



The International Society for Nutraceuticals and Functional Foods



ISNFF Newsletter
December 2021

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Message from the ISNFF

Warm greetings for the holiday season from the ISNFF! We have had a challenging couple of years due to the COVID-19 pandemic and with appearance of OMICRON we are once again in an apparent no win situation, but we keep our spirit high and as the year draws to a close, we wish you good health, happiness, prosperity, and success in 2022.

The ISNFF 2020 Conference and Exhibition that was postponed to 2021, was held October 17-20th in Nanjing, China and this conference that was held in a hybrid form attracted some 110 international participants and to keep within the COVID restrictions of less than 300, it had 280-300 participants. The conference included 2 plenary sessions with 14 speakers, 17 scientific sessions, which included short presentations from student finalists. The scientific sessions had 118 oral presentations and the poster sessions included 75 presentations. There were 21 countries and regions present. A pre-conference session on “how to prepare and successfully publish your manuscript – English paper writing” was held as a pre-conference with presentations from editors of six relevant journals in the field.

The ISNFF 2022 Conference and Exhibition is now planned to be in person and in Crowne Plaza Asia İstanbul Asia Hotel and Convention Centre between October 2 and 5, İstanbul Turkey. We look forward to seeing you there and trust that we can once again meet our friends and could make new ones. In addition to the scientific sessions, technical tours and visit to historic sites are included and you will enjoy the hospitality planned during the Gala Dinner on the Bosphorus.

Please stay safe, take advantage of traditional foods that are known for their health benefits, and strengthen your immune system. Do not forget those who are not fortunate enough to help themselves and follow instructions by authorities. Take care of yourself, your families, and your friends so that we can overcome this hurdle of a lifetime.

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

Dr. Rotimi Aluko (Chair of ISNFF)

Recap of ISNFF 2021 Annual Conference

Fellow Award

Dr. Bo Jiang (China)
Dr. Kenji Sato (Japan)
Dr. Petras Rimantos Venskutonis (Lithuania)
Dr. Debasis Bagchi (USA)

Merit Award

Dr. Hanny C. Wijaya (Indonesia)

Fereidoon Shahidi Fellowship Award

Renan Danielski (Canada)

International Cooperation Award

Dr Aimin Wu

2021 Global Food Science Student Competition (GFSSC) Award List

Platinum Award: Arianna Dick, The University of Queensland, Australia

Gold Award:

Andrea Bresciani, Università degli Studi di Milano, Italy
Chang Liu, Jiangnan University, China
Han Peng, Memorial University of Newfoundland, Canada

Silver Award:

Kaimin Peng, Shanghai for Science and Technology, China
Mei Zhi Alcine Chan, National University of Singapore, Singapore
Ran Yang, University of Tennessee, USA
Xianliang Luo, Zhejiang University, China

Bronze Award:

Aziz Bouymajane, Moulay Ismail University/University of Messina, Morocco/Italy
Fang Zhou, Hunan Agricultural University, China
Gui-Mei Chen, Fuzhou University, China
Jianfen Ye, Jiangnan University, China
Jing Zhang, Zhengzhou University of Light Industry, China
Julio Einar Santillán, National University of Córdoba, Argentina
Mohammed Abdalla, University of El Imam El Mahadi/Jiangnan University, Sudan/China
Renan Danielski, Memorial University of Newfoundland, Canada
Ruiqiu Zhao, Nanjing Agricultural University, China
Ruo Xin Chan, National University of Singapore, Singapore
Sawo Eesiah, North Carolina A&T State University, USA
Shihua Luo, Changsha University of Science & Technology, China
Xueqian Su, Virginia Tech, USA
Yi-Hsiu Wu, ChungShan Medical University, Taiwan
Yu-Jou Chou, National Taiwan University, Taiwan
Zhijie Yang, Beijing Technology and Business University, China

ISNFF 2022 Conference & Exhibition

The ISNFF 2022 Conference and Exhibition will be held in Crowne Plaza Istanbul Asia Hotel and Convention Centre between October 2 and 5, Istanbul, Turkey.

The hotel is located in the heart of the city's industrial district on the Asian side of Istanbul and just a short walk to Via Port (the biggest Outlet Shopping Centre of Istanbul). Ideally, it is situated for the business and leisure travellers. It is only 5 km away from Sabiha Gökçen International Airport and 56 km from Istanbul International Airport. The hotel provides free shuttle service to Sabiha Gökçen International Airport hourly. Regular bus services between the two international airports are also available.



