



# INTERNATIONAL GOOD HERBS NATURAL FOOD INGREDIENTS CONFERENCE

**Murcia, Spain, 14<sup>th</sup> May 2015**

**In the frame of the VII International  
Symposium on Food Technologies**



**In the frame of the VII Murcia Food  
Brokerage Event**



**BROCHURE**



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## INTRODUCTION

The GOOD HERBS International Conference on Natural Food Ingredients was celebrated in the frame of the VII International Symposium on Food Technologies and the VII Murcia Food Brokerage Event. The synergies among all these events are optimal for the researchers, technicians and teachers who can participate in different activities at the same time.

The Conference was integrated by the following activities:

- **Conference:** It was divided in two sessions with seven speakers.
- **Brokerage Event:** short meetings (no more than half an hour) with other researchers or technicians with common interests.
- **Poster Session:** Some posters were shown from different countries.

## CONFERENCE



International Conference on Natural Food Ingredients was divided in two sessions.

### FIRST SESSION



**Chairs: Nastasia Belc and Carmen Mascarell**

#### **Natural ingredients in herbal food supplements**

Authors: Nastasia Belc, Tatiana Onisei, Radu Stoianov, Adina Raducanu, Anca Mihaela Popescu



#### **Nastasia Belc, IBA Bucharest, Romania**

Nastasia Belc is General Director of IBA Bucharest, is member of Management Board of the European “A Healthy Diet for a Healthy Life” Joint Programming Initiative, member of Governing Board of Food Security, Agriculture and Climate Change JPI and member of Scientific Council of National Food Safety Authority.

#### **Abstract**

“Botanicals” are often used as traditional herbal medicine products, while “herbs” are known as culinary spices used in food preparation.

Whole medicinal and aromatic plant parts, such as: leaves, roots, flowers, fruits, seeds are conditioned (by drying, grinding, sieving) or processed (by different methods of extraction) being transformed in standardized or purified raw materials and final products (herbal teas, herbal food supplements) well known as “100% natural”.



Different solid or fluid matrices and diverse forms of presentation are specific to herbal food supplements: powders, capsules, tablets, pills, candies, gum bars as well as syrups, tinctures, vinegars, essential oils, tonic drinks and so on.

A huge number of herbs and botanical extracts are used in food supplements due to their nutritional and physiological effects (tonics of the nervous system, antioxidant, anti-inflammatory, immuno-stimulatory, antispasmodic, detoxifying, slimming, or sexual enhancement). Most of them support the metabolism and the essential body functions of the digestive, circulatory, respiratory, urinary, genital and immune systems and address to appetite enhancement, gastrointestinal absorption, blood pressure and cholesterol control, mental and physical performances, bone strengthening, body building and fatigue relief, menopause discomfort, etc.

The health benefits and efficacy of the herbal food supplements on different health issues and disease prevention due to their formula which include biological active compounds or functional ingredients were scientifically demonstrated.

A review of the total of 18,252 herbal food supplements existing on the Romanian market showed some categories of bioactive compounds of great interest for consumers are more frequently found in such natural products.

The main categories are: flavonoids (over 800 antioxidant compounds); carotenoids (natural colouring agents); glucosinolates (over 90 isothiocyanates); phenols (cafeic acids, chlorogenic acid, hydroxitirozol); fatty acids (conjugated linoleic acids); tocopherols (vitamin E), lignans, coumarins, alkaloids and tannins.

The flavor agents, fibers, enzymes, vitamins as well as sweeteners of natural origin are also intensely used in herbal food supplements.

Essential oils are encapsulated in soft gel or mixed in combined formula for aromatherapy applications.

The combination of complementary plant species in certain herbal food supplements is responsible for better efficacy of the natural products. Some examples will be discussed, such as: *Asperula*, *Foeniculum* and *Matricharia* (having antispasmodic effect) that could be combined with *Cynara*, *Fumaria* and *Rosmarinus* (which stimulate the bile secretion) to improve the digestion, while Ginseng (due to saponins tonic), combined with Cola (coffeine as stimulant) and *Centaurium* or *Citrus* (bitterness and appetite) could be successfully used in asthenia.

