

# Karen Aramais Ghazaryan

Faculty of Biology

Dean

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## Education

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<b>Institution</b>	Yerevan State University
<b>Faculty</b>	Biology
<b>Date</b>	2001 - 2004
<b>Degree name</b>	PhD student

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<b>Institution</b>	Yerevan State University
<b>Faculty</b>	Biology
<b>Date</b>	1999 - 2001
<b>Degree name</b>	Masters

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<b>Institution</b>	Yerevan State University
<b>Faculty</b>	Biology
<b>Date</b>	1995 - 1999
<b>Degree name</b>	Bachelor

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## Scientific Rank/degree

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<b>Institution</b>	Institute of Botany after A.L. Takhtajyan
<b>Date</b>	2022
<b>Degree name</b>	Doctor
<b>Specialty</b>	Biological sciences
<b>Research Topic</b>	Assessment of ecological consequences of soil degradation and ways of their improvement in high-risk areas of the Republic of Armenia

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<b>Institution</b>	Yerevan State University
<b>Date</b>	2016
<b>Degree name</b>	Associate professor
<b>Specialty</b>	Biological sciences

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<b>Institution</b>	Scientific center of zoology and hydroecology
<b>Date</b>	2004
<b>Degree name</b>	Candidate
<b>Specialty</b>	Biological sciences
<b>Scientific Supervisor</b>	Grigoeryan K.V.
<b>Research Topic</b>	Ecological evaluation and management of Lake Arpi and its watershed basin

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## Work experience

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**Institution** Yerevan State University  
**Period of time** 2023 till now  
**Rank/degree** Dean of the Faculty of Biology

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**Institution** Yerevan State University  
**Period of time** 2022 - 2023  
**Rank/degree** Acting Head of the Department of Ecology and Nature Conservation

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**Institution** Yerevan State University  
**Period of time** 2021 till now  
**Rank/degree** Leading researcher

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**Institution** Yerevan State University  
**Period of time** 2016 till now  
**Rank/degree** Associate Professor at the Faculty of Biology, Department of Ecology and Nature Protection

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**Institution** Yerevan State University  
**Period of time** 2015 - 2023  
**Rank/degree** Deputy Dean of the Faculty of Biology

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**Institution** Yerevan State University  
**Period of time** 2008 - 2016  
**Rank/degree** Assistant Professor at the Faculty of Biology, Department of Ecology and Nature Protection

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**Institution** Yerevan State University  
**Period of time** 2005 - 2021  
**Rank/degree** Senior researcher

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## Scientific interests

- Soil ecology; Water resources monitoring and management; Ecological management of the environment; Ecological evaluation of the environment
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## Participation in international conferences and seminars

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**22/05/2023 - 24/05/2023** 2nd Meeting of the International Network of Salt-Affected Soils (INSAS): Managing salt-affected soils for sustainable future  
FAO

Uzbekistan

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**12/09/2023 -  
17/09/2023** - III International Scientific Conference and the II International Scientific School of Young Scientists "Monitoring, protection and restoration of soil ecosystems under anthropogenic load"  
Southern Federal University  
Russian Federation (the)

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**02/05/2018 -  
04/05/2018** - Global Symposium on Soil Pollution  
FAO  
Italy

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**24/08/2018 -  
28/09/2018** - The current state of chernozems  
Southern Federal University  
Russian Federation (the)

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**08/10/2018 -  
10/10/2018** - International Conference Contaminated Sites  
The Ministry of Environment of the Slovak Republic and the Slovak Environment Agency  
Slovakia

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**19/04/2021 -  
30/04/2021** - EGU General Assembly  
European Geosciences Union  
Austria

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**20/10/2021 -  
22/10/2021** - Global Symposium on Salt-affected Soils  
FAO  
Italy

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## Membership

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<b>Institution</b>	Member of council 036, speciality: "Zoology, parasitology, ecology"
<b>Period of time</b>	2023 till now

