

Supplementary Data (MS IJBPAS 2020 5043)

Table I: Experimental scheme and medium composition for assessing metal, dye and co-contaminants removal

	Metal Cd, Cu, Zn 50 mg L ⁻¹ each	Malachite green 50 mg L ⁻¹	EPS 50 gm L ⁻¹ PBS	Bacterial cells (500 µl ml ⁻¹ d. water)
Blank	-	-	-	-
Control 1	Yes	Yes	-	-
Exp 1	Yes	-	Yes	-
Exp 2	-	Yes	Yes	-
Exp 3	Yes	Yes	Yes	-
Control 2	Yes	Yes	-	-
Exp 4	Yes	-	-	Yes
Exp 5	-	Yes	-	Yes
Exp 6	Yes	Yes	-	Yes

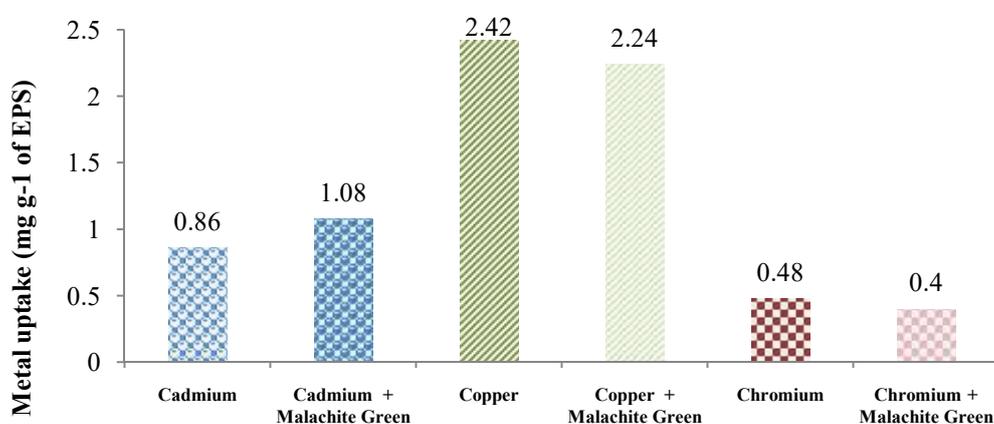


Figure I: Comparison of metal uptake by EPS from *Staphylococcus* sp. MB377 in the absence and presence of dye stress

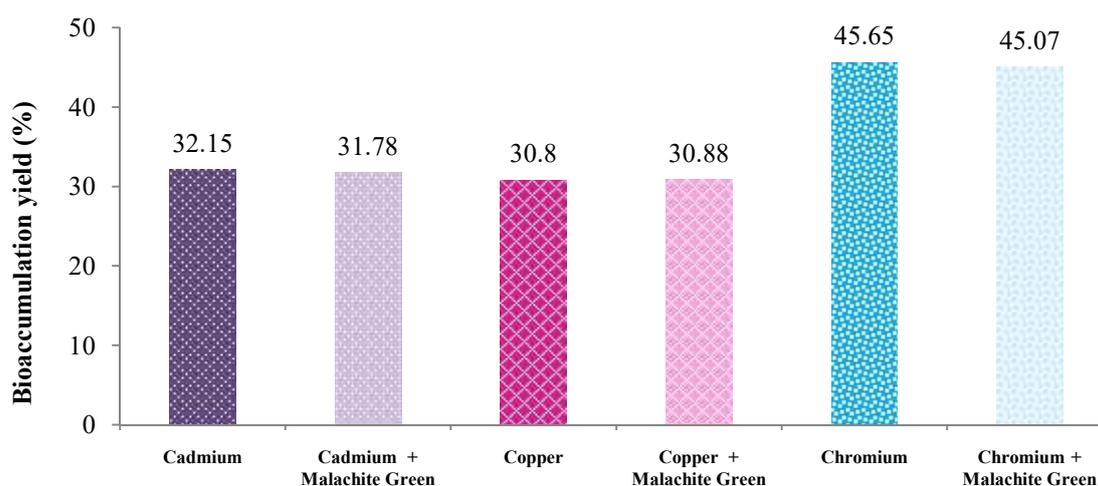


Figure II: Maximum bioaccumulation yields of metals in the absence and presence of dye stress by *Staphylococcus* sp. MB377