## Creation of a new food matrix of bakery products with *Chlorella vulgaris*



**Laia Alemany Costa, Grupo Dulcesol, Spain**

Dr. Laia Alemany is Degree in Chemistry and Food Technology and PhD in Food Science. She has worked in various research groups in Paris, Strasbourg, Bologna and Valencia. She currently is Manager in the Department of R & D Dulcesol Group, where she has participated in various projects focused on developing new ingredients and new products.

### Abstract

Dulcesol Group 's strategy is based on innovation. During recent years they are making real efforts to make innovation part of the whole structure of the organization and not just in a particular department. Not surprisingly, we have changed the organizational structure of the entire group for that to happen, allowing all the Group's employees actively participate in innovation processes that can be generated from the numerous multidisciplinary platforms that have been established in the company.

In DULCESOL we believe that manufacturers are an essential part involved in the success of the diet of a society and, therefore, we can have a positive influence on it having healthy habits.

Microalgae comprise a vast group of photosynthetic, heterotrophic organisms which have an extraordinary potential for cultivation as energy crops. They can be cultivated under difficult agroclimatic conditions and are able to produce a wide range of commercially interesting byproducts such as fats, oils, sugars and functional bioactive compounds.

Microalgae provide vegetable proteins of high biological value, w3 unsaturated fatty acids, antioxidants, pigments, minerals and vitamins, so DULCESOL starting working in bakery products based on these microorganisms.

The objectives of this project are:

- Selection of a suitable strain for the food industry;
- Viability of use;
- Study of different subspecies. Productivity;
- Scaling up. Obtaining microalgae at pilot plant level;
- Applications in bakery and pastry.

Results in different bakery products were presented in the talk as well as the degree of acceptance by the consumers.

## **Presentation of vacuum desiccation methods for food products (freeze drying and vacuum microwave drying application)**



**Pierre Lantheaume, Oerlikon Leybold Vacuum, Germany**

Pierre LANTHEAUME, Global Market Segment Manager – F&P, Oerlikon KN. Graduated in Mechanical Engineering (National Institute of Applied Sciences - INSA Lyon). First experience of 7 years at a food processing OEM (equipment for the meat industry). Joined Oerlikon Leybold Vacuum in 2006 as a technical support for Sogevac product range (rotary vane pumps). In charge of the Food and Packaging market segment since 2013.

### **Abstract**

Fresh food products rapidly deteriorate unless some way can be found to preserve them. Vacuum freeze drying and vacuum microwave drying are two modern methods of food preservation that remove water to inhibit the growth of microorganisms. Comparison of these two technologies and review of the associated vacuum systems. Examples on herbs, spices and condiments are given.

## **Energy efficient vacuum solutions for the food and packaging industry**



**Clive Tunna, Oerlikon Leybold Vacuum, Germany**

Clive TUNNA, Chartered Mechanical & Electrical engineer – University of London. 30 years experience in the industrial vacuum business. Joined OLV in 2007 as Technical and Commercialisation Director. Currently responsible for Technical product development and Product life cycle management, taking a leading role in facilitating innovation.

### **Abstract**

Vacuum equipment represents a significant percentage of the energy used in the food packaging process as well as making a significant contribution to the cost of ownership. Through the careful selection of the vacuum equipment and consideration for the way in which it is installed, it is possible to achieve significant reductions in both the energy consumed, cost of ownership and the cost of installation. Examples on herbs, spices and condiments are given.



## SECOND SESSION



**Chairs: Pedro Abellán Ballesta and Presentación García Gómez**

### **Health benefits of bee pollen depending on its botanical origin**

Authors: Cristina Pardo Martín, Dpto. Biología Vegetal II, Facultad de Farmacia, UCM  
Amelia Virgina González Porto, Centro Agrario de Marchamalo, JCCM

**Cristina Pardo Martín, Universidad Complutense de Madrid, Spain**



Dra. Cristina Pardo Marín is PhD in Biology Sciences from the Complutense University of Madrid UCM and University Lecturer of the Faculty of Pharmacy of the UCM. She has participated in 19 projects of national and international research (3 as Main Researcher), 39 research contracts with private companies and public research centers, all as Main Researcher and she has participated in 48 national and international conferences. 78 publications in international and national journals. From 1980-1987, Secretary of the Association of Spanish Language Palynologists (APLE) and president from 1990 to 1996. Adviser on various national and international journals.