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## Publications

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*Article*

### **Impact of Nanofertilizers for the Mitigation of Multiple Environmental Stresses**

Abhishek Singh, Sapna Rawat, Vishnu D. Rajput, Karen Ghazaryan, Tatiana Minkina,

Abdel Rahman Mohammad Al Tawaha, Ashi Varshney

Nanofertilizers for Sustainable Agroecosystems 2024 431-454

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*Article*

### **Green Synthesis of Nanofertilizers and Their Application for Crop Production**

Abhishek Singh, Ragini Sharma, Vishnu D. Rajput, Karen Ghazaryan, Tatiana Minkina,

Abdel Rahman Mohammad Al Tawaha, Ashi Varshney

*Article*

**Impact of Salinity Stress and Zinc Oxide Nanoparticles on Macro and Micronutrient**

**Assimilation: Unraveling the Link between Environmental Factors and Nutrient Uptake**

Abhishek Singh, Rakesh Singh Sengar, Vishnu D. Rajput, Uday Pratap Shahi, Abdul Latief Al-Ghzawi, Karen Ghazaryan, Tatiana Minkina, Abdel Rahman Mohammad Al Tawaha, Omar Mahmoud Al Zoubi,

Talaat Habeeb

Journal of Ecological Engineering 2024 1-9

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*Article*

**Chenopodium album L.: a promising NaCl accumulating and tolerant plant for mitigation of salinity stress**

Ghazaryan K.A., Margaryan G.H., Minkina T.M., Rajput V.D., Movsesyan H.S.

Revista Brasileira de Botanica 2024 1-20

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*Article*

**Advancing Agricultural Resilience in Ararat Plain, Armenia: Utilizing Biogenic Nanoparticles and Biochar under Saline Environments to Optimize Food Security and Foster European Trade**

Abhishek Singh, Gohar Margaryan, Anna Harutyunyan, Hasmik S. Movsesyan, Hrant Khachatryan,

Vishnu D. Rajput, Tatiana Minkina, Athanasios Alexiou, Dimitrios Petropoulos, Athanasios Kriemadis,

Hassan El-Ramady, Karen Ghazaryan

Egyptian Journal of Soil Science 2024 459-483

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*Article*

**Zinc Oxide Nanoparticles Influence on Plant Tolerance to Salinity Stress: Insights into Physiological, Biochemical, and Molecular Responses**

Abhishek Singh, Vishnu D. Rajput, Shivani Lalotra, Shreni Agrawal, Karen Ghazaryan, Jagpreet Singh,

Tatiana Minkina, Priyadarshani Rajput, Saglara Mandzhieva, Athanasios Alexiou

Environmental Geochemistry and Health 2024 148

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*Article*

**Effects of environmental metal and metalloids on plants and human health: exploring nano-remediation approach**

Priyadarshani Rajput, Abhishek Singh, Shreni Agrawal, Karen Ghazaryan, Vishnu D. Rajput,

Hasmik Movsesyan, Saglara Mandzhieva, Tatiana Minkina, Athanasios Alexiou

Stress Biology 2024 1-25

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*Article*

**Nanotechnology applications for enhanced crop growth and yield. Chapter 4**

Sapna Rawat, Abhishek Singh, Vishnu D. Rajput, Karen Ghazaryan, Tatiana M. Minkina,

Abdel Rahman Mohammad Al-Tawaha, Athanasios T. Alexiou, Priyadarshani Rajput

Sustainable Agriculture: Nanotechnology and Biotechnology for Crop Production and Protection 2024

53-68

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*Article*

**Nanobiotechnology combined approaches for sustainable agriculture. Chapter 1**

Vishnu D. Rajput, Abhishek Singh, Shivani Lalotra, Karen Ghazaryan, Hasmik S. Movsesyan,

Tatiana Minkina, Rahman Mohammad Al-Tawaha, Athanasios T. Alexiou, Priyadarshani Rajput

