ANNALS OF PHYTOMEDICINE An International Journal

Print ISSN: 2278-9839 Online ISSN: 2393-9885

Thomson Reuters: Web of Science: Emerging Sources Citation Index (ESCI)

 $\pmb{UGC: AP is \ now \ included \ in \ the \ approved \ list \ of \ UGC \ Journals}\\$

Link: https://mjl.clarivate.com/home NAAS Rating (2020): Goverment of India: 5.81 MedLine: NLM-ID: 01695900 (Serial)

ANNALS OF PHYTOMEDICINE: An International Journal

BOARD OF EDITORS

EDITOR-IN-CHIEF

Dr. Irfan Ali Khan: Former Director

Nawab Shah Alam Khan Center for Post Graduate Studies and Research, (Osmania University), Mallepally, Hyderabad, T.S., India ukaaz@yahoo.com

MANAGING EDITOR

Dr. Atiya Khanum: Former Chairman

Dept. of Botany, Nawab Shah Alam Khan Center for Post Graduate Studies and Research, (Osmania University), Mallepally, Hyderabad, T.S., India ukaaz@yahoo.com

EDITOR

Dr. Adnan A. Khan: Assistant Professor (Health Sciences)

Division of Nephrology and Hypertension, Department of Medicine, University of California, San Diego, USA

khan.dr.adnan@gmail.com
ASSOCIATE EDITORS

Dr. Syed Ibrahim Rizvi : Professor

Department of Biochemistry, Allahabad Central University, Uttar Pradesh, India sirizvi@gmail.com

Dr. Suaib Luqman: Senior Scientist CIMAP, Lucknow, Uttar Pradesh, India

s.luqman@cimap.res.in

Dr. Narayan Prasad Yadav : Scientist CIMAP, Lucknow, Uttar Pradesh, India

npy a dav @gmail.com

Dr. Sayeed Ahmed: Associate Professor Hamdard University, New Delhi, India sahmad_jh@yahoo.co.in

Dr. Kuntal Das : Professor

Krupanidhi College of Pharmacy, Bengaluru, Karnataka, India drkkdsd@gmail.com

Dr. K. Nagaiah: Chief Scientist IICT, Tarnaka, Hyderabad, T.S., India nagaiah@iict.res.in

Dr. Rekha R. Warrier : Scientist-C

Inst. of Forest Genetics and Tree Breeding, RS Puram, Coimbatore, India rekhawarrier@gmail.com

COORDINATING EDITORS

Dr. Kanti Bhooshan Pandey: Scientist CSIR - C.S.M.C.R.I., Bhavnagar, Gujarat, India kantibiochem@gmail.com

Dr. Ahmad Ali: Assistant Professor

Dept. of Life Sciences, M.U., Mumbai, Maharashtra, India ahmadali@mu.ac.in

Dr. V.V. Asha: Scientist

Rajiv Gandhi Centre for Biotech., Thiruvananthapuram, Kerala, India ashavv@rediffmail.com

Dr. Afroz Alam: Associate Professor

Dept. of Bioscience and Biotech., Banasthali Vidyapith, Rajasthan, India afrozalamsafvi@gmail.com

Aims and Scope

Annals of Phytomedicine (AP), is an international, peer-reviewed scientific journal, dedicated to publishing cutting edge research in all areas of phytomedicine. It will publish significant and outstanding developments in all phases of phytomedicine, thus ensuring its scientific priority. The manuscripts intended for publication shall be rigorously refereed and selected on the basis of quality and originality of the work. The journal is aimed at publishing and disseminating the innovative findings in the field of pharmacognosy, phytopharmacology, phytotherapy, chemistry of natural products, phytopharmaceuticals, biological activity of plant extracts and isolated compounds, clinical studies of standardized phytopreparations, phytotoxicity and standardization of drugs and also other related aspects within a single publication.

Dr. M. Salman Khan: Associate Professor

Dept. of Biotechnology, Integral University, Lucknow, U.P, India contactskhan@gmail.com

Dr. G. Thiribhuvanamala: Associate Professor

Tamil Nadu Agricultural University, Coimbatore, Tamil Nadu, India ragumala2000@gmail.com

Dr. Nupur Mehrotra: Assistant Professor

Dept. of Biochemistry, Mithibai College, Mumbai, Maharashtra, India nupur.mehrotra@mithibai.ac.in

EDITORIAL BOARD

Dr. S.H. Ansari: Professor

Hamdard University, New Delhi, India

shansari@jamiahamdard.ac.in; shansari189@rediffmail.com

Dr. Anake Kijjoa : Professor

Dept. of Chemistry, Universidade do Porto, Portugal

ankijjoa@icbas.up.pt

Dr. Vinay Sharma: Professor and Director

Amity Institute of Biotechnology, Amity University, Rajasthan, India vinaysharma30@yahoo.co.uk

