**Ô nhiễm đất: thực trạng đáng báo động**

(Cập nhật đến ngày 17/3/2023)

Đất là nguồn tài nguyên cự kỳ quan trọng đối với sự sống vạn vật trên giới. Ấy vậy mà tình trạng ô nhiễm nguồn tài nguyên quý giá này lại ngày càng nghiêm trọng. Vấn đề cấp thiết đặt ra cho toàn xã hội lúc này là tìm ra phương án tối ưu, thiết thực nhất để khắc phục tình trạng ô nhiễm môi trường đất ngày càng nguy hại này.

Để hiểu rõ hơn Cục Thông tin KH&CN quốc gia xin giới thiệu một số bài nghiên cứu đã được xuất bản chính thức và các bài viết được chấp nhận đăng trên những cơ sở dữ liệu học thuật chính thống.



1. **Sciencedirect**

1. Mapping soil arsenic pollution at a brownfield site using satellite hyperspectral imagery and machine learning  
Science of The Total Environment 11 October 2022 Volume 857, Part 2 (Cover date: 20 January 2023) Article 159387  
Xiyue Jia, Deyi Hou  
<https://www.sciencedirect.com/science/article/pii/S0048969722064865/pdfft?md5=17c27a76166af1d1ad9b2dec7f5b08a0&pid=1-s2.0-S0048969722064865-main.pdf>

2. Delineating and identifying risk zones of soil heavy metal pollution in an industrialized region using machine learning  
Environmental Pollution 22 December 2022 Volume 318 (Cover date: 1 February 2023) Article 120932  
Di ChenXiahui WangFei Liu  
<https://www.sciencedirect.com/science/article/pii/S0269749122021479/pdfft?md5=bda69a60eb60f95febc94294cf6b3c30&pid=1-s2.0-S0269749122021479-main.pdf>  
  
3. A review on control and abatement of soil pollution by heavy metals: Emphasis on artificial intelligence in recovery of contaminated soil  
Environmental Research 28 February 2023 Volume 225 (Cover date: 15 May 2023) Article 115592  
Krishna Gautam, Poonam Sharma, Huu Hao Ngo  
<https://www.sciencedirect.com/science/article/pii/S0013935123003845/pdfft?md5=63648776b0ef4c222713dc895723d6e1&pid=1-s2.0-S0013935123003845-main.pdf>

4. Scientometric study of treatment technologies of soil pollution: Present and future challenges  
Applied Soil Ecology 18 October 2022 Volume 182 (Cover date: February 2023) Article 104695  
Lorgio Gilberto Valdiviezo Gonzales, Carlos Alberto Castañeda-Olivera, Emigdio Antonio Alfaro Paredes  
<https://www.sciencedirect.com/science/article/pii/S0929139322003110/pdfft?md5=75cd6a8ad8a2752a0381d160ad67af6c&pid=1-s2.0-S0929139322003110-main.pdf>

5. Towards an integrated health risk assessment framework of soil heavy metals pollution: Theoretical basis, conceptual model, and perspectives  
Environmental Pollution 4 November 2022 Volume 316, Part 2 (Cover date: 1 January 2023) Article 120596  
Shiyan Yang, Lijuan Sun, Yong Xue  
<https://www.sciencedirect.com/science/article/pii/S0269749122018103/pdfft?md5=3479992cf75e4509dec71f9f70466320&pid=1-s2.0-S0269749122018103-main.pdf>  
  
6. A comprehensive framework for identifying contributing factors of soil trace metal pollution using Geodetector and spatial bivariate analysis  
Science of The Total Environment 22 October 2022 Volume 857, Part 3 (Cover date: 20 January 2023) Article 159636  
Hangyuan Shi, Peng Wang, Rongbo Xiao  
<https://www.sciencedirect.com/science/article/pii/S0048969722067365/pdfft?md5=c173925c6ab3df5fd672196abc55a6ec&pid=1-s2.0-S0048969722067365-main.pdf>

7. Soil pollution driven by duration of urbanisation and dwelling quality in urban areas: An example from Auckland, New Zealand  
Applied Geochemistry 24 November 2022 Volume 148 (Cover date: January 2023) Article 105518  
A. P. Martin, C. Lim, R. E. Turnbull  
<https://www.sciencedirect.com/science/article/pii/S0883292722003225/pdfft?md5=c78bb488057db2dcf2f211ebcb46b3e3&pid=1-s2.0-S0883292722003225-main.pdf>  
  
