Phyto-inspired and scalable approach for synthesis of PdO-2Mn_2O_3:nano-material for application in water splitting electrocatalysis

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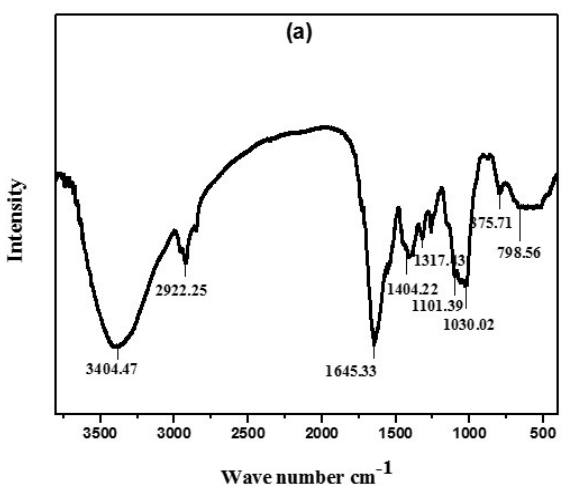
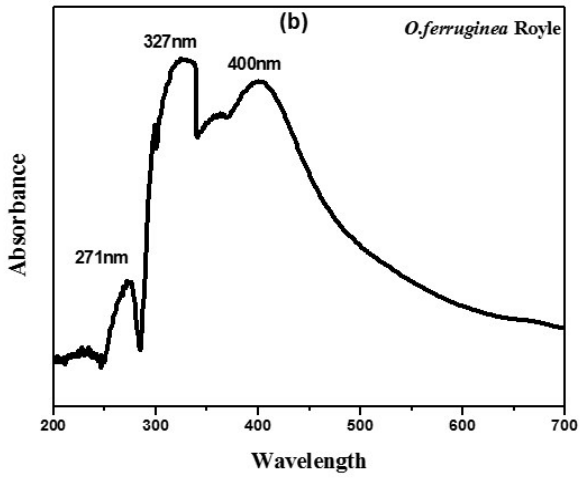




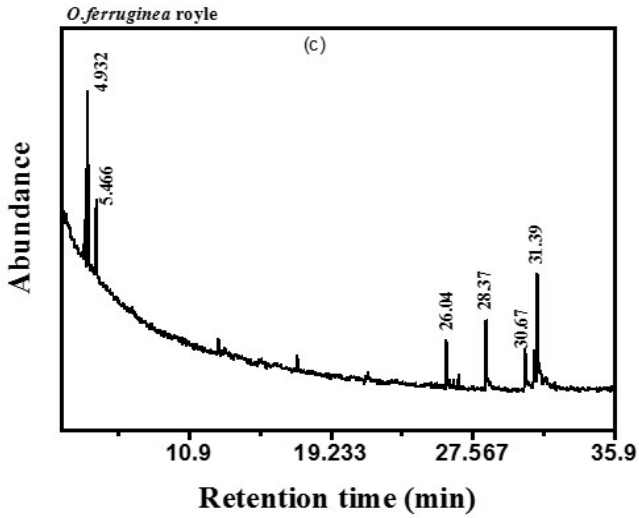


Figure S-1: (a) FTIR spectrum (b) UV-vis spectrum (c) GCMS chromatogram of *Olea ferruginea* royle leave extract

