testing new applications; Technical Cooperation: adaptation to specific needs.

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Technology #XXXXX



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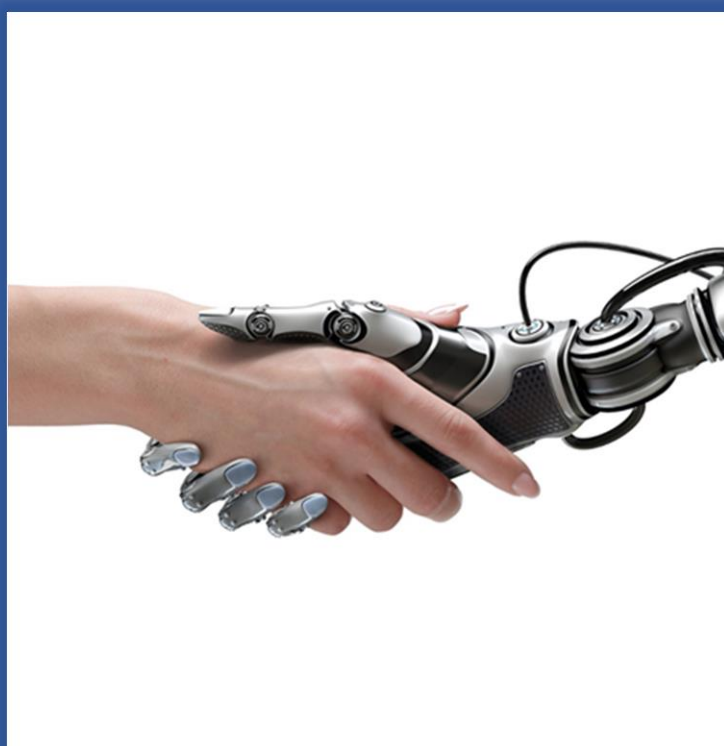
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AGRIFOOD SECTOR



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AGRICULTURAL BIOTECHNOLOGY

Presentation

This research group has more than 15 years of experience in agricultural biotechnology and includes a highly qualified research team in the field of biochemistry and molecular biology. Their research results are directly applicable to the agrifood sector by improving food quality and increasing their added value.

Research Topics

- Improvement of nutritional quality of fruits and their external characteristics.
- Resistance to abiotic stresses, plagues and diseases.
- Cloning and characterisation of genes related to the maturation process of the strawberry.
- Identification and characterisation of genes for drought and salt stress tolerance in tomato and arabidopsis.
- Plant cuticles, fruit cracking of tomato and pepper stripes.
- Proteomics applied to hydrolysed protein.
- Oligosaccharines as elicitors in defence response against pathogens.

Scientific-Technical Services

- Isolation and characterisation of genes for genetic improvement in food plants of interest.
- Peptide sequencing derived from hydrolysed vegetable proteins.
- Study of factors involved in fruit cracking.
- Application of oligosaccharines as elicitors as a defence response against pathogens.

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MICROBIOLOGY AND PATHOLOGY OF PLANTS

Presentation

The group activity pays special attention to the study of bacterial and fungal diseases in horticultural and subtropical crops, mainly avocado, mango fruit, strawberry, cucurbits and olive tree. This group is based in the Department of Microbiology at the UMA, which belongs simultaneously to La Mayora Experimental Centre within the CSIC.

Research Topics

- Biology and pathogenesis of bacteria and phytopathogen fungi: Infection processes. Analysis and characterisation of virulence factors. Functional and comparative genomic analysis. Pathogen-plant-BCA interactions.
- Epidemiology and control of illnesses of horticultural and subtropical crops: population dynamics, genetic structure and resistance mechanisms against pesticides. Important diseases: apical necrosis and mango malformation. Avocado root rotting. Powdery mildew.
- Biocontrol. Strategies compatible with ecological agriculture. Biotechnological approaches: application of bacteria or organic amends. Mechanisms involved in biocontrol.

Scientific-Technical Services

- Chemical and biological control strategies and phytosanitary research.
- Bacteria and fungi detection in plants.
- Diagnosis of bacteria and pathogen fungi.
- Microbiological and toxicity analyses.

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BIOTECHNOLOGY AND ENHANCEMENT OF HORTOCULTURAL SPECIES

Presentation

Research group composed of staff from the UMA and IFAPA (Instituto Andaluz de Investigación y Formación Agraria, Pesquera, Alimentaria y de la Producción Ecológica) - Churriana Centre. This group concentrates its activities on the regeneration and genetic transformation of relevant species within the agrofood business such as strawberries, olives and avocados.

Research Topics

- Study of the physiology of fruit ripening.
- Genetic improvement of strawberry. Control of strawberry ripening by genetic transformation and postharvest physiological analysis.
- Genetic transformation techniques in fruit species, especially olives and avocados.
- Rejuvenation and micropropagation of woody and herbaceous plants. Somatic embryogenesis.

Scientific-Technical Services

- Control of fruit ripening by genetic engineering.
- Micropropagation of woody and herbaceous plants.
- Regeneration and genetic transformation of fruit species for pathogen tolerance.

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BIOTECHNOLOGY AND GENETICS OF AGRICULTURAL SYSTEMS

Presentation

This research group is located in the Department of Cell Biology, Genetics and Physiology (Genetics Area) of the Faculty of Sciences of the University of Malaga. Their scientific activity encompasses the study of plant-pathogen interactions, mainly in the molecular genetics of bacteria and plant viruses.

Research Topics

- Plant-pathogen interactions: resistance to geminiviruses, microbial genetics of plant roots.
- Bioinformatics. Application of the proteomics and functional genomics.
- Genetic and biochemical analysis of DNA replication of sequences.
- Genetic characterisation of species in the horticultural sector.
- Anti-viral strategies.
- Role of post-transductional modifications in virus infection.
- Mechanisms of suppression of the response to jasmonate and its derivatives in the transmission of geminiviruses.
- Interactions between biotic and abiotic stress.
- Mechanisms of suppression of gene silencing mediated by viruses.

Scientific-Technical Services

- Control and phytosanitary research strategies.
- Diagnosis of viruses and bacteria in relevant plant species within the agrofood sector.
- Detection of phytopathogenic viruses and bacteria.
- Development of bioinformatics for application in the proteomics and genomics of plants.
- Training in genetic techniques oriented towards professionals.

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NEW INORGANIC MATERIALS / FUNCTIONAL FOODS

Presentation

Functional foods group is affiliated with the multidisciplinary team of new inorganic materials at the University of Malaga.

Research Topics

- Gas emission treatments in intensive animal farming. For instance, absorption of pollutants produced by livestock such as nitrous oxide, methane, carbon dioxide, ammonia and hydrogen sulphide contained in biogas.
- Enhancement of food quality.
- Functional foods: dairy, sauces, juices, egg-derivatives, cereals, margarines and the like.
- Food preservation processes.
- Waste management: production of biogas, fertiliser with high content of phosphorus.
- Biofuels from biomass (vegetal waste).

Scientific-Technical Services

- Screening of potential functional foods and enhancement of current food supply business by incorporation of additives.
- Food designing based on compatibility between ingredients and additives. Organoleptic analysis. Optimisation of ingredient levels and process conditions on organoleptic properties.

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SYNTHESIS AND APPLICATIONS OF NATURAL PRODUCTS

Presentation

This research group actively co-operates with the department of organic chemistry, Faculty of Sciences. Their efforts are dedicated to the study of photochemistry and natural products to be implemented in areas such as chemical synthesis, nanotechnology, biology and medicine.

Research Topics

- Isolation, structure determination and synthesis of natural products.
- Molecular photochemistry. Reaction mechanisms and synthetic aspects.

Scientific-Technical Services

- Instrumental chemical analysis techniques and structure determination (RMN, GC-MS) for identification and characterisation of compounds found in food.
- Systematic study of natural products for nutrition and dietetics applications.

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RHEOLOGY OF FOODS

Presentation

Characterisation of mechanical behaviour of materials is essential in many industries due to the fact that it allows the investigation of the effect of each component on the viscoelastic response, which is related to stresses and strain rates.

Research Topics

- Rheology of colloidal suspensions.
- Rheology and characterisation of food.
- Rheological and electrokinetic properties of complex fluids, be it colloids or polymers.

Scientific-Technical Services

- Determination of mechanical behaviour, both viscous and elastic components, in foodstuffs and quantification of the acceptable quality level for consumables.
- Investigation of the effect of manufacturing time and expiring date of consumables on their rheological response.

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CATALYTIC PROCESS TECHNOLOGY

Presentation

The research group of Catalytic Process Technology (PROCAT) belongs to Chemical Engineering department. The research activity of PROCAT is focused on applied catalysis for environmental protection, energy conversion and sustainable chemicals production.

Research Topics

- Employment of oils and fats to produce biofuels. New biofuels (solids, liquids and gas).
- Exploitation of by-products for biogas generation.
- Extraction and encapsulation of antioxidants.
- Design of reactors and catalytic processes.
- Catalytic purification of gas effluents. NOx and soot particles removal.
- Catalysis for energy applications. Utilisation and conversion of natural gas, light hydrocarbon and renewable sources for syngas production. Biosolids, biomass and biogas valorisation. Biofuels produced by biomass and algae.
- Development of heterogeneous catalysts for industrial applications.

Scientific-Technical Services

- Testing and characterisation of materials and catalysts.
- Energy valorisation of biomass: sludge from wastewater treatment plants, microalgae, vegetables oils and fats.
- Studies of the use of biomass, biosolids and biogas.
- In-situ chemical reaction monitoring by FTIR-MS.

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PATHOLOGY, GENETICS AND BIOTECHNOLOGY OF AQUACULTURE SPECIES

Presentation

The group of pathology, genetics and biotechnology of aquaculture species studies the genetic and pathological problems affecting fish and mollusc farming in aquaculture. In addition, this team possesses an extensive experience in the analysis and assessment of problems related to pollution and public health in aqueous environment.

Research Topics

- Diagnosis and detection of viruses affecting fish farming.
- Study of immunogens causing bacterial and viral resistance in fish.
- Bacterial pathogenesis in fish and molluscs.
- Microbiology and water biotechnology.
- Design, synthesis and application of antiviral vaccines for fish.

Scientific-Technical Services

- Assessment of the immune response in farmed fish.
- Molecular diagnostics of viruses and bacteria in fish and molluscs.
- Design and evaluation of vaccines.
- Genotyping of individuals and samples.
- Identification of critical points in aquaculture production.
- Microbiological and physicochemical analysis of water.
- Health control of production and aquaculture facilities.
- External certification for aquaculture companies.

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ENGINEERING AND ENVIRONMENTAL MANAGEMENT

Presentation

The Engineering and Environmental Management Group owns the latest equipment for analysis and characterisation of water and soil. Such team comprises highly qualified personnel with expertise in the aforementioned research lines. Experience in the management of waste produced by industry is crucial for the assessment and improvement of recycling as well as recommending measures to address environmental protection.

Research Topics

- Assessment of soil and groundwater contamination.
- Remediation technologies for contaminated soils. Modelling and applications.
- Soil pollution prevention and remediation.
- Wastewater treatment.
- Waste management: industrial, municipal solid waste (MSW) and biomass.
- Lithium ion batteries research and battery recycling.
- Biofuels research.
- Aquaculture: water reuse and control of epizootics.

Scientific-Technical Services

- Chemical and microbiological analysis of potable water.
- Analytical and microbiological evaluation of non-alcoholic drinks.
- Use of whey in goat cheese manufacture.
- Drinking and waste water analysis.
- Waste management assessment.
- Remediation modelling and techniques for contaminated soils.

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PHOTOBIOLOGY AND BIOTECHNOLOGY OF AQUATIC ORGANISMS

Presentation

This research group carry out their scientific activity in two areas, photobiology and the biotechnology of water organisms. The results obtained from their research lend themselves to industrial application in sectors as diverse as the pharmaceutical or foodstuff sectors or that of fish farming.

Research Topics

- Characterisation of fish microbiota by massive sequencing techniques.
- Effects of functional diets on fish microbiota.
- Gene expression analysis in farmed fish by real-time PCR.
- Photoecophysiology of macroalgae and microalgae.
- Resources and plant cartography of macrophytes.
- Climate change in water systems.
- Primary production in extreme ecosystems.
- Microbiology and fish aquaculture.
- Biotechnology of the biofiltration of effluents, mainly fish and pig farms, by means of algae.
- Biocontrol and prevention of illnesses in aquaculture. Bacteriological diagnosis of pathogens in fish. Vaccine development.
- Development and isolation of probiotics.
- Molecular characterisation of probiotics. Effects of microbiota on fish.

Scientific-Technical Services

- Use of biofiltrator algae as functional fodder. Immunostimulant and antioxidant capacity assessments.
- Prevention and biocontrol of aquaculture illnesses. Bacteriological diagnosis of pathogens. Assessment of innate and specific immunological response of farmed fish cultivated. Design and preparation of vaccines.

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WASTE AND ENVIRONMENTAL TECHNOLOGY

Presentation

The research activity of this group focuses on the reuse of lignocellulosic waste and Kraft lignin. Furthermore, a research line in the area of carbon technology is being exploited on carbon catalysis for chemical and environmental applications.

Research Topics

- Development of porous carbon as catalyst support for chemical reactions: olefin production of from alcohols, pollutant removal in gaseous phases (SO_2 , NO_x) and water treatment.
- Thermochemical use of lignocellulosic waste (forest biomass).
- Preparation and characterisation of activated carbon molecular sieves.
- Preparation and characterisation of catalysts.
- Reduction/elimination of pollutants from effluent streams, both liquid and gas.
- Biomass pyrolysis and gasification and industrial waste valorisation.
- Electrocatalysis and energy storage. Design and preparation of carbon-based, metallic and metal oxide electrodes.
- Preparation of carbon/ceramic micro/nanofibres by electrospinning/electrospraying.
- Synthesis of dimethyl ether via catalytic conversion of biomass. Biorefinery.