Dr. N. Udupa: Professor

Dept. of Pharmaceutical Sciences, M.U., Manipal, Karnataka, India n.udupa@manipal.edu

Dr. Jaya Prakash Rao : Professor

Dept. of Chemistry, Osmania University, Hyderabad, T.S., India yjpr_19@yahoo.com

Dr. Alban Ibraliu: Professor

Faculty of Agrl. and Envt., Agricultural University of Tirana, Tirana, Albania albanibraliu@ubt.edu.al

Dr. Francesco Epifanco: Professor

Dept. of Pharmacy, University of Chieti-Pescara, Chieti Scalo (CH), Italy francesco.epifano@unich.it

Dr. Mostafa Elachouri : Professor

Dept. of Biology, Mohammed 1 University, Oujda, Morocco elachourimostafa@gmail.com

Dr. Mohd Iqbal: Former Professor Hamdard University, New Delhi, India iqbalg5@yahoo.co.in

Dr. Koula Doukani: Professor

Faculty of Life Sciences, Ibn Khaldoun University, Tiaret, Algeria kouladoukani@gmail.com

Dr. P.B. Kavi Kishor: CSIR-Emeritus Professor

Dept. of Genetics, Osmania Univerity, Hyderabad, T.S., India pbkavi@yahoo.com

Dr. Byoung Ryong Jeong: Professor

Dept. of Horticulture, G.N.U, Jinju, Republic of Korea brjeong@gmail.com

Dr. S. Raisuddin: Professor Hamdard University, New Delhi, India sraisuddin@jamiahamdard.ac.in Dr. Jamila K. Adam: Professor

Dept. of Biomedical and Clinical Technology, D.U.T., Durban, S.A. adamjk@dut.ac.za

Dr. Munawwar Husain Kazmi: Incharge Director and Professor CRIUM, Hyderabad, T.S., India

criumhyderabad@gmail.com

Dr. Usha Mukundan: Professor and Principal RJ College, Ghatkopar West, Mumbai, Maharashtra, India umukundan@hotmail.com

Dr. Mujeeb Ur Rahman: Professor and Principal

MESCO Institute of Pharmacy, 402, Dhanaura Road, Amroha, U.P., India mujeebhambarb@gmail.com

Dr. V. Dashavantha Reddy: Former Director and Professor CPMB, Osmania Univeristy, Hyderabad, T. S., India vdreddycpmb@yahoo.com

Dr. Hancianu Monica: Professor

Universitatea de Medicina si Farmacie Grigore T Popa Iasi, Romania mhancionu@yahoo.com

Dr. K.V. Rao: Former Director and Professor CPMB, Osmania Univeristy, Hyderabad, T. S., India rao_kv1@rediffmail.com

Dr. Raman Dang: Professor and Former Registrar DPSRU, New Delhi, India

raman.dang@gmail.com; dangraman2000@yahoo.co.in

Dr. Nabil Mohie Abdel-Hamid: Professor

Faculty of Pharmacy, Al-Farahidi University, Baghdad, Iraq nabilmohie@yahoo.com

Dr. Anupama Koneru: Professor and Principal M.J. College of Pharmacy, Hyderabad, T.S., India anupamakoneru@hotmail.com

Dr. Asna Urooj: Professor

Dept. of Food Science and Nutrition, M.U., Karnataka, India asnau321@gmail.com

Dr. Irshad Mahmood : Former Professor

Dept. of Botany, A.M.U., Aligarh, Uttar Pradesh, India irshad.mahmood2@gmail.com

Dr. Nafees Ahmad Khan: Professor and Chairman Dept. of Botany, A.M.U., Aligarh, Uttar Pradesh, India naf9@lycos.com; na.khan.bt@amu.ac.in

Dr. Samiullah Khan : Professor

Dept. of Botany, A.M.U., Aligarh, Uttar Pradesh, India khan_drsami@yahoo.co.in

Dr. C.C. Giri: Professor and Former Director CPMB, Osmania Univeristy, Hyderabad, T. S., India giriccin@yahoo.co.in

Dr. Arvind Kumar Bhatt: Professor

Dept. of Biotechnolgy, Himachal Pradesh University, Shimla, H.P., India bhtarvind@yahoo.com

Dr. Subas Chandra Parija : Professor OUAT, Bhubaneswar, Odisha, India profscparijaouat4691@gmail.com

Dr. A.N. Arun Kumar : Scientist-F

Tropical Forest Research Institute, Mandla Road, Jabalpur, M.P. India anarunkumar@gmail.com

