



N°12, MAY 2019

NEWSLETTER



EUROCAROTEN

EUROPEAN NETWORK TO ADVANCE CAROTENOID RESEARCH
AND APPLICATIONS IN AGRO-FOOD AND HEALTH

WELCOME

We are pleased to welcome you to the 12th issue of the EUROCAROTEN newsletter.

In this issue, dedicated to Catherine Caris-Veyrat, we present summary information from EUROCAROTEN's Brussels INFODAY and EUROCAROTEN training school "Analysis of Carotenoids". In Interview rubric, get to know professor Paul Fraser from Royal Holloway University of London, organizer of training school.

Have a look on the 'News from the Action' rubric to find finished STSMs during the last period and read "STSM experience report" by Slađana Rakita, Alessia Fiore, Aliona Ghendov-Moşanu and Jana Tkáčová

Read about our carotenoid of the month – violaxanthin and about creating carotenoid-rich food products as part of a nutritional strategy to improve dietary intake in an ageing population.

In upcoming events rubric check keynote speakers at EUROCAROTEN's International Conference on Carotenoid Research and Applications in Agro-food and Health, which will be held in November 2019 in Lemesos, Cyprus. In Think Tank Information rubric find information about selected TT Representatives for 4th grant period.

Also, you can find more information about EUROCAROTEN COST Action on its COST website http://www.cost.eu/COST_Actions/ca/CA15136 and on our website www.eurocaroten.eu

*Yours sincerely,
Sanja Krstić,
Marina Green,
Kristina Kljak*



Subscription to the e-mailing list is
available via the EUROCAROTEN
website.

Send your comments and proposals to
info@eurocaroten.eu.

Follow us at:



NEWS FROM THE ACTION

In memoriam **Catherine Caris-Veyrat** [Page 2](#)

Contribution from the Network [Page 3](#)

Finished STSMs [Page 3.4](#)

Past events

EUROCAROTEN Infoday "Raising awareness
about the socioeconomic importance of
carotenoids" [Page 5](#)

March 2019, Brussels, Belgium

EUROCAROTEN training school "Analysis of
Carotenoids" [Page 6](#)

April 2019, Egham, UK

Future Events [Page 7](#)

Keynote speakers at Conference on Carotenoid Research
and Applications in Agro-food and Health
November 2019, Lemesos, Cyprus

FINISHED STSM EXPERIENCE REPORTS

Slađana Rakita [Page 8](#)

Alessia Fiore [Page 9](#)

Aliona Ghendov-Moşanu [Page 10](#)

Jana Tkáčová [Page 11](#)

EUROCAROTEN INTERVIEW [Page 12](#)

Talking with: Paul Fraser

CAROTENIDS IN DAILY LIFE [Page 13](#)

Carotenoid of the Month: Violaxanthin

Converting waste-derived carotenoids into value-added
ingredients

THINK TANK INFORMATION [Page 14](#)

New TT representatives for 4th grant period

THINK TANK INFORMATION [Page 15](#)

Goodbye note from Sanja Krstić and Marina Green,
TT representatives for 3rd grant period



IN MEMORIAM

CATHERINE CARIS-VEYRAT



A farewell to our friend

CATHERINE CARIS-VEYRAT

It is with sadness that we learned the death of our friend Catherine Caris-Veyrat.

Director of research at the research unit “Safety and Quality of Plant Origin Products” (Avignon, France), Catherine left us on February 26, 2019, after fighting a long disease with great dignity and courage.

Catherine joined the National Institute of Agronomical Research (INRA) in 1997 to develop research on fruit and vegetable carotenoids, their physico-chemical properties and their role in human health. As the leader of the “Antioxidant

Chemistry” team, she has supervised several doctoral and post-doctoral fellows and has set up a wide network of collaborations within the framework of European projects. She has developed a unique expertise at INRA and is internationally recognized for her work.

All our thoughts are with Marc, her husband, as well as Marilou and Ysalis, her daughters.

Her laugh and her joy of living will be missed.

CONTRIBUTION FROM THE NETWORK & FINISHED STSMs

Special issue of *Journal of Food Quality* – Impact of Preharvest Treatments on Vegetables Quality

This special issue of *Journal of Food Quality* encourages the submission of original research articles focusing on preharvest factors influencing the quality of vegetables.

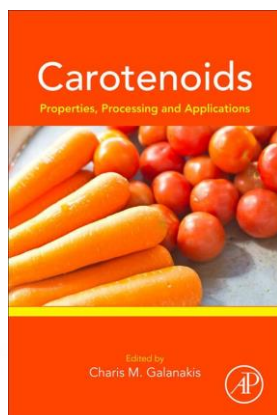
Potential topics include but are not limited to the following:

- Enhancement of the production of bioactive compounds through preharvest treatment of vegetables
- Enhancement of the prohealth quality of vegetables through preharvest treatments: bioaccessibility, bioavailability, metabolism, and potential for biological activity of vegetables
- Effects of preharvest treatments on nutritional and organoleptic quality of vegetables: from seed to food

Authors can submit their manuscripts through the Manuscript Tracking System at
<https://mts.hindawi.com/submit/journals/jfq/prepot/>.

