FLUORIDE

Quarterly Journal of The International Society for Fluoride Research Inc.

www.fluorideresearch.online

Owned & published by THE INTERNATIONAL SOCIETY FOR FLUORIDE RESEARCH INCORPORATED © 2023. All rights reserved.

Editor-in-Chief:

Dr Bruce J Spittle. Dunedin, New Zealand. E-mail: spittle727@gmail.com

Regional Editor for Africa:

Professor Eli Dahi. Denmark (previously Ngongongare, Tanzania). E-mail: elidahi@hotmail.com

Regional Editor for Eastern Europe:

Professor Dariusz Chlubek. Department of Biochemistry and Chemistry, Pomeranian Medical University, Szczecin, Poland. E-mail:dchlubek@pum.edu.pl

Regional Editor for India, Bangladesh, Bhutan, Indonesia, Maldives, Myanmar, Nepal, and Sri Lanka:

Dr Shanti Lal Choubisa. Emeritus Professor of Biotechnology, Department of Advanced Science & Technology, NIMS University Rajasthan, Jaipur-303121, India. E-mail: choubisasl@yahoo.com

Regional Editor for Latin America, including Mexico, Central America, and Cuba:

Dr Alfredo Rigalli. Rosario, Argentina. E-mail: arigalli@unr.edu.ar and arigalli@conicet.gov.ar

Regional Editor for the Middle East:

Dr Amir Hossein Mahvi. Department of Environmental Health Engineering, School of Public Health and Institute for Environmental Research, Tehran University of Medical Sciences, Tehran, Iran. E-mail: ahmahvi@yahoo.com

Regional Editors for Pakistan and Afghanistan:

Dr Muhammad Nauman Ahmad. Department of Agricultural Chemistry, The University of Agriculture, Peshawar, Pakistan. E-mail: drnumanahmad@aup.edu.pk
Dr Syeda Nadia Ahmad. Department of Zoology, University of Chakwal, Chakwal, Pakistan.
E-mail: nadia.ahmad@uoc.edu.pk and dr.nadiaahmad111@gmail.com

Regional Editors for People's Republic of China:

Professor Yanhui Gao. Director of the Institute for Endemic Fluoride Control, Center for Endemic Disease Control, People's Republic of China CDC. E-mail: goayh411@163.com

Professor Zhi-Zhong Guan. Department of Pathology and Key Lab of Endemic and Ethnic Diseases (Guizhou Medical University), Ministry of Education, Guiyang Medical University, Guiyang, People's Republic of China. E-mail: 1457658298@qq.com

Regional Editor for Asia in developmental biology, reproduction, embryology, and endocrinology: Dr Syeda Nadia Ahmad. Department of Zoology, University of Chakwal, Chakwal, Pakistan. E-mail: nadia.ahmad@uoc.edu.pk and dr.nadiaahmad111@gmail.com

Associate Editors:

Professor Zhi-Zhong Guan. Department of Pathology and Key Lab of Endemic and Ethnic Diseases (Guizhou Medical University), Ministry of Education, Guiyang Medical University, Guiyang, People's Republic of China

Professor Emeritus Hardy Limeback. University of Toronto, Toronto, ON, Canada.

Christopher Neurath. American Environmental Health Studies Project, Lexington, MA, USA.

Associate Professor Juliano Pessan, São Paulo State University, Araçatuba, SP - Brazil.

Associate Professor Jashwanti D Sharma. Department of Zoology, University of Rajasthan, Jaipur, India.

Professor Dianjun Sun. Chinese Research Center for Endemic Disease Control, Harbin Medical University,

Lestin Describe Search (Chinese Research Center for Endemic Disease Control, Harbin Medical University,

Harbin, People's Republic of China.

Professor Emeritus Andezhath K Susheela. Fluorosis Research & Rural Development Foundation, Delhi, India. Prof. Masashi Tsunoda. Dept. of Preventive Medicine and Public Health, National Defense Medical College, Japan. **Editorial Assistant:**

Peter Meiers. Saarbrücken, Germany.

Fluoride is available as a free online open access journal at www.fluorideresearch.online and the articles can be accessed by clicking on the links below the titles in the online table of contents for the smallest file size, press quality, and Epub ahead of print (press quality) PDF versions, respectively.