Dr. Lamia Hamrouni Bel Hadj Brahim: Professor Laboratory of Forestry Resources, INRGREF, Ariana, Tunisia lamia.hamrouni@gmail.com

Dr. Wamik Azmi : Professor

Dept. of Biotechnolgy, Himachal Pradesh University, Shimla, H.P., India wamikazmi@rediffmail.com; wamikazmi@yahoo.com

Dr. Zahia Kabouche: Professor

Dept. of Chemistry, University Freres Mentouri-Constantine, Algeria zahiakabouche@umc.edu.dz; zahiakabouche@gmail.com

Dr. P. Venkatachalam: Professor

Dept. of Biotechnology, Periyar University, Salem, Tamil Nadu, India pvenkat67@yahoo.com

Dr. Noureddine Djebli: Professor

Faculty of Natural Sciences, Abdelhamid IBN Badis University, Algeria djebli_n@yahoo.fr

Dr. S.A. Azeez: Professor and Principal Deccan College of Pharmacy, Hyderabad, T.S., India

azphar@gmail.com

Dr. Najmul Islam: Professor

JNU Medical College, A.M.U., Aligarh, Uttar Pradesh, India naimulamu@gmail.com

Dr. N. Geetha: Professor

Bharathiar University, Coimbatore, Tamil Nadu, India geethadrbio@gmail.com

Dr. B. Madhava Reddy: Professor and Principal G. Pulla Reddy College of Pharmacy, Hyderabad, T.S., India madhavareddyb@ymail.com

Dr. Bouamama Hafida: Professor

Dept. of Biology, Cadi Ayyad University, Marrakech, Morocco bouamamahafida@gmail.com

Dr. Ngatu Nlandu Roger : Former Professor Kochi University Medical School, Nankoku, Kochi, Japan doc.rogerngatu@gmail.com

Dr. N. S. Thakur: Professor

Dept. of Food Science and Technology, Dr. Y.S.P.U.H.F., Solan, H.P., India nsthakurpht@gmail.com

Dr. Aruni Weerasinghe : Professor

Faculty of Agriculture, Rajarata University, Arunadhapura, Sri Lanka aruni500@yahoo.com

Dr. Archana Giri: Professor

Dept. of Biotechnology, JNTU-H, Hyderabad, T.S., India archanagiriin@yahoo.co.in

Dr. Zora Dajic Stevanovic: Professor

Dept. of Agriculture, University of Belgrade, Belgrade, Republic of Serbia dajic@agrif.bg.ac.rs

Dr. Dilfuza Jabborova: Senior Scientific Researcher Uzbekistan Academy of Sciences, Tashkent, Uzbekistan dilfuzajabborova@yahoo.com

Dr. Douglas S. A. Chaves: Associate Professor

Dept. de Ciências farmacêuticas, Universidade Federal Rural do Rio de Janeiro, Seropédica/Rio de Janeiro - Brasil. CEP 23897-000 gnosy.ufrrj@gmail.com; chavesdsa@ufrrj.br

Dr. Slim Slim: Associate Professor

School of Higher Education in Agriculture, Carthage University, Tunisia slimbss@yahoo.fr

Dr. Vikneswaran Murugaiyah : Associate Professor

School of Pharma. Sciences, Universiti Sains Malaysia, Penang, Malaysia vicky@usm.my; vickyusm@gmail.com

Dr. Yuva Bellik : Associate Professor

Mohamed El Bachir El Ibrahimi University, Bordj Bou Arreridj, Algeria v.bellik@univ-bba.dz

Dr. S.A. Farooq: Associate Professor

Dept. of Genetic Engineering and Biotechnology, SQU, Muscat, Oman sfarook@squ.edu.om

Dr. Jackson Roberto Guedes da Silva Almeida : Associate Professor Federal University of Vale do Sao Francisco (UNIVASF), Brazil jackson.guedes@univasf.edu.br

Dr. Syed Mohiuddin: Associate Professor

M.J. College of Engineering and Technology, Hyderabad, T.S., India mohiuddin_syed@yahoo.com

Dr. Hytham M. Ahmad : Associate Professor

Faculty of Pharmacy, Menoufia University, Cairo, Egypt hmaahmed@yahoo.co.uk

Dr. Yamina Bouatrous : Associate Professor

Department of Natural Sciences and Life, Mohamed Khider University, Biskra, Algeria

bouatrousyamina@yahoo.fr

Dr. Mastura Binti Mohtar: Senior Scientist

Natural Products Division, FRIM, Kepong, Selangor Darul Ehsan, Malaysia mastura@frim.gov.my

Dr. Getha Krishnasamy : Senior Scientist Natural Products Division, FRIM, Kepong, Selangor Darul Ehsan, Malaysia getha@frim.gov.my

