The International Society for Nutraceuticals and Functional Foods

ISNFF Newsletter
July 2021

Volume 14, Issue 1

CONTENT

MESSAGE FROM THE ISNFF

The International Society for Nutraceuticals and Functional Foods (ISNFF), like other organizations has been affected by the COVID-19 pandemic. This resulted in our decision to postpone the 2020 annual conference and exhibition to 2021. Despite this, we have continued to make remarkable contributions in research and development of functional foods, nutraceuticals, dietary supplements, and natural health products. In doing so, our activities have given great benefit to foster strong, wide, and international communication among professionals in academia, industry, governments, and other organizations, and among inventors, investors, and other interested parties. Our success has been due to the support received from our members who have provided state-of-the-art expertise in the field. Industry relevant R & D work and establishing true pre-clinical and clinical support for the ideas put forth are still needed to establish a strong relationship of laboratory findings and disease risk reduction studies with *in vivo* health promotion data that meet various regulatory approvals.

The primary journal of the ISNFF, Journal of Food Bioactives, has completed its 3rd year of activities with publication of important articles in research, perspectives and reviews that are easily accessible through our dedicated website <isnff-jfb.com> or through ISNFF website <isnff.org>. All manuscripts processed in 2021 continue to receive a waiver of applicable fees, if qualified. The cite impact factor at this point exceeds 5 and we are now in the process of being considered for inclusion in the SCI list, hopefully in the very near future.

We will keep you informed of further details of the 2021 ISNFF conference and exhibition that will be held in a hybrid format. We look forward to hearing your latest findings and developments, to meet old friends and to make new ones in the meeting, in person or virtually. This will take place October 17-20. Please note that applications for the ISNFF Merit Award, Fellow Award, and Fereidoon Shahidi Fellowship should be sent directly to the ISNFF office <isnffsecretary@gmail.com> and to be copied to the attention of Professor Chi-Tang Ho ctho@sebs.rutgers.edu for 2021. The 2021 Global Food Science Student Competition (GFSSC) will be held as well. This virtual event is organized by Jiangnan University (Professor Bo Jiang). Subjects relevant to food science, food bioscience and related to functional foods and nutraceuticals will be of special interest.

Please note that abstracts for the GFSSC should be submitted to gfssc2021@hotmail.com or gfssc2021@jiangna.edu.cn. The MSc and PhD students are eligible and there will be 20 finalists that would be asked to present; there will be one platinum, two gold, three silver and fourteen bronze prizes.

The authors who submit their manuscripts to the be presented at the conference to either Journal of Food Bioactives or Food Production, Processing and Nutrition, will automatically be considered for best paper award. Details will be provided in due course.

The 2021 conference site, Nanjing, is the old capital of China and an exciting place with many historical places to visit during the evenings, if attending in person, and any free time you may find. We sincerely hope that the world overcomes the challenges posed by the pandemic and we arrive stronger than ever in the new juncture this situation has created by leading into new findings that offer opportunities for food production, processing, and nutrition. We will keep you informed through our website, the journal, and also newsletters.

Dr. Fereidoon Shahidi (Principal Founder and Executive Board Member of ISNFF)

Dr. Rotimi Aluko (Chair of ISNFF)

SCIENTIFC REVIEW ARTICLES

Haskap Berry: An Emerging Source of Functional Foods and Nutraceuticals

H.P. Vasantha Rupasinghe, Ph.D., FCIFST
Professor and Killam Chair in Functional Foods & Nutraceuticals
Dalhousie University,
Truro, Nova Scotia, Canada

Haskap (*Lonicera caerulea* L.) berries have been receiving growing interest as a new functional food or "superfruit" and a competitor to well-recognized fruits, including blueberries. The berries have been traditionally used as a medicine for thousands of years by the people of Russia, Japan, and Northeastern China [**1**]. For example, the therapeutic benefits of haskap berry were well known amongst the Japanese Ainu aboriginal people, recognizing the berry as "the elixir of life". The berries are rich in polyphenols, especially anthocyanins and other flavonoids, and exhibit high antioxidant activity and various physiologically beneficial activities. Haskap berries also contain high levels of phenolic acids, iridoids, vitamin C, and other minor constituents including magnesium, phosphorus, calcium, potassium, manganese, sodium, and iron.

