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Editorial:

The editorial team at Mapana - Journal of Sciences is excited to share the new issue for December 2022. I am pleased to see the encouragement and support that this multidisciplinary UGC care-listed journal is receiving from peers and key resource specialists in the physical sciences, chemical sciences, mathematics, biological sciences, and computer sciences. My greatest appreciation and respect go to all the authors who contributed to the current edition. We have made an effort to publish six research articles in this issue that are relevant to the disciplines of mathematics, biological sciences, chemistry, and physics.

To solve homogeneous linear sequential fractional differential equations with constant coefficients, Tyagi and Chandel designed an analytical method. This technique establishes a connection between the solutions of classical differential equations and fractional differential equations by locating their auxiliary equations. This approach is simpler and more precise.

Microbiology is helping in the production of various enzymes with great economic value. The research article written by Dhandayuthapani and Lakshmi, statistically optimized the cultural conditions for the production of lipase from the mutagenic strain of a newly isolated *Bacillus licheniformis* MLP. Response surface methodology was employed and it was observed that 5.5% of sunflower oil, glucose, peptone and 55μML^{-1} of Zn produced maximum lipase activity of 37.21±0.12 UmL^{-1}. These particular statistical strategies can help in the production of enzymes at the industrial scale.

Niloy Das et al. examined the phytochemicals, antioxidant, antibacterial, and larvicidal qualities of the fruit extracts of *Acacia nilotica*. This study established the presence of numerous phytochemicals such as flavonoids, phenols, terpenoids, saponins, and steroids in fruit extracts. Using ferric-reducing antioxidant power assays, it was demonstrated that these phytochemicals contributed to the anti-oxidant properties. The larvicidal and antibacterial properties of the aqueous and alcohol extracts were evident.

In recent years nanotechnology has taken leaps in its development and applications. In the article written by Amit Kumar, nanosphere optics lab field simulator was used, which is based on Mie's theory of sphere scattering, to analyse the extinction spectra, electric field intensity, and changes of gold nanoparticles owing to different semiconductor media. The results show considerable differences since the embedding media has changed. The distinctive adjustable electro-optical characteristics of gold nanoparticles may consequently be advantageous for industrial catalysts, pharmaceuticals, and other consumer goods. According to the study, outcomes can be enhanced in the medium-size range or 25–75 nm. Additionally, when the host material's refractive index rises, the selectivity may be enhanced linearly.

Chandra Sivaram, Kenath Arun, and Avijeet Prasad have discussed the various gravitating properties of negative mass particles and their implications for black holes, cosmology, and fundamental physics. The authors studied the possibility of negative mass particles accounting for the universe's accelerated expansion. They set constraints on the density of these negative mass particles based on astrophysical observations. They also pointed out some inconsistencies in the earlier works on negative mass as a possible model for dark energy while considering the various properties of particles with negative mass in the gravitational field.

Sudesh Pahal and Preity Priya presented a comprehensive research study on low-interaction secure shell honeypots. They demonstrated a user-friendly honeypot with low interaction. They mentioned that once deployed, the honeypot can run without manual intervention and keep track of each deployment session without interfering with parallel processes. Also, the honeypot is capable of recording and analysing suspicious network traffic and notifying the hosting organization about the same. This article makes an effort to provide details about the geographic make-up of hackers encountered and information about preferred protocols, in addition to adding to educational password dictionaries.

Manoj Balachandran
Editor