Dr. Adnan Ahmad Khan: Associate Medical Director

Kidney and Pancreas Transplantation, UCSD, San Diego, CA, U.S.A khan.dr.adnan@gmail.com

Dr. Andria Agusta: Associate Professor

The Indonesian Institute of Sciences, J1, Raya Bogor, Cibinog, Indonesia andria.agusta@lipi.go.id

Dr. Marina Krivtsova: Associate Professor

Dept. of Genetics and Microbiology, UNU, Ukraine maryna.krivcova@gmail.com

Dr. Sevgi Gezici : Associate Professor

Dept. of Molecular Biology, Unviersity of Kilis 7 Aralik, Kilis, Turkey sevgigezici.00@gmail.com

Dr. T. D. Babu: Associate Professor

Amala Cancer Research Centre, Thrissur, Kerala, India babutd@amalains.org; babutharakan@gmail.com

Dr. Ivan Salamon: Associate Professor

Dept. of Ecology, Presov University in Presov, Presov, Slovak Republic ivan.salamon@gmail.com

Dr. Urvesh D. Patel: Associate Professor

College of Vet. Sci. and Animal Husbandry, JAU, Junagarh, Gujarat, India urvesh1981@yahoo.com

Dr. T. Lakshmi: Associate Professor and Associate Dean Saveetha Dental College, Saveetha University, Chennai, T.N., India lakshmi@saveetha.com

Dr. Adil Farooq Wali: Assistant Professor RAK College of Pharmaceutical Sciences, RAK Medical and Health Sciences University, Ras Al Khaimah, U.A.E. farooq@rakmhsu.ac.ae; adil.farooq@gmail.con

Dr. Irfan Ahmad Ghazi : Assistant Professor Dept. of Life Sciences, H.C.U., Hyderabad, T.S., India drirfang@gmail.com

Dr. Jatin H. Patel: Assistant Professor

Dept. of Vet. Pharmacology and Toxicology, College of Vet. Sci. and A.H., Navsari Agricultural University, Navsari, Gujarat, India drjatinvet@yahoo.co.ir

Dr. Belkis Muca: Assistant Professor

Igdir University, Turkey belkismuca@gmail.com

Dr. S. Sumathi: Assistant Professor

Dept. of Biochem., AIHSHEW (Deemed University), Coimbatore, India sumii.venkat@gmail.com

Dr. A. K. Abdussalam : Assistant Professor

Sir Syed College, Karimbam P.O., Taliparamba, Kannur, Kerala, India salamkoduvally@gmail.com

Dr. Vesna Davidovic : Assistant Professor

Faculty of Agriculture, Institute of Animal Sciences, UB, Nemanjina, Serbia vesnadavidovic@gmail.com

Dr. Yaowared Chulikhit: Assistant Professor

Faculty of Pharmaceutical Sciences, KU, Khonkaen, Thailand vaowaredchulikhit@gmail.com

Dr. Souayah Naoufel: Assistant Professor

Dept. of Biology, Al-Ula Branch, Taibah University, Madina, Saudi Arabia souavahnaoufel@vahoo.fr

Dr. Mohamed M. Elsutohy : Assistant Professor Schulich School of Engineering, University of Calgary, Calgary, Canada mohamed.elsutohy@ucalgary.ca

Dr. Nuttinee Teerakulkittipong: Lecturer

Faculty of Pharma. Sciences, Burapha University, Chonburi, Thailand nuttinee@go.buu.ac.th

EDITORIAL ADVISORY BOARD

Professor Bibi Ameenah Firdous Gurib-Fakim

Managing Director CEPHYR, BioPark Mauritius, Socoto Phoenicia, Phoenix, Mauritius

Her Excellency Professor Bibi Ameenah Firdous Gurib-Fakim, Former President of Mauritius

aguribfakim@gmail.com

Padma Shri Dr. E. A. Siddiq Former DDG (ICAR), New Delhi

Presently Honorary Director, Institute of Biotechnology, Professor Jayashankar Telangana State Agricultural University, Rajendra Nagar, Hyderabad, Telangana State, India easiddiq@gmail.com

Padma Shri Dr. P. Pushpangadan Former Director, Tropical Botanic Garden and Research Institute,

Thiruvananthapuram, Kerala, India Presently Director General, Amity Institute for Herbal and Biotech Products Development, 3-Ravi Nagar, Peroorkada P.O., Thiruvananthapuram, Kerala, India

palpuprakulam@yahoo.co.in

Padma Shri Dr. Seyed E. Hasnain Former V.C., Hyderabad Central University, Hyderabad, T.S, India Presently Professor IIT Delhi, Hauz Khas, New Delhi, India Presently V.C., Hamdard Univeristy, New Delhi, India sehiitd@gmail.com