There are many studies in the literature investigating their health benefits, including anti-inflammatory, antidiabetic, neuroprotective, chemopreventive and chemotherapeutic properties [**1, 2**]. In our first Canadian study of assessing the nutritional and nutraceutical quality of Canadian haskap berry cultivars, it was found that the antioxidant capacity of haskap berry was significantly greater compared to that of other commonly consumed fruits [**3**]. Polyphenols extracted from haskap berry exerted suppression of the release of pro-inflammatory cytokines by lipopolysaccharide-induced macrophages *in vitro,* suggesting the anti-inflammatory properties [**4**]. Anthocyanins are the primary bioactive constituents of berries and have exhibited numerous health benefits [**5**]. Independent of cultivars, cyanidin-3-*O*-glucoside (C3G) was found as the predominant bioactive presence in haskap berries [**2, 4, 6**]. The cytotoxicity to breast and liver cancer cell lines was dependent on the concentration of C3G in haskap berry extracts [**7**]. Isolated C3G-rich extracts of haskap berry exhibited anti-diabetes properties *in vitro* [**6**] and C3G-rich extracts of haskap berry showed anti-metabolic syndrome activities in diet-induced obesogenic mice [**8**].

Cancer can be resulted due to extensive DNA damage, often caused by exposure to exogenous and endogenous carcinogenic factors, which impact the cell by impairing transcription, DNA replication, and cell proliferation. Scientific evidence shows that dietary flavonoids help in maintaining genomic integrity; thus, crucial for prevention of carcinogenesis [**9**]. We have demonstrated for the first time that flavonoids-rich haskap berry extracts could reduce carcinogen-induced DNA damage in cultured lung epithelial BEAS-2B cells **[10**]. Moreover, carcinogen-induced tumorigenesis in A/J mice as measured by tumor multiplicity and tumor area was reduced significantly by dietary supplementation of haskap berry [**11**]. It has been also confirmed that the haskap berry bioactives repress proliferative cell nuclear antigen and Ki67 expression in lung tissues. The potential exists for improving the anti-cancer efficacy of haskap berry bioactives through the application of nanoencapsulation technologies that may facilitate entrance,

deposition, retention, and permeability on targeted tissues and through avoiding mucociliary clearance and phagocytosis [**12**].

Therefore, haskap berry has potential to develop as a nutraceutical or functional food ingredient in reducing the risk of certain cancers and other chronic disorders among high-risk populations. In addition to its strong candidacy as a natural source of bioactive polyphenols, haskap berry can be processed into various value-added food products including beverages, snacks, and natural flavor and coloring agents. However, well designed human clinical trials are needed to confirm many of the reported in vitro and in vivo scientific evidence of health-promoting benefits of haskap berry.

References

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The Future of Protein-based Nanodelivery Systems for Bioactive Compounds

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Ottawa, Ontario, Canada

Several food-derived compounds (e.g. polyphenols, peptides and carotenoids) or their metabolites have demonstrated attractive bioactive properties that are beneficial to human health [**1**]. Despite their strong potential, many of these compounds are water-insoluble and have low bioavailability when consumed alone or as a part of the diet [**2, 3**]. This issue is partly caused by the low bioaccessibility in the gastrointestinal tract, or poor intestinal uptake of the nutraceutical compounds. Consequently, the use of delivery systems has been proposed as a way to improve the biostability, bioaccessibility and bioavailability of nutraceuticals, especially those that are water-insoluble [**4**].