8. Spatio-temporal characteristics of soil Cd pollution and its influencing factors: A Geographically and temporally weighted regression (GTWR) method  
Journal of Hazardous Materials 16 December 2022 Volume 446 (Cover date: 15 March 2023) Article 130613  
Menglu Zhao, Huijuan Wang, Zhengqiu Fan  
<https://www.sciencedirect.com/science/article/pii/S0304389422024098/pdfft?md5=ba0f6f54d014599c7ba8f73a0d3ff3f1&pid=1-s2.0-S0304389422024098-main.pdf>

9. Low-cost materials to face soil and water pollution  
Current Opinion in Environmental Science & Health 3 February 2023 Volume 32 (Cover date: April 2023) Article 100453  
Avelino Núñez-Delgado, Esperanza Álvarez-Rodríguez, Manuel Sánchez-Polo  
<https://www.sciencedirect.com/science/article/pii/S2468584423000132/pdfft?md5=bbf16f7fd240cbab9a7140d7d998d51b&pid=1-s2.0-S2468584423000132-main.pdf>

10. Patent mining on soil pollution remediation technology from the perspective of technological trajectory  
Environmental Pollution 17 November 2022 Volume 316, Part 1 (Cover date: 1 January 2023) Article 120661  
Zefeng Qi, Yixin Han, Guozhu Mao  
<https://www.sciencedirect.com/science/article/pii/S0269749122018759/pdfft?md5=17fa3ebac999f456aa7121eb46d41bce&pid=1-s2.0-S0269749122018759-main.pdf>

11. Soil heavy metal pollution from Pb/Zn smelting regions in China and the remediation potential of biomineralization  
Journal of Environmental Sciences 25 January 2022 Volume 125 (Cover date: March 2023) Pages 662-677  
Xinghua Luo, Chuan Wu, Shengguo Xue  
<https://www.sciencedirect.com/science/article/pii/S1001074222000298/pdfft?md5=661662cdf5c101fc10db2767c92a0359&pid=1-s2.0-S1001074222000298-main.pdf>

12. Smallholder vegetable farming produces more soil microplastics pollution than large-scale farming  
Environmental Pollution 2 December 2022 Volume 317 (Cover date: 15 January 2023) Article 120805  
Yaqiong Hao, Haijun Sun, Weiming Shi  
<https://www.sciencedirect.com/science/article/pii/S0269749122020206/pdfft?md5=506d6eddf1efc092d756bbf5941da8e8&pid=1-s2.0-S0269749122020206-main.pdf>

13. The use of environmental magnetic properties, elemental analysis and geostatistical tools for soil pollution assessment, a lesson from Takum, Nigeria  
Physics and Chemistry of the Earth, Parts A/B/C 31 January 2023 Volume 130 (Cover date: June 2023) Article 103377  
M. O. Kanu, O. C. Meludu, Gabriel Joseph  
<https://www.sciencedirect.com/science/article/pii/S1474706523000219/pdfft?md5=aeea8cfc0ee74b6ff91c43383c4cee46&pid=1-s2.0-S1474706523000219-main.pdf>  
  
14. Soil potentially toxic element pollution at different urbanization intensities: Quantitative source apportionment and source-oriented health risk assessment  
Ecotoxicology and Environmental Safety 16 January 2023 Volume 251 (Cover date: February 2023) Article 114550  
Xinyun Li, Lulu Li, Yun Li  
<https://www.sciencedirect.com/science/article/pii/S0147651323000544/pdfft?md5=0aca30ace9b2652589bb881469198527&pid=1-s2.0-S0147651323000544-main.pdf>

15. Effect of tillage state of paddy soils with heavy metal pollution on the nosZ gene of N2O reductase  
Journal of Environmental Sciences Available online 23 February 2023 In press, uncorrected proof  
Liping Jiang, Shiguang Liu, Guibing Zhu  
<https://www.sciencedirect.com/science/article/pii/S1001074223000712/pdfft?md5=444e5a5aba781457a57d10129f6f1568&pid=1-s2.0-S1001074223000712-main.pdf>