Important Dates

Registration and abstract submission information will be posted in early 2022.

Preliminary Program of ISNFF 2022

Food for Health Tracks

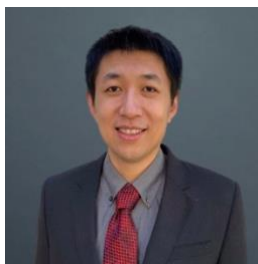
Cardiovascular diseases
Cancer
Brain health/cognitive function
Sports and exercise
Aging/sarcopenia
Sarcopenia, obesity, and diabetes
Immune function
Gastrointestinal diseases
Personalized nutrition and gut microbiota
COVID-19 and other viral diseases
Inflammation and consequences
Absorption, metabolism, and health effects of bioactives
Pre-and probiotics
Others

Food Science Tracks

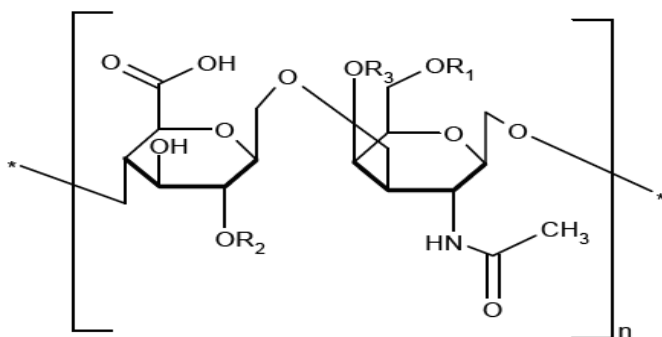
Stabilizing functional food
New functional foods and delivery systems
Product development and optimizing production of functional foods
Nanotechnology for functional foods
Chemistry, biochemistry, and nutrition of functional foods
Cereals, legumes, oilseeds, and nuts in health and disease
Nutraceutical beverages and health
Proteins, biopeptides, and health
Nutraceutical lipids and carbohydrates
Mediterranean diet and health promotion
Olive and its products
Honey and bee wax
Phenolics, carotenoids, and antioxidants
Others

Scientific Review Articles

Testing chondroitin sulfate in nutraceuticals in an industrial setting



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R_1 , R_2 , and R_3 can be either H or SO_3^-
Chondroitin sulfate

Chondroitin is a compound that is abundant in the connective tissues of humans and animals. European Medicines Agency indicates chondroitin sulfate as an anti-osteoarthritis prescription drug, but the US FDA regulates chondroitin sulfate as a dietary supplement, giving U.S. consumers the flexibility to obtain and use chondroitin more freely. In the U.S., Chondroitin sulfate is one of the most popular joint health supplements because it is clinically proven effective and safe in treating osteoarthritis. In sports and fitness nutritions, Chondroitin sulfate is often used to prevent joint pain or treat sports injuries.

Chondroitin sulfate is a sulfated glycosaminoglycan composed of a chain of repeating disaccharide carbohydrates. Animal-derived natural chondroitin sulfate is found as a part of a proteoglycan that consists of a protein core and glycosaminoglycan side chains [1]. From the product quality control standpoint, chondroitin sulfate is challenging to analyze. Depending on the sources, chondroitin sulfate glycosaminoglycan polymer can have wide-range molecular weight, making it difficult to be quantified intact by liquid chromatography with mass spectrometry due to the lack of appropriate reference material. Liquid chromatography with a UV-VIS detector cannot test the intact chondroitin sulfate as well because the polymer has virtually no chromophores. Also, the structure of chondroitin sulfate is similar to other nonfunctional glycosaminoglycans such as keratin sulfate and heparin sulfate, which may present as adulterants and/or interferences that lead to false-positive results. Therefore, one of the keys of chondroitin analysis is to use a specific method that targets chondroitin sulfate [2]. There are several techniques that are used to characterize and quantify chondroitin sulfate in dietary supplements. The selection of the testing technique is dependent on sample matrix, formulation, and methods used when establishing product specification.