EDITORIAL

197-200......USING ARTIFICIAL INTELLIGENCE TO OBTAIN SUFFICIENT AND RELIABLE ANSWERS TO QUESTIONS ABOUT FLUORIDE Bruce Spittle. Dunedin, New Zealand.

smallest file size PDF press quality PDF Epub ahead of print (press quality) PDF

RESEARCH REPORTS

201-216......CAN ARTIFICIAL INTELLIGENCE EFFECTIVELY RESPOND TO FREQUENTLY ASKED QUESTIONS ABOUT FLUORIDE USAGE AND EFFECTS? A QUALITATIVE STUDY ON CHATGPT

Mehmet Buldur, Berkant Sezer. Çanakkale, Türkiye.

smallest file size PDF press quality PDF Epub ahead of print (press quality) PDF July-September 2023

ii

217-243...... PROTECTIVE EFFECT OF ANTHOCYANINS FROM BLUEBERRY ON FLUORIDE-INDUCED IMMUNE SYSTEM INJURY IN WISTAR RATS Shiwen Tan, Shujuan Pang, Siqi Zhu, Wei Wei, Dianjun Sun. Harbin, People's Republic of China.

smallest file size PDF press quality PDF Epub ahead of print (press quality) PDF

244-251..... ASSESSMENT OF FLUORIDE DAILY INTAKE FROM WATER AND TEA INFUSIONS IN ENDEMIC OUARGLA, ALGERIA. Mohamed Amine Kerdoun, Sabah Mekhloufi, Oum El Kheir Adjaine, Rym Messaouda Kerdoun, Halima Dali, Sarra Mouffok. Ouargla and Constantine, Algeria.

smallest file size PDF press quality PDF Epub ahead of print (press quality) PDF

252-260..... ACCUMULATION AND DEPOSITION OF AIRBORNE FLUORIDE ON VEGETATION OVER NINE YEARS OF BIOMONITORING Yihan Zhao, M. Anne Naeth, Connie Nichol. Edmonton, Alberta, Canada.

smallest file size PDF press quality PDF Epub ahead of print (press quality) PDF

261-275...... GROWTH AND BIOCHEMICAL RESPONSES OF LADY'S FINGER (ABELMOSCHUS ESCULENTS) GROWN IN FLUORIDE CONTAMINATED SOIL AUGMENTED WITH BIOCHAR Muhammad Nawaz, Sheikh Saeed Ahmad, Rabail Urooj. Multan, Rawalpindi, and Quetta, Pakistan.

smallest file size PDF press quality PDF Epub ahead of print (press quality) PDF

276-290......MECHANISTIC INSIGHTS INTO THE INTERACTION OF FLUORIDE RESISTANT BACTERIA WITH WHEAT ROOTS TOWARD ENHANCING PLANT PRODUCTIVITY BY ALLEVIATING FLUORIDE STRESS Asma Zulfigar, Rameen Fatima, Shakil Ahmed, Ammara Saleem, Rehana Sardar, M. Numan Ahmad, Nasim Ahmad Yasin. Lahore and Peshawar, Pakistan.

smallest file size PDF press quality PDF Epub ahead of print (press quality) PDF

CORRECTION

The affiliation details were inadvertently omitted from the paper Ahmed S, Umar I, Jabeen F, Ansari M, Bukhari S, Ahmad MN, Sadar R, Ahmad M, Khan MT. Sodium fluoride induced changes in the growth and yield of *Spinacia* oleracea L. Fluoride 2023;56(2): 123-32. The omitted details are below. The online version was corrected on July 2. 2023. My apologies for the omission.

B Spittle, Editor-in-Chief, Fluoride

[Now published in full after the initial publication as an Epub ahead of print on Feb 12, 2022 at www.fluorideresearch.online/epub/files/177.pdf]

Research report Sodium fluoride induced changes in the growth and yield of Spinacia oleracea L. Fluoride 56(2):123-132 Ahmed, Umar, Jabeen, Ansari Rukhari Ahmed. 123 Research report

SODIUM FLUORIDE INDUCED CHANGES IN THE GROWTH AND YIELD OF SPINACIA OLERACEA L.