*Article*

**Impact of nano-enzyme and nanomics for sustainable agriculture: Current status and future prospective**

Shivangi Singh, Omkar Singh, Sakshi Singh, Abhishek Singh, Vishnu D. Rajput, Karen Ghazaryan, Vaishali Singh, Athanasios Alexiou, Abdel Rahman Mohammad Said Al-Tawaha, Aleksandr Yesayan, Armine David Chakhmakhchyan, Hassan El-Ramady

Harnessing NanoOmics and Nanozymes for Sustainable Agriculture 2024 1-18

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*Article*

**Nano-omics-based abiotic and biotic stresses management**

Priyanka Upadhyay, Sonia Navvuru, Praveen Kumar Yadav, Shivani Lalotra, Abhishek Singh, Vishnu D. Rajput, Tatiana Minkina, Karen Ghazaryan

Harnessing NanoOmics and Nanozymes for Sustainable Agriculture 2024 348-371

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*Article*

**Detoxification of Biomedical Waste**

Abhishek Singh, Neha Chakrawarti, Vishnu D. Rajput, Karen Ghazaryan, Tatiana Minkina, Abdel Rahman Mohammad Said Al-Tawaha, Abdel Razzaq Al-Tawaha, Marwa Adel Qotb, Arun Karnwal  
Microbial Applications for Environmental Sustainability 2024 137-149

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*Article*

**Microbial Enzymes for Eco-Friendly Recycling of Wastepaper by Deinking**

Sapna Rawat, Abhishek Singh, Vishnu D. Rajput, Karen Ghazaryan, Tatiana Minkina, Abdel Rahman Mohammad Said Al-Tawaha, Abdel Razzaq Al-Tawaha, Marwa Adel Qotb, Arun Karnwal  
Microbial Applications for Environmental Sustainability 2024 165-176

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*Article*

**Microbial Manganese Peroxidase: Ligninolytic Enzymes for Bioremediation**

Abhishek Singh, Ragini Sharma, Vishnu D. Rajput, Karen Ghazaryan, Tatiana Minkina, Abdel Rahman Mohammad Said Al-Tawaha, Shreni Agrawal, Ashi Varshney, Abdel Razzaq Al-Tawaha, Arun Karnwal

Microbial Applications for Environmental Sustainability 2024 189-199

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*Article*

**Nanoparticles in revolutionizing crop production and agriculture to address salinity stress challenges for a sustainable future**

Abhishek Singh, Shreni Agrawal, Vishnu D. Rajput, Karen Ghazaryan, Aleksandr Yesayan, Tatiana Minkina, Yufei Zhao, Dimitrios Petropoulos, Athanasios Kriemadis, Marios Papadakis,

Athanasios Alexiou

Discover Applied Sciences 2024 317

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*Article*

**Prominent Effects of Zinc Oxide Nanoparticles on Roots of Rice (*Oryza sativa* L.) Grown under Salinity Stress**

Abhishek Singh, Rakesh Singh Sengar, Uday Pratap Shahi, Vishnu D. Rajput, Tatiana Minkina,

*Article*

**Potential of Suaeda nudiflora and Suaeda fruticosa to adapt to high salinity conditions**  
Abhishek Joshi, Vishnu D. Rajput, Krishan K. Verma, Tatiana Minkina, Karen Ghazaryan, Jaya Arora  
Horticulturae MDPI 2023 1-18

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*Article*

**ԷԶՄԻԱՅԵՆԻ ՏԱՐԱԾԱՇՐՉԱՆԻ ԳՐՈՒՆՏԱՅԻՆ ԶՐԵՐԻ ՈՌՈԳԵԼԻ ՀԱՏԿՈՒԹՅՈՒՆՆԵՐԻ ԳՆԱՀԱՏՈՒՄԸ ԸՍՏ ՈՐՈՇ ՀԻԴՐՈՔԻՄԻԱԿԱՆ ՑՈՒՑԱՆԻՇՆԵՐԻ**  
Ա.Ս. Հարությունյան, Հ.Է. Խաչատրյան, Կ.Ա.Ղազարյան  
Հայաստանի կենսաբանական հանդես 2023 13-21

