**Varietal differences influence arsenic and lead contamination of rice grown in mining impacted agricultural fields of Zamfara State, Nigeria**

Jajati Mandala\*, Waheed Ariyo Bakarea,b, Mohammad Mahmudur Rahmanc, Md. Aminur Rahmanc, Abu Bakkar Siddiquec, Effiom Okud Michael D. Wooda, Simon M. Hutchinsona and Debapriya Mondale\*

a *School of Science, Engineering and Environment, University of Salford, Manchester, M5 4WT, United Kingdom.*

*bDepartment of Disease Control and Prevent, Africa Centre for Disease Control and Prevention (Africa CDC), Addis Ababa, Ethiopia.*

c*Global Centre for Environmental Remediation (GCER), College of Engineering, Science and Environment, The University of Newcastle, Callaghan, NSW 2308, Australia.*

*dDepartment of Soil Science, University of Abuja, Nigeria*

e *Institute of Medical and Biomedical Education, St. George’s University of London, SW17 0RE, United Kingdom*

\* ***Corresponding author***: [J.Mandal1@edu.salford.ac.uk](mailto:J.Mandal1@edu.salford.ac.uk) , [dmondal@sgul.ac.uk](mailto:dmondal@sgul.ac.uk)

Table S1. Comparison between the varieties in terms of nutrient content in soil

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Variety** | **K**  **(mg Kg-1)** | **Ca**  **(mg Kg-1)** | **Mg**  **(mg Kg-1)** | **Fe**  **(mg Kg-1)** | **Mn**  **(mg Kg-1)** | **Zn**  **(mg Kg-1)** | **Cu**  **(mg Kg-1)** | **Se**  **(mg Kg-1)** |
| IRAT\_170 (V1) | 1470.76a | 1487.11a | 1819.36a | 16599.38a | 179.77a | 11.03a | 10.48a | 0.23a |
| SIPI\_692033 (V2) | 1549.30a | 1490.80a | 1709.05a | 16268.77a | 244.67a | 11.86a | 12.00a | 0.24a |
| ITA\_315 (V3) | 1337.57a | 1474.10a | 1707.58a | 17093.06a | 196.59a | 10.87a | 9.62a | 0.20a |
| WITA\_4 (V4) | 1428.92a | 1487.87a | 1788.61a | 16989.50a | 177.04a | 10.89a | 10.04a | 0.22a |
| NERICA\_L19 (V5) | 1488.45a | 1457.65a | 1833.61a | 16483.37a | 181.35a | 11.92a | 12.11a | 0.22a |
| NERICA\_L34 (V6) | 1469.25a | 1431.66a | 1734.93a | 16489.59a | 181.12a | 10.64a | 10.05a | 0.20a |
| NCRO\_49 (V7) | 1456.42a | 1455.25a | 1723.24a | 16878.83a | 180.18a | 11.22a | 11.22a | 0.21a |
| ART3\_7L (V8) | 1453.22a | 1411.86a | 1777.81a | 16868.63a | 177.04a | 11.22a | 10.95a | 0.22a |
| ART\_15 (V9) | 1438.67a | 1431.15a | 1704.19a | 16815.67a | 166.64a | 11.88a | 10.54a | 0.20a |
| Bisalayi (V10) | 1376.61a | 1473.46a | 1749.12a | 17083.12a | 175.02a | 11.39a | 11.79a | 0.22a |

Means with same letter are not significantly different (p < 0.01)



Figure S1.Scree Plot representing the percentage of explained variances of the different principal components of soil elemental contents.



Figure S2.Scree Plot representing the percentage of explained variances of the different principal components of rice grain elemental contents.

Figure S3. Correlation between As and Pb in rice grain and the essential elements (n=300)

\* (p < 0.05), \*\* ( p < 0.01) and \*\*\*(p < 0.001)