16. A hybrid framework for delineating the migration route of soil heavy metal pollution by heavy metal similarity calculation and machine learning method  
Science of The Total Environment 8 November 2022 Volume 858, Part 3 (Cover date: 1 February 2023) Article 160065  
Feng Wang, Lili Huo, Yi An  
<https://www.sciencedirect.com/science/article/pii/S0048969722071650/pdfft?md5=416bd93162f50cb195b96cbff03ea158&pid=1-s2.0-S0048969722071650-main.pdf>

17. Chlorinated organic pollutants in global flooded soil and sediments: Pollution status and potential risk  
Environmental Pollution 11 February 2023 Volume 323 (Cover date: 15 April 2023) Article 121270  
Meng Liu, Jing Yuan, Yan He  
<https://www.sciencedirect.com/science/article/pii/S0269749123002725/pdfft?md5=82b38a13bbe1d662768dda6db362e9ef&pid=1-s2.0-S0269749123002725-main.pdf>

18. The collaborative monitored natural attenuation (CMNA) of soil and groundwater pollution in large petrochemical enterprises: A case study  
Environmental Research 15 November 2022 Volume 216, Part 4 (Cover date: 1 January 2023) Article 114816  
Quanwei Song, Zhenkun Xue, Rui Zuo  
<https://www.sciencedirect.com/science/article/pii/S0013935122021430/pdfft?md5=efce21440ee4b5e30a696862ecb6398a&pid=1-s2.0-S0013935122021430-main.pdf>

19. Incorporating field-based research into remote learning: An assessment of soil lead pollution in different land-use types in Los Angeles  
Environmental Research 4 October 2022 Volume 216, Part 1 (Cover date: 1 January 2023) Article 114480  
Wei-Cheng Hung, Naomi Adams, Jennifer A. Jay  
<https://www.sciencedirect.com/science/article/pii/S0013935122018072/pdfft?md5=180eed6f842a26c43439cf40cdae54a3&pid=1-s2.0-S0013935122018072-main.pdf>

20. Long-term application of organic compost is the primary contributor to microplastic pollution of soils in a wheat–maize rotation  
Science of The Total Environment 28 December 2022 Volume 866 (Cover date: 25 March 2023) Article 161123  
Jiajia Zhang, Zishuang Li, Yanhua Chen  
<https://www.sciencedirect.com/science/article/pii/S0048969722082262/pdfft?md5=66f454fc7b88091c62d92f00355892e5&pid=1-s2.0-S0048969722082262-main.pdf>

21. Multivariate studies and heavy metal pollution in soil from gold mining area  
Heliyon 6 January 2023 Volume 9, Issue 1 (Cover date: January 2023) Article e12661  
Osei Akoto, Salome Yakubu, Lyndon N. A. Sackey  
<https://www.sciencedirect.com/science/article/pii/S2405844022039494/pdfft?md5=09acfe5c3e4a8899d03c004d69c44b73&pid=1-s2.0-S2405844022039494-main.pdf>

22. Assessment of soil heavy metal pollution in provinces of China based on different soil types: From normalization to soil quality criteria and ecological risk assessment  
Journal of Hazardous Materials 1 September 2022 Volume 441 (Cover date: 5 January 2023) Article 129891  
Jiawen Zhang, Zhengtao Liu, Xiaonan Wang  
<https://www.sciencedirect.com/science/article/pii/S0304389422016843/pdfft?md5=fe43776d16b45bac10b27bba1f212a16&pid=1-s2.0-S0304389422016843-main.pdf>

23. Membrane lipid peroxidation in lichens determined by the TBARS assay as a suitable biomarker for the prediction of elevated level of potentially toxic trace elements in soil  
Ecological Indicators 17 January 2023 Volume 146 (Cover date: February 2023) Article 109910  
Piotr Osyczka, Karolina Chowaniec, Kaja Skubała  
<https://www.sciencedirect.com/science/article/pii/S1470160X23000523/pdfft?md5=1731a1d8fd66761210c4d4456e8f06e6&pid=1-s2.0-S1470160X23000523-main.pdf>

24. Influencing factors identification and the nested structure analysis of heavy metals in soils in entire city and surrounding the multiple pollution sources  
Journal of Hazardous Materials 8 February 2023 Volume 449 (Cover date: 5 May 2023) Article 130961  
Pengwei Qiao, Shuo Wang, Zhongguo Zhang  
<https://www.sciencedirect.com/science/article/pii/S0304389423002431/pdfft?md5=e15ae61a37c29f64a9220ced6e40ff05&pid=1-s2.0-S0304389423002431-main.pdf>