Professor Habil Akos Mathe
President, International Council for Medicinal and Aromatic Plants
Department of Botany, Széchenyi University, Faculty of Agriculture
and Food Science, Mosonmagyaróvár, Hungary

acatius2005@gmail.com

Professor K. Husnu Can Baser Vice President, International Council for Medicinal and Aromatic Plants Faculty of Pharmacy, Anadolu University, Eskisehir, Turkey

kemalhusnucan.baser@neu.edu.tr

Dr. Abd. Latif Mohmod Former Director General of FRIM, Forest Research Institute Malaysia, Kepong, Selangor Darul Ehsan, Malaysia

latif@frim.gov.my

Professor Asim Ali Khan

Central Council for Research in Unani Medicine (CCRUM), Ministry of AYUSH, Govt. of India, Janakpuri Institutional Area, Janakpuri, New Delhi-110058, India

asim.ccrum@gmail.com

Professor P.K. Abdul Azis

Former V.C., Cochin University of Science and Technology, Kerala, India Former V.C., Aligarh Muslim University, Aligarh, Uttar Pradesh, India Presently V.C., University of Science and Technology, Meghalaya, India dr.azis47@gmail.com

Dr. G.N. Qazi
Former V.C., Hamdard University, New Delhi
Presently Director General, Institute of Medical Sciences, Jamia
Hamdard, New Delhi, India gngazi@jamiahamdard.ac.in

Professor Kakhramon Davranov

Director, Institute of Microbiology of the Academy of Sciences of Uzbekistan, Tashkent, Uzbekistan k.davranov@mail.ru

Dr. Ahmad Kamal

Former Outstanding Scientist, IICT, Hyderabad, Telangana State, India. Presently P.V.C., Hamdard University, New Delhi-110062, India ahmedkamal@iict.res.in; ahmedkamal@iictnet.org

Dr. Rajesh Arora

Director-Life Sciences (T&A), Govt. of India, Ministry of Defence, DRDO, Room No. 342, DRDO Headquaters, Rajaji Marg, New Delhi, India rajesharoratejas@gmail.com

Professor Nazim Sekeroglu

President of AMAPMED, Department of Medicinal and Aromatic Plants, Kills 7 Aralik University, Kills, Turkey nsekeroglu@gmail.com

Professor Marina Spinu

Chancellor of Faculty of Veterinary Medicine, University of Agricultural Sciences and Veterinary Medicine, Cluj-Napoca, Romanian marina.spinu@gmail.com

Professor Namrita Lall

NRF/DST Chair: Plant Health Products from IKS, Plant Sciences Complex, Office 3-39, Medicinal Plant Science (Department of Plant and Soil Science), University of Pretoria, Pretoria 0002, South Africa namrita.lall@up.ac.za

Professor C. Manohara Chary

Emeritus Scientist, Department of Botany, Osmania University, Hyderabad, Telangana State, India cmchary@gmail.com

ANNALS OF PHYTOMEDICINE An International Journal

Print ISSN: 2278-9839 Online ISSN: 2393-9885

Thomson Reuters: Web of Science: Emerging Sources Citation Index (ESCI)

UGC: AP is now included in the approved list of UGC Journals

Link: https://mjl.clarivate.com/home NAAS Rating (2020): Government of India: 5.81 MedLine: NLM-ID: 01695900 (Serial)

A BIANNUAL RESEARCH JOURNAL OF PHYTOMEDICINE

Ethical policy

Annals of phytomedicine: An International Journal impend to publish articles on a broad range of topics in the field of pharmacognosy, phytopharmacology, phytotherapy, chemistry of natural product, phytopharmaceuticals, biological activity of plant extracts and isolated compounds, clinical studies of standardized phytopreparations, phytotoxicity and standardization of drugs. Its peer review process must ensure correct, accurate, standard and authenticity of the research as it is a vital importance in the development and dissemination of knowledge of science.

Submission of a manuscript to Annals of Phytomedicine implies that authors have certified that the scientific work described has neither been published nor is under consideration for publication anywhere else. It also implies that the content of the manuscript has been approved by all coauthors or otherwise by competent authority of the organization where the work was carried out.

Ethics to consider

Those who have made significant contribution to the article with its conception, writing, data collection, statistical analysis, interpretation and data reporting of the study. AP highly encourages the transparency about the contributions by authors.

Originality and plagiarism

It should be entirely first hand information, i.e., authors are responsible and ensure that the written article is of their own work or own words. It must not be copy of others in any aspect. It should not be plagiarized. The author must be able to provide the raw data collected for the article study as and when asked.

Acknowledgement of sources

Proper acknowledgment of the work of others must always be given.