For more information, please visit
<https://www.hindawi.com/journals/jfq/si/156395/cfp/>.

Book “Carotenoids: Properties, Processing and Applications”



EUROCAROTEN member **Charis Galanakis** is an editor of a new book about carotenoids:

"Carotenoids: Properties, Processing and Applications".

Written by a team of experts in the field of food chemistry, food science and technology, as well as bioresource technologists mainly from academia, the book covers the most recent advances in the field of carotenoids, while analysing the potential of already commercialized processes and products.

The book is available at:

<https://www.elsevier.com/books/carotenoids-properties-processing-and-applications/galanakis/978-0-12-817067-0>

Finished STSMs

DETERMINATION OF PHYTOCHEMICAL CONTENT ON PEACH FRUIT MATERIAL WITH STATE-OF-THE-ART ANALYTICAL TECHNIQUES

Grant Holder

George Manganaris, Cyprus University of Technology, Cyprus

Period

26th February – 3rd March 2019

Host Institution

Agricultural University of Athens, Greece

MOLECULAR CHARACTERIZATION OF CAROTENOID MUTANTS IN FRUIT OF CITRUS AND TOMATO

Grant holder

Prof Joseph Hirschberg, The Hebrew University of Jerusalem, Israel

Period

17th – 23rd February 2019

Host Institution

Institute of Agrochemistry and Food Technology, IATA-CSIC

TRANSCRIPTOMIC ANALYSIS OF GENES INVOLVED IN CROCINS BIOSYNTHESIS IN SAFFRON

Grant holder

Alessia Fiore, Italian National Agency for New Technologies, Energy and Sustainable Development

Period

19th January – 22nd March 2019

Host Institution

Universidad de Castilla-La Mancha, Spain

SCREENING OF CAROTENOIDS, ANTIOXIDANT CAPACITY AND BIO ACCESSIBILITY FROM SIX DIFFERENT BERRIES (JUICES AND WASTES) ORIGINATING FROM THE REPUBLIC OF MOLDOVA

Grant Holder

Aliona Ghendov-Moșanu, Technical University of Moldova (TUM) Chisinau, Republic of Moldova

Period

10th February – 10th April 2019

Host Institution

University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca (UASVM Cluj-Napoca), Romania



NEWS FROM THE ACTION

FINISHED STSMs

CAROTENOID RESEARCH IN ANIMAL PRODUCTS

Grant Holder

Sladana Rakita, Institute of Food Technology, University of Novi Sad, Serbia

Period

25th – 29th March 2019

Host Institution

Institute of Animal Science, Czech Republic

CAROTENOID SOURCES AND APPLICATIONS IN ANIMAL FEED

Grant Holder

Nedeljka Spasevski, Institute of Food Technology, University of Novi Sad, Serbia

Period

25th – 29th March 2019

Host Institution

Institute of Animal Science, Czech Republic

CHARACTERISATION OF *RHODOTORULA MUCILAGINOSA* TRANSFORMANTS INCAPACITATED FOR CAROTENOID PIGMENTS PRODUCTION

Grant Holder

Jana Tkáčová, Slovak University of Technology, Slovakia

Period

15th – 31st March 2019

Host Institution

University of Sassari, Faculty of Agriculture, Italy

MOLECULAR AND BIOCHEMICAL CHARACTERIZATION OF TOMATO CRISPCAS9 PLANTS FOR CHY1CHY2 GENES

Grant Holder

Andrea Rujas Arranz, University of Castilla La Mancha, Spain

Period

15th January – 14th April 2019

Host Institution

Italian National Agency for New Technologies, Energy and Sustainable Development (ENEA), Italy

STUDY OF CAROTENOID METABOLISM IN β -CAROTENE SUPPLEMENTED HIGH FAT DIET-FED MICE

Grant Holder

Bojan Stojnic, Universidad de las Islas Baleares, Spain

Period

15th January – 14th April 2019

Host Institution

Italian National Agency for New Technologies, Energy and Sustainable Development (ENEA), Italy

CHARACTERIZATION OF CAROTENOIDs, POSTHARVEST EVOLUTION AND METABOLIC NETWORK WITH VOLATILE APOCAROTENOIDs IN A LONG SHELF LIFE TOMATO VARIETIES CORE COLLECTION

