

**The Balkans Scientific Center of the Russian
Academy of Natural Sciences**

2nd International Symposium:

**Modern Trends in Agricultural
Production and Environmental
Protection**

Tivat-Montenegro

July, 01-04. 2020.

**2nd International Symposium
Modern Trends in Agricultural Production and Environmental Protection**

=====

Publisher

The Balkans Scientific Center of the
Russian Academy of Natural Sciences

In cooperation

Faculty of Agriculture, Lesak
Faculty of Agriculture, Cacak
Institute for Animal Husbandry, Belgrade, Zemun
Fruit Research Institute, Cacak
Faculty of Agriculture, East Sarajevo
Soil Science Institute, Belgrade

Editor

Acad. Prof. dr Mitar Lutovac
Prof. dr Zoran Ž. Ilić

Technical editor

SaTCIP

ISBN

978-86-6042-021-5

Circulation

70 exemplars

Printed by

SaTCIP d.o.o. Vrnjačka Banja

2020.

**LAND AS A PLANETARY HUB OF THE ECOLOGICAL
CONNECTIONS**

**Aleksander Mihailović Semenov¹, Dagutin Đukić², Vesna Đurović²,
Bojana Trifunović³, Leka Mandić²**

¹Faculty of Biology, Department of Microbiology, M.V. Lomonosov Moscow State University, Moscow, Russia Federation

² University of Kragujevac, Faculty of Agronomy Čačak, Cara Dušana 34, Čačak, Serbia

³City Administration for Urbanism, Environmental Protection Group, Župana Stracimira 2, Čačak, Serbia

ABSTRACT

The topic of this paper is about functional unity of the land and near-surface geosphere, as well as their mutual action and connection.

Key words: *ecology, land, protection.*

Ecological functions of the land

In the seventies of the last century the theory of ecological functions of the land (is being created by Nikitin 1977,1982, 1990; Dobrovoljski 1979,2989; Karpecevski 1981; Zoni 1983; Dobrovoljski , Nikitin, 1986, 1990, 1996; Rozanov 1988 etc.) is based on the concept of D. Vernadski, Polinov, Kovda and others who talk about the role of the land in nature and community (Djukic i Djordjevic 2004; Djukic and others, 2018). Research of these functions showed their variety and close dependence of dynamic and functioning of the other geospheres (atmosphere and hydrosphere, lithosphere and byosphere in general). It helped to analyze ecological functions of all subsurface geospheres (schema 1) which form the global biosphere system. The basic results of the analyses are shown in many papers (Nikitin, 1990, 1997; Nikitin and others, 1991, 1992, 1997 etc.) and in monography „Sargenska koža zemlje: Biosfera – zemljište – čovek“(Biosphere – ground – man) (Nikitin, Girusov, 1993).

Multifunctionality of the biosphere

One of the main ideas of these works is the conclusion about tight mutual connection, multifunctionality and the fact that all natural – historical subsurface coatings which form biosphere land as well can't be changed. Knowing this it is obvious we can't have resource exploitation without having various consequences on

2nd International Symposium Modern Trends in Agricultural Production and Environmental Protection

biosphere in general. Unfortunately, there were and still are many attempts of similar theories because obviously there is a lack of understanding of multifunctionality and deep mutual connections within different elements of biosphere.

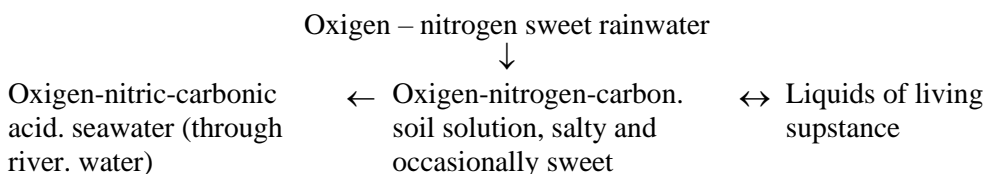
On the other side, Vernadski revealed a lot and gave many information and functional features about biosphere. For example, he emphasized the close connection of hydrosphere and atmosphere with living substance (biological world) of the Earth. Basically, chemical composition of all those wrappers is an overall result of the work of all living organisms during their existence. This especially concerns the global component of the hydrosphere – the world ocean. „Characteristically, in all its depth has living substance, which directly or indirectly determines all chemical properties of the ocean. In the structure of the planet this is the most powerful proof of the living matter“ (Vernadski, 1987).

Permeation between the substance of the atmosphere and hydrosphere is clearly expressed. „We can never separate natural water and natural gases in our researches. They always penetrate each other and naturally determine the phenomena that are inherent in them. Everywhere around us we haven't got gas, which isn't connected to water or aqueous solution which doesn't contain gas“ (Vernadski, 1960).

Water solution as the basic substrate of life

Vernadski (1934) paid attention to mutual penetration, organic mutual connection between components of the biosphere, for example, land and waters of the Earth. Speaking of the overall hydrological significance of the land, he claimed that „great importance in the history of water have soil solutions, which besides desert, envelope the whole land and appear as the substrate of life“.