The intrinsic structures of food proteins make them attractive for a wide range of applications in the development of novel functional products, beyond their role in human nutrition. Using physical treatment methods, proteins can be structured into functional networks that can be used as biomaterials. Proteins can be used in the fabrication of nanocarriers for encapsulation of hydrophobic (e.g. curcumin, β-carotene and astaxanthin) and hydrophilic (e.g. quercetin and ascorbic acid) bioactive compounds, in order to enhance their bioavailability and health-promoting applications [**5**]. This is due to the structural properties of proteins, especially the many sidechain functional groups that can interact with various substances to form nanostructures and complexes [**6**]. These structural and physicochemical properties of proteins facilitate binding and hence encapsulation of ligands, bioactive compounds, and minerals [**6, 7**].

Proteins from various sources have been utilized in producing nanodelivery systems, especially dairy (e.g., casein, whey), fish (sarcoplasmic) and plant-based (e.g., zein, cruciferin, pea) proteins [**6, 7**], but also emerging/alternative proteins such as those derived from edible insects [8]. The nanoencapsulation of curcumin, astaxanthins and coumarin, using different protein-based delivery systems resulted in encapsulation efficiency of 40-98% [**7**]. The encapsulation efficiency achieved depends on the nature of the core and wall materials, and technique used for the fabrication process, which includes coacervation, antisolvent precipitation, cold gelation, thermal gelation, electrospraying and electrospinning [**6, 7**]. Proteins can also be structurally modified, e.g. by glycation/Maillard reaction or succinylation, to improve their physicochemical properties and encapsulation potential [**6, 9**]. The proteins are mostly used in their crude isolate forms, making it practical to include protein-based nanodelivery systems in product development.

Besides optimal encapsulation, it is important to consider the release profile of the nutraceutical compounds when designing protein-based nanodelivery systems. Release in the gastrointestinal tract has been mostly achieved by the pH-dependent mechanism. Studies have reported the release of 10-45% in gastric fluid and 20-90% in intestinal fluid for some encapsulated food compounds [**7**]. Ideally, the design should be such that less is released from the protein nanocomplex in the stomach and more is offloaded in the intestine where absorption occurs. To achieve this goal, chitosan (pI 6.5) has been used to form polyelectrolyte complexes with proteins, thus achieving high stability at gastric

pH due to electrostatic interaction. In this system, chitosan is deprotonated at intestinal pH resulting in its dissociation from the complex due to weaker protein-polysaccharide interaction [**7**]. Furthermore, an understanding of the binding parameters between the proteins and bioactive compounds is also crucial in designing nanodelivery systems with efficient encapsulation and release properties [**8, 9**].

In summary, food proteins have strong prospects for use in preparing vehicles for the delivery of nutraceutical compounds or drugs in the food and pharmaceutical industry. However, more information is needed to fully realise this potential. For instance, future studies should further optimize and characterize the release profile of the encapsulated compounds under the gastrointestinal environment. More work is also needed to understand the fate of undigested nanocomplexes and potential nano-bio interactions that may pose a safety risk or alter the surface functionality and delivery property of the protein-based nanoparticles.

References

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WELCOME TO ISNFF2021

We are delighted to invite you to the 13th International Conference and Exhibition on Nutraceuticals and Functional Foods (ISNFF2021), which will take place October 17-20, 2021.

The organizing committee is putting its utmost efforts into preparing for the conference, which will be held at the Platinum Hanjue Hotel in Nanjing, China.

We welcome your participation in ISNFF2021 and very much look forward to welcoming all of you to our wonderful city. Conference details will be communicated in due course.

SCIENTIFIC TOPICS OF ISNFF2021

Selected conference topics are given below. Other suggested topics may also be considered.