Grant holder

José Luis Rambla, Universitat Jaume I, Spain

Period

16th January – 15th April 2019

Host Institution

italian National Agency for New Technologies, Energy and Sustainable Development (ENEA), Italy

CHARACTERIZATION OF UGT GLYCOSYL TRANSFERASE IN SAFFRON

Grant Holder

Filippo Sevi, Italian National Agency for New Technologies, Energy and Sustainable Development (ENEA), Italy

Period

19th January – 18th April 2019

Host Institution

Universidad de Castilla-La Mancha, Spain

EFFECTS OF INNOVATIVE EXTRACTION PROCESSES ON CAROTENOID RECOVERY FROM ALGAE

Grant Holder

Prof Mladen Brnčić, University of Zagreb Faculty of Food Technology and Biotechnology, Croatia

Period

7th – 14th April 2019

Host Institution

University of Valencia, Spain



NEWS FROM THE ACTION FINISHED EVENTS

EUROCAROTEN INFO DAY “RAISING AWARENESS ABOUT THE SOCIOECONOMIC IMPORTANCE OF CAROTENOIDS”

28th March 2019
Brussels, Belgium



Organizers:

- COST Association
- Dr. Antonio J. Meléndez-Martínez (Universidad de Sevilla, Spain)
- Dr. Carmen Socaciu (University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, Romania)

The first EUROCAROTEN's Infoday, entitled “Raising awareness about the socioeconomic importance of carotenoids” was held on 28th March 2019 in Brussels. Both EUROCAROTEN members and various stakeholders (companies, international associations, scientists, technologists, funding bodies, European Commission experts) participated at this event allowing discussion about possible collaborations. The Infoday started with the presentation of Mr. Bart Veys (COST Policy Support Unit) about COST and achievements of COST Actions. Chair of EUROCAROTEN, Dr. Antonio J. Meléndez-Martínez, presented both carotenoids and EUROCAROTEN, COST Action dedicated to

carotenoids, followed by presentation about working groups (WG), their goals and deliverables by WG leaders or vice-leaders (Paul Fraser, WG1 leader; Anamarija Mandić, WG2 vice-leader; Torsten Bohn, WG3 leader; Anneli Ritala, WG4 leader). Davide Delaiti (Eurostars) presented Eurostars projects within EUREKA.

Last presentations were from Dr. Karin Metzloff (European Plant Science Organisation) and Dr. Francisca Serra-Vich (Full Professor, UIB, Spain; Former National Expert at European Commission).

Dr. Metzloff presented the European Plant Science Organisation and its activities, and discussed how plant science could contribute to society in Europe today and in future. Dr. Serra-Vich presented health claims within Nutrition and health, how they are made and registered within the EU, and emphasized that there no claims regarding carotenoids.

NEWS FROM THE ACTION

FINISHED EVENTS

EUROCAROTEN TRAINING SCHOOL: ANALYSIS OF CAROTENOIDS

8th – 10th April 2019

Royal Holloway University of London
Egham, UK



Organizer:

- Professor Paul D. Fraser, Royal Holloway University of London, UK

In total, 18 young researchers from 10 countries participated at Training School: Analysis of Carotenoids, held in April 2019 in Egham. The ECIs (Early Career Investigators) and PhD students highly appreciated given the opportunity to attend this event.

Training school started with the introductory lecture “Carotenoid analysis: Extraction and chromatography” by Prof. Gerhard Sandmann (University of Frankfurt, Germany), after which participants started practical training in the lab. Practical courses included “Transformation of *E. coli* and inoculation of cultures”, “Extraction of carotenoids from different plant samples (carrot, mandarin, marigold) and loading of UPLC”, “Screen of *E. coli* transformation plates; extraction of *E. coli*” and “Quantitative extraction (tomato) and demonstration of extraction artefacts (Goji berries, *Xanthophyllomyces*); loading of UPLC”. These courses were designed to perform each step of carotenoid analysis from extraction to the analysis of obtained chromatograms, including effects of different extraction conditions and use of different chromatographic columns.

The last day of Training school mini-symposium was held where talks were given by Prof. Sandmann, Prof. Maria Jesus Rodrigo (IATA-CSIS, Spain), Prof Giovanni Giuliano (ENEA, Italy) and Dr. Paula Mapelli Brahm (Universidad de Seville, Spain).

The large extent of practical training, organized by Dr. Marilise Nogueira and Dr. Harriet Berry, enabled familiarization with insights and skills in carotenoid analysis. Furthermore, participants very much benefited from discussion with Prof. Sandmann during laboratory work and data analysis. As a special added value of the training school, all participants of training school had the opportunity to network with each other and socialize during breaks or meals.





