

FROM THE EDITOR

Dear Colleagues,

Welcome to the December 2015 issue of *Science Diliman*. Let me first thank the authors for sharing basic knowledge as well as applications of researches in their fields of expertise. I also thank the Science Diliman team for completing the publication of this issue.

This issue presents four diverse researches covering quaternion matrices, synthesis of copper nanoparticles, barcoding of catfish, and optimized extraction of mango kernel butter.

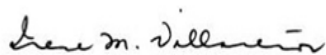
Quaternions are also used in electromechanics, quantum mechanics, and 3D animation to calculate movement and rotation. I viewed a real-world application of quaternions in computer graphics with the open source program NASA WorldWind at <http://worldwind.arc.nasa.gov/java/>. The research paper of Ralph John dela Cruz gave a mathematical description of quaternion matrices.

Metallic copper nanoparticles were successfully synthesized and characterized by Mary Donnabelle L. Balela and Kathy Lois S. Amores. The synthesized copper nanoparticles also exhibited antimicrobial activity. Nanoparticles or nanopowders or nanoclusters or nanocrystals are submicroscopic with dimensions up to 100 nanometers. Nanoparticles have varied applications in medicine (e.g., in drug delivery systems), in manufacturing (e.g., as industrial catalysts) and materials (e.g., as nanocomposites), in energy (e.g., as batteries) and electronics (e.g., as supercapacitors), and in the environment (e.g., in remediation).

Different species of catfish may look very similar in terms of their morphological features to the untrained eye. DNA barcoding, which uses a very short genetic sequence from a part of the genome, was utilized by the research group of Brian S. Santos to distinguish the different catfish species in the Philippines. The gene region used by the research group is the 648 base-pair region in the mitochondrial cytochrome c oxidase 1 gene "COI". Santos et al. concluded that *C. batrachus* and *C. macrocephalus* are native to the Philippines while *C. gariepinus* is an introduced species.

The mango seed, which is a major waste of mango, is a potential source of oil. Mango oil may be used as edible oil, as extenders in manufacturing soap and cosmetics, and it may also provide nutritional benefits. Mango kernel butter is well-characterized in terms of its chemical composition with oil content of 8 to 10%. It has a similar chemical composition to shea and cocoa butter. Its major constituents are oleic acid and stearic acid. The research group of Edgardo V. Casas optimized the parameters used in the microwave pretreatment of mango kernels, which increased the yield of mechanically extracted mango kernel butter. Microwave is a non-ionizing electromagnetic radiation.

Please read the complete articles including the layman's abstracts to better understand the researches.



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Editor-in-Chief