### **Abstract**

Bee pollen (BP) is the charges of pollen balls that bees collect from flowers. They are formed by a multitude of small pollen grains, caked with other bee substances (honey, nectar, salivary secretions, etc.). BP is a highly nutritious food for larvae and young bees. Additionally, for humans, is also an important natural product used therapeutically in medicine, pharmaceutical industries and as



nourishment. BP is composed of proteins, lipids, sugars, fiber, mineral salts, amino acids, phenolic compounds and vitamins. BP composition is very variable depending on its floral origin.

Carbohydrates comprise 30% of the BP, they are mainly fructose and glucose, comprising about 90% of all sugars. Similar to what happens with honey, the very low sucrose percentages (not exceeding 5%), makes it a consumable product for everyone, diabetic included.

Crude Fiber content varies considerably (between 10 and 13 g/ 100g), particularly due to the botanical origin.

Protein content strongly depends on the BP botanical origin. Observed average of total protein content is 20.07% (13 – 27%). However, in families as *Boraginacea*, *Scrophulariaceae* or *Leguminosae* the average content in proteins is higher than 25%. On the contrary in families as *Caprifoliaceae* or *Cisteaceae* the average in proteins content is below 15%.

Polyphenols (flavonoids) content also strongly depends on the BP botanical origin. Observed average of total protein content is 1.31 g gallic acid / 100g pollen (0.75 – 4.22 g gallic acid / 100 g pollen). *Fagaceae*, *Salicaceae*, *Vitaceae* or *Rosaceae* have higher averages, over 2 g gallic acid / 100 g pollen, instead, *Caprifoliaceae*, *Ericaceae* or *Cisteaceae* have average lower than 1 g gallic acid / 100g pollen. Polyphenols are responsible for BP color.

Vitamins, BP is rich in: Provitamin A (1 – 20%), Vitamins group B, Vitamin E (4 – 32%) and, mainly, Vitamin C (7 – 56mg / 100g).

Contents for crude fiber, Vitamin A, B and E have been obtained from existing bibliography. Contents for Carbohydrates, Proteins, Polyphenols and Vitamin C have been obtained in University labs.

### **Antioxidant properties of honey and other bee products, from different botanical origins, of interest to the food industry**



#### **Amelia González, Centro Apícola Regional de Marchamalo, Spain**

Dra Amelia González is PhD In Biology from the University of Vigo, currently Senior Researcher in the Agricultural Center Marchamalo (included in the recently created IRIAF - Regional Research Institute and Agricultural Development and Forestry), specialized in Palynology studying the botanical and geographical origin of bee products, as well as the different sources and resources used in bee nutrition.

#### **Abstract**

Products of the hive include bees wax, propolis, brood, venom, pollen, royal jelly, and of course, honey. Generally, honey is classified by the floral source of the nectar from which it was made. Honeys can be from specific types of flower nectars or can be blended after collection. The pollen in honey is traceable

to floral source and therefore region of origin. The rheological & melissopalynological properties of honey can be used to identify the major plant nectar source used in its production.

Honey is classified by its floral source, and there are also divisions according to the packaging and processing used. There are also regional honeys.

Antioxidant properties of different varieties of honey were studied and their applications to food products.

### **Contamination of aromatic herbs and medicinal plants by fungi and associated mycotoxins**



#### **Florentina Israel, Biotechnology Research Centre, Romania**

Dra Florentina Israel is associated professor at the University of Agricultural Sciences and Veterinary Medicine from Bucharest, Faculty of Biotechnology, Department of Chemistry. Also acting at Center of Applied Biochemistry and Biotechnology BIOTEHNOL. Expertise in chemical and biochemical characterization of food, feed and biotechnological products.