NEWS FROM THE ACTION

FUTURE EVENTS

Save the date

26 -28 November 2019

The Royal Apollonia Hotel
Lemesos

International Conference on Carotenoid Research and Applications in Agro-food and Health



PAUL CHRISTOU

Universidad de Lleida, Spain

Talk title: Third generation plant biotechnology products to address the Food-Feed-Nutrition-Health nexus



PAUL FRASER

Royal Holloway University of London, UK

Talk title: Creating plant molecular factories for nutritional and industrial carotenoids production



ANDREU PALOU

University of the Balearic Islands, Spain

Talk title: Health claims and nutrition information



TORSTEN BOHN

Luxembourg Institute of Health (LIH)

Talk title: Carotenoids – are we ready for dietary intake recommendations?



GIOVANNI GIULIANO

ENEA, Rome

Talk title: Convergent evolution of crocin biosynthesis in higher plants



NORA O'BRIEN

University College Cork, Ireland,

Talk title: Pro-vitamin A Carotenoids in Foods: Nutritional Significance in Developing World Countries



ELIZABETH J. JOHNSON

School of Medicine, Tufts University, USA

Talk title: Lutein as a part of a nutrient pattern for brain health



ANTONIO MELENDEZ

Universidad de Seville, Spain

Talk title: Carotenoids and derivatives for the industry: Traditional, emerging and prospective applications

FINISHED STSM'S EXPERIENCE REPORT

Sladana Rakita

CAROTENOID RESEARCH IN ANIMAL PRODUCTS

Affiliation	Institute of Food Technology, University of Novi Sad, Serbia
Position	Research associate
Host Institution	Institute of Animal Science, Czech Republic
E-mail	sladjana.rakita@fins.uns.ac.rs



My Short Term Scientific Mission took place in Prague at the Institute of Animal Science, for a period of one week, under the supervision of Prof. Milan Marounek.

The main goal of my visit was to learn the technique for determination of zeaxanthin and lycopene in animal based products using a HPLC so that I can further implement it in the laboratory of my Home institution. The additional aim was to determine the concentration of malondialdehyde (MDA) as an indicator of oxidative stability during storage in egg yolk samples.

During the visit, I introduced myself and my scientific area to the host Prof. Milan Marounek and his assistants. I collaborated with Dr. Tomáš Taubner who thoroughly explained to me basic principles of HPLC method for determination of zeaxanthin and lycopene. For carotenoid analysis, we used available samples in order to go through each step of the method.

Determination included chemical and standard preparation, construction of calibration curve, sample preparation, HPLC analysis and data analysis. The additional method which was demonstrated in the Host institution is used for determination of MDA concentration in egg yolk samples by derivatizing MDA with 2,4-dinitrophenylhydrazine (DNPH) using HPLC.

I had the chance to work in a well-equipped and organized laboratory and to use well-established

analytical methods. We thoroughly discussed the results that have been obtained and made some conclusions and proposals for future collaboration and joint research. From the beginning to the end, the cooperation was productive. All members of the Host group were helpful, supportive and willing to answer questions and give advices. While working in a lab, I significantly improved my laboratory skills by learning new methods.

Since I had a great opportunity to learn techniques which can be implemented and conducted in laboratories at the Home institution as routine analysis, I truly believe that the knowledge I gained and the practical work will enhance research capacities of the Home institution.

The visit to the Institute of Animal Science brought an added value to the already established and a more efficient collaboration between the two involved COST partner groups, and hence for the whole COST Action.

First of all, I would like to express my sincere gratitude to Prof. Milan Marounek for his willingness to receive me, for warm welcome and hospitality. Further, many thanks to Dr. Tomáš Taubner for taking the time for sharing his knowledge with me. I am also thankful to EUROCARTEN network for financial support and providing this valuable opportunity for my professional and personal development. I highly recommend young researchers to undertake short research stays abroad to improve their expertise and broaden scientific horizons.



FINISHED STSM'S EXPERIENCE REPORT

Alessia Fiore

TRANSCRIPTOMIC ANALYSIS OF GENES INVOLVED IN CROCINS BIOSYNTHESIS IN SAFFRON

Affiliation	Italian National Agency for New Technologies, Energy and Sustainable Development (ENEA), Italy
Position	Junior research scientist
Host Institution	Universidad de Castilla-La Mancha, Spain
E-mail	alessia.fiore@enea.it



The STSM Grant allowed me to realize my research plans related **transcriptomic analysis of genes involved in crocins biosynthesis in saffron** which I am interested. Crocins biosynthesis and accumulation in saffron is developmentally controlled, increasing their concentration as the stigma develops. Until now, **little is known about the molecular mechanisms governing crocins biosynthesis and accumulation**. This study aimed to provide a set of gene regulatory processes implicated in apocarotenoid biosynthesis and accumulation. In the present COST project, I proposed to analyse and study a RNA Seq data generated from *Crocus sativus* RNA to improve our knowledge about crocins biosynthesis, formation and accumulation; more in detail, my targets was been the **major transcription factor families related to apocarotenoid accumulation and biosynthesis**. During the STSM I had the chance to learn methods to reach this goal and for this reason I'm very thankful for all to **Dr. Lourdes Gomez Gomez and Dr. Oussama Ahrazem** that introduced me the laboratory work on transcription analysis in very efficient but also and friendly way.