Scientific-Technical Services

- Charcoal and activated carbon production from lignocellulosic waste.
- Activated carbon preparation from pyrolysis of waste tyres.
- Development of inorganic materials for catalysis, environment and energy applications.
- Efficient elimination of gaseous pollutants (nitrogen oxides and volatile organic compounds) as well as liquid phase.

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ARTIFICIAL OLFACTION

Presentation

Machine Perception & Intelligent Robotics (MAPIR) research group has proven expertise in the development of mobile robot systems such as localisation, mapping, autonomous navigation, computer vision, human-robot interaction and robotic olfaction.

Research Topics

- Gas distribution modelling. Spatial and temporal variability of gas concentration.
- Gas sensing. Detection of volatile substances and signal conversion of information. Artificial olfaction / electronic noses.
- Odour identification and classification of volatile samples within a set of known odour category.
- Autonomous robots.
- Computer vision. Acquisition, processing, analysis and understanding of digital images.

Scientific-Technical Services

- Development of telepresence robotics.
- Data analysis and decision making via artificial intelligence and machine learning.
- Autonomous vehicle development, e.g., robots, cars, drones.
- Detection, identification and classification of volatile compounds and odours.
- 3D modelling.
- Smart environments.

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BUSINESS INTELLIGENCE LABORATORY

Presentation

The Business Intelligence Laboratory hold the highest technological specialisation to reach first class companies as well as to endow their business approaches with intelligence and efficiency. They belong to the Computational Intelligence research group.

Research Topics

- Business Intelligence applied to business processes.
 1. Consultancy of intelligent technological development: artificial intelligence for digital transformation.
 2. Smart Visual Data: beyond data volume, it is aimed at quality and effectiveness.
 3. Design of Business Intelligence boards: higher efficiency in business processes, business value, and smart growth.
- Business Intelligence digital marketing.
 1. Decision-making support systems: inside information for successful actions.
 2. Intelligent analysis: from data to strategic knowledge.
 3. Competitive environment monitoring.
 4. Infrastructure of business Intelligence: highly specialised online platform.
 5. Smart advertising: from big data to smart data.
 6. Analysis: data, business impact.
- Travelling Intelligence.
- Business Intelligence in corporate finance: monitoring and performance analysis, forecast of market indexes, decision-making support.

Scientific-Technical Services

- Precision farming for productivity optimisation.
- Organic livestock and animal welfare.
- Real-time harvest monitoring.
- Market analysis of the competition to adjust production –forecast.
- Weather forecast for harvest planning.
- Geomarketing.
- Marketing analysis of farming products.
- Google training course in digital marketing: Google Activate program.

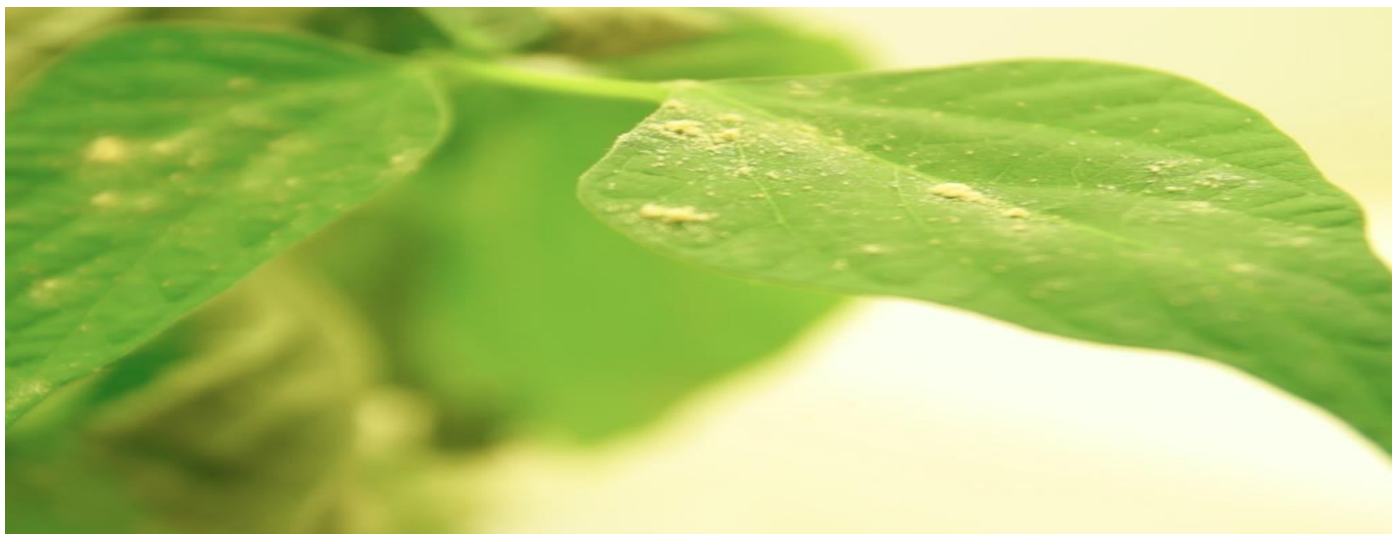
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IDENTIFICATION AND DIAGNOSIS OF PATHOGEN FUNGI



TECHNOLOGY SUMMARY

Field kit consisting of multi-well plates containing all the active substances authorised to test for the control of the pathogenic fungus Botrytis, which affects many types of crops. Such kit allows a rapid screening in each sample showing within a few days the most effective fungicide for a particular case study.

CONTEXT

Plant health is usually threatened by diseases which can affect the plant itself or its fruits even when they are surrounded by optimal maintenance conditions. As a consequence of diseases, plants can show deformation, stains or rotten leaves/fruits followed by leaf falling or discolouration. Diseases in plants are related to fungi, bacteria and viruses that can be spread by wind, rainwater splashing, insects, infected seeds or addition of infected soil. The affected area can vary from a small discoloured patch to a large irregularly shaped area of the plant/fruit.

BENEFITS

QUICK IDENTIFICATION: Rapid detection and reliable for fungi pathogens.

ECONOMICAL: It avoids the utilisation of needless fungicides.

VERSATILE: It can be apply to both multiple crops and a huge variety of pathogens.

APPLICATIONS

Detection and identification of pathogens for control of plant diseases as well as in horticultural and subtropicals crops.

APICAL NECROSIS AND MALFORMATION OF MANGO
ROOT ROT OF AVOCADO
POWDERY MILDEW OF CUCURBITS
TUBERCULOSIS OF OLIVE TREE

IDENTIFICATION AND DIAGNOSIS OF PATHOGEN FUNGI

IP RIGHTS

The technology is not patented although it is available for demonstration and field testing.

DEVELOPMENT STAGE

Technology demonstrated in relevant environment.

KEYWORDS

FUNGICIDE
PATHOGEN FUNGI
BOTRYTIS
PLANT DISEASES



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Technology #1

DEVELOPED BY

The group of Biology and Control of Plant Diseases from the Institute for Mediterranean and Subtropical Horticulture "La Mayora".

BUSINESS OPPORTUNITY

The technology can be exploited in the agriculture sector.

PARTNERSHIP

Searching for industrial partners/licensee for the technology to be exploited in the market.

FRUIT AND VEGETABLES ENRICHED WITH VITAMIN C



TECHNOLOGY SUMMARY

Among the components that improve the nutritional qualities of the fruits are the vitamins. Numerous protein coding genes which are involved in different metabolic pathways have been identified and isolated, for example, the biosynthesis of L-ascorbic acid in plants. The present technology allows to generate plants with an increased content of vitamin C, leading to a significant enhancement in their nutritional value.

CONTEXT

Plant responses to adverse environmental conditions is complicated. It requires a profound knowledge of the genes and processes involved for plant growth under these negative environmental conditions. In our group we have identified essential genes for plant responses to abiotic stresses. In our laboratory we are using several approaches such as biochemical, genetic and cell biology in order to understand the mechanisms by which these genes are expressed.

APPLICATIONS

The present technology, with special impact in the field of the vegetal biogenetics, is applicable for the production of fruits and vegetables with a higher content of vitamin C and nutritional properties.

BENEFITS

NUTRITIONAL: Increase in nutritional properties of fruits and vegetables.

ORGANOLEPTICS: Organoleptic properties are preserved, which results in an economic value added.

RESISTANCE AGAINST OXIDATIVE STRESS: High levels of vitamin C is beneficial for plants during growth and development.

APICAL NECROSIS AND MALFORMATION OF MANGO
ROOT ROT OF AVOCADO
POWDERY MILDEW OF CUCURBITACEAS
TUBERCULOSIS OF OLIVE TREE

FRUIT AND VEGETABLES ENRICHED WITH VITAMIN C

IP RIGHTS

The technology is protected by a granted patent in Spain.

DEVELOPMENT STAGE

The technology has been tested in laboratory.

KEYWORDS

VITAMINS
ENRICHED FOODS
GENETICS
FRUITS
VEGETABLES



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Technology #2

DEVELOPED BY

The group of plant breeding and biotechnology in the Institute for Mediterranean and Subtropical Horticulture "La Mayora".

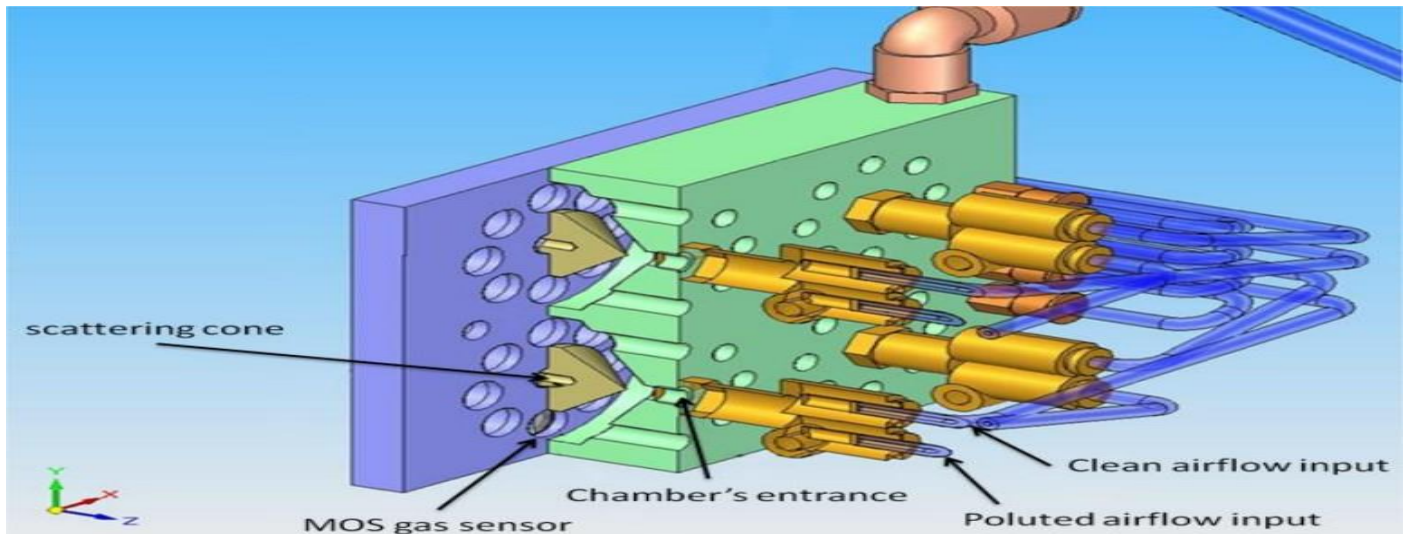
BUSINESS OPPORTUNITY

Improvement of properties of edible plants for animals unable to synthesise vitamin C.

PARTNERSHIP

Searching for companies interested in licensing agreements and/or collaborations to develop such technology.

ARTIFICIAL OLFACTION FOR GAS QUANTIFICATION



DESCRIPTION

The present technology consists of a versatile modular electronic system of artificial olfaction which allows to quantify both concentration and composition of the surrounded gas together with its temporal and spatial evolution. The system can be arranged as a function of its intended application.

CONTEXT

There is a huge number of simple and complex substances responsible for odour, to a greater or lesser extent, depending on its equilibrium vapour pressure or volatile nature. Much information can be extracted from the chemical composition of the odour such as nature of the sample, concentration and conditions of the sample. Currently, only a few prototypes of electronic nose are available in the market presented as simple and compact devices. In theory, there is no a limitation in terms of number of detectors. However, a previous specific design must be carried out as the quantity of detectors increase in order to optimise the size of the equipment.

BENEFITS

DATA COLLECTION: temporal and spatial data collection that allows further processing via statistics and artificial intelligence.

EASY INTEGRATION: the device can include a vast number of intelligent auxiliary modules, regardless the connection order and type of module.

PORTABLE: The system can be portable combining an auxiliary battery module for this purpose.

APPLICATIONS

The technology is applicable to environment, agriculture and food industry, among others. The device can guarantee quality assurance in food processing industry.

AGRIFOOD
ELECTRONIC NOSE
DETECTION AND IDENTIFICATION
INSTRUMENTATION

ARTIFICIAL OLFACTION FOR GAS QUANTIFICATION

IP RIGHTS

The invention is protected by a granted patent in Spain.

DEVELOPMENT STAGE

The technology has been tested in laboratory and some real scenarios and environments.

KEYWORDS

GAS DETECTION
ELECTRONIC NOSE
ODOURS
ARTIFICIAL OLFACTION



DEVELOPED BY

The Machine Perception and Intelligent Robotics (MAPIR) research group, University of Málaga.

BUSINESS OPPORTUNITY

Technology with a great potential in several areas such as environment and agrifood, mainly.

PARTNERSHIP

Searching for companies interested in licensing agreements and/or technical collaborations for the technology to be commercialised.

