# Philippine Journal of Science

Volume 151 No. 5, October 2022

Philippine Journal of Science (Philipp J Sci) is a scientific journal published by the Department of Science and Technology (DOST) and managed by the Science and Technology Information Institute (STII).

# Editorial Board

Editor-in-Chief **Caesar A. Saloma, Ph.D.** National Institute of Physics, College of Science University of the Philippines Diliman, Quezon City, Philippines

# Dolores A. Ramirez, Ph.D.

Institute of Plant Breeding College of Agriculture and Food Science University of the Philippines Los Baños College, Laguna, Philippines

### Fabian M. Dayrit, Ph.D.

School of Science and Engineering Ateneo de Manila University Loyola Heights, Quezon City, Philippines

#### Queena N. Lee-Chua, Ph.D.

Department of Mathematics Ateneo de Manila University Loyola Heights, Quezon City, Philippines

# Rafe M. Brown, Ph.D.

Department of Ecology and Evolutionary Biology 1345 Jayhawk Blvd., Dyche Hall University of Kansas Lawrence, KS 66045 USA

## William G. Padolina, Ph.D.

National Academy of Science and Technology DOST Complex, Bicutan, Taguig City

### Rosalia C.M. Simmen, Ph.D.

Department of Physiology and Biophysics, and The Winthrop P. Rockefeller Cancer Institute University of Arkansas for Medical Sciences Biomed Bldg. 1, Rm. 212D, 4301 W. Markham St. Little Rock, AR 72205 USA

#### Ronaldo P. Ferraris, Ph.D.

Department of Pharmacology and Physiology New Jersey Medical School 185 S. Orange Avenue Newark, NJ 07103-2714 USA

#### Josefino C. Comiso, Ph.D.

Laboratory for Hydrospheric Processes, Code 971 National Aeronautics and Space Administration Goddard Space Flight Center Greenbelt, MD 20771 USA

#### Sohichi Hirose, Ph.D.

Department of Civil and Environmental Eng'g. School of Environment and Society Tokyo Institute of Technology Ookayama, Meguro-ku, Tokyo, Japan

#### Victor B. Amoroso, Ph.D.

Center for Biodiversity Research and Extension in Mindanao, and Biology Department College of Arts and Sciences Central Mindanao University Musuan, Bukidnon, Philippines

#### Dr. Fortunato B. Sevilla III, Ph.D.

Research Center for the Natural and Applied Sciences University of Santo Tomas España Blvd., Manila