

ICAT'22

**10th International Conference on
Advanced Technologies**

ABSTRACT BOOK

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Abstract Book

**Editor
Omer Faruk BAY**

International Conference on Advanced Technologies, ICAT'22
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PREFACE

10th International Conference on Advanced Technologies (ICAT'22) has been organized with success in Van, TÜRKİYE on November 25-27, 2022.

The main objective of this conference is to provide a platform for researchers and academicians from all over the world to present their researches and professional development activities. This conference provides opportunities for the delegates from the electrical and computer engineering areas to exchange new ideas and to establish business or research relations and to find global partners for future collaboration.

All paper submissions have been double blind and peer reviewed and evaluated based on originality, technical and/or research content/depth, correctness, relevance to conference, contributions, and readability. Selected papers presented in the conference that match with the topics of the journals will be published in the following journals:

- International Journal of Applied Mathematics, Electronics and Computers (IJAMEC)
- International Journal of Automotive Engineering and Technologies (IJAET)
- International Journal of Energy Applications and Technology (IJEAT)
- Intelligent Methods in Engineering Sciences (IMIENS)
- Yuzuncu Yil University Journal of the Institute of Natural and Applied Sciences
- Tribology and Materials

At this conference, there were 275 paper submissions. Each paper proposal was evaluated by two reviewers. And finally, 169 papers were presented at the conference from 32 different countries (Türk, ye, Algeria, Bangladesh, Brazil, Bulgaria, Colombia, Czech Republic, India, Iran, Islamic Republic of, Iraq, Italy, Japan, Korea Democratic People's Republic of, Macao, Malaysia, Mauritania, Mauritius, Mexico, Morocco, Namibia, Pakistan, Romania, Senegal, Serbia, South Africa, Spain, Sri Lanka, Taiwan, Tunisia, United Kingdom, United States, Vietnam).

This conference has been supported by Van Yuzuncu Yil University. In particular, we would like to thank Prof. Dr. Hamdullah Sevli, Rector of Van Yuzuncu yil University. We also thank to Plusbase Ltd. Sti, and colleagues in our conference office. They have made a crucial contribution towards the success of this conference.

Looking forward to see you in next ICAT.

Omer Faruk BAY
Editor

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STORAGE AND UV STABILITY OF SMALL UNILAMELLAR LIPOSOMES WITH ENCAPSULATED SILYMARIN AND SILIBININ

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ABSTRACT

In the present research, the storage and UV stability of small unilamellar liposomes (SUVs) with encapsulated silymarin and silibinin were investigated in terms of changes in vesicle size, polydispersity index (PDI), zeta potential, mobility, and conductivity. Silymarin and silibinin were encapsulated within phospholipid liposomes produced using the proliposome method and subsequently sonicated. On the 1st day, vesicle size was 1681.0 ± 55.5 nm for silymarin liposomes and 1884.7 ± 2.5 nm for silibinin liposomes, whereas PDI was 0.321 ± 0.012 and 0.319 ± 0.011 . Additionally, the zeta potential of SUVs with silymarin and silibinin was -38.6 ± 0.8 and -37.6 ± 1.2 mV, respectively, whereas mobility and conductivity were -3.03 ± 0.06 $\mu\text{mcm/Vs}$ and 0.149 ± 0.002 mS/cm (for silymarin sample) and -2.94 ± 0.09 $\mu\text{mcm/Vs}$ and 0.154 ± 0.002 mS/cm (for silibinin sample). After 28 days of storage at 4°C, there was a statistically significant increase in the vesicle size of SUVs with silymarin and silibinin (2703.5 ± 44.5 and 2172.5 ± 26.2 nm) and a decrease in zeta potential (-16.7 ± 0.5 and -9.8 ± 0.1 mV), mobility (-1.31 ± 0.04 and -0.76 ± 0.01 $\mu\text{mcm/Vs}$), and conductivity (0.027 ± 0.001 and 0.023 ± 0.001 mS/cm). On the other hand, UV irradiation did not affect changes in vesicle size and PDI of all liposomes, but it caused a decrease in zeta potential, -32.9 ± 1.0 mV for silymarin and -33.9 ± 0.3 mV for silibinin, mobility, -2.64 ± 0.1 and -2.47 ± 0.2 $\mu\text{mcm/Vs}$, and conductivity, 0.131 ± 0.005 and 0.075 ± 0.006 mS/cm. Also, after 28 days of storage, UV-irradiated SUVs with silymarin and silibinin have significantly higher vesicle size and lower zeta potential, mobility, and conductivity in comparison to the measurements immediately after UV irradiation. In conclusion, both non-treated and UV-irradiated silymarin- and silibinin-loaded SUVs were unstable during storage at 4°C, resulting in changes in vesicle size, zeta potential, mobility, and conductivity, thus additional experiments for improving liposomal stability should be performed.

KEYWORDS - Small unilamellar liposomes, silymarin, silibinin, proliposome method, stability