Redundancy

The work or the study carried must not be published multiple times with any other form, Work once submitted to current journal then it should not be submitted to other journals or any other sources in any other forms.

Conflict of interest and disclosure

The author or authors must declare any conflict of interest related with the article to be published before submitting and publishing the data or the study.

Errors or false reporting

The author or authors should be whole responsible for the published work; if at all any errors or mistake found with the study or in reporting the data. It is the author's obligation to promptly notify the journal editor or publisher and cooperate with the editor to retract or correct the paper.

Hazards and human or animal subjects

Statements of compliance are required if the study involves chemicals, procedures or equipment that have any unusual hazards inherent in their use, or if it involves the use of human or animal subjects.

Studies on volunteers or patients require ethical committee approval and informed consent, which should be documented in the submitted work.

Abstracting and Indexing

Thomson Reuters: Web of Science, Chemical Abstract Services (CAS), International Scientific Indexing (ISI), Scientific Indexing Services (SIS), Cite Factor, Google Scholar, J-Gate, Research Gate, BINGO, Active Search Results (ASR), EFITA, Cite Seer, Yahoo Search, Indian Science Abstracts (ISA), Medicinal and Aromatic Plants Abstracts (MAPA), Indian Citation Index (ICI), IFSIJ, IIOR, ISRA - JIF, MSN, Journal Seek, AOL, ISEEK, Eurasian Scientific Journal Index (ESJI), ASK, DIIF, Dogpile, SciCentral, My Web Search, Infospace, COSMOS, Ayush Research Portal, Research Bib, Refseek, Genamics, Genamics Journal Seek, Yanolex, SAIF, Anoox, JIF, Crossref, Inforbase Index, Electronic Journal Library, Berlin-Germany, International Committee of Medical Journals Editors, Journal Quality Factor Reports, Biotechnology Department, Kerala University, India, Institute for Information Resources, Lucknow, India, MU Digital Library, Manipal, India, Pak Academic Search, Pakistan, OAJSE, Scholar steer, Root indexing, ICMJE, CMFRI, IIJIF, Scholar Impact Factor, Base, OAJI, GIF, Journal Index.net, Omics Internationals, DRJI, WZB-Germany, Scholarly Open Access-Scribd, TIB-DRJI, International Society of Indexing (ISI), Jour Informatics, Quality Factor, World Share, Contenko, Duck Duck Go, Baidu, Bing.

Copyright

The corresponding author signs and accepts all responsibility on behalf of any and all coauthors. Transfer of copyright to Annals of Phytomedicine of Ukaaz Publications, becomes effective if and when the article is accepted for publication.

Printing charges

All the papers submitted for publication in "Annals of Phytomedicine: An International Journal" will be charged Rs. 7,500/- per article from India and the overseas articles US\$ 200 per article. All the authors are advised to prepare the manuscript, typed in double space on one side of A4 size white paper with 9 font size in Page Maker format / MS-Word, keeping proper margins on each side.

Payments are accepted either by demand draft (DD) or online transfer in favour of "Annals of Phytomedicine-Ukaaz Publications", payable at Hyderabad, Telangana State, India.

Account No.: 860020110000719 Swift code: BKIDINBBHMB

IFSC: BKID0008600

Bank: Bank of India, Abids Branch, Hyderabad, Telangana Satate

Instructions for preparation of manuscript is given on next page Any enquiry relating to subscription should be sent to the Managing Editor for orders, claims, product enquries and other related matters of the article. All rights are reserved, no part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form or by any means-electronic, mechanical, photocopying, recording, without the prior written permission of the publisher.

Copyright : Ukaaz Publications, Hyderabad, India Publisher : Editor-in-Chief: Dr. Irfan Ali Khan Circulation : Managing Editor: Dr. Atiya Khanum

Technical support : S. Vamshi Krishna

Distribution : Managing Editor: Dr. Atiya Khanum

Editor-in-Chief : Dr. Irfan Ali Khan Managing Editor : Dr. Atiya Khanum Editor : Dr. Adnan A. Khan **Editorial Office** : Hyderabad, India

> 16-11-511/D/408, Shalivahana Nagar, Moosarambagh, Hyderabad-500036,

Telangana State, India

Editor-in-Chief: +91-09246509453 Managing Editor: +91-09246584140

E-mail: ukaaz@yahoo.com

Website: www.ukaazpublications.com San Diego, USA

7281, Arroyo Grande Road, San Diego,

CA 92129, USA

khan.dr.adnan@gmail.com

ANNALS OF PHYTOMEDICINE

An International Journal

Print ISSN: 2278-9839 Online ISSN: 2393-9885

Thomson Reuters: Web of Science: Emerging Sources Citation Index (ESCI)