25. Application of metabolomic methods to evaluate the impact of pollutants on soil organisms: Recent progress and future perspectives  
Current Opinion in Environmental Science & Health 16 December 2022 Volume 31 (Cover date: February 2023) Article 100431  
Myrna J. Simpson  
<https://www.sciencedirect.com/science/article/pii/S2468584422001064/pdfft?md5=cccc3d9219397037b28cd5d2a2eb4eb0&pid=1-s2.0-S2468584422001064-main.pdf>

26. Soil contamination by waste transformer oil: A review  
Materials Today: Proceedings 6 September 2022 Volume 72, Part 1 (Cover date: 2023) Pages 306-310  
Richa Tiwari, Pratibha Agrawal, Amit J Agrawal  
<https://www.sciencedirect.com/science/article/pii/S2214785322050945/pdfft?md5=df8e4b8283d19f2e7eb080fa9d04faa5&pid=1-s2.0-S2214785322050945-main.pdf>

27. Variation in pollution status, sources, and risks of soil heavy metals in regions with different levels of urbanization  
Science of The Total Environment 4 January 2023 Volume 866 (Cover date: 25 March 2023) Article 161355  
Fei Zheng, Xin Guo, Bing Chen  
<https://www.sciencedirect.com/science/article/pii/S0048969722084595/pdfft?md5=0ed954d92167395ecf6d1e68aebd8322&pid=1-s2.0-S0048969722084595-main.pdf>

28. Spatiotemporal variation of soil heavy metals in China: The pollution status and risk assessment  
Science of The Total Environment 3 February 2023 Volume 871 (Cover date: 1 May 2023) Article 161768  
Jiangdan Shi, Di Zhao, Lei Huang  
<https://www.sciencedirect.com/science/article/pii/S0048969723003832/pdfft?md5=9e4bc653f2d8a92cef388b22e513176a&pid=1-s2.0-S0048969723003832-main.pdf>  
  
29. Effects of microplastics and cadmium on the soil-wheat system as single and combined contaminants  
Plant Physiology and Biochemistry 12 January 2023 Volume 196 (Cover date: March 2023) Pages 291-301  
Su Chen, Tianzhen Feng, Ying Liu  
<https://www.sciencedirect.com/science/article/pii/S098194282300027X/pdfft?md5=d83c91dcfa8145789ed39c039c9b8135&pid=1-s2.0-S098194282300027X-main.pdf>

30. Quantitative source apportionment and driver identification of soil heavy metals using advanced machine learning techniques  
Science of The Total Environment 23 February 2023 Volume 873 (Cover date: 15 May 2023) Article 162371  
Jiatong Zheng, Peng Wang, Rongbo Xiao  
<https://www.sciencedirect.com/science/article/pii/S0048969723009877/pdfft?md5=fad590c42fb13f70de4939a5aa09fa17&pid=1-s2.0-S0048969723009877-main.pdf>

31. Critical review on phytoremediation of polyfluoroalkyl substances from environmental matrices: Need for global concern  
Environmental Research 18 November 2022 Volume 217 (Cover date: 15 January 2023) Article 114844  
Elaheh Kavusi, Behnaz Shahi Khalaf Ansar, Tess Astatkie  
<https://www.sciencedirect.com/science/article/pii/S0013935122021715/pdfft?md5=5af94ad160d9cc31ceb23b927db191a5&pid=1-s2.0-S0013935122021715-main.pdf>

32. Impact of polyethylene microplastics and copper nanoparticles: Responses of soil microbiological properties and strawberry growth  
Applied Soil Ecology 22 December 2022 Volume 184 (Cover date: April 2023) Article 104773  
Andrés Pinto-Poblete, Jorge Retamal-Salgado, Mauricio Schoebitz  
<https://www.sciencedirect.com/science/article/pii/S0929139322003894/pdfft?md5=3ab095ec7916828b1c37353ee051a2fb&pid=1-s2.0-S0929139322003894-main.pdf>