Table II: Metal uptake efficiency of *Staphylococcus* sp. MB377 and EPS with and without malachite green dye stress

	Sorption efficiency (%)					
	Cadmium	Cadmium + Malachite green	Copper	Copper + Malachite green	Chromium	Chromium + Malachite green
In the presence of EPS						
Sorption of metals on to EPS	95.67	95.49	90.47	90.68	87.97	86.31
In the presence of <i>Staphylococcus</i> sp. MB377						
Total sorption	96.45	95.34	92.39	92.64	90.95	90.16
Metal internalized by the cells	96.28	95.19	92.08	92.36	90.70	89.93
Metal taken up by cell surface	0.18	0.15	0.31	0.28	0.24	0.23

Table III: FTIR data of malachite green dyedepicting major peaks, comparison of exopolymeric (EPS) matrix and bacterial biomass prior to and after dye adsorption

<i>Staphylococcus</i> sp. strainMB377						
Wave number (cm ⁻¹)						
FTIR spectrum of MG	Exopolymeric (EPS) matrix	MG laden EPS		Bacterial biomass	MG laden bacterial biomass	
499.58, 561.30, 621.10, 659.68, 721.40, 833.28, 1174.69, 1375.29, 1473.66, 1585.54, 1616.40, 1718.63, 2924.18, 3421.83	538.16, 617.24, 1114.89, 1458.23, 1654.98, 2085.12, 3416.05	SP	1097.53, 3456.55	572.88, 702.11, 817.85, 947.08, 1082.10, 1228.70, 1521.89, 1654.98, 2360.95, 2924.18, 3365.90	SP	574.81, 1089.82, 2362.88, 2920.32, 3443.05
		DP	538.16, 617.24, 1458.23, 1654.98, 2085.12		DP	947.08, 1228.70, 1521.89, 1654.98
		SM	-		SM	702.11, 817.85
		NP	723.33, 808.20, 887.28, 1384.94		NP	538.16, 767.69

MG = Malachite green, SP = Shifted peaks, DP = Disappeared peaks, SM = Similar peaks, NP = New peaks

Table IV: FTIR data of EPS and bacterial biomass depicting major peaks, comparison of peak modifications in exopolymeric (EPS) matrix and bacterial biomass prior to and after adsorption of malachite green containing cadmium, copper and chromium

<i>Staphylococcus</i> sp. strainMB377												
FTIR spectrum of EPS	FTIR spectrum of bacterial biomass	FTIR spectrum of Cd	Cd laden EPS	Cd laden bacterial biomass	FTIR spectrum of Cu	Cu laden EPS	Cu laden bacterial biomass	FTIR spectrum of Cr	Cr laden EPS	Cr laden bacterial biomass		
Wave number (cm ⁻¹)												
538.16, 617.24, 1114.89, 1458.23, 1654.98, 2085.12, 3416.05	572.88, 702.11, 817.85, 947.08, 1082.10, 1228.70, 1521.89, 1654.98, 2085.12, 2360.95, 2924.18, 3365.90	723.33, 808.20, 862.21, 887.28, 981.80, 1089.82, 1261.49, 1400.37, 1656.91, 3331.18	SP	862.21, 981.80, 1087.89, 1653.05, 3437.26	SP	1089.82, 1653.05	721.40, 2870.17, 3429.55	603.74, 1105.25, 1132.25, 1222.91, 1383.01, 1722.49, 1701.42, 1778.48	SP	887.28, 1091.75, 3404.47	721.40, 983.73, 1095.60, 1635.69, 3439.19	
			DP	538.16, 617.24, 1458.23, 2085.12	723.33, 817.85, 947.08, 1228.70, 1521.89, 2360.95, 2924.18	DP	538.16, 617.24, 1458.23, 2085.12		572.88, 817.85, 947.08, 1082.10, 1228.70, 1521.89, 2360.95	DP	538.16, 617.24, 1458.23, 2085.12	572.88, 817.85, 1228.70, 1521.89, 2360.95, 2924.18
			SM	-	-	SM	-		--	SM	1654.98	-
			NP	597.95, 1400.37	887.28,	NP	597.95, 864.14, 1400.37		889.21, 1130.32, 1629.90	NP	705.97, 731.05, 786.98, 810.13, 1400.37, 1560.46, 2337.80	887.21