Once in Spain, I was impressed by "**Instituto Botánico, Departamento de Ciencia y Tecnología Agroforestal y Genética**" for the technical equipment and welcome. The **cooperation with the group members was very pleasant and productive**, since I always felt welcome and well supported.

On the weekends, I took the opportunity to explore the cities and in particular "**el jardín botánico de Albacete**" that is really very nice.

Looking back on that great experience, I can only say that **I really enjoyed my mission and highly appreciated the support from EUROCAROTEN**. My work and the started cooperation were of great benefit to my experience, which has been implemented.

The obtained research results and discussions generated by this STSM program will be reported in at least one joint scientific publication and open some new joint research perspectives in both countries. **This STSM program has therefore provided important results and new perspectives to my ongoing research**. This program was a professional challenge as well as an important professional experience.



FINISHED STSM'S EXPERIENCE REPORT

Aliona Ghendov-Moșanu

SCREENING OF CAROTENOIDS, ANTIOXIDANT CAPACITY AND BIO
ACCESSIBILITY FROM SIX DIFFERENT BERRIES (JUICES AND WASTES)
ORIGINATING FROM THE REPUBLIC OF MOLDOVA

Affiliation	Technical University of Moldova (TUM) Chisinau, Republic of Moldova
Position	Postdoctoral researcher
Host Institution	University of Lleida, Spain, Spain
E-mail	aliona.mosanu@tpa.utm.md



My short-term scientific mission was carried out at the **University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, Romania** for 8 weeks, under the supervision of **Prof. Carmen Socaciu**. In my post-doctoral work I investigated the **carotenoids, antioxidant capacity and bioaccessibility from six different berries (juices and wastes) originating from the Republic of Moldova**. Objectives were to perform a comparative carotenoid screening of juices and waste from 6 fruits (rosehip, sea buckthorn, mountain ash, hawthorn and pumpkin pulp), using HPLC-MS, to determine their antioxidant potential and bioavailability tested in simulated gastrointestinal environment. As part of this research program, **I acknowledged new techniques and standardized methods**, to mention LC-MS/MS and HPLC-DAD for the determination of carotenoids in waste extracts of berries, methods which are not available at TUM.

At a scientific level, the STSM stay has been a very good experience. It enabled me to **stay at a new research University and get familiar with an excellent and internationally recognised laboratory**. Prof. Carmen Socaciu and her team have extensive experience in screening of carotenoids, antioxidant capacity and bioaccessibility from plant materials and I'm sure that the experience and **results I got there will be very fruitful, not only for my Postdoctoral work but also to my scientific career**. The laboratory team gave support me and created a nice atmosphere.

I am very grateful for this opportunity to get acquainted with new scientists (**Prof. Adela Pinte, Prof. Andrea**

Bunea, Prof. Constantin Bele, drd. Cristina Tudor, chim. Florinela Fetea, tech. Luminița Mureșan) and to work in this scientific team.

The city Cluj-Napoca is known as a major cultural and university center full of creative energy. During this STSM, I visited various exhibitions of creativity and I was at sports matches.

Finally, I would like to express **my sincere gratitude to Prof. Carmen Socaciu and her team** for their willingness and support, for the guidance and unconditioned help in the laboratory. I thank the COST Action CA15136 EUROCAROTEN for the effort and to make possible such opportunities to scientists. **I am recommending this experience to other researchers for their professional and the personal development.**



FINISHED STSM'S EXPERIENCE REPORT

Jana Tkáčová

CHARACTERISATION OF *RHODOTORULA MUCILAGINOSA* TRANSFORMANTS INCAPACITATED FOR CAROTENOID PIGMENTS PRODUCTION

Affiliation Slovak University of Technology, Slovakia
Position PhD student
Host Institution University of Sassari, Faculty of Agriculture, Sardinia, Italy
E-mail jana_tkacova@stuba.sk