UGC: AP is now included in the approved list of UGC Journals

Link: https://mjl.clarivate.com/home

NAAS Rating (2020): Government of India: 5.81 MedLine: NLM-ID: 01695900 (Serial)

A BIANNUAL RESEARCH JOURNAL OF PHYTOMEDICINE

Volume 9, Number 2, December 2020

DOI: http://dx.doi.org/10.21276/ap.2020.9.2

Invited commentary

1. Role of Unani medicine in empowering national healthcare

Asim Ali Khan

DOI: http://dx.doi.org/10.21276/ap.2020.9.2.1

Invited article

6. Herbs that heal: Floristic boon to the natural healthcare system

Tamanna Malik, V. K. Madan and Ram Prakash DOI: http://dx.doi.org/10.21276/ap.2020.9.2.2

Special invited review article

15. Micronutrients and phytochemicals against COVID-19: Mechanism and molecular targets

Yuva Bellik, Mostapha Bachir-Bey, Wided Fatmi, Mokhtaria Kouidri, Yasmina Souagui and Sidi Mohammed Ammar Selles DOI: http://dx.doi.org/10.21276/ap.2020.9.2.3

30. Medicinal plants, aromatic herbs and spices as potent immunity defenders: Antiviral (COVID-19) perspectives

Nupur Mehrotra

DOI: http://dx.doi.org/10.21276/ap.2020.9.2.4

50. Benefits of dietary sesame seed and flaxseed to strengthen immune system during COVID-19 pandemic and prevent associated comorbidities related health risks

S. Rehan Ahmad and Pritha Ghosh

DOI: http://dx.doi.org/10.21276/ap.2020.9.2.5

62. Importance of vegetables as healthier diet in the management of COVID-19 pandemic

A. Indhuleka, R. Sanjana, J. Janet and V. Ragavi DOI: http://dx.doi.org/10.21276/ap.2020.9.2.6

80. Spices boosting immunity in COVID-19

Santwana Palai, Manaswini Dehuri and Ritun Patra DOI: http://dx.doi.org/10.21276/ap.2020.9.2.7

Review article

97. Challenges and opportunities for traditional herbal medicine today with special reference to its status in India

Bushra Parveen, Abida Parveen, Rabea Parveen, Sayeed Ahmad, Minhaj Ahmad and Muhammad Iqbal

DOI: http://dx.doi.org/10.21276/ap.2020.9.2.8

113. Systematic review on screening the role of chemosensitizer or synergistic drug and doxorubicin as dual drug loaded nanoparticle in overcoming multidrug resistant breast cancer

MD Imad Uddin and B Veeresh

DOI: http://dx.doi.org/10.21276/ap.2020.9.2.9

125. Review on common buckwheat (Fagopyrum esculentum Moench): A potent Himalayan crop

Kuldip Chandra Verma, Amit Singh Rana, Nidhi Joshi and Dheeraj Bhatt

DOI: http://dx.doi.org/10.21276/ap.2020.9.2.10

134. Ashwagandha (Withania somnifera (L.) Dunal): A scientific review with respect to Ayurvedic perspectives

C.P. Khare and Andrew Vikram Naharwar

DOI: http://dx.doi.org/10.21276/ap.2020.9.2.11

Original article

142. Development of standard operating procedures, phytochemical screening with HPTLC fingerprint of a polyherbal formulation Aaisha Ansari, Mohammed Abdul Rasheed Naikodi, Uzma Viquar, Javed Inam Siddiqui, Munawwar Husain Kazmi

DOI: http://dx.doi.org/10.21276/ap.2020.9.2.12

155. Formulation and storage studies of herbal based RTS beverages from persimmon (Diospyros kaki L.) fruit

Anjali Gautam, Anju K. Dhiman, Surekha Attri and Deepika Kathuria

DOI: http://dx.doi.org/10.21276/ap.2020.9.2.13

164. Synthesis and characterization of chitosan nanoparticles loaded with 6-gingerol isolated from Zingiber officinale Rosc.

MD Imad Uddin, P. Venkata Raja Srikar, Y. Preethi Karunya, Rachana Chakraborty and R. Deepika

DOI: http://dx.doi.org/10.21276/ap.2020.9.2.14

Table of contents

172. Assessment of the preventive effects of Silybum marianum (L.) Gaertn. seeds hydroethanolic extract and silymarin on complete Freund's adjuvant-induced arthritis in wistar rats

Marwa S. Saber, Hanaa I. Fahim, Osama M. Ahmed, Noha A. Ahmed and Mohammed Abdel-Gabbar

DOI: http://dx.doi.org/10.21276/ap.2020.9.2.15

183. Preliminary phytochemical screening, FTIR and GC-MS analyses of aqueous, ethanolic and methanolic extracts of stem of *Tinospora cordifolia* (Willd.) Miers for search of antidiabetic compounds