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*Article*

**Uncharted risk measures for the management of sustainable mining**  
Beatriz A. Watts, Valéria C. Palmeira Zago, Lakshmi Gopakumar, Karen Ghazaryan, Hasmik Movsesyan  
Integrated Environmental Assessment and Management 2023 949-960

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*Article*

**Salinity stress and nanoparticles: Insights into antioxidative enzymatic resistance, signaling, and defense mechanisms**  
Abhishek Singh, Vishnu D. Rajput, Ragini Sharma, Karen Ghazaryan, Tatiana Minkina  
Environmental Research 2023 116585

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*Article*

**Nano Zinc-enabled strategies in Crops for Combatting Zinc Malnutrition in Human Health**  
Abhishek Singh, Vishnu D. Rajput, Divya Pandey, Ragini Sharma, Karen Ghazaryan, Tatiana Minkina  
Frontiers in Bioscience-Landmark 2023 158

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*Article*

**A Review on Crop Responses to Nanofertilizers for Mitigation of Multiple Environmental Stresses**  
Abhishek Singh, Vishnu D. Rajput, Abdel Rahman Mohammad Al Tawaha, Omar Mahmoud Al Zoubi, Talaat Habeeb, Sapna Rawat, Karen Ghazaryan, Tatiana Minkina  
Ecological Engineering and Environmental Technology 2023 280-296

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*Article*

**Nanoparticle-Based Priming-Enhanced Agricultural Practices: Promoting Sustainable Plant Growth and Development**  
Abhishek Singh, Sapna Rawat, Vishnu D. Rajput, Karen Ghazaryan, Tatiana Minkina, Abdel Rahman Mohammad Al Tawaha, Athanasios T. Alexiou, Karansher Singh Sandhu  
Nanoprimer Approach to Sustainable Agriculture 2023 142-157

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*Article*

**Seed Nanoprimer: An Innovative Approach for Upregulating Seed Germination and Plant Growth Under Salinity Stress**  
Abhishek Singh, Shreni Agrawal, Vishnu D. Rajput, Karen Ghazaryan, Hasmik S. Movsesyan, Tatiana Minkina, Abdel Rahman Mohammad Al Tawaha, Athanasios Alexiou, Badal Singh,

*Article*

**Nano-Enabled Approaches for Biofortification Strategies to Enhance Crop Production with Micronutrient Enrichment**

Abhishek Singh, Vishnu D. Rajput, Neha Chakrawarti, Karen Ghazaryan, Tatiana Minkina, Sakshi Singh  
Nano-Biofortification for Human and Environmental Health 2023 1-14

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*Article*

**ZnO-NP-Based Biofortification to Enhance Crop Production with Micronutrient Enrichment to Combat Malnutrition**

Abhishek Singh, Vishnu D. Rajput, Neha Chakrawarti, Karen Ghazaryan, Tatiana Minkina, Sakshi Singh  
Nano-Biofortification for Human and Environmental Health 2023 99-108

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*Article*

**Impact of Zinc Oxide Nanoparticles on Seed Germination Characteristics in Rice (*Oryza Sativa* L.) Under Salinity Stress**

Abhishek Singh, Rakesh Singh Sengar, Vishnu D. Rajput, Shreni Agrawal, Karen Ghazaryan, Tatiana Minkina, Abdel Rahman Al Tawaha, Omar Mahmoud Al Zoubi, Talaat Habeeb  
Journal of Ecological Engineering 2023 142-156