SP = Shifted peaks, DP = Disappeared peaks, SM = Similar peaks, NP = New peaks

Table 5: FTIR data of EPS and bacterial biomass depicting major peaks, comparison of peak modifications in exopolymeric (EPS) matrix and bacterial biomass prior to and after adsorption of malachite green containing cadmium, copper and chromium

Staphylococcus sp. strain MB377

Wave number (cm⁻¹)

FTIR spectrum of EPS	FTIR spectrum of bacterial biomass	FTIR spectrum of MG+Cd	MG+Cd laden exopolymeric (EPS) matrix		MG+Cd laden bacterial biomass	MG+Cu laden exopolymeric (EPS) matrix		MG+Cu laden bacterial biomass	FTIR spectrum of MG+Cr	MG+Cr laden exopolymeric (EPS) matrix		MG+Cr laden bacterial biomass		
538.16, 617.24, 1114.89, 1458.23, 1654.98, 2085.12, 3416.05	572.88, 702.11, 702.11, 817.85, 947.08, 1082.10, 1228.70, 1521.89, 1654.98, 2360.95, 2924.18, 3365.90	624.96, 702.11, 725.26, 750.33, 829.42, 904.04, 941.29, 981.80, 1361.79, 1446.66, 1483.31, 1585.54, 2079.33	SP	1653.05, 3450.77	723.33, 813.99, 1116.82, 2877.89, 3431.48	SP	989.52, 1095.60, 1653.05	723.33, 1217.12, 2345.52, 3431.48	725.26, 887.28, 1060.88, 1170.83, 1219.05, 1309.71, 1359.86, 1444.73, 1483.31, 1519.96, 1585.54	SP	1647.26, 3452.70	723.33, 1105.25, 1624.12, 3437.26		
			DP	538.16, 617.24, 1114.93, 1458.23, 2085.12	572.88, 947.08, 1228.70, 1521.89, 1654.98, 2360.95	559.38, 599.88, 665.46, 702.11, 725.26, 773.48, 825.56, 902.72, 939.36, 993.37, 1016.52, 1363.72, 1475.59	DP	538.16, 617.24, 1458.23, 2085.12, 3404.47		572.88, 817.85, 947.08, 1082.10, 1521.89, 1654.98, 2924.18	DP	538.16, 617.24, 1114.93, 1458.23, 2085.12	572.88, 817.85, 947.08, 1228.70, 1521.89, 2360.95, 2924.18	
			SM	-	-	-	-	SM		-	-	SM	-	-
			NP	723.33, 812.06, 887.28, 1383.01	887.28, 1629.90	NP	725.26, 810.13, 887.28, 935.51, 1261.49, 1384.94	889.21		NP	723.33, 810.13, 887.28, 1097.53, 1384.94	889.21, 1384.94		

SP = Shifted peaks, DP = Disappeared peaks, SM = Similar peaks, NP = New peaks

Table I: Efficiency of EPS and *Staphylococcus* sp. MB377 in removal/degradation of Malachite Green dye in the absence and presence of metal stress

	Dye removal efficiency (%)			
	Malachite Green	Malachite Green + cadmium	Malachite Green + copper	Malachite Green + chromium
Dye uptake by EPS	84.49	85.10	83.90	84.76
Dye removal by <i>Staphylococcus</i> sp. MB377	78.92	79.65	79.35	81.63

Table II Malachite Green uptake by EPS in the absence and in presence of metal stress

	dye uptake (mg g ⁻¹)			
	Malachite Green	Malachite Green + chromium	Malachite Green + copper	Malachite Green + cadmium
<i>Staphylococcus</i> sp. MB377	0.62	0.65	0.66	0.86

Table III: Maximum bioaccumulation yield of Malachite Green dye by *Staphylococcus* sp. MB377

	Bioaccumulation yield (%)			
	Malachite Green	Malachite Green + cadmium	Malachite Green + copper	Malachite Green + chromium
<i>Staphylococcus</i> sp. MB377	0.15	0.45	0.42	0.26