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Technology #3

PRODUCTION OF CAPSULES OF PROBIOTICS FOR FISH



TECHNOLOGY SUMMARY

Shewanella PDP11 is a potential probiotic for aquaculture fish. However, when incorporated into feed for oral administration, this probiotic completely loses its viability within a short period of time. Thus, development of a preparation is required in order to maintain viability of this probiotic which must be provided to fish independently from feed. The present invention consist of a preparation of probiotic enclosed in spherical capsules with uniform morphology and size.

CONTEXT

Incorporation of probiotic into fish diets has a positive health effect. The mechanisms proposed for action mode of probiotic are: (i) pathogen suppression; (ii) an immunostimulation effect; and (iii) improvement in nutrition. The probiotic Shewanella PDP11 is a bacterium isolated from the skin of healthy breams. It is known that such probiotic can give rise to specific immunity to bacterial pathogens in gilthead bream and sole.

BENEFITS

STABILITY: capsules are stable in the aqueous environments.

LIFETIME: probiotic enclosed in capsules leads to a longer lifetime, which may allow mass production.

INDEPENDENT ADMINISTRATION: which hinders inactivation during feed manufacture.

SIMPLE PRODUCTION: economical equipment.

AUTHORISED COMPOUNDS: capsules compatible with food industry.

APPLICATIONS

Control of diseases and growth rate enhancement in fish through incorporation of probiotic PDP11 in feed.

AGRIFOOD
FISHERIES
MARINES RESOURCES
AQUACULTURE

PRODUCTION OF CAPSULES OF PROBIOTICS FOR FISH

IP RIGHTS

These series of inventions are protected by granted patents in Spain. IP rights belong to the University of Málaga.

DEVELOPMENT STAGE

The technology has been tested in real scenarios and environments.

KEYWORDS

AQUACULTURE
PROBIOTIC
ENCAPSULATION
FEED



DEVELOPED BY

The group of Photobiology and Biotechnology of Aquatic Species of the Faculty of Science of the University of Málaga.

BUSINESS OPPORTUNITY

Optimisation of rearing, breeding and fattening processes of aquaculture species for fish farming. Efficiency and sustainability.

PARTNERSHIP

Searching for companies interested in licensing agreements and/or collaborations to develop such technology.

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Technology #4

GENERATION OF ABSORBENTS FOR WATER DEPURATION



DESCRIPTION

These generation methods have been designed for preparation of absorbent materials intended to decontamination of drinking water containing organic compounds and heavy metal ions. Clay minerals included in the Smectite group are used as raw materials. Methods for synthesis of such materials are both economical and easily scalable, leading to a wide range of absorbent materials.

CONTEXT

Uncontrolled dumping causes serious problems to water resources. Thus, water contamination has led to more restrictive regulations reducing the levels of pollutants permitted to be discarded. Smectite clays are characterised for a high specific surface area, and hence a high adsorption/absorption capacity. Therefore, these clays can absorb a wide range of compounds from organic molecules (i.e. oils) to heavy metals via ion exchange.

BENEFITS

HUMAN CONSUMPTION: properties of absorbent materials enable water purification down to parameters fit for human consumption.

ECONOMICAL: cost-effective compared to previously established methods.

EFFECTIVE: this method can quantify the ideal concentration of absorbent material for accurate decontamination

APPLICATIONS

The technology is applicable mainly to environment in the area of water treatments such as water conditioning, removal of heavy metals and removal of organic compounds.

ENVIRONMENT AND ENERGY

CHEMISTRY

FISHERIES AND MARINE RESOURCES

AGRICULTURE

GENERATION OF ABSORBENTS FOR WATER DEPURATION

IP RIGHTS

The invention was developed in collaboration with a company. This technology is protected by a granted patent in Spain.

DEVELOPMENT STAGE

The technology has been tested in real scenarios and environments.

KEYWORDS

DECONTAMINATION
WATER TREATMENTS
ABSORBENT MATERIALS
CLAYS



DEVELOPED BY

The Inorganic Chemistry, Crystallography and Mineralogy research group of the University of Málaga in the Faculty of Sciences.

BUSINESS OPPORTUNITY

The present technology can be applied to factories where a huge volume of water is consumed in their processes such as washing and rinsing before conditioning for agricultural irrigation, treatment of feed water, processed or waste water for their reuse.

PARTNERSHIP

Searching for companies interested in licensing agreements and/or collaborations to develop such technology.

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Technology #5

CLASSIFICATION METHOD FOR SEA BASS STOCKS



TECHNOLOGY SUMMARY

Assessments of genetic structures for both wild and farmed fish populations are essential to guarantee traceability and food safety in processed sea bass products. This invention provides with a new tool based on microsatellite markers, which consists of PCR coamplification and analysis of 6 loci jointly in order to classify sea bass species.

CONTEXT

Sea Bass (*Dicentrarchus labrax*) is widely farmed in European aquaculture. Success in aquaculture relies on breeding control, better knowledge of fish biology, and technological innovations. Due to the large number of individuals in sea bass farming, hard discrimination between adult fish, eggs and young larvae causes difficulties upon control and management of breeding stocks.

BENEFITS

TIME & COST SAVING: multiplex PCR amplifies several different DNA sequences simultaneously.

ACCURATE: low risk of error due to minor handling.

PRECISE: simple, robust and reproducible methodology.

SMALL QUANTITY OF DNA: it can be extracted from eggs, larvae, fins, blood, dead tissues, or processed fish.

ENHANCED STOCKS: useful for quality control.

APPLICATIONS

Analyses of fish populations, both individually and as a group, to determine accurately kinship relations. Genetic characterisation for wild and farmed fish populations.

BIOTECHNOLOGY

FISHERIES

MARINES RESOURCES

AQUACULTURE

CLASSIFICATION METHOD FOR SEA BASS STOCKS

IP RIGHTS

The invention is protected by a granted patent in Spain.

DEVELOPMENT STAGE

The technology has been tested in laboratory.

KEYWORDS

GENETICS
DETECTION KIT
PCR TECHNIQUES
SEA BASS



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Technology #6

DEVELOPED BY

The group of Cell Biology, Genetics and Physiology of the Faculty of Science of the University of Málaga.

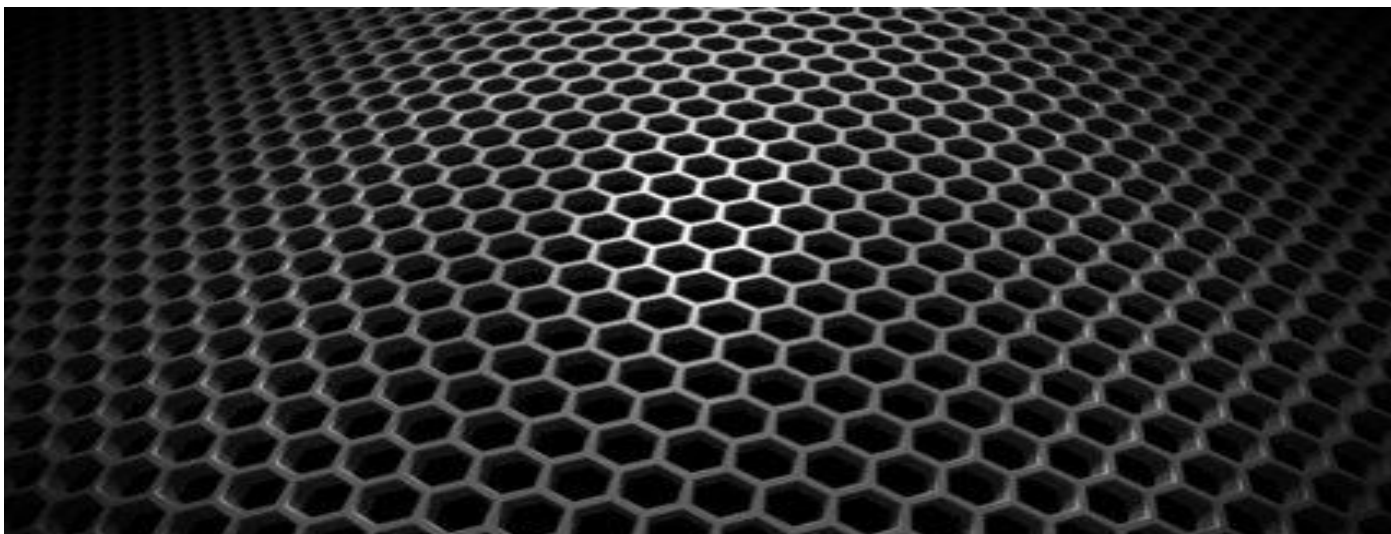
BUSINESS OPPORTUNITY

Optimisation and efficiency of breeding for farmed sea bass in aquaculture. Traceability of sea bass processed products.

PARTNERSHIP

Searching for companies interested in licensing agreements and/or collaborations to develop such technology.

ADVANCED PROPERTIES OF CARBONACEOUS MATERIALS



TECHNOLOGY SUMMARY

This invention consists of fibrous carbonaceous materials characterised by optimised properties such as high specific surface area and excellent resistance to oxidation. At least a carbonaceous precursor together with a chemical agent are needed to produce such materials.

CONTEXT

In the last decades, there has been an exponential growth in the utilisation of carbon fibres or similar elongated carbon structured materials such as membranes, meshes and grids due to their unique chemical, mechanical, electrical and magnetic properties.

BENEFITS

ECONOMICAL: precursors are cost-effective.

SIMPLE PREPARATION: processes are simpler, hence a positive effect on costs.

ENVIRONMENTALLY FRIENDLY: sustainable preparation processes.

APPLICATIONS

Valorisation and transformation of biomass and industrial coproducts, catalysis, adsorbents for environmental applications in water treatments and gas effluents, electrodes for water depuration, energy storage and energy conversion.

ENVIRONMENT

CHEMISTRY

ENERGY

MATERIALS

ADVANCED PROPERTIES OF CARBONACEOUS MATERIALS

IP RIGHTS

The invention is protected by a granted patent in Spain. IP rights belong to the University of Málaga.

DEVELOPMENT STAGE

The technology has been tested in laboratory.

KEYWORDS

CARBON

BIOMASS

CATALYSIS

CARBONACEOUS MATERIALS

WASTE



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Technology #7

DEVELOPED BY

The Waste and Environmental Technologies research group in the Chemical Engineering department, Faculty of Science, University of Málaga.

BUSINESS OPPORTUNITY

This technology can be relevant to a wide range of industries from valorisation of biomass, biorefinery, adsorbents for organic compound, heavy metals, nitrates, nitrites, gas effluents to electronic devices, transport, environment and the like for energy storage applications.

PARTNERSHIP

Searching for companies interested in licensing agreements and/or collaborations to develop such technology.



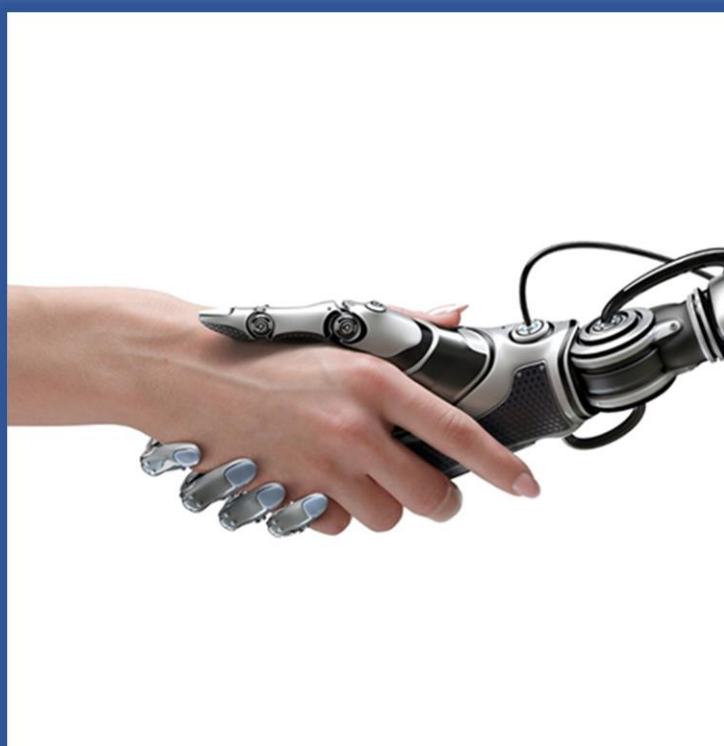
universidade de aveiro
theoria poiesis praxis

Interreg
Sudoe



TuRBO  **Sudoe**

European Regional Development Fund



R&D&I PORTFOLIO

AGRIFOOD SECTOR

MARIA JOÃO CARDOSO

Title

Centre for Environmental and Marine Studies (CESAM)

Presentation

CESAM is a multi- and interdisciplinary research unit connecting environmental & marine sciences, singular in the Iberian Peninsula, with a local unique estuarine ecosystem (Ria de Aveiro), including researchers from 5 Departments of the University of Aveiro and also members from the University of Lisbon.

Scientific-Technical Services

- Development of bivalve depuration systems using fage therapy
- Studies on photodynamic therapies as alternatives for conventional antimicrobial agents
- Meteorological and climate changes predictions
- Internal/external air quality measurements
- Measurement and characterization of emissions to air
- Studies on aerodynamics and particle dispersion
- Studies and settlement of plant growth promoting rizobacteria for applications in saline agriculture
- Development of traceability and anti-counterfeit systems using nucleic acids
- Plant micropropagation
- Studies on new approaches for plant defense, without fungicides
- Tests for cultivars' selection
- Assessment of efficacy and ecological safety of plant protection products using an integrated ecotoxicological toolbox
- Microbial contamination source tracking using genetic comparison techniques
- Studies on fuel combustion behavior
- Studies on biomass usage for fuel gas production
- Studies on biomass usage for biochar production
- Studies on chemicals' health and environmental impacts by analysis of gene differential expression of the model organism *Enchytraeus crypticus*
- Development of customized modular systems for integrated multitrophic aquaculture
- Development of fingerprinting and traceability systems for marine products using molecular tools

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Title

Aveiro Institute of Materials (CICECO)



Presentation

The associate laboratory CICECO – Aveiro Institute of Materials, formerly CICECO-Centre for Research in Ceramics and Composite Materials, was created in March 2002 at the University of Aveiro, Portugal, with the mission of developing the scientific and technological knowledge necessary for the innovative production and transformation of ceramics and organic-inorganic hybrids and materials for a sustainable development.

