Proceedings of the

Multi-disciplinary Seminar Series

AGORA 2022

National Seminar Series

Sree Narayana College, Kollam

Affiliated to University of Kerala

NAAC 'A' Grade, ARIIA All India Rank II

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Chief Editor's Message

The 'AGORA National Seminar Series' is an annual event showcasing the social, scientific and technological activities of research and academic communities of all types of organizations and institutes across the country. The major purpose of this seminar series is to spread the knowledge in various subjects across different departments of the college so as to enrich the inter-disciplinary culture in the entire campus. AGORA series is being conducted by coordinating different departments of S. N. College, Kollam to disseminate knowledge to the entire academic community. AGORA 2022 has succeeded in bringing many luminaries in science and arts subjects with its research together with main focus within the college to deliberate and debate on the recent advances in various subjects. The proceedings of AGORA 2022 being published now will certainly go a long way to enlighten researches and teachers in their pursuit of knowledge. Let the outcome of these deliberations engender commendable results and kindle genuine spirit of enquiry and research.

Prof. Dr. Nisha J. Tharayil

(Principal, S. N. College, Kollam)

Editor's Message

It is our great pleasure to welcome you to this issue of the Proceedings of the Multi-disciplinary Seminar Series of Sree Narayana College, Kollam - AGORA 2022 which showcases the social, scientific and technological activities of research and academic communities of all types of organizations and institutes across the country. AGORA 2022 mainly focuses on the contributions from the research community in a multi-disciplinary and interdisciplinary aspect. The seminar brought together students, researchers and educators of varied domains to share their ideas, views and also to explore their technical abilities.

This issue contains papers accepted over single iterations of the review process. We would like to express my gratitude to the Chief Editor and other expert members for their sustained support to make the launch of this 'Proceedings' possible. We also acknowledge the authors themselves, without whose expert input there would have been no AGORA seminar series. Their efforts made a great contribution to its success.

Dr. P. Nikhil Chandra

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Contents

14

Synthesis, characterization and antibacterial studies of curcumin metal complexes

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Abstract: Ca (II) and Ce(III) complexes of curcumin have been prepared from the metal chloride salts and commercially available curcumin in presence of pyridine catalyst. The prepared complexes were characterized using Infrared and UV spectroscopy. Anti-bacterial study of the synthesized complexes indicated that all the complexes possess antibacterial activity and particularly the Ce (III) complexes possess better anti-bacterial activity than the pure ligand against the gram negative bacteria Salmonella typhimurium.

Introduction: Curcumin, a major constituent of turmeric exhibits great promise as a therapeutic agent, and is currently in human clinical trials for a variety of conditions, including multiple myeloma, pancreatic cancer, myelodysplastic syndromes, colon cancer, psoriasis and Alzheimer's disease. The unique charge and bonding characteristics facilitate penetration into the blood brain barrier superior to other known non-steroidal anti-inflammatory drug (NSAID). Curcumin is a free radical scavenger and hydrogen donor, and exhibits both pro- and antioxidant activity [1].

Under physiological conditions (pH > 7.2),~90% of curcumin degrades within 30 min into several products, namely, trans-6-(4′-hydroxy-3′- methoxyphenyl)-2,4-dioxo-5-hexanal, ferulic acid, feruloylmethane, and vanillin. It is also susceptible to degradation on exposure to light. Curcumin also suffers from its poor bioavailability besides being susceptible to degradation in light. A more facile and convenient way to enhance the solution stability without compromising its therapeutic efficacy is binding to a metal ion. Binding of Curcumin to a metal ion via its β-diketone moiety significantly reduces the tendency of a Curcumin to undergo hydrolyses in aqueous medium, which could result in an improved therapeutic efficacy. By the suitable choice of the metal and the ancillary ligands in a ternary structure, the complex can be directed to targeting cancer cells without effecting the normal cells [2].

Antimicrobial studies of few metal complexes of Curcumin were already reported. A copper Curcumin was found to be useful for the development of a vaginal gel against viral infection. Also notable is an early report the inhibition of an HIV-1 and HIV-2 proteases and several Curcumin boron complexes. Antiarthritic/antirheumatic activity has been reported for vanadyl and gold complexes of curcumin. Reports were available on synthesis