Enzymatic hydrolysis and liquid-chromatography analysis can quantify chondroitin sulfate sodium in dietary supplements (complex formulation) and processed raw ingredients. During sample preparation, Chondroitinase is used to break the glycosaminoglycan into chondroitin disaccharide units. This method then uses reversed-phase liquid-chromatography equipped with PDA detector to determine the total amount of chondroitin sulfate sodium by using corresponding external chondroitin disaccharide

calibration standards (Δ Di-0S, Δ Di-4S, and Δ Di-6S). Because Chondroitinase will only hydrolyze chondroitin sulfate, this technique can differentiate chondroitin sulfate from other glycosaminoglycans such as keratin sulfate and heparin sulfate. This technique was adopted as AOAC official method 2015.11 and sometimes recognized as the “AOAC method.” [3] When handling unprocessed animal-derived raw material with bonded chondroitin sulfate, an additional overnight protease pretreatment step is often needed. This step can break proteoglycan and release chondroitin sulfate from its protein core. It is NOT recommended to use this overnight protease pretreatment step for supplements and ingredients that do not contain unprocessed animal-derived raw material because the additional pretreatment may slightly degrade purified chondroitin sulfate, leading to a lower result.

Cetyl pyridinium chloride (CPC) is a positively charged polymer that can form an ion-pair with chondroitin sulfate during sample preparation [4]. This ion-pair is insoluble in water and cause turbidity. The concentration of chondroitin sulfate can be determined by titrating a solution of chondroitin sulfate and measuring the resulting turbidity. This technique is adopted by the United States Pharmacopeia as its monograph method and sometimes recognized as the “USP method.” This technique can be performed relatively easily at a low cost. However, it has several drawbacks because it cannot differentiate chondroitin sulfate from other glycosaminoglycans and other anionic large-molecules, leading to possible false-positive results. This technique also cannot break proteoglycan containing chondroitin sulfate, making it not appropriate to be used for analyzing unprocessed crude animal-derived raw material.

References:

1. Martel-Pelletier J, Farran A, Montell E, Vergés J, Pelletier JP. Discrepancies in composition and biological effects of different formulations of chondroitin sulfate. *Molecules*. 2015 Mar;20(3):4277-89.
2. Ji D, Roman M, Zhou J, Hildreth J. Determination of chondroitin sulfate content in raw materials and dietary supplements by high-performance liquid chromatography with ultraviolet detection after enzymatic hydrolysis: single-laboratory validation. *Journal of AOAC International*. 2007 May 1;90(3):659-69.
3. Brunelle SL. Determination of Chondroitin Sulfate Content in Raw Materials and Dietary Supplements by High-Performance Liquid Chromatography with UV Detection After Enzymatic Hydrolysis: Single-Laboratory Validation First Action 2015.11. *Journal of AOAC International*. 2016 Jan 1;99(1):53-4.
4. Liang Z, Bonneville C, Senez T, Henderson T. Development and validation of a photometric titration method for the quantitation of sodium chondroitin sulfate (bovine) in Cosequin® DS chewable tablet. *Journal of pharmaceutical and biomedical analysis*. 2002 Apr 15;28(2):245-9.



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The global consumption of sea cucumber has increased drastically due to its high nutritional value. Sea cucumber contains a number of essential high-value nutraceuticals and pharmaceuticals with unique biological properties such as antithrombotic, anticoagulant, anticancer, anti-inflammatory, and antidiabetic activities [1]. It has long been consumed as food and used as a traditional remedy to cure many ailments in Asian countries. The body wall of sea cucumber is the major marketable part, which is exported in the world market as frozen, cooked-dried, cooked-salted, and cooked-salted-dried form, and also consumed as soups. East Asian countries, including China, Hong Kong, South Korea, Japan, and Taiwan, are the most important markets for the sea cucumber industry. However, sea cucumber is not popular in the North American market, possibly due to its appearance and plain taste. In the contemporary market, various product forms originating from different body parts of the sea cucumber are available. More recently, sea cucumber-based capsules, jellies, liquid extracts, joint power supplements, and cosmetics are available in the functional food and nutraceutical market. Interestingly, sea cucumber viscera from Pacific and Mediterranean species have been consumed raw, boiled, or pickled to cure different diseases [1].