CICECO is the largest Portuguese institute in the field of materials science and engineering, with over 370 people comprising 46 academic staff, 37 full-time researchers and, in December 2016, 89 post-doctoral associates, 108 PhD students and 81 other students. Activities are supported by 12 technicians and administrative personnel.

Scientific-Technical Services

- Detection of low concentration contaminants by Raman spectroscopy
- Food industry residues valorization by extraction and/production of added-value co-products (ex: PHA, bioethanol)
- Characterization of raw materials
- Development of edible biofilms
- Development of modified packaging surfaces for better properties
- Development of nanofiber membranes
- Studies on biopolymer functionality, such as polysaccharides and proteins, and their use to produce nano-structured materials
- Development of biorefinery concept to create processes of fractionation and chemical/biotechnological transformation of biomass into chemicals, fuels and (nano)materials, at laboratory, pilot and industrial scales, adding value to agro-forest resources

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Title

Organic Chemistry, Natural Products and Food Stuff
Research Unit (QOPNA)



Presentation

The main objectives of the Organic Chemistry, Natural Products and Food Stuff research unit are centered in three main areas, namely organic synthesis, mass spectrometry and food chemistry/biochemistry. The researchers involved will pursue the objectives of their own areas but also the common scientific interests, mainly centered in the structural characterization of natural products. Such collaborative approach will be also extended to other national and international research groups, looking for interdisciplinary studies and assessment of the potential applications for the new products.

Vision: to become a leading inter-disciplinary European Research Laboratory studying bioactive compounds, through organic synthesis and isolation from natural sources and further application like as health promoting materials and/or as functional foods;

Mission: Development of scientific and technological knowledge in the discovery, preparation and transformation of naturally related bioactive compounds and materials in the sustainable way.

Scientific-Technical Services

- Isolation, characterization and application of cell wall polysaccharides
- Food chemical composition characterization and development of non-destructive and/or non-invasive methods for food analysis
- Application of high-pressure technology on non-thermal/cold pasteurization, creation/development of new food products and other biotechnological applications
- Characterization of changes during food processing and preservation and its correlation with food chemical composition and sensorial characteristics
- Development of new methodologies to study food aromatic profiles
- Development of new products and processes for the food industry
- Studies on food industry residues valorization
- Establishment of new synthetic methodologies leading to natural compounds and related analogues
- Structural characterization of organic compounds and biomolecules
- Proteomics and lipidomics

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Title

GEOBIOTEC – Geobiosciences, Geoengineering and Geotechnologies



Presentation

GEOBIOTEC was created with a mission to explore the geological, biological, physical and chemical processes that shape the Earth's environment, with emphasis on the role of humans as an agent of change aiming the sustainable development. GEOBIOTEC is now the largest Portuguese research unit in the field of Earth Sciences, comprising 75 integrated researchers with PhD degree and 65 other researchers. GeoBioTec is dedicated to understanding the Earth as an integrative system. Its mission is to explore the geological, biological, physical and chemical processes that shape the Earth's environment, with emphasis on the role of humans as an agent of change aiming the sustainable development.

General Objectives: Based on well-known methods of study in our scientific field and on an excellent laboratorial infrastructure in the areas of geophysics, geochemistry, biology, pedology, petrology, mineralogy, industrial minerals, geomaterials, geotechnics, isotope geology, hydrogeology, structural geology, volcanology and remote sensing, the Unit aims at a better, deeper knowledge of: a) certain aspects of the geology of Portugal (continent and the Azores islands); b) the environmental conditions related to groundwater, rivers, soils, plants and monument stone determined by geogenic and anthropogenic factors in certain areas; c) the exploration, characterisation, processing, specification, application and evaluation of raw materials; d) physical and chemical properties of special clays and sands traditionally used as curative or healing materials; e) physical and chemical degradation mechanisms and products of natural stones, mortars and cements.

Scientific-Technical Services

- Characterization of food products (such as water, olive oil and wine) concerning radiogenic isotopes for geographic origin determination (fingerprinting)
- Studies on soil phytoremediation and phytomining
- Analysis of contaminants in waters, soils and plants by ICP-MS
- Characterization of geologic materials

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Title

Other research institutes



Presentation

The University of Aveiro holds other research institutes which experts who may provide services and technologies with transversal application to all industries.

Expertise and competences

- Design
- Marketing
- Cognitive neurosciences applied to consumers
- Communication sciences and technologies
- Electronic engineering
- Electrical engineering
- Mechanical engineering
- Informatics engineering
- Automation and robotics
- Telecommunications
- Social sciences
- International development and cooperation
- Economics and internationalization of business
- Energy efficiency and sustainability
- Industrial and logistics management

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Title

Institute of Environment and Development (IDAD)



Presentation

IDAD – Institute of Environment and Development is a non-profit scientific and technical association of public utility founded in 1993. IDAD has an extensive experience and provides integrated support to environmental needs that companies have in different areas.

IDAD has a broad expertise in the coordination of multi-sectorial projects ranging from air quality to water resources, flora and fauna, landscape, social psychology or public health working with teams of diverse specialists who provide different types of intervention.

Services

- Strategic and planning studies
- Environmental monitoring and impact
- Characterization of gaseous emissions
 - Stack sampling
 - Sampling done at the workplace
 - Analyses of SO₂, NO_x, H₂S, fluorides, chlorides, particles, metals and dioxins
 - Sampling of landfill gas
- Physicochemical characterization of water and wastewater
 - Domestic sewage and industrial effluents
 - Surface water and groundwater
- Characterization of indoor air quality
 - Determination of temperature, relative humidity, analyses of VOCs, CO, CO₂, O₃, NO₂, HCl, NH₃, SO₂, H₂S, HCHO particles
 - Analyses of bacteria and fungi
- Continuous monitoring of air pollution using a mobile laboratory – LabQAr
 - SO₂, NO_x, PM₁₀, O₃, CO, BTX
 - Meteorological data
- Air quality monitoring
 - Total suspended particulate matter, PM₁₀, PM_{2.5} and metals
 - Polycyclic aromatic hydrocarbons (PAH)
 - Dioxins and furans
 - Hydrocarbons
 - Acidic compounds and particulate derivatives
- Mapping atmospheric pollution using passive diffusers
 - SO₂, NO_x, BTX
- Noise
 - Determining discomfort levels
 - Assessment of workers' exposure to noise

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Title

Central Analyses Laboratory (LCA)



Presentation

Central Analyses Laboratory (LCA) is an executive unit of the University of Aveiro responsible for performing and providing analysis service to internal and external entities. The aim of LCA entails the provision of quality services to the University's researchers in addition to asserting itself as a qualified service provider to public and private entities, thus optimising and maximising the instrumental resources and skills available in the LCA and in the University in general.

Services

- **Analysis by ICP**
Determination of the content of several elements in different samples (natural water, wastewater, synthesis or biological materials, rocks, soil samples, sediments, air filters, etc.) by ICP-OES and ICP-MS analysis.
- **X-ray diffraction of polycrystalline materials**
Determines the crystalline phases in powders, at a temperature ranging between 77 K and 700 K and analyses the crystalline phases, the texture and residual stress of solid materials and thin films.
- **Isotopic analysis**
Isotopic ratio determination by Thermal Ionization Mass Spectrometry (TIMS) of Rb/Sr and Sm/Nd radioactive decay systems, in a wide spectrum of earth materials ranging from rocks, minerals, fossils, soils, waters and fluids. This data may be used in geochronology, petrology and geochemistry studies, also in paleobiological evolution, paleoclimate change and environmental research as well as in the certification and authentication of products (water, wine, etc.).

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Title

Industrial Quality Laboratory (LIQ)



Presentation

Industrial Quality Laboratory (LIQ) is a technical and scientific association, of which the University of Aveiro holds 80% of the shares, and is one of the UA's interface units with the economic agents. It aims to provide services and support to several sectors, ranging from the industrial to the commercial, including its infrastructures and facilities, via accredited testing services, calibration services, analysis of electrical installation projects and technical inspections.

The Trials and Metrology Laboratories and the Inspection Services are accredited by IPAC – Portuguese Institute of Accreditation – and are therefore included in the Portuguese Quality System.

The Trials Laboratory is acknowledged in the scope of the following international agreements:

- ENEC – European Agreement for the certification of lighting equipment, its components, information and technology equipment, as well as several electric and electronic components
- CCA – Cenelec Certification Agreement for low voltage electronic products
- KEYMARK – Certification trademark for household appliances (white goods)

Services

- Testing laboratory
 - Low-voltage switchgear
 - Light fittings
 - Domestic appliances (white goods)
 - Electrical resistance
 - Electronics, EMC and noise
- Inspection of facilities and project analysis

Analysis of electrical installation projects and inspection of Type C electrical installations (ERIEL – Regional Entity of Electrical Installations in the scope of CERTIEL's performance).
- Metrology laboratory for the following units:
 - Electrical
 - Dimensional
 - Temperature and humidity
 - Pressure
 - Mass
- Inspection of sports equipment

(Decree-Law No. 100/2003 of 23rd May)

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PRODUCTION METHOD OF A NEW RECOMBINANT COLLAGENASE FOR COLLAGENS DIGESTION



TECHNOLOGY SUMMARY

Method for obtaining collagenase with high collagenolytic activity, through a process based on recombinant DNA technology. This new process enables collagenase purification e isolation through a simple and economical procedure, obtaining an active enzyme with remarkable storage stability.

CONTEXT

Collagens are fibrous molecules with high proteolytic resistance and with structural and regulator roles in animal tissues. Collagenases digest collagens and are crucial for cell and tissue manipulation, treatment of human pathologies associated to excessive collagen deposition and treatment of wounds that need necrotic tissues debridement. However, commercially available collagenases have high production costs and restricted storage stability.

BENEFITS

HYDROLYZING ACTIVITY ON SEVERAL COLLAGEN

TYPES: type I (major component of connective tissues, i.e. bone skin), type II (cartilages) and type III (blood vessels).

MORE EFFICIENT, INEXPENSIVE AND FASTER: purification and isolation relies on a single chromatography step.

HIGH STORAGE STABILITY in both lyophilized and solution forms.

EFFICIENT DOSE/EFFECT RELATION: proven activity on collagen from cultured osteoblasts, without associated cytotoxicity.

This technology is based on cloning and recombinant expression of an *Aeromonas* spp. collagenase gene. The genetic construction involves the inclusion of a signal peptide and a histidine tail, which effectively contribute for obtaining a pure, stable and non-toxic enzyme.

APPLICATIONS

Collagenase obtained by this method can be used in the following applications:

CELL AND TISSUE CULTURE

WOUND DEBRIDEMENT

TREATMENT OF DUPUYTREN'S DISEASE

MEAT TENDERIZE AND PROCESSING

TANNERY INDUSTRY (facilitates dyeing process and leather treatment)

PRODUCTION METHOD OF A NEW RECOMBINANT COLLAGENASE FOR COLLAGENS DIGESTION

IP RIGHTS

National patent granted.

DEVELOPMENT STAGE

TRL4-5: method validated in the laboratory, with small- and large-scale prototypes.

Preclinical research - molecular and biochemical characterization, established cytotoxic effect. The results of the cytotoxicity tests are quite promising with regard to product safety.

KEYWORDS

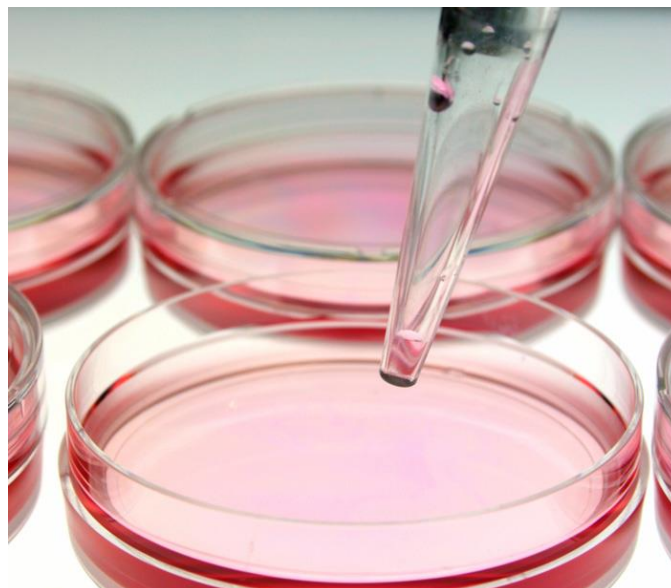
COLLAGENASE

COLLAGEN

RECOMBINANT ENZYME

CALL AND TISSUE CULTURE

STABILITY



DEVELOPED BY

Researchers of Centre for Environmental and Marine Studies (CESAM) of the University of Aveiro.

BUSINESS OPPORTUNITY

Technology transfer by licensing.

Testing of new applications.