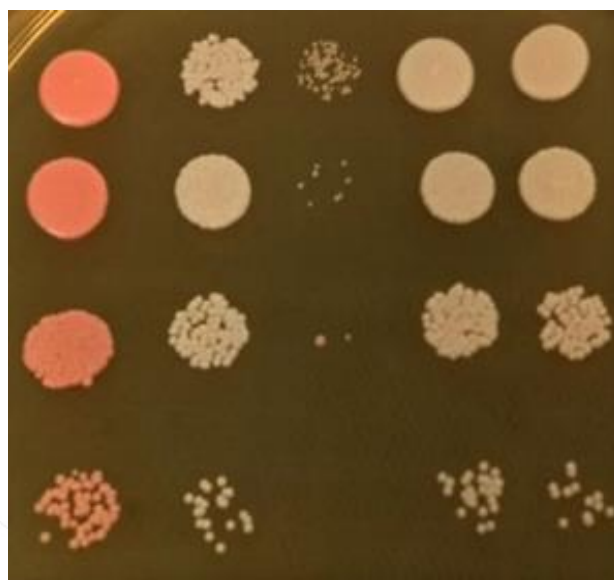
The STSM short-term fellowship has been carried out at University of Sassari in Sardinia, Italy. I have spent 17 days at laboratory of Assoc. prof. Ilaria Mannazzu to study white recombinants of *Rhodotorula mucilaginosa* incapacitated to produce carotenoid pigments. The research was focused on identification and localisation of incorporated deletion cassette in carotenoid genes resulting in white colonies of recombinants. By addition of H_2O_2 , NaCl and $CuSO_4$ into agar medium, the impact of carotenoid gene deletion on cell growth was determined and resistance of mutant strains to oxidative stress was estimated.

Obtained results explain the effect of blocked carotenoid pathway to growth and metabolomics of *R. mucilaginosa*. Moreover, spot assay analysis of resistance to stress factors observes the way of mutant reaction to oxidative stress.

I am thankful for the opportunity of STSM mobility program I was able to complete study as a part of long collaboration with Assoc. Prof. Ilaria Mannazzu that will be published in scientific papers and presented at scientific conferences.

I would like to take the opportunity to thank Assoc. Prof. Ilaria Mannazzu for the chance to be a part of her team and for her advices and supervision during the Short-

term scientific mission. As well as my thank belongs to Dr. Chiara Multineddu for help during experiment proceeding. I also thank to the COST EUROCARTEN committee for supporting my application that ensured me to expand my research skills in molecular biology at University of Sassari.





EUROCAROTEN INTERVIEW

TALKING WITH:

Paul D. Fraser

Affiliation	Royal Holloway University of London
Position	Professor of Biochemistry
Country	UK
Area of Interest	Biosynthesis, regulation and manipulation of isoprenoid biosynthesis in plant and microorganisms.



Please tell us a bit about your lab and what you work on?

The laboratory focuses on the biosynthesis, regulation, sequestration and manipulation of isoprenoids, such as industrial and nutritional valuable carotenoids. Incorporated within these activities are modern technologies such as metabolomics, proteomics and gene editing.

In general terms, which area of the carotenoids do you find most interesting?

The development of new sources of carotenoids which indirectly can lead to furthering our understanding of the pathway and its incorporation in generic metabolism.

As an STSM hosting lab, what type of collaborative projects would you envision?

The lab is happy to provide STMS and training schools although the funding schemes imposed by COST are very restrictive but I am sure they have their reasons.

I think the main focus should be integrated projects as carotenoid research has made incredible advances

since the pioneering initiatives provided by Prof Bramley and Prof Giuliano to foster collaborative activities across Europe and beyond.

The advances achieved through these networks has transcended the immediate field and provided exemplar cases for other valuable natural products.

In your eyes, how can the EUROCAROTEN Action contribute to carotenoid research?

The workshop in Croatia was the highlight to date from my perspective because it really addressed current research activities, industrial perspectives and the gaps that existed in the field. In addition, global activities were incorporated into the workshop and the opportunity to assess the progress of “Golden Rice and Vitamin A deficiency in Low Medium Income Countries” (LMICs). It is disappointing that the COST ACTION has not been able to leverage more funds for integrated projects in the field and foster better interaction between health and emerging markets with renewable sources. I think this could be because we are too carotenoid “focused” and not looking at carotenoids as an integral component of other industrial and physiological processes.