The orange-footed sea cucumber (*Cucumaria frondosa*) is abundant in the northwest Atlantic, which has been harvested in recent years for commercial purposes but remains under-explored for its bioactive compounds. However, due to the recognition of essential high-value nutraceuticals and pharmaceuticals, including proteins (collagen), lipids (omega-3 fatty acids), carotenoids, chondroitin sulfate, saponin, and phenolics, with various biological properties it has captured the attention of researchers [2]. The body wall is the major marketable portion of this species, whereas some sea cucumber processing industries also sell tentacles (flower). However, during the processing of sea cucumber, several visceral by-products are produced that are ultimately discarded as waste. These visceral by-products represent up to 50% of the sea cucumber biomass and are a rich source of fatty acids and amino acids, as well as bioactive compounds, mainly carotenoids and phenolics. In our research, we have found that the phenolics of the Atlantic sea cucumber exist mainly in the as free form and which is higher in flower than the viscera and body wall. Most of the phenolics present are phenolic acids and flavonoids, which demonstrate strong antioxidant activity by scavenging free radicals and chelating metal ions. It is presumed that these phenolics originate from their diet. Furthermore, phenolic compounds exhibit biological properties such as inhibition of DNA strand scission and LDL-cholesterol oxidation, as well as antiglycation, anti-tyrosinase, and α -glucosidase activities. Apart from these, protein hydrolysates prepared from different body parts of Atlantic sea cucumber show antioxidant activity as reflected in their inhibition of lipid oxidation [3]. Hence, these findings demonstrate the desirable functionalities of bioactive compounds of Atlantic sea cucumber and their potential for use as functional food ingredients. Additionally, utilizing by-products would address both the environmental concerns and economic sustainability of sea cucumber industries. Therefore, special attention should be paid to product development as sea cucumber and its discards offer numerous opportunities for the development of functional foods and nutraceuticals.

References

1. Bordbar, S., Anwar, F., & Saari, N. (2011). High-value components and bioactives from sea cucumbers for functional foods - A review. *Marine Drugs*, 9(10), 1761–1805.
2. Hossain, A., Dave, D., & Shahidi, F. (2020). Northern sea cucumber (*Cucumaria frondosa*): A potential candidate for functional food, nutraceutical, and pharmaceutical sector. *Marine Drugs*, 18, 1-27.
3. Senadheera, R. L. T., Dave, D., & Shahidi, F. (2021). Antioxidant potential and physicochemical properties of protein hydrolysates from body parts of North Atlantic sea cucumber (*Cucumaria frondosa*), *Food Production, Processing and Nutrition*, 3. 1-22.

Upcoming Nutraceuticals and Functional Foods Events

February 2022

1-3, Berry Health Benefits Symposium, Tampa Bay, Florida

April 2022

20-23, 10th International Conference on Polyphenols and Health (ICPH), London, UK

May 2022

1-4, AOCs Annual conference, Atlanta, USA

June 2022

21-24, 3rd International Conference on Food Bioactives & Health, Parma, Italy

July 2022

10-13, IFT Annual Meeting & Food Expo, Chicago, USA

September 2022

28-30, 15th Annual Meetings of Polyphenols Applications 2022, Valencia, Spain

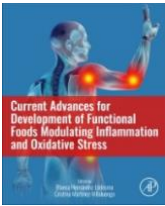
October/November 2022

2-5, Annual Conference and Exhibition of International Society for Functional Foods and Nutraceuticals (ISNFF), Istanbul, Turkey

20-21, NUTS 2022, Reus, Spain

31 Oct – 3 Nov, IUFoST World Congress, Singapore.

New Titles



Current Advances for Development of Functional Foods Modulating Inflammation and Oxidative Stress, 1st Edition

Editors: Blanca Hernandez-Ledesma, Cristina Martinez-Villaluenga

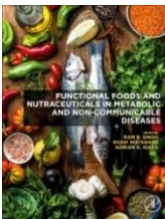
December 2021, Elsevier



Nutrition and Functional Foods in Boosting Digestion, Metabolism and Immune Health, 1st Edition

Editors: Debasis Bagchi, Sunny Ohia

December 2021, Elsevier



Functional Foods and Nutraceuticals in Metabolic and Non-communicable Diseases, 1st Edition