33. Sustainable phytoextraction of metal-polluted agricultural land used for commercial photovoltaic power generation  
Journal of Cleaner Production 27 January 2023 Volume 391 (Cover date: 10 March 2023) Article 136093  
Zhu Li, Xi Sun, Peter Christie  
<https://www.sciencedirect.com/science/article/pii/S0959652623002512/pdfft?md5=c8e9ceb342865329514aa8fafb2ffdb3&pid=1-s2.0-S0959652623002512-main.pdf>  
  
34. Effect of salinity on the potential cadmium phytoremediation from the polluted soil by carpobrotus rossii  
Heliyon 20 February 2023 Volume 9, Issue 3 (Cover date: March 2023) Article e13858  
Mohammad Bagher Miranzadeh, Parnia Bashardoust, Faezeh Ghadami  
<https://www.sciencedirect.com/science/article/pii/S2405844023010654/pdfft?md5=ea8290b917d04c7264761a11b6e1ab40&pid=1-s2.0-S2405844023010654-main.pdf>

35. Microplastics and mesoplastics as emerging contaminants in Tehran landfill soils: The distribution and induced-ecological risk  
Environmental Pollution 27 February 2023 Volume 324 (Cover date: 1 May 2023) Article 121368  
Mohammad Mehdi Ghorbaninejad Fard Shirazi , Sakine Shekoohiyan, Mohsen Heidari  
<https://www.sciencedirect.com/science/article/pii/S0269749123003706/pdfft?md5=f06309db4183e917409a98e15bfae119&pid=1-s2.0-S0269749123003706-main.pdf>

36. Zinc speciation and desorption kinetics in a mining waste impacted tropical soil amended with phosphate  
Science of The Total Environment 19 December 2022 Volume 864 (Cover date: 15 March 2023) Article 161009  
Frederico Prestes Gomes, Matheus Bortolanza Soares, Luís Reynaldo Ferracciú Alleoni  
<https://www.sciencedirect.com/science/article/pii/S0048969722081128/pdfft?md5=0e6edb927e3f8cdcbe4dd2e1eeeac08c&pid=1-s2.0-S0048969722081128-main.pdf>

37. Effect of parent material and atmospheric deposition on the potential pollution of urban soils close to mining areas  
Journal of Geochemical Exploration 25 November 2022 Volume 244 (Cover date: January 2023) Article 107131  
Antón Vázquez-Arias, Francisco José Martín-Peinado, Annika Parviainen  
<https://www.sciencedirect.com/science/article/pii/S0375674222001893/pdfft?md5=da26a6a4e34223f2aa29389ae6a2af7b&pid=1-s2.0-S0375674222001893-main.pdf>

38. Enhanced silicate remediation in cadmium-contaminated alkaline soil: Amorphous structure improves adsorption performance  
Journal of Environmental Management 22 November 2022 Volume 326, Part B (Cover date: 15 January 2023) Article 116760  
Lulu Long, Na Huang, Gang Yang  
<https://www.sciencedirect.com/science/article/pii/S0301479722023337/pdfft?md5=b53949fb7b7f8816fe55fd6ceef756ae&pid=1-s2.0-S0301479722023337-main.pdf>

39. Spatial distribution, source identification, and human health risk assessment of PAHs and their derivatives in soils nearby the coke plants  
Science of The Total Environment 5 December 2022 Volume 861 (Cover date: 25 February 2023) Article 160588  
Shu Zhang, Hailing Li, Taicheng An  
<https://www.sciencedirect.com/science/article/pii/S0048969722076914/pdfft?md5=26879442d08a78a92cef74984a071170&pid=1-s2.0-S0048969722076914-main.pdf>

40. Distribution characteristics of microplastics in soil of Loess Plateau in northwest China and their relationship with land use type  
Science of The Total Environment 15 January 2023 Volume 868 (Cover date: 10 April 2023) Article 161674  
Mengwei Zhang, Yu Zheng, Xuetao Guo  
<https://www.sciencedirect.com/science/article/pii/S0048969723002899/pdfft?md5=67b5653361e6ebff9443601716cea2ac&pid=1-s2.0-S0048969723002899-main.pdf>