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*Article*

**Insight into Methanobiology and Role of Emerging Technologies in Methane Management**

Abhishek Singh, Karen Ghazaryan, Hasmik S. Movsesyan, Athanasios T. Alexiou, Abdel Rahman Mohammad Al Tawaha, Neha Chakrawarti, Ragini Sharma, Shreni Agrawal, Omkar Singh, Uday Pratap Shahi  
Biogeosystem Technique 2023 12-31

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*Article*

**Study of tolerance and phytodesalination potential of wheat, oat, emmer, and barley for sustainable saline agriculture**

GHAZARYAN, K.A., HARUTYUNYAN, A.S., KHACHATRYAN, H.E., SINGH, A., MINKINA, T.M., RAJPUT, V.D., MOVSESYAN, H.S.  
Applied Ecology and Environmental Research 2023 4853-4882

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*Article*

**Small Tech, Big Impact: Agri-nanotechnology Journey to Optimize Crop Protection and Production for Sustainable Agriculture**

Արհիշեկ Սինխ, Vishnu D Rajput, Ashi Varshney, Կարեն Ղազարյան, Tatiana Minkina  
Plant Stress 2023 1-26

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*Article*

**Biogeochemical and microscopic studies of soil and *Phragmites australis* (Cav.) Trin. ex Steud. plants affected by coal mine dumps**

Karen Ghazaryan, Hasmik Movsesyan, Tatiana Minkina, Grigoriy Fedorenko, Dina Nevidomskaya, Aleksei Fedorenko, Svetlana Sushkova, Saglara Mandzhieva, Victor Chaplygin, Yuri Litvinov, Yuri Popov, Christopher Rensing, Vishnu D. Rajput, Ming H. Wong  
Environmental Science and Pollution Research 2023 406-421

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Article

**Green Nanofertilizers: the Need for Modern Agriculture, Intelligent, and Environmentally-Friendly Approaches**

Abdel Rahman Mohammad Al Tawaha, Abhishek Singh, Vishnu D. Rajput, Ashi Varshney, Shreni Agrawal, Karen Ghazaryan, Tatiana Minkina, Omar Mahmoud Al Zoubi, Talaat Habeeb, Lysenko Dionis, Hanan Aref Hasan, Samar Shawaqfeh

Ecological Engineering and Environmental Technology 2023 1-21

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Article

**ԷԶՄԻԱԾՆԻ ՏԱՐԱԾԱՇՐՉԱՆԻ ԳՅՈՒՂԱՏՆՏԵՍԱԿԱՆ ՆՇԱՆԱԿՈՒԹՅԱՆ ՀՈՂԱՏԱՐԱԾՔՆԵՐԻ ԱՂԱԿԱԼԿԱԾՈՒԹՅԱՆ ԱՍՏԻՃԱՆԻ ԳՆԱՀԱՏՈՒՄԸ**

Գ.Հ. Մարգարյան, Հ.Է. Խաչատրյան, Կ.Ա. Ղազարյան

Հայաստանի կենսաբանական հանդես 2023 32-43

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Article

**Phytoremediation of copper-contaminated soil by Artemisia absinthium: comparative effect of chelating agents**

Ghazaryan K.A., Movsesyan H.S., Minkina T.M., Nevidomskaya D.G., Rajput V.D.

Environmental Geochemistry and Health 2022 1203-1215

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Article

**Chapter 2. Updated analysis of the exposure of plants to the nanomaterials**

Arpna Kumari, Sneha Rajput, Vishnu D. Rajput, Dina Nevidomskaya, Saglara S. Mandzhieva, Svetlana Sushkova, Poonam Kumari, Karen Ghazaryan

Toxicity of Nanoparticles in Plants 2022 25-45

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Article

**Особенности распределения мощности эквивалентной дозы гамма-излучения и концентрации радионуклидов в почвах на территории г. Новочеркасска Ростовской области**

Бураева Е., Горбунов А., Дергачева А., Маломыжева Н., Невидомская Д., Минкина Т., Литвинов Ю.,

Казарян К.

