NUMERICAL DATA

List and analytical results of CRMs used in this study (2018)

Producer	CRM	Matrix	n	Element (ng/g)	Obtained value	Certified value	Recovery (%)
IGGE IRMA	GBW07403(GSS-3)	Yellow-brow soil	12	THg	598 ± 79	590 ± 80	101 ± 13
IGGE, CAGS	GBW10020	Citrus Leaves	15	THg	145 ± 11	150 ± 20	97 ± 8
NRCC	TORT-2	Lobster	8	MeHg	145 ± 8	152 ± 13	96 ± 17
IAEA	IAEA-405	Sediment	5	MeHg	5.20 ± 0.31	5.49 ± 0.53	95 ± 6

The linear correlation coefficients (r) between different tissues of rice plants for their Hg concentrations by using Pearson's correlation matrix. (2018)

Item	IHg				MeHg			
	Soil	Root	Stem	Leaf	Soil	Root	Stem	Leaf
Root	0.91				0.98			
Stem	0.91	0.93			0.96	0.93		
Leaf	0.85	0.89	0.95		0.93	0.93	0.92	
Grain	0.58	0.61	0.69	0.64	0.93	0.91	0.92	0.90

Source: https://www.sciencedirect.com/science/article/pii/S0883292717303736#!

Types of heavy metals, permissible level, health hazards and sources (2017)

Metal contaminant	Permissible level (ppm)	Health hazards	Major sources
Lead, Pb	0.1	Mental retardation in children, Liver, Kidney, gastrointestinal damage(GIT), causes sterility, anemia, muscle and joint pains, Hypertension	Paint, pesticides, smoking, batteries, water pipes, automobile emission, mining, burning of coal, lamps
Mercury, Hg	0.01	Corrosive to skin, eyes and muscle membrane. Dermatitis, nervous and kidney damage, anorexia, protoplasm poisoning, severe muscle pain	Pesticides, batteries, paper and leather industry, thermometers, electronics, amalgam in dentistry, pharmaceuticals
Arsenic, As	0.02	Bronchitis, carcinogenic dermatitis, liver tumors, gastrointestinal damage (GIT)	Pesticides, fungicides, metal smelters, Coal fumes, Wood Preservatives
Zinc, Zn	5.0	Nervous membrane and skin damage, Causing short term illness called metal fume fever and restlessness	Refineries, brass manufacture, metal plating, plumbing
Cadmium, Cd	0.06	Kidney damage, bronchitis, carcinogenic, gastrointestinal disorder, bone marrow, cancer, weight loss	Welding, electroplating, pesticides, fertilizers, CdNi batteries, nuclear fission plant
Chromium, Cr	0.01	Allergic dermatitis, producing lung tumors, human carcinogens	Steel industry, mining, cement, paper, rubber, metal alloy paints
Copper, Cu	3.0	Long term exposure causes irritation of nose, mouth, eyes, headache, stomachache, dizziness, diarrhea	Brass manufacture, electronics, electrical pipes, additive for antifungal
Nickel, Ni	3.0	Causes chronic bronchitis, reduced lung function, nasal sinus, cancer of lungs	Steel industry, mining, magnetic industry

Source: https://www.sciencedirect.com/science/article/pii/S1878535213002712

Some examples of selective detoxification of mercury and lead by biosorbents as plant material. (2017)

Plant material	Metal ion	Result	Reference
Carica papaya wood	Hg (II)	96%	Basha et al. (2009)
Ricinus communis L. (Castor) leaves	Hg (II)	80%	Rmalli et al. (2008)
Sawdust (*Acacia arabica*)	Pb(II), Hg (II), Cr (VI), Cu(II)	Pb > Cr > Cu and Hg	Meena et al. (2008)
Oriza sativa husk	Pb(II)	98%	Zulkali et al.(2006)
Agricultural by product *Humulus lupulus*	Pb(II)	75%	Gardea-Torresdey et al. (1998)
Agro waste of black gram husk	Pb(II)	Up to 93%	Saeed et al. (2005)
Febrifuga bark	Pb(II)	100%	Bankar and Dara (1985)
Waste tea leaves	Pb (II)	92%	Ahluwalia and Goyal (2005)
Rice bran	Pb (II), Cd (II), Cu (II), Zn (II)	>80.0%	Montanher et al. (2005)
Saw dust of Pinus sylvestris	Pb (II), Cd (II)	96%, 98%	Taty-Costodes et al. (2003)
Maple saw dust	Pb (II), Cu (II)	80–90%	Yu et al. (2001)
Water hyacinth	Pb (II), Cu (II), Co (II), Zn (II)	70–80%	Kamble and Patil (2001)
Low cost sorbents (bark, dead biomass, chitin, sea weed, algae, peat moss, leaf mold, moss	Pb (II), Hg (II), Cd (II), Cr (VI),	Good results	Bailey et al. (1999)
Rice straw, soybean hulls, sugarcane bagasse, peanut and walnut shells	Pb (II), Cu (II), Cd (II), Zn (II),Ni (II)	Pb > Cu > Cd > Zn > Ni	Johns et al. (1998)