Read more @ www.facebook.com/eurocaroten

CAROTENOIDS IN OUR DAILY LIFE

CAROTENOID OF THE MONTH

Name: Violaxanthin

Chemical Formula: $C_{40}H_{56}O_4$

Molecular Weight: 600.85 g/mol

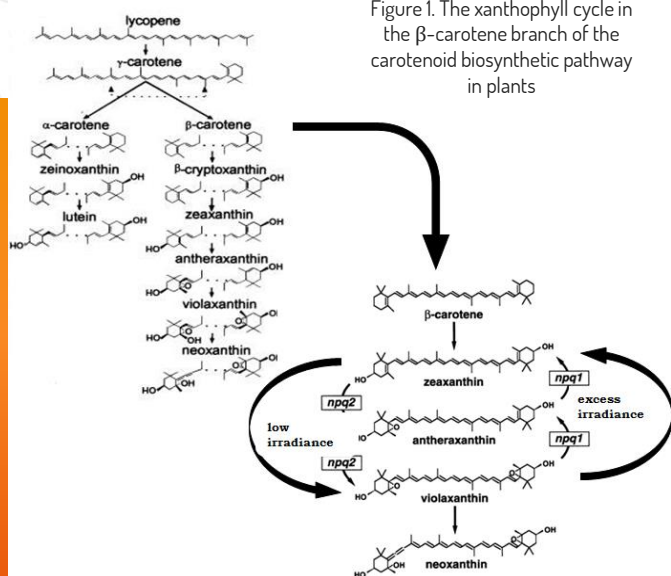
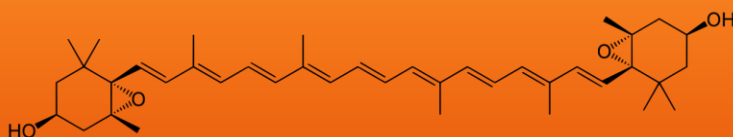


Figure 1. The xanthophyll cycle in the β -carotene branch of the carotenoid biosynthetic pathway in plants

CAROTENOID OF THE MONTH: Violaxanthin

Violaxanthin is a natural xanthophyll pigment with an orange colour found in a variety of plants including pansies, mango, papaya, potatoes, olive fruit, yellow bell peppers, spinach and also in a variety of brown algae. It is an epoxycarotenol that is 5,5',6,6'-tetrahydro-5,6:5',6'-diepoxy- β,β -carotene substituted by hydroxy groups at positions 3 and 3'. As a food additive, it is used under the E number E161e; however, this use is approved only in Australia and New Zealand, where it is listed under the INS number 161e.

It is biosynthesized from zeaxanthin by epoxidation. The xanthophyll cycle is an enzymatic, reversible process through which the carotenoids violaxanthin, antheraxanthin, and zeaxanthin are interconverted in response to the need of balancing light absorption in order to use the energy to drive the reactions of photosynthesis. The cycle is thought to be one of the main avenues for safely dissipating excitation energy absorbed in excess of that needed for photosynthesis by plants. The products of the light-dependent phase of xanthophyll cycles play an important role in the protection against oxidative stress generated not only by an excess of light but also by other ROS-generating factors such as drought, chilling, heat, senescence, or salinity stress.

Text by Anissa Peçuli (Spahiu), PhD at Agriculture University of Tirana, Albania.

E-mail: apeculi@ubt.edu.al

CREATING CAROTENOID-RICH FOOD PRODUCTS AS PART OF A NUTRITIONAL STRATEGY TO IMPROVE DIETARY INTAKE IN AN AGEING POPULATION

The demographic change in many European countries means that in the near future older adults will make up a much larger proportion of populations. In anticipation of this, nutritional strategies to enable healthier ageing are growing in importance. One way of improving health in all age groups, including older adults, is to improve dietary quality by combining results from research on dietary patterns and behaviour with the development of new food products, as is done by the NutriAct Competence Cluster Nutrition Research Berlin-Potsdam.

A large body of evidence shows that high consumption of fruits and vegetables rich in carotenoids can lower the risk of developing various non-communicable diseases, which becomes particularly important in later life. As there is limited proof that highly concentrated isolated carotenoids can offer the same beneficial effect, it is favourable to increase the consumption of carotenoid-rich fruits and vegetables. By developing everyday food products that contain larger proportions of such fruits and vegetables, higher intakes of carotenoids become more easily achievable without the necessity of drastic changes in dietary habits or the use of supplements. These carotenoid-rich foods further have the potential to be implemented in intervention trials for the elucidation of novel biomarkers.

Text by Amy Schmiedeskamp, Scientific Associate at Leibniz-Institute of Vegetable and Ornamental Crops and PhD Candidate at University of Potsdam, Germany

E-mail: schmiedeskamp@igzev.de

Read more @ www.facebook.com/eurocaroten



THINK TANK INFORMATION

TT REPRESENTATIVES FOR THE 4th GRANT PERIOD



Anisa PEÇULI
PhD
Faculty of Biotechnology
and Food
Agriculture University of
Tirana, Albania
E-mail: apeculi@ubt.edu.al



Ng'andwe KALUNGWANA
PhD Student
School of Nutrition and
Food Sciences
University of Leeds
United Kingdom
Email: fsnak@leeds.ac.uk

My experience as Head of Research group at my institution had learned me a lot about being patient, empowering my communication skills and being more efficient in time management. I am eager to learn, I am dedicated and passionate at what I do. The varied nature of the role as TT involving writing articles and publishing these on a newsletter and on social media greatly appeals due to my researcher experience where collecting data and writing articles is the main responsibility.