ЭКОЛОГИЯ И ПРОМЫШЛЕННОСТЬ РОССИИ 2022 48-53

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Article

**Comparative Case Study of Atmospheric Parameters over India and China during Covid 19 Lockdown**

Abhishek Singh, Sapna Rawat, Anil Kumar Singh, Karen Ghazaryan, Omkar Singh, Ragini Sharma, Neha Chakrawarti, Sakshi Singh, Omkar Singh

Biogeosystem Technique 2022 77-88

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Article

**The identification of phytoextraction potential of Melilotus officinalis and Amaranthus retroflexus growing on copper- and molybdenum-polluted soils**

Karen A. Ghazaryan, Hasmik S. Movsesyan, Tatiana M. Minkina, Svetlana N. Sushkova, Vishnu D. Rajput

Environmental Geochemistry and Health 2021 1327-1335

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Article

**Adaptive potential of Typha laxmannii Lepech to a heavy metal contaminated site**



Tatiana M. Minkina, Grigoriy M. Fedorenko, Dina G. Nevidomskaya, Yuri A. Fedorov, Tatiana N. Pol'shina, Aleksei G. Fedorenko, Victor A. Chaplygin, Saglara S. Mandzhieva, Karen A. Ghazaryan, Hasmik S. Movsesyan, Tara M. Hassan  
Plant and Soil 2021 273-287

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*Article*

**Influence of soil pollution on the morphology of roots and leaves of *Verbascum thapsus* L**

Victor Chaplygin, Natalia Chernikova, Grigorii Fedorenko, Aleksei Fedorenko, Tatiana Minkina,

Dina Nevidomskaya, Saglara Mandzhieva, Karen Ghazaryan, Hasmik Movsesyan, Vladimir Beschetsnikov

Environmental Geochemistry and Health 2021 1-17

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*Article*

**ZnO and CuO nanoparticles: a threat to soil organisms, plants, and human health**

Vishnu Rajput, Tatiana Minkina, Svetlana Sushkova, Arvind Behal, Alexey Maksimov, Eliza Blicharska,

Karen Ghazaryan, Hasmik Movsesyan, Natalia Barsova

Environmental Geochemistry and Health 2020 147-158

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*Article*

**Suitability assessment of groundwater for irrigation purpose at high-risk sites of the Ararat plain**

Ghazaryan K.A.

Proceedings of the YSU B: Chemical and Biological Sciences 2020 75-82

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*Article*

**Comparative hydrochemical assessment of groundwater quality from different aquifers for irrigation purposes using IWQI: a case-study from Masis province in Armenia**

Karen Ghazaryan, Hasmik Movsesyan, Aram Gevorgyan, Tatiana Minkina, Svetlana Sushkova,

Vishnu Rajput, Saglara Mandzhieva

Groundwater for Sustainable Development 2020 1-21,100459

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*Article*

**Soil salinization in the agricultural areas of Armenian semi-arid regions: case study of Masis region**

Ghazaryan K.A., Gevorgyan G. A., Movsesyan H.S., Khachatryan H.E.

Proceedings of the YSU B: Chemical and Biological Sciences 2020 159-167

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*Article*

**Հողի ֆերմենտային ակտիվության ցուցանիշների կիրառական ասպեկտները**

Խաչատրյան Հ.Է., Ղազարյան Կ.Ա., Մովսեսյան Հ.Ս.

Հայաստանի կենսաբանական հանդես 2020 65-71

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*Article*

**SOIL MICROBIAL BIOMASS AND ENZYME ACTIVITIES RESPONSE TO COPPER AND MOLYBDENUM POLLUTION IN THE VICINITY OF ZANGEZUR COPPER AND MOLYBDENUM COMBINE, ARMENIA**

Ghazaryan K.A., Movsesyan H.S.