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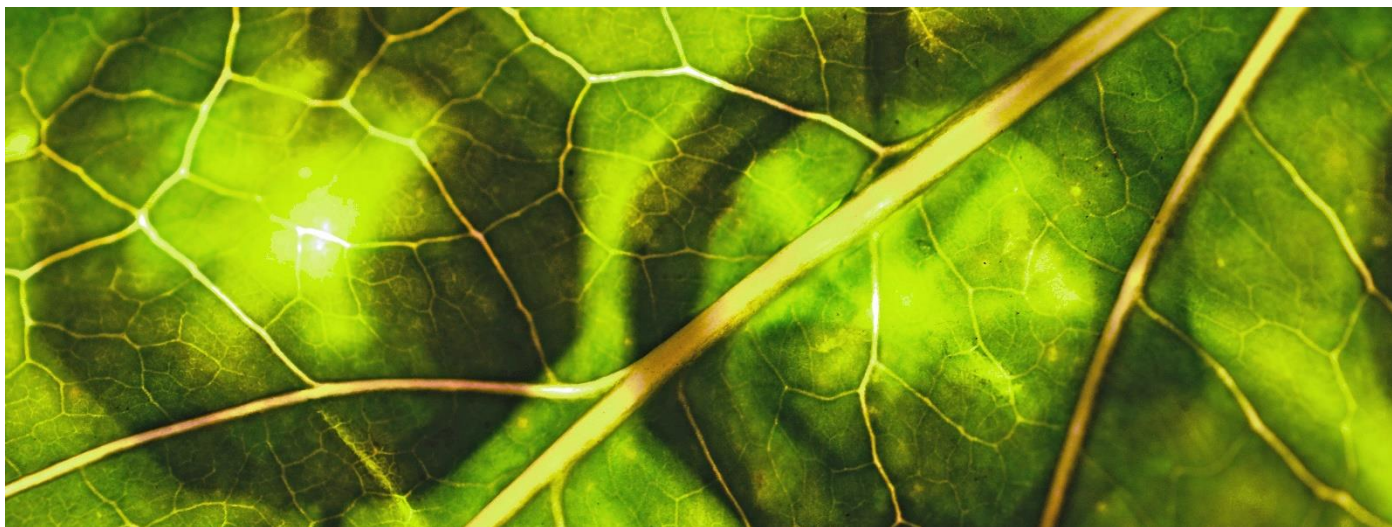
Technology #CI12022

PARTNERSHIP

The University of Aveiro seeks partners within the sector of production/purification of bioactive substances for scientific and clinical research applications.

The University is also interested in partners in tanning, food (namely for meat tendering), pharmaceuticals and cosmetics industries.

FAST AND NON-SEQUENTIAL MEASUREMENT METHOD FOR THE LIGHT RESPONSE OF CHLOROPHYLL a FLUORESCENCE



TECHNOLOGY SUMMARY

New method for the measurement of the in vivo emission of chlorophyll a fluorescence by photosynthetic organisms, through the generation of light-response curves with independent observations, measured in a non-sequential and much faster way than the existing methods. The method combines the (i) projection in the sample of spatially separated light beams of different intensity or quality, using a digitally-controlled projector, with (ii) the measurement of the emitted fluorescence as a response to each light beam using an image fluorometer.

CONTEXT

The measurement of the in vivo emission of chlorophyll a fluorescence using a type of instrument called "pulse modulation amplitude fluorometer" is a technique widely used in fundamental and applied studies on the photosynthetic activity of plants, lichens, algae and other photosynthetic organisms. One of the most commonly used methods consists in the measurement of "light response curves", based on the quantification of fluorescence emission of a sample exposed to different levels of light intensity.

The methods currently used are affected by two main problems: they are time consuming and based on independent measurements. This technology enables the construction of light response curves consisting of independent measurements in a much faster way than any previously described method.

BENEFITS

NON-SEQUENTIAL MEASUREMENTS

TEMPORALLY-INDEPENDENT MEASUREMENTS

MUCH FASTER than the established methods.

HIGH FLEXIBILITY: to define and control the range of light intensity and color applied to the samples.

APPLICATIONS

Method to be used as a modular component to couple to fluorometry imaging systems, with several applications in photosynthetic organisms:

EVALUATION OF PHYSIOLOGIC STATES
 PREDICTION OF VARIATIONS IN PHOTOSYNTHETIC
 EFFICIENCY UNDER DIFFERENT LIGHTING CONDITIONS
 IDENTIFICATION AND SELECTION OF VARIETIES WITH
 HIGHER PHOTOSYNTHETIC EFFICIENCY

FAST AND NON-SEQUENTIAL MEASUREMENT METHOD FOR THE LIGHT RESPONSE OF CHLOROPHYLL a FLUORESCENCE

IP RIGHTS

National patent granted.

DEVELOPMENT STAGE

TRL 4: tested in laboratory and available for presentation.

The method was extensively tested in a wide variety of samples and measurement conditions. Protocols and operating parameters were defined enabling to guide the development of new equipment (Serôdio et al. 2013 Plant Physiology).



KEYWORDS

CHLOROPHYLL a FLUORESCENCE

PULSE AMPLITUDE MODULATION (PAM) FLUOROMETRY

LIGHT CURVES

DIGITAL PROJECTOR

LIGHT MASK

DEVELOPED BY

Researchers of Centre for Environmental and Marine Studies (CESAM) of the University of Aveiro.

BUSINESS OPPORTUNITY

License agreement.

Joint further development.

Testing of new applications.

Adaptation to specific needs.

PARTNERSHIP

The University of Aveiro seeks partners within the sector of electronic equipment development and manufacture, as well as other universities and research institutes

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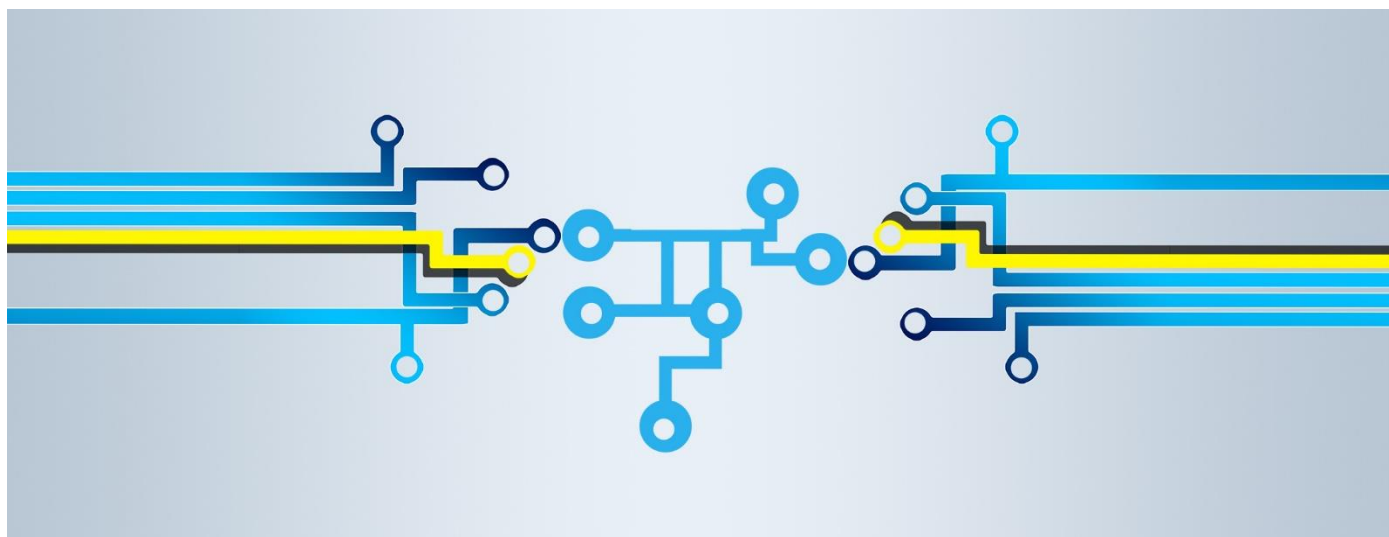
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Technology #CI13021

ELECTROCHEMICAL BIOSENSOR FOR DETECTION AND QUANTIFICATION OF ALKYLPHENOLS



TECHNOLOGY SUMMARY

Fast, efficient and accurate method for the quantification of alkylphenols (APs). These sensors are based on a network of single-walled carbon nanotubes functionalized with a highly specific anti-AP antibody, which is at the core of the AP quantification reaction. This quantification is determined as a function of the changes in the electrical current, which varied according not only to the presence or absence of these compounds, but also in proportion to their concentration.

BENEFITS

REDUCED SAMPLE VOLUME: less than 1ml.

NO SAMPLE PREPARATION REQUIREMENTS

IN SITU ANALYSIS: potentially, there is no need of laboratorial analysis.

MUCH FASTER: the analysis takes only a few minutes.

IMPROVED OR EQUAL

DETECTION/QUANTIFICATION LIMITS: compared to the current techniques.

REDUCED COST

CONTEXT

Alkylphenols are used in plastics production and in the synthesis of non-ionic surfactants widely used as components of detergents, paints, herbicides, humectant agents, cosmetics, pesticides and many other domestic, industrial and agricultural products. AP and their derivatives are known endocrine disruptors with estrogenic action, which associated to its ubiquity, entail constant analysis and monitoring.

In general, the techniques currently used for APs quantification are based in methods that require extensive sample preparation, are very expensive and utilize specific equipment (HPLC, LC-MS and GC-MS). The proposed sensors allow replacing those techniques, since they are fast, efficient and accurate and allow a much more widespread use since they are very low cost and easy to use.

APPLICATIONS

This technology has several applications:

ENVIRONMENTAL (alkylphenols monitoring)

INDUSTRIAL (quality control, e.g. liquid food products)

The technology may be adapted to other compounds as well, widening its applications into other sectors.

ELECTROCHEMICAL BIOSENSOR FOR DETECTION AND QUANTIFICATION OF ALKYLPHENOLS

IP RIGHTS

National patent pending.

DEVELOPMENT STAGE

TRL 4: tested at laboratorial level for detection and quantification of alkylphenols.

Available for presentation.

KEYWORDS

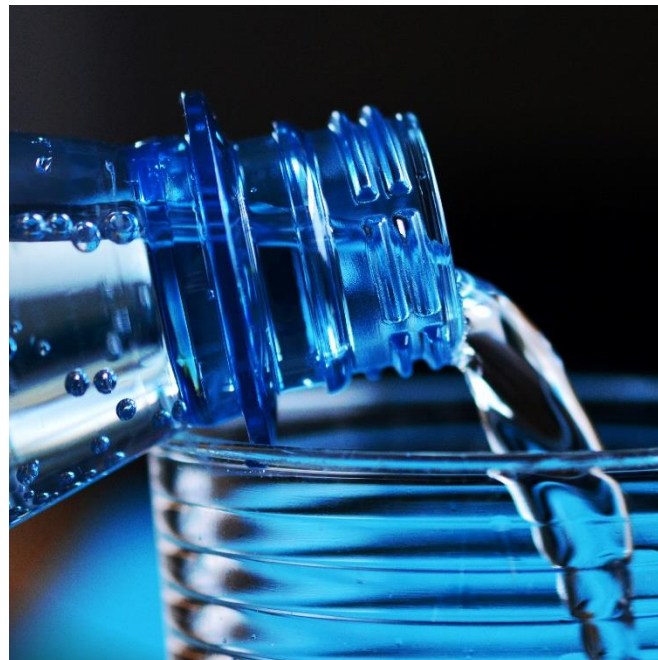
ALKYPHENOLS

WATER

BIOSENSOR

ENVIRONMENT

POLLUTION



DEVELOPED BY

Researchers of Centre for Environmental and Marine Studies (CESAM) of the University of Aveiro, of INESC-MN (Lisbon) and of the University of Sfax, Tunisia.

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Technology #CI16007

BUSINESS OPPORTUNITY

Licensing agreement.

Development of new formulations and/or applications.

PARTNERSHIP

The University of Aveiro seeks partners in environmental and/or pharmaceutical sectors, as well as companies operating in the area of (bio)sensors.

Based on the biosensor's efficiency and sensitivity, it is of particular interest to partners working in the fields of food industry, but also for potential partners undertaking efforts in biology and environmental monitoring.

PÍNEA – ECO-FRIENDLY FIRELIGHTER



TECHNOLOGY SUMMARY

Eco-friendly firelighters, exclusively composed by natural and recycled materials, based on forest waste and bee wax. The firelighter resulting from this mixture is, itself, involved in a vegetal fiber-based paper, which can be detachable and individually used. The product aims the promotion of a better environmental sustainability and a closer relationship with the forest.

CONTEXT

Currently, fire-ignition facilitator products are divided in two types: industrially produced and natural. Industrial products consist in traditional firelighters made with chemicals and toxic products like petroleum, or ecologic materials like wood mixed with paraffin. Natural products are collected directly from the environment, like dry pine cones and needles. However, gives its structure, those products take up much more space than traditional firelighters.

The proposed eco-friendly firelighters are made exclusively with natural and recycled materials, without chemicals or petroleum derivatives, allowing a burning without unpleasant odors and dark smoke. It is a practical and beneficial product, presenting an ecological, urban and visually attractive solution for traditional use of firelighters. Allied with similar efficiency compared to chemical firelighters, these ones don't generate residues, once its package is part of the product itself.

BENEFITS

ECO-FRIENDLY: there firelighters use natural and recycled products.

WITHOUT PARAFFIN

EQUAL EFFICIENCY compared to chemical firelighters.

WITHOUT UNPLEASANT ODORS

WITHOUT DARK SMOKE

REDUCED VOLUME

NO RESIDUES: the package is part of the product itself.

APPLICATIONS

The product is used for facilitate fire ignition in:

FOOD PREPARATION (for domestic use or catering)

FIREPLACES AND STOVES

PÍNEA – ECO-FRIENDLY FIRELIGHTER

IP RIGHTS

National patent pending.

National trademark granted.

National design granted.

DEVELOPMENT STAGE

TRL 4: laboratorial prototype demonstrated.

Available for presentation.



KEYWORDS

FIRELIGHTER

PINE CONE

FOREST WASTE

BEESWAX

ECOLOGY

DEVELOPED BY

Teachers and students from Communication and Art Department (DeCA) of the University of Aveiro.

BUSINESS OPPORTUNITY

Licensing agreement for the patent application, trade-mark and/or design.

Product co-development.