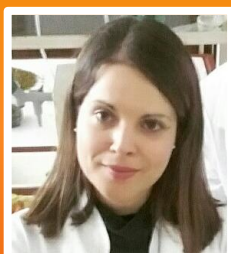
I am highly motivated that throughout this period, as member of TT to be engaged in ongoing policy of the project and develop concrete policy products, facilitates goal accomplishment of the project, provides necessary resources or helps to remove obstacles to help the team accomplish its goals.

Having been involved in Nutrition and Health research in the last 10 years, mainly to assess nutritional status in communities with high vitamin A deficiencies, I am quite certain that there can never be a better opportunity than being a member of the Think Tank Committee of the EUROCARTEN Network. This is an organization with the goal that seeks to enhance the competitiveness of the European agro-food industry and the promotion of health by coordinating research on carotenoids. Indeed, this opportunity is not only fascinating but also well suited with my current PhD project on the bioaccessibility, uptake and subsequent bioavailability of dietary carotenoids.



OF EARLY CAREER INVESTIGATORS AND
OTHER YOUNG RESEARCHERS

Representatives for 3rd grant period:

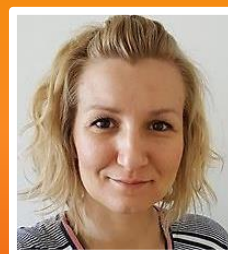


Sanja Krstić
sanja.vlaisavljjevic@dh.uns.ac.rs



Marina Green
mgreen@wilt.ie

ECI spokesperson:



Kristina Kljak
kkljak@agr.hr

THINK TANK INFORMATION

GOODBYE NOTE FROM REPRESENTATIVES FOR 3rd GRAND PERIOD



Sanja Krstić

"It was my pleasure to be a representative of Think Thank (TT) ECI network and to cooperate with wonderful colleagues and members of EUROCARTEN COST action. As a member of the TT team, I met many colleagues who are engaged in various research studies and established a valuable cooperation. This membership was a great experience for me that expanded my professional aspects and provided me with valuable knowledge. I sincerely hope that my cooperation with such a successful team will continue in the future."



Marina Green

"It has been an interesting experience to be part of the EUROCARTEN Think Tank Committee. Learning the process of elaboration, preparation and content curation of a Newsletter in a scientific group within a European action was challenging and valuable. It has been enriching to actively participate in publishing the EUROCARTEN Newsletter. Being a TT representative facilitated me to develop new skills regarding communication to work within a group of different backgrounds and interests, for a common objective. The editing of high value material like the STSMs or the carotenoid of the month was stimulating. I wish all the success for the upcoming think tank representatives and all the best for this last year to the EUROCARTEN action, that has given so much to the scientific community and to society."

ACKNOWLEDGEMENTS

We would like to thank everyone who has so kindly contributed with the content present in this newsletter:

Antonio J. Meléndez Martínez and Cristina L.M. Silva for their guidance and supervision during the making of the EUROCARTEN Newsletter.

Slađana Rakita, Alessia Fiore, Aliona Ghendov-Mošanu and Jana Tkáčová who have kindly given their testimony.

Prof. Paul Fraser for his contribution to our EUROCARTEN Interview.

Anisa Peçuli and Amy Schmiedeskamp for their contribution to our "Carotenoids In Our Daily Life" rubric.

This newsletter is part of dissemination strategy of COST Action EUROCARTEN, supported by COST (European Cooperation in Science and Technology).

COST (European Cooperation in Science and Technology) is a pan-European intergovernmental framework. Its mission is to enable break-through scientific and technological developments leading to new concepts and products and thereby contribute to strengthening Europe's research and innovation capacities.

DISCLAIMER

"The EUROCARTEN COST Action support for the production of this newsletter does not constitute endorsement of the contents which reflects the views only of the authors, and the COST Action cannot be held responsible for any use which may be made of the information contained therein."

NEWSLETTER CONTRIBUTORS

Editors:

Antonio J. Meléndez-Martínez (ajmelendez@us.es)

Kristina Kljak (kkljak@agr.hr)

Marina Green (mgreen@wit.ie)

Sanja Krstić (sanja.vlaisavljevic@dh.uns.ac.rs)

Dissemination:

Anneli Ritala (anneli.ritala@vtt.fi)

George Manganaris (george.manganaris@cut.ac.cy)

Cristina Luisa Silva (clsilva@porto.ucp.pt)

Mladen Brncic (mbrncic@pbf.hr)

Design and Layout:

Miguel Braga (miguel.braga@brag.pt)