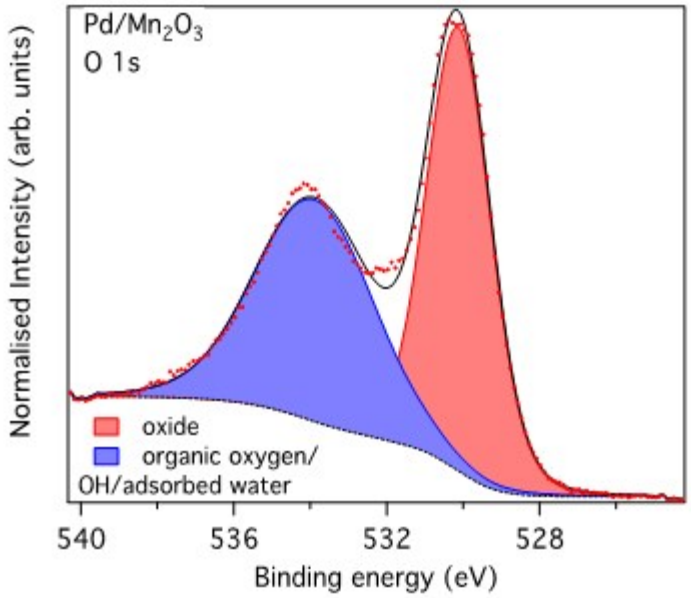


Figure S-2: XPS-O1s core level spectra recorded from PdO-2Mn_2O_3

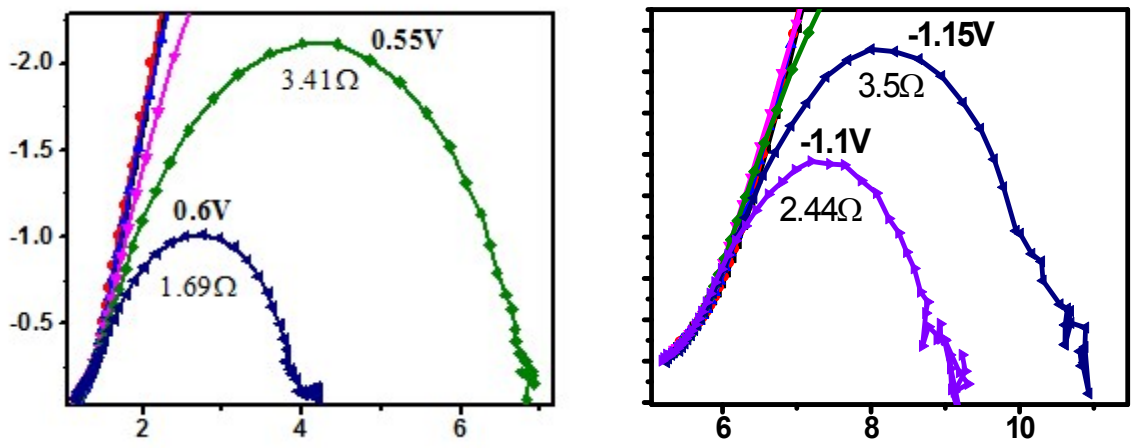


Figure S-3: (a) Inset of OER Nyquist plot at various over-potentials (b) Inset of HER Nyquist plot at various over-potentials