Editor: Ram Singh

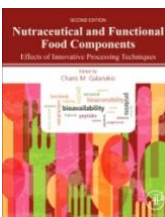
November 2021, Elsevier



Bioactive Food Components Activity in Mechanistic Approach, 1st Edition

Editors: Cinthia Cazarin, Juliano Bicas, Glaucia Pastore, Mario Junior

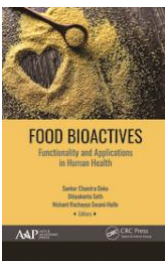
November 2021, Elsevier



Nutraceutical and Functional Food Components Effects of Innovative Processing Techniques, 2nd Edition

Editor: Charis Galanakis

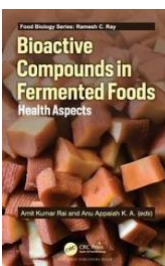
October 2021, Elsevier



Food Bioactives Functionality and Applications in Human Health, 1st Edition

Editors: Sankar Chandra Deka, Dibyakanta Seth, Nishant Rachayya Swami Hulle

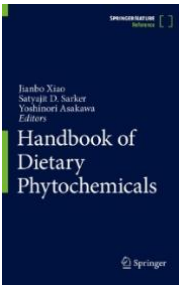
December 2021, Apple Academic Press



Bioactive Compounds in Fermented Foods, Health Aspects, 1st Edition

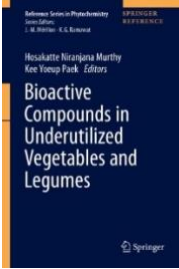
Editors: Amit Kumar Rai, Anu Appaiah K. A.

November 2021, CRC Press



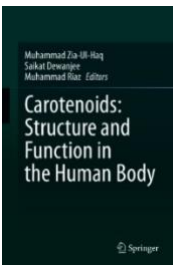
Handbook of Dietary Phytochemicals

Editors: Jianbo Xiao, Satyajit D. Sarke, Yoshinori Asakawa
Springer Nature Singapore Pte Ltd., 2021



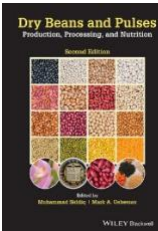
Bioactive Compounds in Underutilized Vegetables and Legumes

Editors: Hosakatte Niranjana Murthy, Kee Yoeup Paek
Springer, Cham, 2021



Carotenoids: Structure and Function in the Human Body

Editors: Muhammad Zia-Ul-Haq, Saikat Dewanjee, Muhammad Riaz
Springer Nature Switzerland AG, 2021



Dry Beans and Pulses Production, Processing, and Nutrition, 2nd Edition

Editors: Muhammad Siddiq, Mark A. Uebersax

Wiley-Blackwell, December 2021

ISNFF Journals

Journal of Food Bioactives (JFB)

The JFB, a dedicated publication of ISNFF, was launched in 2018 and completed yet another 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 or that of the isnff (isnff.org). Volume 16 is in the publication stage and will be released shortly this month.

Website: <http://www.isnff-jfb.com/index.php/JFB>

Calculated Impact Factor (2020): 3.50

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 now serves as its Founding Editor. Dr. Shahidi is also the principal Founding Member of ISNFF and the Nutraceuticals and Functional Food Division of IFT.

Website: <https://www.journals.elsevier.com/journal-of-functional-foods>

Impact Factor (2020): 4.35



International Society
for Nutraceuticals & Functional Foods

Membership Application 2022

Last Name: _____		First Name: _____	
Membership #: ISNFF-			
Company / Institution / University:			
Address:			
Telephone: () _____		Fax: () _____	
Email address:			

New Membership	<input type="checkbox"/>
Renewal	<input type="checkbox"/>
Cancel Membership	<input type="checkbox"/>
Member	\$95 <input type="checkbox"/>
Student Member	\$45 <input type="checkbox"/>
Corporate Member	\$2,000 <input type="checkbox"/>
Corporate Member (Renewal)	\$500 <input type="checkbox"/>
Affiliate and Chapter Member	\$2,000 <input type="checkbox"/>

Payment Method:

Money Order:

Credit Card: VISA MASTERCARD

Credit Card #: _____

Card Holder: _____

Expiry Date: _____

Please complete form and return to:

ISNFF, P.O. Box 29095, 12 Gleneyre Street, St. John's, NL, A1A 5B5 Canada
 Or scan and forward by Email: ISNFFsecretary@gmail.com