41. A novel dehydrocoenzyme activator combined with a composite microbial agent TY for enhanced bioremediation of crude oil-contaminated soil  
Journal of Environmental Management 13 January 2023 Volume 331 (Cover date: 1 April 2023) Article 117246  
Qiyou Liu, Shuo Sun, Lin Li  
<https://www.sciencedirect.com/science/article/pii/S0301479723000348/pdfft?md5=b45c5fd6b5354c05e11790327601ca1c&pid=1-s2.0-S0301479723000348-main.pdf>

42. Environmental impact of metal halide perovskite solar cells and potential mitigation strategies: A critical review  
Environmental Research 14 December 2022 Volume 219 (Cover date: 15 February 2023) Article 115066  
Pavani Dulanja Dissanayake, Kyung Mun Yeom, Yong Sik Ok  
<https://www.sciencedirect.com/science/article/pii/S0013935122023933/pdfft?md5=064d2cb8e299c64fa4ac14e9d679de3d&pid=1-s2.0-S0013935122023933-main.pdf>

43. nZVI-induced iron poisoning aggravated the toxicity of TCEP to earthworm in soil  
Environmental Pollution 29 November 2022 Volume 317 (Cover date: 15 January 2023) Article 120785  
Meirui Yang, Xinyue Wu, Daohui Lin  
<https://www.sciencedirect.com/science/article/pii/S0269749122019996/pdfft?md5=ce761fd7cd5cd5202ae13f4e4009f43d&pid=1-s2.0-S0269749122019996-main.pdf>

44. Vanadium-resistant endophytes modulate multiple strategies to facilitate vanadium detoxification and phytoremediation in Pteris vittata  
Journal of Hazardous Materials 11 November 2022 Volume 443, Part B (Cover date: 5 February 2023) Article 130388  
Liang Wang, Xiaoyong Liao, Hai Lin  
<https://www.sciencedirect.com/science/article/pii/S0304389422021823/pdfft?md5=20a5492d44c85329cd7b2fa3565cce0a&pid=1-s2.0-S0304389422021823-main.pdf>

45. Nutritional additives dominance in driving the bacterial communities succession and bioremediation of hydrocarbon and heavy metal contaminated soil microcosms  
Microbiological Research 22 February 2023 Volume 270 (Cover date: May 2023) Article 127343  
Simone Cavazzoli, Andrea Squartini, Marja I. Roslund  
<https://www.sciencedirect.com/science/article/pii/S0944501323000459/pdfft?md5=ef5ac511b6eacda6b795ff3f605ea232&pid=1-s2.0-S0944501323000459-main.pdf>

46. Lactic acid bacteria promoted soil quality and enhanced phytoextraction of Cd and Zn by mustard: A trial for bioengineering of toxic metal contaminated mining soils  
Environmental Research 2 November 2022 Volume 216, Part 4 (Cover date: 1 January 2023) Article 114646  
Shuqiang Zhang, Yiman Li, Zengqiang Zhang  
<https://www.sciencedirect.com/science/article/pii/S0013935122019739/pdfft?md5=a71eeb48d6572ba751f83a7d6db2d489&pid=1-s2.0-S0013935122019739-main.pdf>

  **2. Springer**

1. The impacts of mining on soil pollution with metal(loid)s in resource-rich Mongolia  
Václav Pecina, David Juřička, Josef Hedbávný, Martin Klimánek… in Scientific Reports (2023)  
[https://link.springer.com/content/pdf/10.1038%2Fs41598-023-29370-w.pdf?pdf=core](https://link.springer.com/content/pdf/10.1038/s41598-023-29370-w.pdf?pdf=core)

2. Pollution and probabilistic human health risk assessment of potentially toxic elements in the soil-water-plant system in the Bolkar mining district, Niğde, south-central Turkey  
Abdurrahman Lermi, Emmanuel Daanoba Sunkari in Environmental Science and Pollution Research (2023)  
[https://link.springer.com/content/pdf/10.1007%2Fs11356-021-15398-w.pdf?pdf=core](https://link.springer.com/content/pdf/10.1007/s11356-021-15398-w.pdf?pdf=core)

3. Exploring geochemical distribution of potentially toxic elements (PTEs) in wetland and agricultural soils and associated health risks  
Imran Khan, Bharat C. Choudhary, Saifi Izhar… in Environmental Science and Pollution Research (2023)  
[https://link.springer.com/content/pdf/10.1007%2Fs11356-023-25141-2.pdf?pdf=core](https://link.springer.com/content/pdf/10.1007/s11356-023-25141-2.pdf?pdf=core)  
  
