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| Title | Risk assessment of lead distribution in soils, rice (Oryza saliva L.) and wheat (Triticum aestivum L.) in Damietta governorate, Egypt. | | |
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| Abstract |  |
| Grains of rice and wheat are important food as a cereal crop in Egypt as in the world. Recently, the lead (Pb) content of soils and plants increased as a result of different pollutant sources causing negative environmental impacts. Therefore, this study aimed to estimate the level of Pb in the soils, rice and wheat plants of Damietta governorate cultivated area and evaluate its impact on human health. Results shows that soil total Pb in the surface layer (26.7 ± 11.1 mg kg-1) are higher than the subsurface layers (1.27 ± 0.13-fold) due to its low mobility with soil depth. The DTPA extractable Pb in the surface layers (0.69 ± 0.50 mg kg-1) are also higher than subsurface (1.35 ± 0.42-fold) and represents a small fraction from total (2.39 ± 1.1%). Moreover, DTPA extractable Pb shows a significant positive correlation with total soils Pb (r2 = 0.73) and organic matter content (r2 = 0.82), on the other hand, a negative correlation with the soil pH (r2 = - 0.76). Rice grain Pb concentrations (0.09 ± 0.02 mg kg-1) is lower than straw (0.72 ± 0.12 mg kg-1), which represents 12.6% ± 1.70-fold. A significant correlation is found between rice grains and straw Pb content (r2 = 0.95) that also increasing soil DTPA extractable Pb rice straw (r2 = 0.91) and grains (r2 = 0.93). On the other hand, wheat grain Pb concentrations (0.08 ± 0.024 mg kg-1) is lower than straw (0.63 ± 0.19 mg kg-1), which represents 11.9% ± 1.74-fold. However, a significant correlation is found between wheat grain and straw Pb concentrations (r2 = 0.92) that also by increasing soil DTPA extractable Pb wheat straw (r2 = 0.82) and grains (r2 = 0.75). Rice and wheat grains Pb concentrations are lower than the permissible limits according to WHO/FAO and EU (0.20 mg kg-1) and no potential human health risk is concluded yet. Key words: Lead; rice (Oryza sativa L.); wheat (Triticum aestivum L.); grains; Egypt | |

**Please specify which Sustainable Development Goal (SDG) (s) falls under your research:**

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| Goal 1 | No Poverty | Goal 2 | Zero Hunger |
| **Goal 3** | **Good Health and Well-Being** | Goal 4 | Quality Education |
| Goal 5 | Gender Equality | Goal 6 | Clean Water and Sanitation |
| Goal 7 | Affordable and Clean Energy | Goal 8 | Decent Work and Economic Growth |
| Goal 9 | Industry, Innovation and Infrastructure | Goal 10 | Reduced Inequalities |
| Goal 11 | Sustainable Cities and Communities | Goal 12 | Responsible Consumption and Production |
| Goal 13 | Climate Action | Goal 14 | Life below Water |
| Goal 15 | Life on Land | Goal 16 | Peace, Justice and Strong Institutions |
| Goal 17 | Partnerships for the Goals |  |  |