#### **Abstract**

Aromatic herbs and medicinal plants present a rather high risk of microbial contamination and the risk of mycotoxins has to be considered. Mycotoxins are secondary metabolites of fungi that affect food safety, the most dangerous being aflatoxins, ochratoxin A, deoxynivalenol, zearalenone and fumonisins. The evaluation on contaminant fungi and associated mycotoxins in aromatic herbs and medicinal plants in Europe is justified by consumption dynamics, usage diversity and climate changes. Herbs are currently used to obtain a very wide range of food products: meat, cheese, bakery products and confectionery, juices, spirits, balsamic vinegar, flavored oils, candy and chocolate. Among the herbs in European countries occur frequently basil, parsley, dill, thyme, sage, rosemary, celery leaves, bay leaves, chives, coriander, chervil, marjoram, juniper, oregano, tarragon, watercress. This study considers the increased and diversified use of these herbs and, on the other hand, the cumulative effect of mycotoxins in all the products we consume.



Photos of participants



## BROKERAGE EVENT

The VII Murcia Food Brokerage Event has an International scope and in which companies and researchers from different countries held bilateral meetings to establish technology cooperation agreements regarding to the most novel trends on the sector.

Many of the participants in the International Good Herbs Conference applied for bilateral meetings and have their agenda:



### Agenda for Angel Martinez

#### CTC National Technological Centre for the Food and Canning Industry

Note: This is the preliminary meeting schedule!

The final meeting schedule (including last minute changes) will be handed over to you at the reception desk at the event!

#### B2B Meetings 1 (Thursday, 09:30 - 13:30) - Thu, 14 May 2015

Time	Table	Organisation / Participant	
09:30	9	Symbiona S.A. — Justyna Dziewota-Jabłorńska (Poland)	Own Booking
10:00	6	Universidade Católica Portuguesa. Escola Superior de Biotecnologia — Ana Amaro (Portugal) Research Partnership: Use of aromatic and medicinal herbs like natural ingredients in the food sector	Guest Booking
10:30	25	American University of Madaba — Basem Dababneh (Jordan) Research Partnership: Use of aromatic and medicinal herbs like natural ingredients in the food sector	Guest Booking



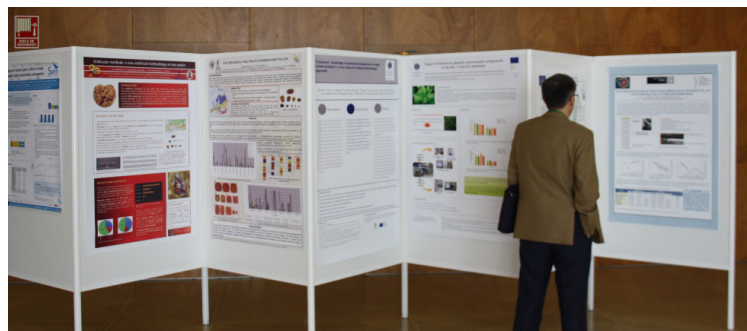


## POSTER SESSION

The following posters were presented by participants in the Conference:

1. **Resistant Starch type 3: effect on body weight, body composition and appetite.** R. Romero-Gonzalez<sup>1</sup>, C. Fyfe<sup>1</sup>, H. EM McKinnon<sup>1</sup>, S.H Duncan<sup>1</sup>, S. Gratz<sup>1</sup>, D. Bosscher<sup>2</sup>, A. Bonnema<sup>2</sup>, G. Horgan<sup>1</sup>, J. Harrold<sup>4</sup>, J. Halford<sup>4</sup>, E. Näslund<sup>5</sup>, H.J Flint<sup>1</sup>, A. M Johnstone<sup>1</sup>. <sup>1</sup>University of Aberdeen, Rowett Institute of Nutrition and Health, Scotland, UK, <sup>2</sup>Cargill, R&D Centre, Vilvoorde, Belgium, <sup>3</sup>Cargill R&D Centre, Minneapolis (MN), USA; <sup>4</sup>Department of Psychological Sciences, University of Liverpool, UK. <sup>5</sup>Department of Clinical Sciences, Danderyd Hospital, Karolinska Institutet, Stockholm, Sweden.
2. **Molecular methodology: a new anti-fraud technique for bee pollen.** Ana Lumberras, Alberto Benavent-González, Amelia Virginia González-Porto & Cristina Pardo Martín
3. **Palynological analysis of European bee pollen.** Amelia Virginia González-Porto & Cristina Pardo Martín
4. **Consumers' knowledge on protected designation of origin of food products – a cross cultural training methodology approach.** Silva A.P.<sup>1</sup>, Amaro A.<sup>1</sup>, Villegas B.<sup>2</sup>, Lucia N.<sup>3</sup>, Fisichella, C.<sup>3</sup>, Tupasela T.<sup>4</sup>, Monteiro M.<sup>1</sup>, Pintado M<sup>1</sup>, Cardoso E<sup>1</sup>. <sup>1</sup>Universidade Católica Portuguesa, Portugal, <sup>2</sup>AINIA, Spain, <sup>3</sup> Fondazione Qualivita, Italy, <sup>4</sup>LUKE Finland. [ecardoso@porto.ucp.pt](mailto:ecardoso@porto.ucp.pt)
5. **Impact of harvest on phenolic and aromatic compounds of *Mentha piperita* infusions.** Marta Coelho<sup>1</sup>, Maria João Pereira<sup>1</sup>, Luísa Cardoso<sup>2</sup>, Luís Alves<sup>2</sup>, Francisco Campos<sup>1</sup>, Manuela Pintado<sup>1</sup>. <sup>1</sup>CBQF - Centro de Biotecnologia e Química Fina – Laboratório Associado, Escola Superior de Biotecnologia, Universidade Católica Portuguesa/Porto, Rua Dr. António Bernardino Almeida, 4200-072 Porto, Portugal. <sup>2</sup> Cantinho das Aromáticas, Rua do Meiral, 508, 4400-501 Canidelo, Vila Nova de Gaia, Portugal
6. **Identification of proteins of agro-alimentary interest in flours and protein isolates derived from olive seeds.** Adoración Zafra<sup>1,2</sup>, Juan Pedro Sánchez-Rivas<sup>2</sup>, Rebeka Krebesová<sup>1</sup>, Elena Lima<sup>1</sup>, Jose Carlos Jiménez López<sup>1</sup>, Antonio Jesús Castro<sup>1</sup> y Juan de Dios Alché<sup>1,\*</sup>. <sup>1</sup>Estación Experimental del Zaidín, CSIC, Departamento de Bioquímica, Biología Celular y Molecular de Plantas, 18008 Granada, España, <sup>2</sup> Grupo Elayo. C/ El Almendro 37, 23670 Castillo de Locubín, Jaén. \* e-mail: [juandedios.alche@eez.csic.es](mailto:juandedios.alche@eez.csic.es)





### Molecular methods: a new antifraud methodology on bee pollen

A. Lombardi\*, A. Benavent-González, A. González-Fernández, C. Pardo\*

\*Centro Biológico Integrado de Investigación en Biotecnología y Alimentos, CSIC, Madrid, Spain

**INTRODUCTION**

The traditional procedure for bee pollen (BP) identification based on cultural and morphological analysis of pollen grains is not reliable. BP is a complex mixture of pollen grains from different plants, which makes it difficult to identify. A new methodology based on molecular methods is proposed. This methodology is based on the use of DNA sequencing and PCR amplification of specific markers. The results show that this methodology is more reliable than the traditional one.

**MATERIAL AND METHODS**

BP samples from 10 different flowers (Alfalfa, Sunflower, Rape, Buckwheat, and others) were collected. The pollen grains were extracted and the DNA was isolated. The DNA was then amplified using specific primers. The resulting PCR products were sequenced and compared with the sequences of the reference pollen grains.

**RESULTS AND DISCUSSION**

The results show that the molecular methodology is more reliable than the traditional one. It can identify the pollen grains in a mixture of different pollen grains. This methodology can be used for the identification of BP and for the detection of fraud.

### IDENTIFICACIÓN DE PROTEÍNAS DE INTERÉS AGROALIMENTARIO EN BARRAS Y ANÁLISIS PROTEOMICO DE SEMILLAS DE OLIVO

A. Zafra\*, J.P. Sánchez-Rovito\*, R. Knežević\*, A. Castro\*, J.D. Aicua\*

\*Unidad Experimental de Dado, CSIC, Departamento de Bioquímica, Biología Celular y Molecular de Plantes, 1000 Granada, España

**INTRODUCCIÓN**

El aceite de oliva virgen extra es un producto de gran calidad y valor nutricional. Sin embargo, el mercado está saturado de productos falsificados. Por ello, es necesario desarrollar métodos para la identificación de proteínas de interés agroalimentario en barras y análisis proteómico de semillas de olivo.