Considering different forms of natural water, Vernadski pointed out that the study of soil solutions reveals a great phenomenon in history of water which connects different types of water such as the sea, rivers and rainwater. Scheme of dependence between soil and other waters according to him (1934) is like this:



No matter Vernadski thought that soil solutions are of great importance in hydrosphere of the Earth, in hydrological researches not enough attention has been paid to the direction of all forms of land in the processes occurring in the hydrosphere. Because of this many theories and incorrect suggestions appeared in the field of water protection from pollution, using soil as a factor which contains

2nd International Symposium
Modern Trends in Agricultural Production and Environmental Protection

=====

wastewater from cities and other places. But, on the other hand we can't forget that hydrosphere which contains soil solutions which have wastewater bring to a pollution in hydrosphere in general in rivers, ocean (Đukić et al., 2011, 2013, 2015; Đukić and Mandić, 2016).

CONCLUSION

We must conclude that we mustn't ignore the great importance of the soil, its functional part in biosphere, and planetary hub of the ecological connections. Therefore we need to create a better connection between podology and related sciences in order to protect nature and have a better approach especially, within geography of the ground.

ACKNOWLEDGEMENTS

This study is part of the project – TR 31057 funded by the Ministry of Education and Science, Republic of Serbia

REFERENCES

- Dobrovoljski G.V. (1979): O nekim problemima genetičkog poštvođenja. Poštvođenje, No 7, s. 103-111.
- Dobrovoljski G.V. (1989): Ekologija i poštvođenje. Poštvođenje No 12, s. 5-12.
- Dobrovoljski G.V., Nikitin E.D. (1986): Ekologičke funkcije poštvi. M.: Izd-vo MGU, 137 s.
- Dobrovoljski G.V., Nikitin E.D. (1990): Funkcije poštvi u biosfere i ekosistemima. M.: Nauka, 270 s.
- Dobrovoljski G.V., Nikitin E.D. (1996): Funkcionalno-ekologička geografija poštvi. Poštvođenje, No 1, s. 16-22.
- Đukić D., Jemcev V.T., Mandić L. (2011): Sanitarna mikrobiologija zemljišta, Budućnost, Novi Sad, 502 str.
- Đukić D., Jemcev V., Semenov A., Iutinska G., Selicka O. (2018): Ekološka biotehnologija (knjiga 1), Agronomski fakultet u Čačku, 844 str.
- Đukić D., Jemcev V.T., Đorđević S., Trifunović B., Mandić L., Pešaković M. (2013): Bioremedijacija zemljišta, Štamparija "Budućnost" DOO, Novi Sad, 207 str.

2nd International Symposium
Modern Trends in Agricultural Production and Environmental Protection

=====

Đukić D., Mandić L. (2016): Mikrobiološko prečišćavanje otpadnih voda. Agronomski fakultet u Čačku, 378 str.

Đukić D., Mandić L., Đorđević S. (2015): Mikrobiološka i fitoremedijacija zagađenih zemljišta i voda. Agronomski fakultet u Čačku, 294 str.

Đukić, A.D., Đorđević, S. (2004): Prirodoslovna mikrobiologija. "Stylos", Novi Sad, str. 179.

Karpačevskij L.O. (1981): Les i lesnie počvi. M.: Lesn. prom-st. 261 s.

Nikitin E.D. (1977): O biogeocenotičkih funkcijah počv. Vestnik MGU. Ser. Počvovedenie, No 4, s. 3-8.

Nikitin E.D. (1982a): Rolj počv v žiznji prirodi. M: Znanie, 50 s.

Nikitin E.D. (1990a): Berežite počvu. M.: Znanie, 60 s.

Nikitin E.D. (1997a): Effektivnost žizni I sohroneie bioferi. Žiznj Zemlji: Zemlevedenie I ekologija. M.: Izd-vo MGU, s. 22-33.

Nikitin E.D., Gradusov B.P., Zalogin B.S. (1992): Problema funkcij biosferi I ekologičeskoe počvovedenie. Žiznj Zemli: Geodinamika i ekologija. M.: Izd-vo MGU, s. 109-115.

Nikitin E.D., Šoba S.A., Šiškina L.P. (1997): Ekologičeskie funkcii biosferi i počvi, ih antropogennie izmenenija i ohrana. Žiznj Zemli: Zemlovedenie I ekologija. M.: Izd-vo MGU, s. 74-87.

Nikitin E.D., Zalogin B.S., Kuljminskaja K.S. (1991): Ekologičeskie funkcii počvennogo pokrova I gidrosferi. Žiznj Zemli. Ekologičeskie problemi i prirodoohrannoe obrazovanie. M.: Izd-vo MGU, s. 106-114.

Nikitin E.D., Girusov G.V. (1993): Šagrenevaja koža Zemli: biosfera – počva – čelovek. Pod red. G.V. dobrovoljskogo. M.: Nauka, 110 s.

Rozanov B.G. (1988): Geomembrana: Membrannaja funkcija počvi v planetarnoj geosfernoj sisteme Zemli. Počvovedenie, No 7, s. 54-59.

Vernadski V.I. (1934): Očerki geohimii. M.: nauč.-tehn. izd.-vo, 167 s.

Vernadski V.I. (1960): izbrannie sočinenija. M.: ANSSSR, T.4, 651 s.

Vernadski V.I. (1987): Himičeskoe stroenie biosferi Zemli i ejo okruženija. M.: Nauka, 339 s.

Zoni S.V. (1983): Sovremennie problemi genezisa I geografii počvi. M.: Nauka, 168 s.