Source: https://www.sciencedirect.com/science/article/pii/S1878535213002712

Effect of bacterial consortium on growth promotion of Chickpea (Cicer arietinum L.) grown in mercury amended and non-amended soil (2016)

Treatments	−C + $HgCl_2$ a	−C − $HgCl_2$ b	+C + $HgCl_2$ c	+C − $HgCl_2$ d
growth attributes	(Control)			
Germination (%)	60 ± 0.5 (a)	70 ± 0.5 (b)	80 ± 0.6 (c)	90 ± 0.6 (d)
Shoot length (cm)	46 ± 0.5 (a)	47 ± 0.6 (a)	56 ± 0.6 (b)	57 ± 0.5 (b)
Root length (cm)	14 ± 0.5 (a)	15 ± 0.6 (a)	21 ± 0.6 (b)	22 ± 0.6 (b)
Shoot fresh weight (g)	2.6 ± 0.5 (a)	3.6 ± 0.5 (a)	5.6 ± 0.6 (b)	6.6 ± 0.6 (b)
Root fresh weight (g)	0.2 ± 0.4 (a)	0.2 ± 0.5 (a)	0.3 ± 0.6 (b)	0.3 ± 0.4 (b)
No. of pods/plant	4 ± 0.5 (a)	5 ± 0.5 (a)	7 ± 0.6 (b)	8 ± 0.6 (b)
No. of seeds/pod	1 ± 0.3 (a)	1 ± 0.3 (a)	2 ± 0.3 (a)	2 ± 0.3 (a)
Weight of seed (g)	0.2 ± 0.05 (a)	0.2 ± 0.06 (a)	0.4 ± 0.05 (a)	0.4 ± 0.06 (a)

The results shown are mean of three independent experiments ± standard error. The $p < 0.05$ was calculated by ANOVA. The different letters (a–d) indicate significant difference between means of each treatments calculated by Duncan's multiple range test ($p = 0.05$).

- A Without bacterial culture and with HgCl2.
- B Without bacterial culture and HgCl2.
- C With bacterial culture and HgCl2.
- D With bacterial culture and without HgCl2.

Source: Aatif Amin at al.(2016), Screening of mercury-resistant and indole-3-acetic acid producing bacterial-consortium for growth promotion of Cicer arietinum L.,Journal of basic microbiology

Effect of MALE and HgCl2on seed germination and seedling growth of maize (2016)

Treatments	Germination (%)	Shoot fresh weight (g)	Shoot dry weight (g)	Root fresh weight (g)	Root dry weight (g)
Control	100 ± 5.01^{a}	1.148 ± 0.065^{cd}	0.171 ± 0.039^{bc}	0.677 ± 0.098^{bcd}	0.156 ± 0.014^{a}
1 mg/kg HgCl2	76.0 ± 3.78^{c}	0.649 ± 0.041^{d}	0.024 ± 0.005^{d}	0.377 ± 0.067^{d}	0.096 ± 0.051^{bc}
0.5 mg/kg HgCl2	90.67 ± 7.00^{b}	0.993 ± 1.040^{d}	0.131 ± 0.019^{c}	0.477 ± 0.059c^{d}	0.050 ± 0.078^{c}
5%MALE + 1 mg/kg HgCl2	100 ± 6.01^{a}	1.747 ± 0.039a^{b}	0.242 ± 0.037a^{b}	1.032 ± 0.132^{ab}	0.143 ± 0.091^{ab}
2.5%MALE + 1 mg/kg HgCl2	100 ± 8.09^{a}	1.591 ± 0.071^{bc}	0.196 ± 0.056^{bc}	0.814 ± 0.093^{bc}	0.141 ± 0.086^{ab}
5%MALE + 0.5 mg/kg HgCl2	100 ± 4.11^{a}	2.187 ± 1.120^{a}	0.292 ± 0.069^{a}	1.358 ± 0.254^{a}	0.188 ± 0.034^{a}
2.5%MALE + 0.5 mg/kg HgCl2	100 ± 5.00^{a}	1.993 ± 0.065^{ab}	0.220 ± 0.028^{ab}	1.408 ± 0.142^{a}	0.186 ± 0.076^{a}
LSD	4.347	0.540	0.084	0.413	0.056

Means sharing a common English letter are statistically similar. The ± represents value of standard error. MALE, Moringa oleifera aqueous leaf extract.