- Do functional foods and nutraceutical help prevent COVID-19 and other pandemic viruses?
- Medicinal and herbal products as nutraceuticals and natural health products
- Health claims, global regulations and market trends in functional foods and nutraceuticals
- Functional beverages, including caffeinated (tea, coffee, and cacao) drinks, soy products and human health
- Functional carbohydrates, lipids, proteins and bioactive peptides
- Gut microbiota, pre-/probiotics and health
- In vitro, in vivo and RCTs for functional foods and nutraceuticals
- Metabolomics in functional foods and nutraceuticals
- Nutraceuticals and functional foods in health promotion and disease prevention
- Phenolic and polyphenolics as antioxidants, immune enhancing, and anti-inflammatory products and cosmoceuticals
- Cereals, legumes and oilseeds, including superseeds and nuts
- Analysis of bioactives and functional food ingredients
- Food processing and ultra-processed foods
- How to prepare and publish your research findings successfully
- Student poster sessions (e-posters and 5 min presentations)-Multiple fellowships and awards
- Others
- Number of sessions 15-18

UPCOMING NUTRACEUTICALS AND FUNCTIONAL FOODS EVENTS

July 2021

19-23, Institute of Food Technologists IFT21, Chicago, IL USA

August 2021

21-26, ACS Agricultural and Food Chemistry Division, Atlanta, GA, USA

September 2021

23-24, Polyphenols Applications, Valencia, Spain

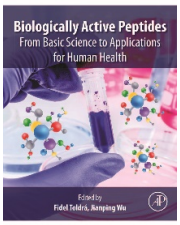
October 2021

17-20, ISNFF Annual Meeting, Nanjing, China

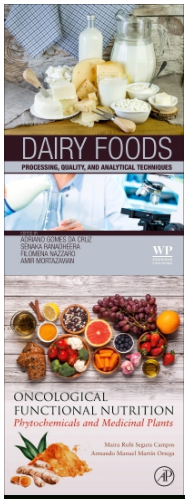
December 2021
16 – 21, Pacifichem, Honolulu, Hawaii, USA

October-November, 2022
TBD, ISNFF Annual Meeting, Didim/Aydın, Turkey

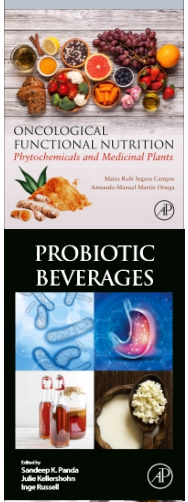
NEW TITLES



Biologically Active Peptides: From Basic Science to Applications for Human Health
Fidel Toldra, Jianping Wu
June 2021 by Academic Press



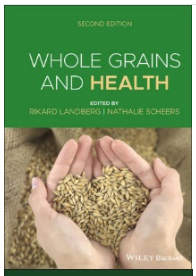
Dairy Foods: Processing, Quality and Analytical Techniques
Adriano Cruz Chaminda Ranadheera Filomena Nazzaro Amir Mortazavian
July 2021 by Woodhead Publishing



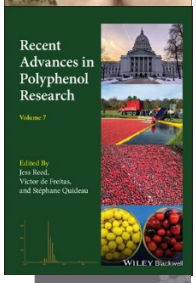
Oncological Functional Nutrition: Phytochemicals and Medicinal Plants
Maira Rubi Segura Campos, Armando Manuel Martin Ortega
August 2021 by Academic press

Probiotic Beverages
Sandeep Panda Julie Kellershohn Inge Russell
April 2021 by Academic Press

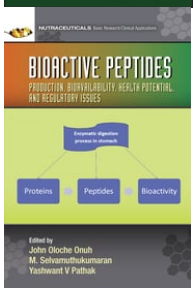
Probiotics and Prebiotics in Foods: Challenges, Innovations, and Advances
Adriano Gomes da Cruz C. Senaka Ranadheera Filomena Nazzaro Amir Mortazavian
March 2021 by Academic Press



Whole Grains and Health, 2nd Edition
Rikard Landberg, Nathalie Scheers
May 2021 by Wiley-Blackwell



Recent Advances in Polyphenol Research, Volume 7
Jess Reed, Victor de Freitas, Stéphane Quideau
April 2021 by Wiley Blackwell



Bioactive Peptides
John Oloche Onuh, M. Selvamuthukumaran, Yashwant V Pathak
June 2021 by CRC Press

ISNFF JOURNALS

Journal of Food Bioactives (JFB)

The JFB, a dedicated publication of ISNFF, was launched in 2018 and completed a successful year with many reviews and original manuscripts. Please note that papers presented during ISNFF Conferences and Exhibition may be submitted for publication consideration to the Journal of Food Bioactives (isnff-jfb.com). To review the published manuscripts please refer to the journal website. Volume 14 was recently published. We have also moved to Scholar One Software which is more familiar to the authors.