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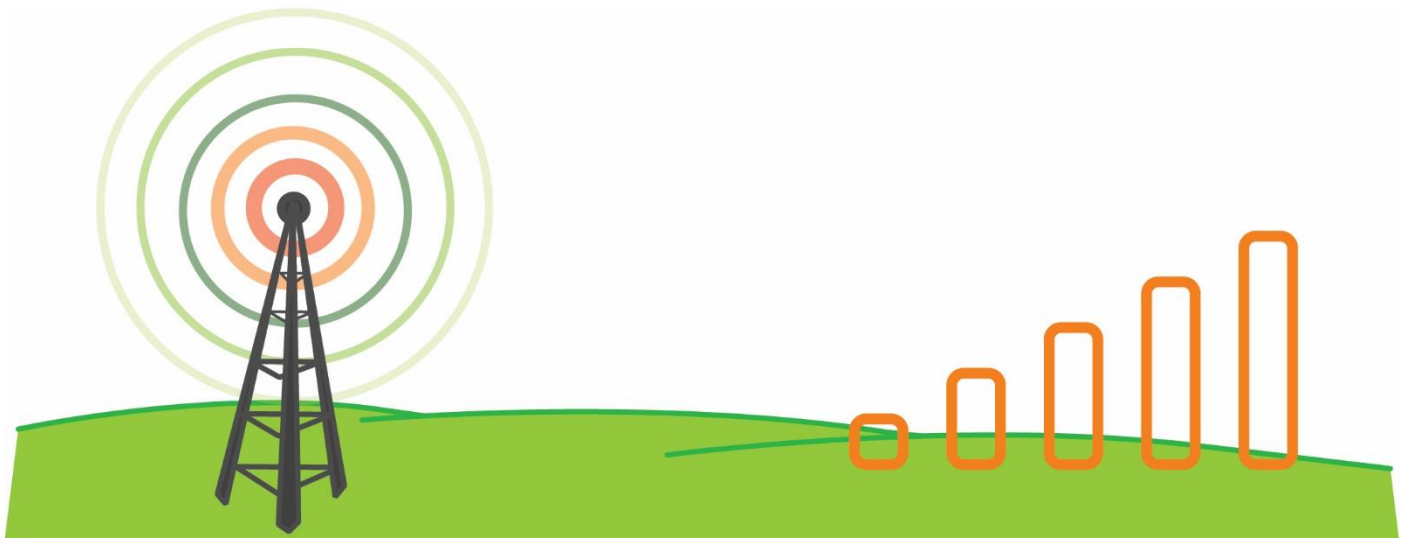
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Technology #CI16017

PARTNERSHIP

The University of Aveiro seeks partners within the industries of pinewood products, firelighters, honey and paper.

PASSIVE SENSOR SYSTEM POWERED BY WIRELESS POWER TRANSMISSION



TECHNOLOGY SUMMARY

Network of wireless and passive sensors (without batteries), using a set of unique sensors which use a frequency for the data transfer (obtained by sensors) and another frequency for the reception of energy that is emitted by transmitters that power the sensors. For this, only a central data reception and wireless transmission structure is required which communicates with each of the sensors independently. These sensors have lower power consumption and higher data rates (up to 960 Mb/s).

BENEFITS

Compared to traditional sensors:

LOWER COST: these sensors do not use any kind of batteries.

INCREASED CONVENIENCE: these sensors do not require battery charge or change as well as wiring.

Compared to other passive sensors:

LOWER POWER CONSUMPTION

HIGHER DATA TRANSMISSION RATES: up to 960Mb/s

CONTEXT

Wireless sensors, which transmit the collected information without the need of wiring, have gained increasing commercial importance. These sensors can be used in a wide range of situations, from environmental monitoring to farm and industrial control. However, most sensors still need to use batteries, which increases maintenance and environmental costs.

The presented sensors are an alternative since they do not require any type of battery and receive energy through a specific frequency emitted by an energy transmitter. These passive sensors gain even more relevance if sensor networks are formed, in which several nearby sensors detect and transmit environmental data.

APPLICATIONS

This passive sensor system can be used in a wide range of applications, such as:

COLLECTION OF ENVIRONMENTAL DATA (e. g. farm fields, inside buildings)

ACCESSES CONTROL (e. g. parking lots, buildings)

APPLICATIONS THAT REQUIRE HIGH TRANSMISSION RATES (e. g. audio or video sensors)

PASSIVE SENSOR SYSTEM POWERED BY WIRELESS POWER TRANSMISSION

IP RIGHTS

Internacional patent pending (*Patent Cooperation Treaty*).

DEVELOPMENT STAGE

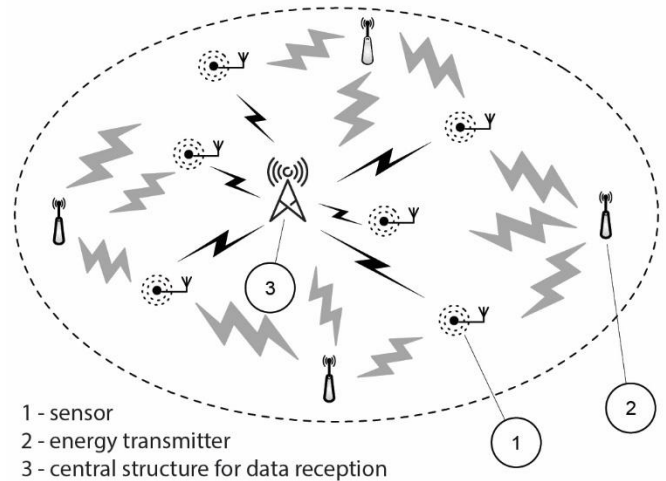
TRL 4: Field tests performed with prototypes.

KEYWORDS

BACKSCATTER

WIRELESS POWER TRANSMISSION

PASSIVE SENSORS



DEVELOPED BY

Researchers from the Telecommunications Institute (IT) from the University of Aveiro.

BUSINESS OPPORTUNITY

License agreement.
Joint development.
Adaptation to specific needs.
Testing of new applications.
Industrialization.

PARTNERSHIP

The University of Aveiro seeks partners with the area of sensor development and manufacturing.

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Technology #CI16018

NANOENCAPSULATED GINGER EXTRACT FOR FOOD APPLICATIONS



TECHNOLOGY SUMMARY

Method for obtaining a dairy product, e.g. yogurt, with ginger extract and a natural additive, cyclodextrin. Cyclodextrin is a nanocapsule with taste-masking properties, allowing using higher amounts of ginger while keeping a mild taste. The taste-masked yogurt is better accepted by consumers than the one without the additive.

CONTEXT

Ginger is currently much in vogue for food applications by its nutraceutical properties as digestive, anti-nausea and anti-inflammatory. Moreover, its immune-boosting action makes it ideal for wintertime foods. Commercially available yogurts with ginger have just a small quantity, which provides a spicy flavour but is insufficient for medicinal properties to be observed. Increasing the amount of ginger to clinically-relevant doses leads to an overwhelming taste that makes the product inedible.

This technology solves the issue of the strong flavour by encapsulating ginger's bitter/pungent components at the nano level. This way, one can have all the benefits and keep the flavour mild. The result is a well-accepted product as demonstrated by tests conducted on a panel of non-trained tasters of all ages.

BENEFITS

PRESERVATION OF GINGER'S BENEFICIAL PROPERTIES.

BETTER ACCEPTATION of the product by the consumers.

MILDER AND MORE PLEASANT FLAVOUR for ginger-added products.

LONGER SHELF LIFE

NON-TOXIC

APPLICATIONS

This method of nanoencapsulation of ginger extract by cyclodextrin can be used in the production of:

FUNCTIONAL FOODS

NANOENCAPSULATED GINGER EXTRACT FOR FOOD APPLICATIONS

IP RIGHTS

Trade secret.

DEVELOPMENT STAGE

TRL 3: The product (yogurt) was produced on a small scale and a product preference test was conducted comparing it against a control (product with the same amount of ginger but with no additive). The tests were conducted on a panel of non-trained tasters of all ages.



KEYWORDS

GINGER

DAIRY

TASTE-MASKING

NANOENCAPSULATION

DEVELOPED BY

Researchers from the Organic Chemistry, Natural Products and Foods Stuffs Research Unit (QOPNA) from the University of Aveiro.

BUSINESS OPPORTUNITY

Joint further development.

Testing of new applications.

License agreement.

PARTNERSHIP

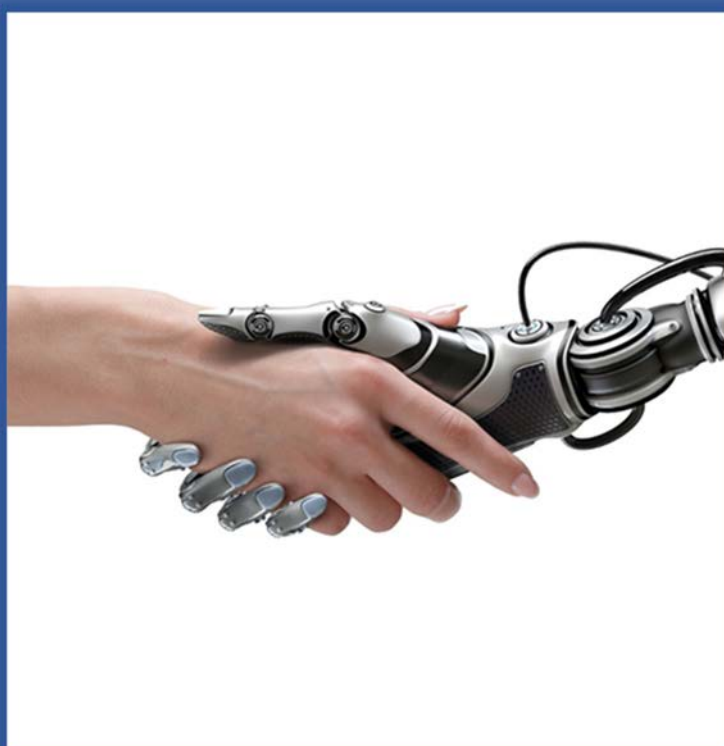
The University of Aveiro seeks partners within food industry.

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Technology #CI18007



R&D&I PORTFOLIO

Agri-food Sector

University of Trás-os-Montes and Alto Douro

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



Presentation

The Centre for the Research and Technology of Agro-Environmental and Biological Sciences (CITAB) can be highlighted, given its relevance for research in this area, with agriculture as one of its pillars. CITAB has major competences across various value chains: vine and wine, olives and olive oil, fruits and vegetables, which are focused on increasing the sustainability of natural resources under climate changes, and on the ecosystems services to gain competitiveness of the value chains. The key competences rely on climate modelling to predict the effect of climate change on yield and quality of agriculture and forestry products, which is supported by comprehensive studies on plant physiology. The soil, substrates and fertilization studies intend to ensure soil sustainability and optimization of inputs to reduce the greenhouse gas emissions. Further competences to reduce the chemical inputs on agri-forestry systems are focused on developing new biopesticides and in the study of soil microorganisms to improve the resistance of the plants to biotic and abiotic stresses. The valorisation of co-products from the agri-food industry with uses in the food, cosmetic and pharmaceutical industry is one of the key competences, which are very well supported by studies with animal models. During the last decade there is a focus on the application of new technologies to monitor crop development and product quality using cutting-edge methodologies.

Scientific-Technical Services

Food processing and food safety - Development of functional foods and technological solutions to improve quality and safety in the food sector.

Phytochemical assessment of food matrices and co-products - Characterization of phytochemical compositions of diverse food matrices and co-products, including distinct families of compounds, as well as specific contents through HPLC and correlation with spectroscopic methodologies.

Legumes production and consumption: innovative food products - Development of new food products, fresh and processed, with high functional and nutritional value, derived from minor used legume crops, such as pea, faba bean and cowpea.

Microbial genetic resources for industrial applications - Isolation and selection of microbial genetic resources for industrial applications and of beneficial soil microorganisms to develop biostimulants, biofertilizers and biopesticides for sustainable agriculture.

Increase of resilience of chestnut to biotic factors - Development of protection strategies for chestnut to ink disease, blight disease and gall wasp.

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



Scientific-Technical Services

Pre and post-harvest quality - Analysis of biochemistry of leaves, histology of fruits/leaves, composition of fruits/vegetables, sensorial analysis of foods. Physiological measurements, irrigation management, genetic variability. Post-harvest technologies and processing.

Studies about wine conservation and stabilisation - Development of studies to improve the knowledge about wine ageing and innovative processes.

Tools for precision agriculture - Sensors and microsenors, data integration systems for disease detection, for several agri-food applications.

Creation of added value for co-products from the agri-food industry - Development of new products resulting from waste and co-products from agri-food industry (i.e. wine industry), reducing waste and therefore creating products with commercial value, in the food, cosmetic and pharmaceutical industries.

Technological non-invasive solutions - Development of technological and non-invasive solutions for inspection and quality assessment in fruits and legumes, to support decision-making in the management of diverse cultures.

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Presentation

The Animal and Veterinary Research Centre (CECAV) has the research line Food Quality/Safety and Public Health which develops their studies on the zoonosis area with impact in public health, and in food-borne pathogens through the food chain, along with the development of strategies to guarantee the safety of foods, including the accomplishment of sensory, technological and commercial traits.

Scientific-Technical Services

Food packaging - Types of packaging and sensorial quality of foods, respective conservation shelf life, alternative edible covering.

Meat quality assessment - Evaluation of muscle:fat ratio to analyse meat quality using real time ultrasonography.

Legumes production and consumption: innovative feed products - Development of innovative feed products ensuring valuable protein source from locally grown legumes, namely pea, faba bean and cowpea, to reduce imported soya.

Studies with animal models - Studies of the efficiency of the use of co-products and respective bioactive compounds, generated on the agri-food industry, on the development of new feeds for livestock production and reduction of the use of antibiotics.

Use of fungi in the valorisation of co-products for animal feed - Application of biological treatments using white-rot fungi to increase the nutritive value of co-products from the wine and olive oil industries, and evaluation of the potential of their use as functional feeds in animal nutrition.

