

## ***EDITORIAL COMMENT***

Dear readers,

In the second issue of the journal for 2023, edited on English language, you will have the pleasure to get closer and familiar with nine scientific articles, included in the five main rubrics – *Man and Biosphere*, *Space Technology and Environmental Monitoring*, *Microorganisms and Environment*, *Forest Ecology and Biology*, *Radiation Ecology*. In the rubric Scientific Forums I would like to inform you about the Eighth International Conference *Ecological Engineering and Environment Protection (EEEP'2024) with Youth Scientific Session* which will be carried out in Velingrad (Bulgaria), June 6-9, 2024.

The article by leading experts from the European Space Agency, presented in the section *Man and Biosphere*, is especially intriguing. It examines important questions regarding the approaches and directions in the space research conducted by the leading countries in this scientific topic. It is known that at the end of the 80s almost all space key players were involved in regenerative life support developments. Very often, these efforts start from the gas phase and edible biomass production, later-on extended to the waste valorisation as a resource for biomass production. If Russia, USA and Japan went rather rapidly to human campaigns, Europe limited its ambition to smaller scales. System and modelling efforts were clearly NASA and ESA specificity in the approach. Nowadays, mainly China with the Lunar Palace project and Europe with MELiSSA are active in closed loop life support system. In this thematic issue is also the following article, which focuses on microbiological research related to the possibility of bioconversion of cellulosic waste in terrestrial and space conditions. For Bulgaria, this is a new scientific direction and the first successful steps have been taken in this direction. The third article aims to confirm the hypothesis of the eminent Bulgarian scientists Prof. Vassil Vuchev for oil reserves in Bulgaria. With the method of text mining and analysis, appropriate references are found, which explain geological prerequisites to form oil deposits. Several geological works for oil and gas deposits prospecting and research have been carried out in the territory of Bulgaria, localized mainly in the territory of North Bulgaria, and in recent years they have also covered part of the Bulgarian aquatory of the Black Sea. Oil is extracted near Dolni Dubnik and Gigen, district Pleven, near Dolni Lukovit, district Lovech and in the 80s and began operation of the field near the village Bohot, district Pleven and Selanovtsi, district Vratsa. Smoke plumes can be emitted from power plants, heating plants, refineries, etc. The rise of the plume depends on many factors, including chimney outlet diameter, flue gas velocity, effluent temperature, wind speed, deceleration rate, etc. However, increased plume height plays an important role in reducing downwind ground level air pollutant concentrations. Various plume uplift prediction equations such as those of Holland (1953), Rauch (1962), Briggs (1965), etc. have been analyzed. In the present paper, the plume lift formula derived by Rauch (1962) and Lucas-Moore-Spurr (1963) is supplemented so that the resulting equation calculates the plume lift more accurately.

In the rubric *Space Technology and Environmental Monitoring* are presented and analyzed various the possibilities of applying the models for the study of marine acidification using satellite data for a limited coastal area in the Black Sea region of Bulgaria. A review of the publications in various scientific databases related to the major projects of international and governmental organizations such as UNESCO, IALA, EC, NOAA, etc. was prepared too. The study takes into account the gaps in the information on the acidification of the Bulgarian coastal waters by exploring the possibilities for satellite remote monitoring, which would allow the creation of spatio-temporal and prognostic models.

The advantages of nanotechnology in global biomedical applications are now widely recognized. AgNPs have bactericidal and antiviral effects and can be used as broad-spectrum bactericidal agents. In the article issued in the rubric *Microorganisms and Environment* the question of studying the effects of AgNPs in order to determine their dosage and safety is raised. Therefore, further research activities on the biocompatibility, bioactivity and toxicity of AgNPs are needed, as irreversible toxic effects of AgNPs on animals and humans have been proven. Their possible application requires a careful evaluation of the ratio between benefit and risk. The second article in this rubrics would also be of interest to researchers trying to understand some of the anomalous properties of electrolyzed water. The results reflect experiments on the physical properties of electrochemically activated water conducted over the past few years. During the electrolysis of tap water with a semi-permeable membrane, two fractions are obtained - catholyte and anolyte

with different values of physical and chemical indicators. Powerful hydrogen and redox potential have been studied by many researchers, but without accurate evaluation of their changes over different time intervals. Tables for the values of these parameters are also presented here.

One promising approach in the conservation of rare species, including common yew (*Taxus baccata* L.), is ex situ propagation and reintroduction into the wild (see rubric *Forest Ecology and Biology*). The traditional vegetative propagation of this species by rooting cuttings does not give satisfactory results, since the main factor remains the stage of development of the donor plant. The authors prove that cuttings from young specimens taken from the Maglizh locality form more root primordia, with 44% successful rooting. In addition, young yew plants are sensitive to summer droughts and to the allelopathic effect of their neighboring *Rhododendron ponticum* shrubs, which reduces the success of their reintroduction. A limiting factor is the thick leaf layer and shading by beech trees in the lower part of the slopes, as well as damage by wild herbivores, mainly roe deer and rabbits.

As global electricity demand grows gradually and annually by about 3%, by 2060 nuclear, natural gas and renewable energy generation is proposed to meet most of the growth in energy demand instead of coal and crude oil. In an article presented in the section *Radiation Ecology* the authors propose a model using nuclear power to generate power instead of coal and fossil fuels, which also reduced CO<sub>2</sub> emissions. This proposed model expects a reduction in CO<sub>2</sub> emissions in 2060 for the Unfinished Symphony scheme from 592 to 147 gigatonnes. It is concluded that replacing coal and fossil fuel sources with nuclear energy technology is a good solution to reduce global CO<sub>2</sub> emissions in the future 2060, which is considered to be very efficient and effective in controlling climate change. Moreover, the use of nuclear reactors is a safer technology and will encourage countries to move towards this technology, which will meet the world's energy needs and also fight global warming.

Dear readers, in Velingrad (Bulgaria) from 6 to 9 June 2024 will be carried out the 8th International Conference *Ecological Engineering and Environment Protection with Youth Scientific Session* (EEEEP'2024). Your participation will contribute not only to raising the level of the conference, but also to the establishment of fruitful cooperation and enlarge partnership in the various fields of ecology, biotechnology, and many other scientific fields that will be presented at the Conference.

Enjoy reading and welcome!

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