

Journal of Nature Studies

Volume 21 No. 1
January – June 2022

Scientific Peer-Reviewed Journal Published by
the **Philippine Society for the Study of Nature (PSSN)**

ISSN 2244-5226
www.journalofnaturestudies.org



Editor-in-Chief

Inocencio E. Buot, Jr., PhD
University of the Philippines Los Baños, Philippines

Managing Editor

Elaine Loreen C. Villanueva, MSc
University of the Philippines Open University, Philippines

Editorial Board

Arlen A. Ancheta, PhD
University of Sto. Tomas, Philippines

Ricardo Bagarinao, PhD
University of the Philippines Open University, Philippines

Marilyn Belarmino, PhD
Genetic Resources Center, East West Seed Company,
Philippines

Merites M. Buot, PhD
University of the Philippines Los Baños, Philippines

Leni D. Camacho, PhD
University of the Philippines Los Baños, Philippines

Rajasekaran Chandrasekaran, PhD
Vellore Institute of Technology, India

Mohan Devkota, PhD
Tribhuvan University, Nepal

Puvadol Doydee, PhD
Kasetsart University, Thailand

Romeo A. Gomez, PhD
Benguet State University, Philippines

Albert Remus R. Rosana, MSc
University of Alberta, Canada

Lynlei L. Pintor, PhD
Department of Environment and Natural Resources, Philippines

Ramamoorthy Siva, PhD
Vellore Institute of Technology, India

Rachel C. Sotto, PhD
University of the Philippines Los Baños, Philippines

Sukendah, PhD
Universitas Pambangan Nasional, Indonesia

Lita B. Sopsop, PhD
Western Philippines University, Philippines

Naomi G. Tangonan, PhD
University of Southern Mindanao, Philippines

The **Journal of Nature Studies** is an online, open access, peer-reviewed journal in English that publishes reports of original research in the natural and applied sciences (agriculture, biology and its allied fields including studies on social sciences as related to nature and the environment). It also publishes notes and reviews on relevant and timely subjects on nature. The Journal of Nature Studies aims to cater to global or international readership thus the broad composition of its Board of Editors/Reviewers. Two issues a year comprise a volume. Supplements may be issued anytime as necessary.