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Chemistry Centre of Vila Real - CQ



Presentation

The Chemistry Centre of Vila Real (CQ) has the research line Food and Chemistry & Biochemistry which develops innovative technologies for food processing, analysis of food bioactive compounds, food safety and quality control, and valorisation of agrifood industry by-products.

Scientific-Technical Services

Food packaging - Types of packaging and sensorial quality of foods, respective conservation shelf life, alternative edible covering.

Creation of added value for co-products from the agri-food industry - Development of new products resulting from waste and co-products from agri-food industry (i.e. wine industry), reducing waste and therefore creating products with commercial value, in the food, cosmetic and pharmaceutical industries.

Environmental remediation - Innovative Advanced Oxidation Processes (AOPs) and biological treatment processes to reduce the pollution load of problematic agro-industrial wastewaters (e.g. winery and olive mil effluents).

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A PROCESS FOR THE TREATMENT AND RECOVERY OF RESIDUES AND EFFLUENTS FROM OLIVE OIL PRODUCTION UNITS THROUGH THE UTILIZATION AND PROCESSING OF CORK INDUSTRY WASTE



TECHNOLOGY SUMMARY

This technology relates to a process using cork waste, namely cork dust, and particles coming from the outer surface of cork boards, mechanically or manually mixed with effluents and/or waste from olive oil production units. The obtained product is dehydrated, resulting in a product with high calorific value for combustion, that can be used as an energy source.

CONTEXT

The industrial residues and effluents from the olive oil production units represent an environmental problem and needs to suffer a treatment, that has inherent costs. Thanks to this technology, it's possible to create a viable and profitable alternative to warehousing and/or a deposition in the landfill, obtaining a product with commercial value.

BENEFITS

- Simple process with low implementation costs
- Co-product from olive oil and cork industries with commercial value
- Reduce of environmental impacts, using the residues and effluents from the olive oil and cork production
- Create add value in the value chain
- Heat energy source burning in boilers or other heating structures
- Electricity source being possible to use for energy production stations (biomass) that uses the process of burning in the generation of energy

APPLICATIONS

- Olive oil companies (2 stage production)
- Wood, cork, and cellulose sectors
- Waste recovery companies
- Heating
- Biomass stations
- Co-generation companies

A PROCESS FOR THE TREATMENT AND RECOVERY OF RESIDUES AND EFFLUENTS FROM OLIVE OIL PRODUCTION UNITS THROUGH THE UTILIZATION AND PROCESSING OF CORK INDUSTRY WASTE

IP RIGHTS

National Patent

European Patent: Spain, Italy, Greece

DEVELOPMENT STAGE

TRL 7: system prototype demonstration in operational environment

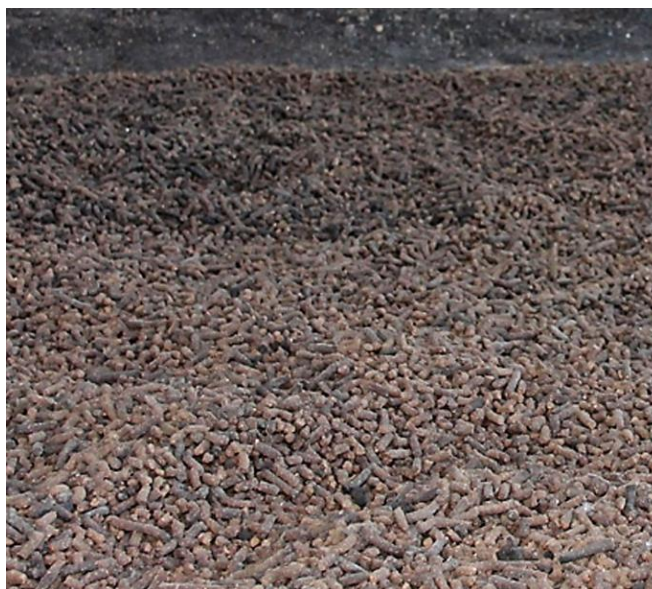
KEYWORDS

Olive oil

Cork

Residues

Combustion



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Technology nº 103470

DEVELOPED BY

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BUSINESS OPPORTUNITY

Pellets production

PARTNERSHIP

Licensing

Joint Venture Agreement

PROCESS FOR BIOMASS PRODUCTION FROM RESIDUE AND INDUSTRIAL EFFLUENTS, IN PARTICULAR FROM TIMBER, CORK AND CELLULOSE INDUSTRIES



TECHNOLOGY SUMMARY

This technology relates to a process that uses solid waste from the wood and cork sectors, which, added to the liquid effluents from the wood, cork and cellulose sectors, through an integrated biomass production line, generate energy-valued products due to its capacity to generate heat energy, mechanical and electrical by burning in boiler, cogeneration or other heating structures, namely in the form of briquettes or pellets.

CONTEXT

The valorisation of waste and co-products is an increasingly important aspect of company's productivity improvement strategies. The adoption of environmentally-friendly practices was primarily mandated by law, but companies quickly found that they could also play a very important role in productivity, company image and customer relationships, regulatory and oversight bodies and the society.

BENEFITS

- Simple solution with low implementation costs
- Co-product obtained from industrial waste that otherwise has inherent costs to its treatment
- Applicable to all existing production methods
- High calorific value
- Reduce of environmental impacts
- Create add value in the value chain

APPLICATIONS

- Wood and cork industry
- Cellulose industry
- Machinery and equipment manufacturers
- Waste management companies
- Heating
- Electricity/Biomass industry

PROCESS FOR BIOMASS PRODUCTION FROM RESIDUE AND INDUSTRIAL EFFLUENTS, IN PARTICULAR FROM TIMBER, CORK AND CELLULOSE INDUSTRIES

IP RIGHTS

National Patent

DEVELOPMENT STAGE

TRL 4: technology validated in lab

KEYWORDS

Combustion
Biomass
Briquettes
Pellets



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Technology nº 103739

DEVELOPED BY

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Artur da Rosa Pires

BUSINESS OPPORTUNITY

Pellets production

PARTNERSHIP

Licensing

Joint Venture Agreement

METHOD FOR THE PRODUCTION OF CANDIED FRUIT AND VEGETABLES AND DRIED FRUIT AND VEGETABLES WITHOUT SUCROSE BY USING SUCROSE SUBSTITUENT AGENTS AND RESPECTIVE CANDIED FRUIT AND VEGETABLES



TECHNOLOGY SUMMARY

This invention relates to an innovative process for the production of candied fruits and vegetables without sucrose, by using confection solutions containing sucrose substitutes. The resulting products exhibit healthier characteristics, and may be subjected to additional processes to reduce water content, with or without additional functional properties.

CONTEXT

Osmotic dehydration is the common technique used to produce candied fruits, however these products are often caloric because of the use of concentrated solutions of sucrose. This technology allows to produce candied fruits and vegetables without sucrose, resulting in more attractive products, to a growing market, looking for healthy, natural and tasty processed products, that's the trend for recent years.

BENEFITS

- Applicable to the production in the traditional method
- Healthier solution
- Reduce human health risks, as it has: low glycemic index, reduced caloric content (except fructose)
- Reduce obesity

APPLICATIONS

- Fruit processing industry
- Ice cream industry
- Cereal flakes industry
- Bakery industry
- Dairy products industry

METHOD FOR THE PRODUCTION OF CANDIED FRUIT AND VEGETABLES AND DRIED FRUIT AND VEGETABLES WITHOUT SUCROSE BY USING SUCROSE SUBSTITUENT AGENTS AND RESPECTIVE CANDIED FRUIT AND VEGETABLES

IP RIGHTS

National Patent

European Patent – under analysis

DEVELOPMENT STAGE

TRL 9: actual system proven in operational environment (competitive manufacturing in the case of key enabling technologies; or in space)

KEYWORDS

Processing food

Candied

Fruit

Vegetable



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Technology nº 105662

DEVELOPED BY

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Ana Isabel Ramos Novo Amorim de Barros

BUSINESS OPPORTUNITY

Production of candied fruit and vegetables without sucrose

PARTNERSHIP

Licensing

PROCESS FOR OBTAINING MUSHROOM DIETARY FIBER AND RESPECTIVE FIBER



TECHNOLOGY SUMMARY

The invention consists of a process which uses wastes resulting from the production of mushrooms (mycelium, feet and defective mushrooms) and surplus mushrooms which are mixed with a solution giving a product with suitable characteristics to be used as food ingredient in the form of dietary fiber, with an improved chemical composition.

CONTEXT

The benefits for health resulting from dietary fiber consumption are well recognised and these nutritional properties have recently led to the production of food enriched in dietary fiber. Normally dietary fiber is obtained from vegetable origin. Thanks to this technology it's possible to get dietary fiber from a non-vegetable substrate, from fungi origin.

BENEFITS

- Co-product from mushroom industry with commercial value
- Reduce of the environmental impact of agroindustrial waste
- Improve human health
- Create add value in the value chain

APPLICATIONS

- Food industry: cookies, cereal flakes, processed meat
- Food healthy supplements

PROCESS FOR OBTAINING MUSHROOM DIETARY FIBER AND RESPECTIVE FIBER

IP RIGHTS

National Patent

DEVELOPMENT STAGE

TRL 4: technology validated in lab

KEYWORDS

Mushroom
Dietary fiber
Co-product



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Technology nº 104691

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BUSINESS OPPORTUNITY

Dietary fibers for food industry

PARTNERSHIP

Licensing

FAST CLONE ID – ULTRA-FAST, DESTRUCTIVE OR NON-DESTRUCTIVE AND ENVIRONMENTALLY FRIENDLY IDENTIFICATION OF PLANT CLONES USING SPECTROSCOPY, MULTIVARIATE ANALYSIS OR ARTIFICIAL INTELLIGENCE METHODS



TECHNOLOGY SUMMARY

The technology relates to a simple and fast method of identification of plant clones, using a combination of spectroscopic method, multivariate analysis and artificial intelligence methods for fast and automatic data classification.

CONTEXT

There are several methods of identifying clones of fruits and legumes, however these methods require complex and slow experimental protocols and as such their use on a large scale is impractical, as they require specialized training, as well as a large amount of laboratory supplies.

BENEFITS

- Easy and simple method
- Fast results
- Safe and cheap, as it doesn't require laboratory reagents
- Adaptable to use in agricultural fields
- Environmental friendly, as it works in a non-destructive way
- Better productive results (precision agriculture)

APPLICATIONS

- Quality control and food safety (HACCP)
- Laboratorial analysis
- Winery industry

FAST CLONE ID – ULTRA-FAST, DESTRUCTIVE OR NON-DESTRUCTIVE AND ENVIRONMENTALLY FRIENDLY IDENTIFICATION OF PLANT CLONES USING SPECTROSCOPY, MULTIVARIATE ANALYSIS OR ARTIFICIAL INTELLIGENCE METHODS

IP RIGHTS

National Patent

DEVELOPMENT STAGE

TRL 7: system prototype demonstration in operational environment

KEYWORDS

Winery
Grapes identification



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Technology nº 106253

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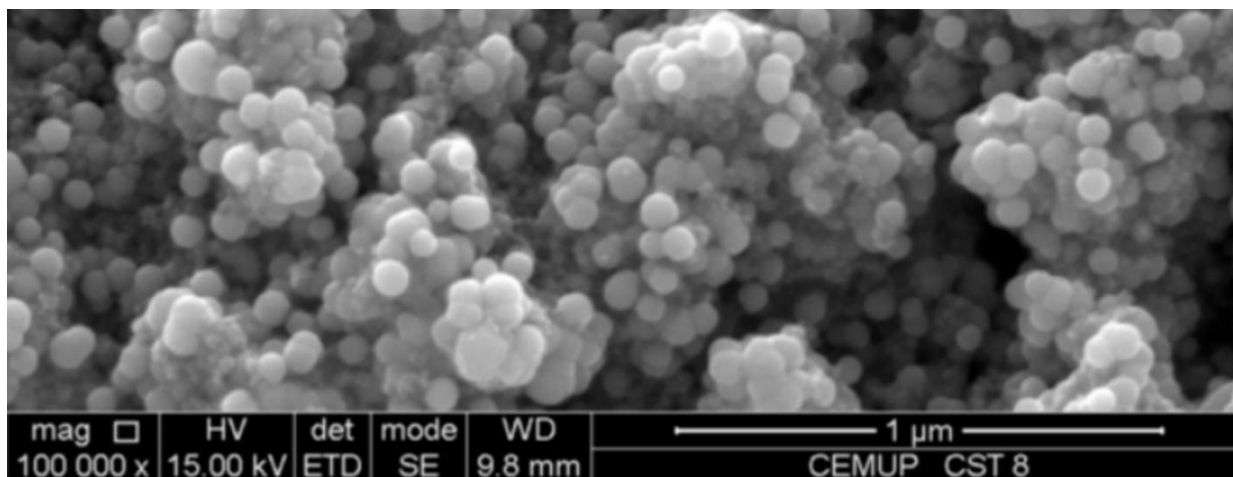
BUSINESS OPPORTUNITY

Development of the equipment

PARTNERSHIP

Licensing

USE OF *PEDIOCOCCUS PARVULUS* FOR THE DEGRADATION AND BIOLOGICAL DETOXIFICATION OF OCRATOXIN A, WITH METHOD AND KIT



TECHNOLOGY SUMMARY

The method for inactivating ocratoxin A uses new strains of *Pediococcus Parvulus* that are suitable to biotransform ocratoxin A into the non-toxic compound ocratoxin α , and therefore to detoxify this mycotoxin. The new bacteria strains are protected and deposited in pure culture in the Spanish Type Culture Collection (CECT).

CONTEXT

Lactic acid bacteria (LAB) are commonly used in the production of fermented food, feed and drink products. A less known beneficial feature of LAB is the capacity of some strains to control health hazards linked to mycotoxins. This invention refers to the use of a microorganism for the biological detoxification of mycotoxins, namely for the detoxification of ocratoxin A, the method and the kit.