Proceedings of the YSU B: Chemical and Biological Sciences 2020 235-245

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*Article*

**Study of copper, lead, and zinc speciation in the Haplic Chernozem surrounding coal-fired power plant**

Marina Burachevskaya, Tatiana Minkina, Victor Chaplygin, Tatiana Bauer, Victor Chaplygin, Inna Zamulina, Svetlana Sushkova, Alexey Fedorenko, Karen Ghazaryan, Hasmik Movsesyan, Denis Makhinya  
Applied Geochemistry 2019 102-108

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*Article*

**Copper phytoremediation potential of wild plant species growing in the mine polluted areas of Armenia**

Ghazaryan Karen, Movsesyan Hasmik, Ghazaryan Naira, Watts Beatriz Amanda  
Environmental Pollution 2019 491-501

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*Article*

**Molecular characterization of Zn in Technosols using X-ray absorption spectroscopy**

Tatiana Minkina, Dina Nevidomskaya, Victoria Shuvaeva, Tatiana Bauer, Alexander Soldatov, Saglara Mandzhieva, Alexander Trigu, Yan Zubavichus, Karen Ghazaryan  
Applied Geochemistry 2019 168-175

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*Article*

**Copper phytoextraction and phytostabilization potential of wild plant species growing in the mine polluted areas of Armenia**

Karen A. Ghazaryan, Hasmik S. Movsesyan, Hrant E. Khachatryan, Naira P. Ghazaryan, Tatiana M. Minkina, Svetlana N. Sushkova, Saglara S. Mandzhieva, Vishnu D. Rajput  
Geochemistry: Exploration, Environment, Analysis 2019 155-163

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*Article*

**ՊՂԼՁՈՎ ԵՎ ՄՈՒԲԴԵՆՈՎ ԱՐՏՈՏՎԱԾ ՀՈՂԵՐՈՒՄ ԱՃՈՂ ARTEMISIA VULGARIS ԵՎ MEDICAGO COERULEA ԲՈՒՄԱՏԵՍԱԿՆԵՐԻ ՖԻՏՈՒՔՍՏՐԱԿՑԻԱՅԻ ՆԵՐՈՒԹԻ ԲԱՅԱՀԱՅՏՈՒՄԸ**

Ղազարյան Կ.Ա.  
Հայաստանի կենսաբանական հանդես 2019 26-32

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*Article*

**THE IMPACT OF ZANGEZUR COPPER AND MOLYBDENUM COMBINE ACTIVITIES ON THE POLLUTION OF AGRICULTURAL LANDS AND CROPS BY TOXIC ELEMENTS**

K.A. Ghazaryan, H.S. Movsesyan, H.E. Khachatryan, T.G. Leah, H.G. Zhamharyan  
Proceedings of the YSU B: Chemical and Biological Sciences 2019 119-125

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*Article*

**Ֆիտոռեմեդիացիան որպես ծանր մետաղներով հողերի աղտոտվածության նվազեցման կենսատեխնոլոգիա**

Խաչատրյան Հ.Է., Ղազարյան Կ.Ա., Մովսեսյան Հ.Ս.  
Հայաստանի կենսաբանական հանդես 2019 39-47

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*Article*

**Hydrochemical analysis and evaluation of groundwater quality for irrigation in Masis Region, Armenia**

Ghazaryan K.A., Movsesyan H.S., Khachatryan H.E., Yezekyan A.S.  
Proceedings of the YSU B: Chemical and Biological Sciences 2019 193-199

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*Article*

**Effects of zinc-oxide nanoparticles on soil, plants, animals and soil organisms: A review**

Ghazaryan K.A., Movsesyan H.S., Rajput V.D., Minkina T.M., Behal A., Sushkova S.N., Mandzhieva S., Singh R., Gorovtsov A., Tsitsuashvili V.S. , Purvis W.O.

