**Table S5. Total Hg concentration and speciation in paddy soil samples**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Location** | **Sample name** | **THg** | **iHg** | **MeHg** | **%MeHg** | **% (THg AEF/THgT)** | **% (THg WSF/THgT)** |
| **THgT**  | **THgWSF** | **iHgAEF** | **iHgWSF** | **MeHgT**  | **MeHgWSF** | **%MeHgT**  | **%MeHgAEF** | **%MeHgWSF** |
| μg g-1 | ng g-1 | μg g-1 | ng g-1 | ng g-1 | pg g-1 | % | % | % | % | % |
| Dashuixi | DSX1-PS | 157.4 | ± | 26.8 | 0.61  | ± | 0.05  | 50.7 | ± | 3.2 | 0.60 | ± | 0.05 | 150 | ± | 34 | 6 | ± | 4 | 0.1  | 0.3  | 1.0  | 32  | 0.000  |
| DSX2-PS | 25.0 | ± | 2.6 | 0.19  | ± | 0.01  | 9.2 | ± | 2.0 | 0.18 | ± | 0.01 | 32 | ± | 7 | 8 | ± | 1 | 0.1  | 0.3  | 4.3  | 37  | 0.001  |
| DSX3-PS | 155.6 | ± | 53.6 | 1.00  | ± | 0.07  | 37.9 | ± | 0.6 | 0.99 | ± | 0.07 | 147 | ± | 16 | 6 | ± | 1 | 0.1  | 0.4  | 0.6  | 24  | 0.001  |
| DSX4-PS | 92.2 | ± | 4.9 | 1.38  | ± | 0.05  | 39.2 | ± | 0.8 | 1.36 | ± | 0.05 | 41 | ± | 11 | 14 | ± | 1 | 0.0  | 0.1  | 1.0  | 43  | 0.001  |
| Meizixi | MZX1-PS | 15.6 | ± | 0.4 | 0.42  | ± | 0.02  | 9.3 | ± | 0.2 | 0.41 | ± | 0.02 | 50 | ± | 12 | 9 | ± | 3 | 0.3  | 0.5  | 2.2  | 60  | 0.003  |
| MZX2-PS | 31.6 | ± | 15.3 | 0.48  | ± | 0.03  | 16.6 | ± | 0.7 | 0.47 | ± | 0.03 | 58 | ± | 14 | 15 | ± | 2 | 0.2  | 0.3  | 3.1  | 53  | 0.002  |
| MZX3-PS | 48.0 | ± | 0.5 | 1.06  | ± | 0.08  | 25.0 | ± | 0.5 | 1.04 | ± | 0.08 | 93 | ± | 14 | 20 | ± | 4 | 0.2  | 0.4  | 1.9  | 52  | 0.002  |
| Baigoushu | BGS1-PS | 1.8 | ± | 0.1 | 0.03  | ± | 0.00  | 1.9 | ± | 0.1 | 0.03 | ± | 0.00 | 6 | ± | 2 | 8 | ± | 1 | 0.3  | 0.3  | 24  | 100  | 0.002  |
| BGS2-PS | 1.1 | ± | 0.0 | 1.04  | ± | 0.04  | 1.5 | ± | 0.1 | 1.00 | ± | 0.04 | 6 | ± | 1 | 44 | ± | 4 | 0.6  | 0.4  | 4.2  | 100  | 0.091  |
| Gouxi | GX3-PS1 | 55.1 | ± | 1.4 | 　 | ND　 | 　 | 33.4 | ± | 2.7 | 　 | ND　 | 　 | 72 | ± | 13 | 　 | ND　 | 　 | 0.1  | 0.2  | ND　 | 61  | ND　 |
| GX3-PS2 | 1.9 | ± | 0.1 |  | ND | 　 | 2.3 | ± | 0.1 |  | ND | 　 | 9 | ± | 2 |  | ND | 　 | 0.5  | 0.4  | ND　 | 100  | ND |
| GX3-PS3 | 19.8 | ± | 2.1 |  | ND | 　 | 14.2 | ± | 0.4 |  | ND | 　 | 52 | ± | 8 |  | ND | 　 | 0.3  | 0.4  | ND　 | 72  | ND |
| GX4-PS1 | 5.5 | ± | 0.1 |  | ND | 　 | 2.2 | ± | 0.0 |  | ND | 　 | 14 | ± | 2 |  | ND | 　 | 0.3  | 0.7  | ND　 | 39  | ND |
| GX4-PS2 | 1.4 | ± | 0.1 | 　 | ND　 | 　 | 2.0 | ± | 0.4 | 　 | ND　 | 　 | 6 | ± | 1 | 　 | ND　 | 　 | 0.5  | 0.3  | ND　 | 100  | ND　 |

Results are expressed as mean value ± SD of triplicate sample analysis (n=3). SD means standard deviation. ND: not determined. PS: paddy soil. THg concentration (THgT) in paddy soil was determined by using an advance mercury analyzer (AMA). Meanwhile paddy soil samples were digested using acid (6 mol L-1 HNO3) for quantification of MeHg in soil (MeHgT), as well as the acid extractable fraction (AEF) of iHg in the bulk soil (iHgAEF). THg concentration in water soluble fraction (THgWSF) (extracted by pure Mill-Q water) is the sum of MeHg (MeHgWSF) and iHg concentration in water soluble fraction (iHgWSF). All the speciation analysis was performed by GC-ICP-MS. %MeHgT, %MeHgAEF, %MeHgWSF, are the fractions of MeHgT in the THgT, MeHgT in the THgAEF , MeHgWSF in the THgWSF, respectively.