4. Fractionation and risk assessment of potentially toxic elements in surface soil from northeast China mountains  
Kunshan Bao, Kewei Zhao, Rongqin Liu, Wei Xing, Ying Yan… in Journal of Soils and Sediments (2023)  
[https://link.springer.com/content/pdf/10.1007%2Fs11368-022-03360-3.pdf?pdf=core](https://link.springer.com/content/pdf/10.1007/s11368-022-03360-3.pdf?pdf=core)  
  
5. Evaluating heavy metal pollution risks and enzyme activity in soils with intensive hazelnut cultivation under humid ecological conditions  
Betül Bayrakli in Environmental Monitoring and Assessment (2023)  
[https://link.springer.com/content/pdf/10.1007%2Fs10661-023-10934-2.pdf?pdf=core](https://link.springer.com/content/pdf/10.1007/s10661-023-10934-2.pdf?pdf=core)  
  
6. Effects of different heavy metal pollution levels on microbial community structure and risk assessment in Zn-Pb mining soils  
Ruiqi Yang, Gaogao Ma, Chenglong Liu… in Environmental Science and Pollution Research (2023)  
[https://link.springer.com/content/pdf/10.1007%2Fs11356-023-26074-6.pdf?pdf=core](https://link.springer.com/content/pdf/10.1007/s11356-023-26074-6.pdf?pdf=core)  
  
7. Investigation of the best possible methods for wind turbine blade waste management by using GIS and FAHP: Turkey case  
Samet Ozturk, Fatih Karipoglu in Environmental Science and Pollution Research (2023)  
[https://link.springer.com/content/pdf/10.1007%2Fs11356-022-23256-6.pdf?pdf=core](https://link.springer.com/content/pdf/10.1007/s11356-022-23256-6.pdf?pdf=core)  
  
8. Effects of lead pollution on soil microbial community diversity and biomass and on invertase activity  
Xin Sun, Mingjie Sun, Ying Chao, Xiaoyang Shang, Hui Wang, Hong Pan… in Soil Ecology Letters (2023)  
[https://link.springer.com/content/pdf/10.1007%2Fs42832-022-0134-6.pdf?pdf=core](https://link.springer.com/content/pdf/10.1007/s42832-022-0134-6.pdf?pdf=core)  
  
9. Compositional mapping, uncertainty assessment, and source apportionment via pollution assessment-based receptor models in urban and peri-urban agricultural soils  
Prince Chapman Agyeman, Ndiye Michael Kebonye… in Journal of Soils and Sediments (2023)  
[https://link.springer.com/content/pdf/10.1007%2Fs11368-022-03417-3.pdf?pdf=core](https://link.springer.com/content/pdf/10.1007/s11368-022-03417-3.pdf?pdf=core)  
  
10. Copper metal elimination from polluted soil by electro-kinetic technique  
Laith Hamdan Hawal, Khitam abdulhussein saeed… in Environmental Monitoring and Assessment (2023)  
[https://link.springer.com/content/pdf/10.1007%2Fs10661-023-11057-4.pdf?pdf=core](https://link.springer.com/content/pdf/10.1007/s10661-023-11057-4.pdf?pdf=core)  
  
11. Study on the Remediation of Cadmium/Mercury Contaminated Soil by Leaching: Effectiveness, Conditions, and Ecological Risks  
Yinghua Li, Jiaru Sun, Jie Qian, Tianci Huang, Fei Su in Water, Air, & Soil Pollution (2023)  
[https://link.springer.com/content/pdf/10.1007%2Fs11270-023-06060-x.pdf?pdf=core](https://link.springer.com/content/pdf/10.1007/s11270-023-06060-x.pdf?pdf=core)  
  
12. Spatial distribution, sources, and risks of heavy metals in soil from industrial areas of Hangzhou, eastern China  
Yiyi Wang, Haixia Yu, Mengyuan Yi, Rongbing Zhou… in Environmental Earth Sciences (2023)  
[https://link.springer.com/content/pdf/10.1007%2Fs12665-023-10774-w.pdf?pdf=core](https://link.springer.com/content/pdf/10.1007/s12665-023-10774-w.pdf?pdf=core)

     Nguồn: Cục Thông tin khoa học và công nghệ quốc gia