Shakil Ahmed, a,* Ismat Umar, Fareeha Jabeen, Madeeha Ansari, Shanila Bukhari, b M. Nauman Ahmad, CRehana Sadar, Maria Ahmad, Muhammad Tajammal Khan, d Syeda Rubab Zadide

Lahore and Peshawar, Pakistan

^a Institute of Botany, University of the Punjab, Lahore 54590, Pakistan; ^b Department of Botany, Kinnaird College for Women Lahore-Pakistan; ^c Agricultural Chemistry Department, University of Agriculture, Peshawar-Pakistan; ^d Division of Science & Technology, Department of Botany, University of Education, Lahore-Pakistan; Department of Botany, GC University, Lahore-Pakistan. *Corresponding author: Prof. Dr. Shakil Ahmed, Applied Environmental Biology & Environmental Biotechnology Research Lab, Institute of Botany, University of the Punjab, Lahore 54590, Pakistan E-mail: shakil.botany@pu.edu.p

MEMBERS OF THE ISFR INC. ADVISORY BOARD 2023

President:

iii

Professor Dianjun Sun, Chinese Research Center for Endemic Disease Control, Harbin Medical University, Harbin, People's Republic of China.

First Vice President:

Dr Javed Ahsan Quadri, All India Institute of Medical Sciences, New Delhi, India.

Co-Secretaries:

Professor Dariusz Chlubek. Pomeranian Medical University, Szczecin, Poland.

Professor Masashi Tsunoda. National Defense Medical College, Tokorozawa, Japan.

Editor-in-Chief, Regional Editors, Associate Editors, and Editorial Assistant:

As listed below.

Members at Large:

Asia:

Professor Koichi Kono. Osaka Medical College, Osaka, Japan.

Assistant Professor Amir Hossein Mahvi. Tehran University of Medical Science, Tehran, Iran.

Professor Emeritus AK Susheela. Fluorosis Research & Rural Development Foundation, Delhi, India.

Professor Guifan Sun. China Medical University, Shenyang, China.

Europe:

Professor Miklós Bély. Hungarian Academy of Science, Budapest, Hungary.

Professor Andrzej Bohatyrewicz. Pomeranian Medical University, Szczecin, Poland.

Professor Jürgen Franke. Rehaklinik an der Salza, Bad Langensalza, Germany.

Professor Boguslaw Machaliñski. Pomeranian Academy of Medicine, Szczecin, Poland.

Professor Jörg Spitz. Society for Medical Information and Prevention, Wiesbaden, Germany.

Treasurer of Fluoride:

Dr Bruce Spittle. Dunedin, New Zealand.

MEMBERS OF THE ISFR INC. EDITORIAL BOARD 2023

Editor-in-Chief:

Dr Bruce J Spittle. Dunedin, New Zealand. E-mail: spittle727@gmail.com

Regional Editor for Africa:

Professor Eli Dahi. Denmark (previously Ngongongare, Tanzania). E-mail: elidahi@hotmail.com

Regional Editor for Eastern Europe:

Professor Dariusz Chlubek. Department of Biochemistry and Chemistry, Pomeranian Medical University, Szczecin, Poland. E-mail:dariusz.chlubek@pum.edu.pl

Regional Editor. for India, Bangladesh, Bhutan, Indonesia, Maldives, Myanmar, Nepal, and Sri Lanka:

For papers on all aspects of fluoride. Dr Shanti Lal Choubisa. Emeritus Professor of Biotechnology, Department of Advanced Science & Technology, Nims University Rajasthan, Jaipur-303121, India. E-mail: choubisasl@yahoo.com

Regional Editor for Latin America, including Mexico, Central America, and Cuba:

Dr Alfredo Rigalli. Rosario, Argentina. E-mail: arigalli@unr.edu.ar and arigalli@conicet.gov.ar

Regional Editor for the Middle East:

Dr Amir Hossein Mahvi. Department of Environmental Health Engineering, School of Public Health and Institute for Environmental Research, Tehran University of Medical Sciences, Tehran, Iran. E-mail: ahmahvi@yahoo.com

Regional Editors for Pakistan and Afghanistan:

Dr Muhammad Nauman Ahmad. Department of Agricultural Chemistry, The University of Agriculture, Peshawar, Pakistan. E-mail: drnumanahmad@aup.edu.pk

Dr Syeda Nadia Ahmad, Department of Zoology, University of Chakwai, Chakwai, Pakistan. E-mail: nadia.ahmad@uoc.edu.pk and dr.nadiaahmad111@gmail.com

Regional Editors for People's Republic of China:

Professor Yanhui Gao. Director of the Institute for Endemic Fluoride Control, Center for Endemic Disease Control, People's Republic of China. E-mail: goayh411@163.com

Regional Editors for People's Republic of China (continued):

Professor Zhi-Zhong Guan, Department of Pathology and Key Lab of Endemic and Ethnic Diseases (Guizhou Medical University), Ministry of Education, Guiyang Medical University, Guiyang, People's Republic of China. E-mail: 1457658298@qq.com

Regional Editor for Asia in developmental biology, reproduction, embryology, and endocrinology:

Dr Syeda Nadia Ahmad, Department of Zoology, University of Chakwai, Chakwai, Pakistan. E-mail: nadia.ahmad@uoc.edu.pk and dr.nadiaahmad111@gmail.com

Associate Editors

İν

Professor Zhi-Zhong Guan, Department of Pathology and Key Lab of Endemic and Ethnic Diseases (Guizhou Medical University), Ministry of Education, Guiyang Medical University, Guiyang, People's Republic of China.

Professor Emeritus Hardy Limeback. University of Toronto, Toronto, ON, Canada.

Christopher Neurath. American Environmental Health Studies Project, Lexington, MA, USA.

Associate Professor Juliano Pessan, Sao Paulo State University, Araçatuba Dental School, Araçatuba, SP-Brazil

Associate Professor Jashwanti D Sharma. Department of Zoology, University of Rajasthan, Jaipur, India.

Professor Dianjun Sun. Chinese Research Center for Endemic Disease Control, Harbin Medical University, Harbin, China.

Professor Emeritus AK Susheela. Fluorosis Research & Rural Development Foundation, Delhi, India.

Professor Masashi Tsunoda. National Defense Medical College, Tokorozawa, Japan.

Editorial Assistant:

Peter Meiers. Saarbrücken, Germany.

Editorial Board Members:

Dr Miklós Bély. Hungarian Academy of Science, Budapest, Hungary.

Dr Russell L Blaylock. Ridgeland, Mississippi, USA.

Professor Andrzej Bohatyrewicz. Dept. of Orthopedics & Traumatology, Pomeranian Medical University, Szczecin, Poland.

Professor Masahiko Chikuma. Osaka University of Pharmaceutical Sciences, Osaka, Japan. Professor Edward Czerwinski. Jagiellonian University, Kraków, Poland.

Dr Mark Diesendorf. Sustainability Centre, Box 521, Epping, NSW 1710, Australia.

Professor Sina Dobaradaran. Bushehr University of Medical Sciences, Bushehr, Iran. Professor J Franke. Rehaklinik an der Salza, Bad Langensalza, Germany. Assistant Professor Toshitaka Horiuchi. Nihon University School of Dentistry at Matsudo, Japan. Professor Koichi Kono. Osaka Medical College, Osaka, Japan.

Professor Jerzy Krechniak. Medical University, Gdańsk, Poland.

Professor Emeritus C James Lovelace. Humbolt State University, Arcata, CA, USA.

Professor Boguslaw Machaliñski. Pomeranian Academy of Medicine, Szczecin, Poland. Professor Frank Murray. Murdoch University, Murdoch, WA, Australia.

Professor Masayuki Okazaki. Hiroshima University, Hiroshima, Japan.

Dr James C Pushnik. California State University, Chico, CA, USA.

Professor Masashi Shimahara. Osaka Medical College, Takatsuki City, Osaka, Japan. Professor Jörg Spitz. Society for Medical Information and Prevention, Wiesbaden, Germany. Professor Anna Strunecká. Charles University, Prague, Czech Republic.

Professor Guifan Sun. China Medical University, Shenyang, China.

Professor Satoshi Takizawa. Dept. of Urban Engineering, Graduate School of Engineering, University of Tokyo.

Professor Emeritus SPS Teotia. Institute of Higher Medical Sciences, Whitefield, India.

Professor Jundong Wang. College of Animal Science & Veterinary Medicine, Shanxi Agricultural University, Taigu, Shanxi, PR China. Professor Emeritus Y Yoshida. Osaka Medical College, Osaka, Japan.

Professor Emeritus NBK Yoshitake. Shiga University of Medical Science, Otsu, Japan. Professor Boasham Zheng. Institute of Geochemistry, Chinese Academy of Sciences, Guiyang, Guizhou, PR China.