**MATERIAL Y MÉTODOS DE EXTRACCIÓN**

Se utilizaron semillas de olivo y barras de aceite de oliva virgen extra. Se realizó la extracción de proteínas y se realizó el análisis proteómico.

**RESULTADOS**

Se identificaron proteínas de interés agroalimentario en barras y análisis proteómico de semillas de olivo.

### PALYNOLOGICAL ANALYSIS OF EUROPEAN BEE POLLEN

González-Porta, A.V. & Pardo-Martin, C.\*

\*Centro Biológico Integrado de Investigación en Biotecnología y Alimentos, CSIC, Madrid, Spain

**INTRODUCTION**

Bee pollen (BP) provides all the essential nutrients for growth and development of bees. BP is a complex mixture of pollen grains from different plants, which makes it difficult to identify. A palyнологical analysis of European BP is proposed.

**OBJECTIVES**

The aims of this study are to contribute to the knowledge of the plants and families which appear more frequently in the European BP. Main sources of European BP (wild vegetation / cultivated plants). Location of the hives (countrywide / crops).

**MATERIAL AND METHODS**

BP samples from 10 different flowers (Alfalfa, Sunflower, Rape, Buckwheat, and others) were collected. The pollen grains were extracted and the DNA was isolated. The DNA was then amplified using specific primers. The resulting PCR products were sequenced and compared with the sequences of the reference pollen grains.

**RESULTS**

The results show that the palyнологical analysis of European BP is more reliable than the traditional one. It can identify the pollen grains in a mixture of different pollen grains. This methodology can be used for the identification of BP and for the detection of fraud.

### Consumers' knowledge on protected designation of origin of food products | a cross cultural training methodology approach

Silva A.P., Amaro A., Villegas B., Lucia N., Faischeit C., Tupaseta T., Monteiro M., Pinheiro M., Cardoso E.

\*Universidade Católica Portuguesa, Portugal | \*AINIA, Spain | \*Fondazione Qualifica, Italy | \*LUXE Poland

**Introduction**

Food products with Protected Designation of Origin (PDO) have been a success in Europe, with more than 1,000 products registered. Culture and sensory profiles play a key role in the authenticity of PDO products, contributing differentiating factors. However, these products are not easily available to consumers, as mostly are produced in remote companies with local sales. Given the relevance of these products in the European food system, culture and economy, it seems important to identify the knowledge and needs of consumers concerning PDO products.

**Methodology**

A case study was designed to evaluate the training of consumers and its relation to a better understanding of the intrinsic value of European PDO's. A Training Needs Assessment (TNA) was developed to identify learning needs and to help design the training course. An international team designed based on courses are being held in 4 different countries involving more than 150 participants.

**Results**

A qualitative approach was used in 5 countries. In each country 2 focus groups were performed with consumers (n=10) aiming to identify the drivers and obstacles of PDO products consumption. Results showed that consumer's knowledge on PDO products is limited. Most products are famous for their names rather than for the PDO mark. Consumers buy the products not for the PDO mark and do not may put own comprehension of the difference among them. A course on sensory evaluation is quite lacking to be performed at home and a face-to-face training session with a specialized instructor are rather key elements to be included in the further consumer's training on PDO products.

**Conclusions**

The work carried out so far allows us to design and develop a Training Program for Consumers adequate to their different needs in terms of learning methodology learning contents and consumer experience. A blended approach was followed (a face-to-face session was included). The course is based on Moodle Learning Platform. Collaborative learning will be promoted. Distance, autonomous, learning will be promoted and supported by guided testing tools. Multimedia and interaction contents will be the basis of the course presentations, videos, photos, questionnaires and exercises.



## CONCLUSIONS

An interesting mix of different activities made of this International Conference a place where participants could meet the speakers not only in a rigid way in a traditional Conference. Attending the Conference, attending bilateral meetings and looking some interesting posters made for the participant the feeling to be an important part of the event.

## Aknowledgements

Erasmus + Programme, Integration of good practices and new methods for professional training in the field of herbs processing for food and food supplements, Good Herbs. Contract 2014-1-RO01-KA200-002902.