Source: Amina Bibi at al.(2016), Moringa oleifera Lam. leaf extract as bioregulator for improving growth of maize under mercuric chloride stress, Soil & Plant Science

Effect of MALE and HgCl2 on leaf photosynthetic pigments and total soluble phenolics of maize (2016)

Treatments	Chlorophyll (mg/g F.W)	Carotenoids (mg/g F.W)	Total soluble phenolics in roots (µg/g F.W)
Control	11.06 ± 0.581^{bc}	2.865 ± 0.014^{b}	28.93 ± 4.915^{d}
1 mg/kg HgCl2	4.20 ± 1.712^{d}	2.867 ± 0.051^{b}	81.04 ± 5.912^{c}
0.5 mg/kg HgCl2	6.93 ± 3.901^{cd}	3.354 ± 0.813^{b}	77.33 ± 7.990^{c}
5%MALE + 1 mg/kg	12.63 ± 2.001^{ab}	7.452 ± 1.253^{a}	138.54 ± 6.712^{a}
HgCl2			
2.5%MALE + 1	13.63 ± 4.091^{ab}	3.225 ± 0.710^{b}	89.67 ± 5.312^{bc}
mg/kg HgCl2			
5%MALE +	16.88 ± 6.171^{a}	2.580 ± 0.513^{b}	104.33 ± 9.008^{b}
0.5mg/kg HgCl2			
2.5%MALE + 0.5	13.56 ± 3.512^{ab}	3.422 ± 0.961^{b}	82.73 ± 7.012^{bc}
mg/kg HgCl2			
LSD	4.347	1.055	2.160

Means sharing a common English letter are statistically similar. The ± represents value of standard error. MALE, Moringa oleifera aqueous leaf extract.

Source: Amina Bibi at al.(2016), Moringa oleifera Lam. leaf extract as bioregulator for improving growth of maize under mercuricchloride stress, Soil & Plant Science

Biomass and mercury concentration in Chinese brake fern. (2016)

Treatment	Hg in shoots	Hg in roots	Shoot biomass	Final Hg in soil
	(mg/kg)	(mg/kg)	(dry weight, g)	(mg/kg)
F4HgT0 (Control)	0.38 (0.53) c†	BD	6.1 (1.6)	BD
F4HgT1 (250 mg/kg)	123 (88) b	749 (330) b	5.9 (1.6)	85 (23) c
F4HgT2 (500	540 (393)	1525 (786) b	3.9 (1.1)	207 (43) b
mg/kg)	b			
F4HgT3 (1000 mg/kg)	1469 (761) a	6802 (3325) a	3.9 (0.3)	413 (77) a

*The numbers in parenthesis indicate standard deviation. #BD - below detection limit.

†Means followed by a different letter are significantly different at the 0.05 probability level, grouped into classes a, b and c Source: S. Shiyab at al. (2016), Phytoextraction and Accumulation of Mercury in Selected Plant Species Grown in Soil Contaminated with Different Mercury Compounds

Mercury concentrations in Beard grass shoots and roots and soil (average with standard deviation) (2016)

Treatment	Hg in shoots		Hg in roots	Hg in soil
G5HgT0 (Control)	6.08	(3.89)	9.73 (10.7)	BD
G5HgT1 (250 mg/kg)	40	(27)	1579 (855)	85 (23)
G5HgT2 (500 mg/kg)	26	(12)	2241 (1101)	207 (43)
G5HgT3 (1000 mg/kg)	65	(40)	2298 (468)	413 (77)

Source: Han. At al. (2016), Phytoextraction and Accumulation of Mercury in Selected Plant Species Grown in Soil Contaminated with Different Mercury Compounds

Mercury concentrations in shoots and roots of Indian mustard grown in aged soils contaminated by Hg(NO3)2, HgCl2, and HgS (average with standard deviation) (2016)

Treatment	Hg in shoots	Hg in roots	Original Hg in soil
	mg/kg	mg/kg	mg/kg
Hg(NO3)2	2.1 (2.5)	24 (17)	100
HgCl2-1	0.8 (0.8)	26 (11)	100
HgCl2-2	12 (22)	110 (39)	250
HgCl2-3	325 (287)	1775 (1096)	1000
HgS -1	35 (29)	17 (11)	1000
HgS -2	79 (51)	87 (43)	2000

Source: Y. Su at al.(2016), Phytoextraction and Accumulation of Mercury in Selected Plant Species Grown in Soil Contaminated with Different Mercury Compounds

Detection of Mercury in Food products, from highest to lowest values (2009)

S.No	Product Name	Total Mercury	Limit of Detection (ppt)
1	Quaker oatmeal to go	350	80
2	Jack Daniel's Barbecue Sauce (Heinz)	300	100
3	Harshey's Choclate Syrup	257	50
4	Kraft original Barbiecue Sauce	200	100
5	Nutri-grain Strawberry Cereal Bars	180	80
6	Manwich Bold Stoppy Joe	150	80
7	Market Pantry Grape Jelly	130	80
8	Smucker's Strawberry Jelly	100	80
9	Pop-Tarks Frosted Blueberry	100	80
10	Hunt's Tomato Katchup	87	50
11	Wish-Bone Western Sweet & Smooth Dressing	72	50
12	Coco – Cola Classic	62	50
13	Yoplait Strawberry Yogurt	60	20
14	Minute Maid Berry Punch	40	30
15	Yoo-Hoo Choclate Drink	30	20
16	Nesquik Choclate Milk	30	20
17	Kemps Fat Free Choclate Drink	30	20

Source: Institute for Agriculture & Trade Policy Report, 2009