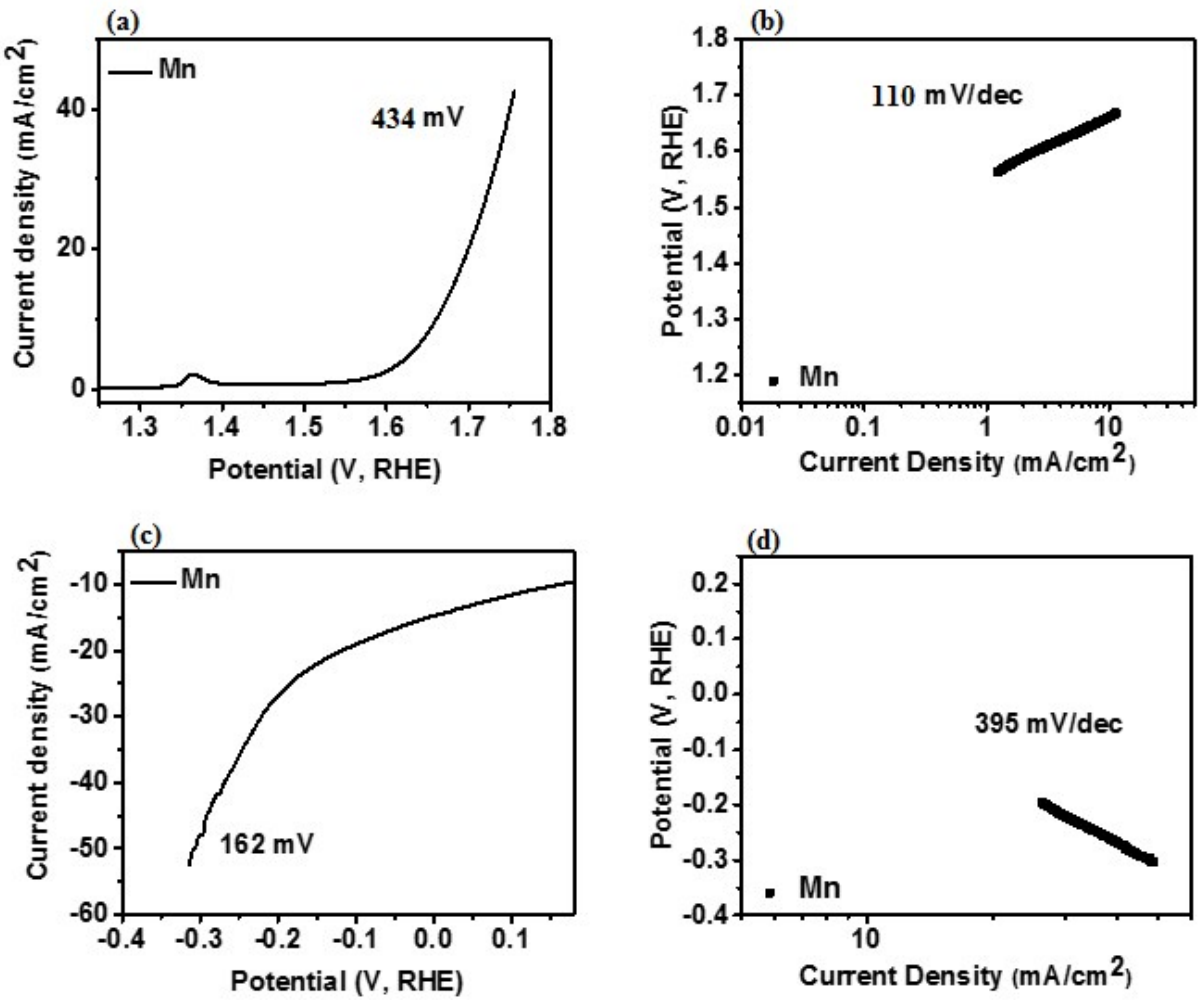


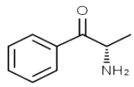
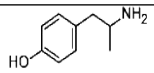
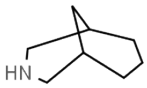
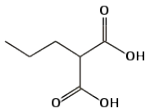
Figure S-4: Electro-catalytic behavior of individual Mn_3O_4 : (a) OER over-potential (b) Tafel slope for OER (c) HER over-potential plot and (d) Tafel slope for HER

Table (S-1): FTIR peak values and Functional groups of *O.ferruginea* Royle plant

	Peaks	**Bond**	**Functional group**
OFR leave extract	3404.47	O-H stretch, H bonded	Alcohols, phenols, water
	2922.25	C-H stretch	Alkanes
	1645.33	-C=C- stretch	Alkenes
	1404.22	-C-C stretch (in ring)	Aromatics
	1317.43	N–O asymmetric stretch	Nitro compounds

	1261.49	C-N stretch, C-O, C-H wag	Amines, alcohols, carboxylic acids, esters, ethers alkyl halides
	1101.39	C-N stretch C-O, C-H wag	Amines, alcohols, carboxylic acids, esters, ethers alkyl halides
	1030.02	C-N stretch	Aliphatic amines
	875.71	=C-H bend	Alkenes
	748.56	=C-H bend, C-Cl stretch	alkyl halides

Table-S2: Phytochemical analysis of methanol extract of OFR leave extract by GCMS

Retention time	**Area (%)**	**Height (%)**	**F. wt (g/mol)**	**Formula**	**Compound name**	**Structure**
4.932	27.03	24.65	149	$C_9H_{11}NO$	Cathinone	
5.46	12.47	10.91	151	$C_9H_{13}NO$	Benzenemethanol	
26.04	4.68	7.63	125	$C_8H_{15}N$	3-Azabicyclo nonane	
28.36	9.45	11.46	146	$C_6H_{10}O_4$	Propanedioic acid	
31.391	19.43	18.20	127	$C_8H_{17}N$	1-cyclohexylethylamine