Environmental Nanotechnology, Monitoring and Management 2018 76-84

<https://www.journals.elsevier.com/environmental-nanotechnology-monitoring-and-m...>

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*Article*

**Toxicity of copper oxide nanoparticles on spring barley (*Hordeum sativum distichum*)**

Vishnu Rajput, Tatiana Minkina, Alexey Fedorenko, Svetlana Sushkova, Saglara Mandzhieva,

Vladimir Lysenko, Nadezhda Duplii, Grigory Fedorenko, Konstantin Dvadnenko, Karen Ghazaryan

Science of the Total Environment 2018 1103-1113

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*Article*

**Geochemistry of Potentially Toxic Trace Elements in Soils of Mining Area: A Case Study from Zangezour Copper and Molybdenum Combine, Armenia**

Karen A. Ghazaryan, Hasmik S. Movsesyan, Hrant E. Khachatryan, Naira P. Ghazaryan

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**Environmental risk assessment of soil pollution by some trace elements around open mine and tailing dump of Akhtala Mining and Processing Enterprise**

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**POTENTIALLY TOXIC ELEMENTS CONTENT IN SOILS IN THE VICINITY OF SHAMLUGH COPPER MINING AREA (ARMENIA): ECOLOGICAL, AGRICULTURAL AND HEALTH RISK ASSESSMENT**

K. A. GHAZARYAN, H. S. MOVSESYAN, G. A. GEVORGYAN

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**Human health risk assessment of heavy metal pollution in soils around Kapan mining area, Armenia**

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**Copper absorption status of agricultural plant species and their phytoremediation potential**

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**Application of various methods for evaluation of heavy metal pollution in soils around Agarak copper-molybdenum mine complex, Armenia**

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**Ագարակի պղնձամոլիբդենային կոմբինատի շրջակա հողերի միկրոտարրերով աղտոտվածության հետ կապված Էկոլոգիական ռիսկերի գնահատումը**

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**Effect of Natural and Technogenic Factors on the Mobility and Transformation of Metal Compounds in Soil**

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**Rapid evaluation of heavy metals impact on biochemical activity and microbial size in soils around Zangezur Combine, Armenia**

Flavio Fornasier, Karen Ghazaryan, Hasmik Movsesyan, Naira Ghazaryan

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**Geochemistry of potentially toxic trace elements in soils of mining area: a case study from Zangezur Copper and Molybdenum Combine, Armenia**

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**Effect of PBO nanoparticle on plant growth**

Rajput V.D., Chaplugin V.A., Minkina T.M., Sushkova S.N., Mandzhieva S.S., Tsitsuashvili V.S.,

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**Copper bioaccumulation status and phytoremediation potential of some agricultural plant species growing in polluted agricultural lands of Armenia**

Ghazaryan Karen, Ruzan Avetisyan, Hrant Zhamharyan

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**Copper phytoremediation potential of native plant species growing in the mine polluted areas of south Armenia**

Ghazaryan K., Antonyan S., Movsesyan H.

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Conference

**Environmental risk assessment of soil contamination by trace elements around open mine**

**and tailing dump of the Akhtala Ore Processing Combine**

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**Copper phytoremediation potential of wild plant species growing in the mine polluted areas of Armenia**

Ghazaryan Karen, Movsesyan Hasmik, Khachatryan Hrant, Antonyan Susanna, Ruzan Avetisyan

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**Strength of zinc fixation in soils in the conditions of aerosol contamination**

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**The lead compounds in the soil in conditions of air pollution**

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**Фракционное распределение цинка в чернозёмах зоны аэротехногенного загрязнения**

Бурачевская М.В., Манджиева С.С., Минкина Т.М., Казарян К.А., Мовсесян А.С., Сушкова С.Н.

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**Mechanism of hyperaccumulation of heavy metals by of *Verbascum thapsus* from soil**

Chernikova Natalia, Chaplygin Victor, Nevidomskaya Dina, Ghazaryan Karen, Mandzhieva Saglara,

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**Study of soil salinization process in the semi-arid agricultural areas of Masis region, Armenia**

Ghazaryan Karen, Movsesyan Hasmik, Khachatryan Hrant

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