Web-site: http://www.isnff-jfb.com/index.php/JFB

Calculated Impact Factor (2020): > 5.000

Journal of Functional Foods (JFF)

The very first issue of the JFF, as the first publication, proposed by ISNFF, as a joint undertaking with Elsevier, was first released in October 2008 (dated January 2009). This journal, the Official Scientific Journal of ISNFF, overtaken by Elsevier, was founded by Professor Fereidoon Shahidi who also serves as its Founding Editor who is also the principal Founding Member of ISNFF.

2020 Impact Factor: 4.451

2021 Annual Conference & Exhibition

Functional Foods, Nutraceuticals, Natural Health Products and Dietary Supplements

October 17-20, 2021

Hotel Platinum Hanjue, Nanjing, Jiangsu, China

International Advisory Board

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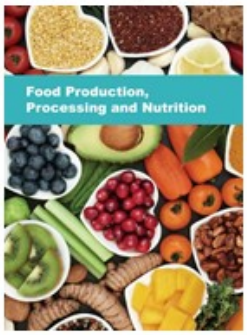
Conference Symposia

- Do functional foods and nutraceuticals help preventing COVID-19 and other pandemics?
- Health claims, global regulations and market trends in functional foods ad nutraceuticals
- Medicinal and herbal products as nutraceuticals and natural health products
- Immune function, gut health and microbiota
- Functional proteins and biopeptides
- Metabolomics in functional foods and nutraceuticals
- Tea and other caffeinated and non-caffeinated beverages
- Cereals, legumes and oilseeds bioactives
- Food processing and ultra-processed foods
- Functional lipids and carbohydrates
- Pre- and probiotics and health
- Production and analysis of bioactives and functional food ingredients
- Phenolic and polyphenolic compounds and Derivatives in he
- Absorption, bioavailability and stabilization of food bioactives
- Student paper competition/presentations
- In-vitro, in-vivo and randomized control trials for functional foods and nutraceuticals
- Others

Pre-conference

How to prepare your manuscript and successfully publish it in SCI journals



For further information, visit: ***isnff.org***

Disclaimer : Program details and speakers may change due to circumstances

ISNFF2021 CONFERENCE REGISTRATION

October 17-20, 2021
Nanjing, China

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Categories	Until Sept 3, 2021	After Sept 3, 2021
☐ Member	$99	$149
☐ Non-member	$149	$199
☐ Student member	$49	$49
☐ Student non-member	$75	$99
☐ Accompanying person	N/A	N/A
☐ Exhibitor (Full Booth)	$2,000 - 2 complementary registrations	
☐ Exhibitor (Tabletop)	$1,000 - 1 complimentary registration	
☐ Gala Dinner	N/A	

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For Sponsorships, please consult the isnff website

ISNFF TITLE & ABSTRACT SUBMISSION

Call for Presentation Papers 2021

Platform for Foods, Nutrition, and Medical Science
October 17-20, 2021
Platinum Hanjue Hotel, Nanjing, China
Abstract submission deadline September 3, 2021

I would like to attend and present:	☐ ***Oral*** ☐ ***Poster*** ☐ ***Oral or Poster*** ☐ ***Student competition*** ***Session Name:***
Title:	
Abstract (150 words or less):	
Key words (3-5 key words)	
Authors: (underline the presenting author):	
Address:	
Telephone:	
E-mail(of each author, in order):	

If presenting, when submitting your abstract please indicate poster/oral and indicate primary and secondary session selection.

Choice 1: _____

*Choice 2:*_____

(Please submit abstract to the website: www.isnff2021.com before September 3, 2021)

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Corporate Member (Renewal)	**$500**	☐
Affiliate and Chapter Member	**$2,000**	☐

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