

Walailak Journal of Science and Technology (WJST)

Advisory Board

Keerath Sanguansai, Walailak University, Thailand Kan Chantrapromma, Walailak University, Thailand Amara Changsub, Walailak University, Thailand Montree Issarakraisila, Walailak University, Thailand

Editor in Chief David J. Harding, Walailak University, Thailand

Associate Editor Charuai Suwanbamrung, Walailak University, Thailand

Piyapong Chotipuntu, Walailak University, Thailand

Editorial Board Ahmad Ismail,

Universiti Putra Malaysia, Malaysia Atef Abdrabou, United Arab Emirates University, United Arab Emirates Bahram Hemmateenejad, Shiraz University, Iran Bhaskar Choubey, University of Glasgow, United Kingdom Carlo Santulli, Università La Sapienza, Italy Chandra Prakash Kala, Indian Institute of Forest Management, India Che Abd Rahim Mohamed, Universiti Kebangsaan Malaysia, Malaysia Chuanhe Tang, South China University of Technology, China Claude E. Boyd, Auburn University, United States Damrong Khummongkol, Shinawatra University, Thailand Ehab Abdel Rahman Abu-Basha, Jordan University of Science and Technology, Jordan El Sayed H. El Ashry, University of Alexandria, Egypt Fabio Grizzi, IRCCS Istituto Clinico Humanitas, Italy Frederick William H. Beamish, University of Guelph, Canada Fridoon Jawad Ahmad, King Edward Medical University, Pakistan Guo-Cheng Wu, Neijiang Normal University, China Haydar Akca, Abu Dhabi University, United Arab Emirates Jinrong Wan, University of Missouri-Columbia, United States Jitbanjong Tangpong, Walailak University, Thailand Jyotindra C Prajapati, Charotar University of Science and Technology, India Krzysztof Górski, Radom University of Technology, Poland

Manager Kosin Sirirak, Walailak University, Thailand

Managing Staff

Kaewjai Suksa-ard, Walailak University, Thailand Laddawan Monkeaw, Walailak University, Thailand Nuson Song-iat, Walailak University, Thailand Surasi Vadhanavikit, Walailak University, Thailand Shigeru Kato, Seikei University, Japan Waldemar W. Koczkodaj, Laurentian University, Canada Winai Pralomkarn, Walailak University, Thailand

Chitnarong Sirisathitkul, Walailak University, Thailand

Pilan Saensuk, Walailak University, Thailand Sanae Rujivan, Walailak University, Thailand

Kyoung-Woong Kim, Gwangju Institute of Science and Technology, Korea K.V.L.N. Acharyulu, Bapatla Engineering College, India Laith Ahmed Najam, Mosul University, Iraq Ming Hung Wong, Hong Kong Baptist University, Hong Kong Mohammad Mehdi Rashidi, Bu-Ali Sina University, Iran Mohammad Salem Abdullah Nemat Al-Hwaiti, Al-Hussein Bin Tala University, Jordan Mohamed El-Doma, University of Khartoum, Sudan Mohsen Saeedi, Iran University of Science and Technology, Iran Narayanan Kannan, Korea Ocean Research & Development Institute, Korea Praveen Agarwal, Anand Intenational College of Engineering, India Qin Xin, University of the Faroe Islands, Denmark Rattikorn Yimnirun, Suranaree University of Technology, Thailand Roberto Montemanni, Dipartimento Tecnologie Innovative, SUPSI, Switzerland Salah El-Sayed El-Hendawy, Suez Canal University, Egypt Salah Shaker Hashem AL-Luaibi, University of Basrah, Iraq Sharif Hussein, Universiti Sains Malaysia, Malaysia Sumit Goyal, National Dairy Research Institute, India Tanongkiat Kiatsiriroat, Chiang Mai University, Thailand Vuda Sreenivasarao, Defence University College, Deberziet, Ethiopia Wattanapong Kurdthongmee, Walailak University, Thailand Zhongwei Guan, University of Liverpool, United Kingdom

Suwimol Chantan, Walailak University, Thailand Wanrudee Rattanapanth, Walailak University, Thailand

http://wjst.wu.ac.th

Walailak J Sci & Tech