Preety Dubey, Shiv Kumar Jayant and Nalini Srivastava

DOI: http://dx.doi.org/10.21276/ap.2020.9.2.16

198. Effect of packaging on phenols, flavonoids and antioxidant activity of dried wild pomegranate (*Punica granatum* L.) arils prepared in solar tunnel drier

Abhimanyu Thakur, N. S. Thakur, Hamid and Sunakshi Gautam

DOI: http://dx.doi.org/10.21276/ap.2020.9.2.17

207. Nutritional composition and antioxidant profiles of Nigella sativa L. seeds

Swati Agarwal, Shraddha Tripathi, Arshi and Neetu Mishra

DOI: http://dx.doi.org/10.21276/ap.2020.9.2.18

215. Revitalizing property of banana peel extracts by antioxidant activity and antibacterial activity against acne causing Staphylococcus epidermidis

P. Saravana Kumari, R. Ranjitha and N. Vidhya

DOI: http://dx.doi.org/10.21276/ap.2020.9.2.19

223. Comparative assessment of Rhododendron (Rhododendron arboreum Sm.) flowers extract beverages through biochemical analysis and its quality evaluation during storage

N.S. Thakur, Aarti, Sunakshi Gautam, Aashu Chandel, Neerja Rana, Abhimanyu Thakur and Hamid

DOI: http://dx.doi.org/10.21276/ap.2020.9.2.20

232. Protective effect of the polyherbal formulation, Nalpamaram against ethanol induced hepatotoxicity in rats

S. Jyothilekshmi, A. K. Valsa and Ramadasan Kuttan DOI: http://dx.doi.org/10.21276/ap.2020.9.2.21

239. Hepatoprotective activity and constituents of Nigrospora sp. CMH2_13: An endophytic fungus isolated from leaves of Phyllanthus amarus Schum, and Thonn.

Smita K. Puri, Prasanna V. Habbu, Preeti V. Kulkarni, Arun B. Joshi, V. H. Kulkarni and Sheshagiri R Dixit

DOI: http://dx.doi.org/10.21276/ap.2020.9.2.22

247. Protective effect of different parts of *Terminalia catappa* L. in the hematological and biochemical profiles of immunosuppressed mice

P. Venkatalakshmi and P. Brindha

DOI: http://dx.doi.org/10.21276/ap.2020.9.2.23

257. Phytochemical analysis and in vitro free radical scavenging activity of rhizome of Zingiber officinale Rosc.

P. Manju and A. Pushpa

DOI: http://dx.doi.org/10.21276/ap.2020.9.2.24

263. Pharmacognostical evaluation of indigenous herbal drug: Carissa carandas Linn. fruit

Sonia Singh, Meenakshi Bajpai and Pradeep Mishra

DOI: http://dx.doi.org/10.21276/ap.2020.9.2.25

271. Phytochemical evaluation of *Amorphophallus smithsonianus* Sivad.: A rare endemic species from Western Ghats, Kerala, India Raghavan Kavalan, A. K. Abdussalam and K. M. Gothandam

DOI: http://dx.doi.org/10.21276/ap.2020.9.2.26

277. Optimization of coating material for encapsulation of flax seed oil containing omega-3 fatty acids

Dinesh Chandra Rai, Arvind and Vinod Kumar Paswan

DOI: http://dx.doi.org/10.21276/ap.2020.9.2.27

283. Effect of piperine and quercetin pretreatment on safety profile of marbofloxacin after repeated oral administration in broiler chickens

Harshad B. Patel, Urvesh D. Patel, Chirag M. Modi, Dhaval T. Fefar and Amit R. Bhadaniya

DOI: http://dx.doi.org/10.21276/ap.2020.9.2.28

293. Development of production technology for preparation of beetroot powder using different drying methods

Durga Shankar Bunkar, Anima Anand, Kamalesh Kumar Meena, S. K. Goyal and V. K. Paswan

DOI: http://dx.doi.org/10.21276/ap.2020.9.2.29

302. Production, purification and characterization of prodigiosin by Serratia nematodiphilia (NCIM 5606) using solid-state fermentation with various substrate

Kamlesh Kumar Maurya, Abhishek Dutt Tripathi, Deepak Kumar and Suresh Kumar Srivastava

DOI: http://dx.doi.org/10.21276/ap.2020.9.2.30

Author index and instructions for preparation of manuscript

Cover photograph: Micronutrients and phytochemicals against COVID-19: Mechanism and molecular targets

Yuva Bellik, Mostapha Bachir-Bey, Wided Fatmi, Mokhtaria Kouidri, Yasmina Souagui and Sidi Mohammed Ammar Selles