BENEFITS

- Applicable to food and feed products
- Preserves nutritive quality of products treated
- Environmental friendly, compared to chemical and physical treatments
- Promotes food safety
- Probiotic properties: cholesterol lowering effects, resistance to gastrointestinal stress and adherence to intestinal cells

APPLICATIONS

- Food industry: vegetables (pickles), processed meat, fish, dairy products
- Drink industry: beer and wine
- Feed industry: silage

USE OF *PEDIOCOCCUS PARVULUS* FOR THE DEGRADATION AND BIOLOGICAL DETOXIFICATION OF OCRATOXIN A, WITH METHOD AND KIT

IP RIGHTS

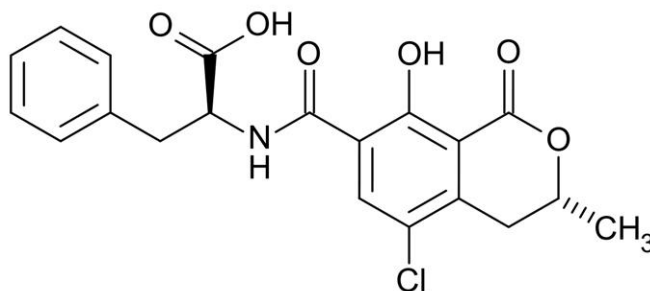
National Patent

DEVELOPMENT STAGE

TRL 4: technology validated in lab

KEYWORDS

Ocratoxin A
Food
Drinks
Strain



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Technology nº 107534

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BUSINESS OPPORTUNITY

Development of the equipment

PARTNERSHIP

Licensing

ANALYSIS AND PREDICTION PROCESS OF THE STRUCTURAL BEHAVIOR OF THE VEGETATION



TECHNOLOGY SUMMARY

The present invention relates to an ecological modelling process in the field of studies of vegetation structure and dynamics. The protocol uses methodologies that allow the obtaining of graphic results from which the structural and behavioral characteristics of the vegetation are extracted. Based on this floristic-structural characterization, vegetation is established the guiding hypothesis of the relations of dependence and independence of the physiognomic variables chosen for the construction of the model. This process needs, firstly, that the vegetation of the study area is very well characterized, for which the prior existence of a database which, if it does not exist, will have to be created.

CONTEXT

There are already available predictive ecological models, however these ones are complex reflecting in a greater difficulty in its use either by the decision maker in planning or by the technician environmental. It is in this context that the stochastic-dynamic models arise, where the present invention is inserted. This methodology makes it possible to obtain results, in a relatively fast and expeditious way, allowing to determine in a dynamic and interactive way how an ecosystem subject to natural or anthropogenic changes will behave in space and time.

BENEFITS

- Simple method, can be used by users with general technical knowledge
- Faster method, less time to the characterization of natural resources (data collection, statistical treatment, interpretation of results)
- Low cost method, as doesn't need specialized work and to many field trips
- Universal model which allows a generalization of the concept for different vegetation covers
- Forecasting vegetation response to disturbance factors, contributing to the decision-making process

APPLICATIONS

- Agriculture sector
- Forestry sector
- Rural enterprise

ANALYSIS AND PREDICTION PROCESS OF THE STRUCTURAL BEHAVIOR OF THE VEGETATION

IP RIGHTS

National Patent

DEVELOPMENT STAGE

TRL 4: technology validated in lab

KEYWORDS

Ecological models
Vegetation
Hypotheses
Scenarios



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Technology nº 103930

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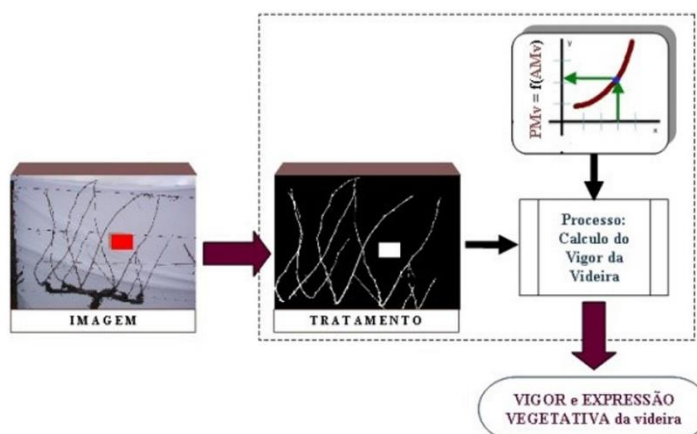
BUSINESS OPPORTUNITY

Ecological model use

PARTNERSHIP

Licensing

NON-DESTRUCTIVE METHOD AND DEVICE TO CALCULATE VIGOUR AND VEGETATIVE EXPRESSION IN TREE-SHRUB VEGETATION AND APPLICATION THEREOF



TECHNOLOGY SUMMARY

The present invention refers to a novel method for calculating the vigour and vegetative expression in a grapevine, based on a digital image, obtained prior to pruning. The image of the grapevine is obtained on the field, using a digital camera, there being no need for the camera to have special features. The image is subject to digital processing so as to allow identifying, locating and isolating a reference mark, with known dimensions which will give way to determine the area of a pixel within the image and the grapevine canes, which will in turn allow the calculation of the total area of the canes.

CONTEXT

The field of the present method is the Wine-growing sector, aiding the vegetative/productive balance assessment of grapevines, by means of the calculation of vigour (defined in wine-growing scientific area as "vigour estimate") and of vegetative expression. The vigour determination is one of several parameters determined in technical scientific research, which reveal the vegetative/productive balance in grapevines, being directly related with the life span thereof and productive and qualitative capability of the grapes.

BENEFITS

- Fast method reducing the workforce
- Reduces the use of several equipment's
- Contributes to the decision-making process
- Better productive results (precision agriculture)

APPLICATIONS

- Wine sector

NON-DESTRUCTIVE METHOD AND DEVICE TO CALCULATE VIGOUR AND VEGETATIVE EXPRESSION IN TREE-SHRUB VEGETATION AND APPLICATION THEREOF

IP RIGHTS

National Patent

DEVELOPMENT STAGE

TRL 4: technology validated in lab

KEYWORDS

Grapewine
Vigour
Vegetative expression



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BUSINESS OPPORTUNITY

Development of respective equipment

PARTNERSHIP

Licensing

AEROBIC BIOLOGICAL PROCESS OF TREATMENT OF AGRO-INDUSTRIAL EFFLUENTS WITH HIGH AROMATIC COMPOUNDS BASED ON THE APPLICATION OF MICROORGANISMS OF THE SPECIES *CANDIDA OLEOPHILA*



TECHNOLOGY SUMMARY

The present invention relates to the application of viable yeasts of the species *Candida Oleophila* in the aerobic treatment of agricultural effluents with a high organic load, in particular, wine, oleic, fruit and other products rich in aromatic compounds, in order to reduce their pollutant impact on watercourses and / or in municipal Wastewater Treatment Plants (TSARs), in the case of discharge into basic sanitation pipes.

BENEFITS

- Simple method, can be used by users with general technical knowledge
- Low cost method, as doesn't need specialized work and to many field trips
- Improves the process of treatment of agroindustrial effluents

CONTEXT

In order to solve the environmental problems resulting on urban or industrial wastewater discharges, nowadays it is essential to attenuate the contamination caused by its indiscriminate disposal in the environment, implementing new technologies to minimize water pollution. Some of the existent technologies (adsorption, filtration, coagulation-flocculation) only promotes a phase transfer of the pollutant, and doesn't degrade it. For these reasons, biological treatments are often opted for, although their application to industrial wastewater may be problematic owing to the presence of substances inhibiting microbial metabolism. This inhibition results in a loss of efficiency and, in more severe cases, the disruption of processes. The cost-effectiveness of the biological treatment of this type of effluent can be improved by a biological pre-treatment to reduce or eliminate inhibitory substances such as aromatic compounds.

APPLICATIONS

- Agriculture sector

AEROBIC BIOLOGICAL PROCESS OF TREATMENT OF AGRO-INDUSTRIAL EFFLUENTS WITH HIGH AROMATIC COMPOUNDS BASED ON THE APPLICATION OF MICROORGANISMS OF THE SPECIES *CANDIDA OLEOPHILA*

IP RIGHTS

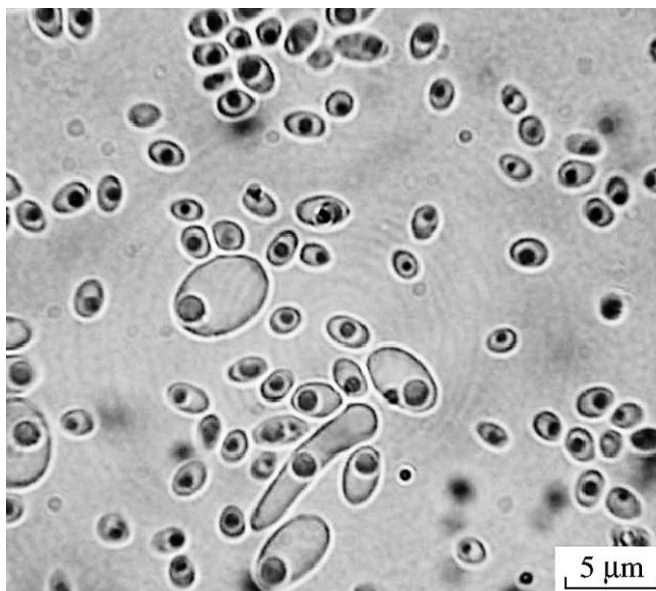
National Patent

DEVELOPMENT STAGE

TRL 4: technology validated in lab

KEYWORDS

Agroindustrial effluents
Aromatic compounds
Treatment
Microorganisms



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BUSINESS OPPORTUNITY

Development of respective kit

PARTNERSHIP

Licensing

SALMON-PINK WINE OBTAINED FROM WHITE GRAPES, WINEMAKING PROCESS, AND DERIVED PRODUCTS



TECHNOLOGY SUMMARY

The present application relates to a wine obtained from white grape varieties capable of synthesizing small amounts of anthocyanins, in which the final colour of the wine is salmon-pink, different in chromatic terms from all white wines currently on the market, as well as its production process. Additionally, this technology further relates to its derivative products such as a semi-sparkling wine obtained from white grapes with salmon-pink colour and white sparkling wine with salmon-pink colour.

CONTEXT

There is a major trend in the current wine market for the consumption of innovative products, both in the form of production and in their sensorial characteristics. This change of trend has been verified in the last 10 years with the significant increase in the consumption of rosé wine that presents a distinct colour and aroma with respect to the traditional wines such as red wine and white wine, with a reddish colour until now.

BENEFITS

- Reduce of costs, as it is a less processed wine, namely in the colour elimination operations.
- Environmental friendly because of the reduction of operations as well as the use of oenological products, and the volume of lees.
- Higher concentration of volatile compounds due the less processing, resulting in a more aromatic wine than the corresponding white wines.
- Appealing wine from its colour to its preparation, it has more attractive characteristics for today's consumers.

APPLICATIONS

- Wine sector

SALMON-PINK WINE OBTAINED FROM WHITE GRAPES, WINEMAKING PROCESS, AND DERIVED PRODUCTS

IP RIGHTS

National Patent – under analysis

PCT – under analysis

DEVELOPMENT STAGE

TRL 9: actual system proven in operational environment (competitive manufacturing in the case of key enabling technologies; or in space)

KEYWORDS

Winery

White grapes

Salmon-pink wine



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Technology nº 107389

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BUSINESS OPPORTUNITY

New wine product

PARTNERSHIP

Licensing

PREPARATION OF CEREAL PRODUCTS SUITABLE FOR CELIAC PATIENTS BY THE CREATION OF SUPRAMOLECULAR STRUCTURES BETWEEN PROTEINS AND CHITOSAN



TECHNOLOGY SUMMARY

The present invention relates to a method for detoxifying wheat flour (*Triticum spp.*) and gluten by forming supramolecular structures with chitosan. The invention also relates to the corresponding detoxified flour and gluten having toxic epitope values reduced by 65 and 88%, respectively, for patients with celiac disease, when compared with non-modified or original flour and gluten. In addition, the invention relates to the use of the detoxifying method for other cereals and their respective products.

BENEFITS

- Products with lower amounts of toxic epitopes compared to existing ones
- Chitosan is a non-toxic, hypoallergenic, biocompatible and biodegradable polysaccharide, already present in the human diet
- Chitosan is a cheaper product than the products previously used
- Fast production, without the use of high temperatures and without the occurrence of toxic side products
- Products sensorially, viscoelastically and mechanically similar to the classic products

CONTEXT

Celiac disease is an autoimmune disease that translates into an enteropathy that occurs after contact with gluten in genetically susceptible individuals. The disease causes villous atrophy of the mucosa of the small intestine, causing damage to nutrient absorption, with the most common symptoms being diarrhea, delayed growth, anemia and fatigue. In addition, other symptoms such as neurological complications, hormonal dysregulation and primary biliary cirrhosis are also associated. The only effective treatment is a strictly gluten-free diet, with no drugs to prevent damage or autoimmune response in the body. Considering the relevance of this problem, research on the allergenicity of wheat proteins and proteins from other cereals is particularly important.

APPLICATIONS

- Food industry
- Pharmaceutical industry

PREPARATION OF CEREAL PRODUCTS SUITABLE FOR CELIAC PATIENTS BY THE CREATION OF SUPRAMOLECULAR STRUCTURES BETWEEN PROTEINS AND CHITOSAN

IP RIGHTS

National Patent – under analysis

PCT – under analysis

DEVELOPMENT STAGE

TRL 4: technology validated in lab

KEYWORDS

Wheat flour

Gluten

Celiacs

Cereals



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BUSINESS OPPORTUNITY

Flours for celiacs

PARTNERSHIP

Licensing