Electronic Supplementary Material (ESI) for Environmental Science: Nano.

Supporting Information

Multifunctional Dual Emissive Fluorescent Probe Based on Europium-doped Carbon Dots (Eu-TCA/NCDs) for Highly Selective Detection of Chloramphenicol, Hg^{2+} and Fe^{3+}

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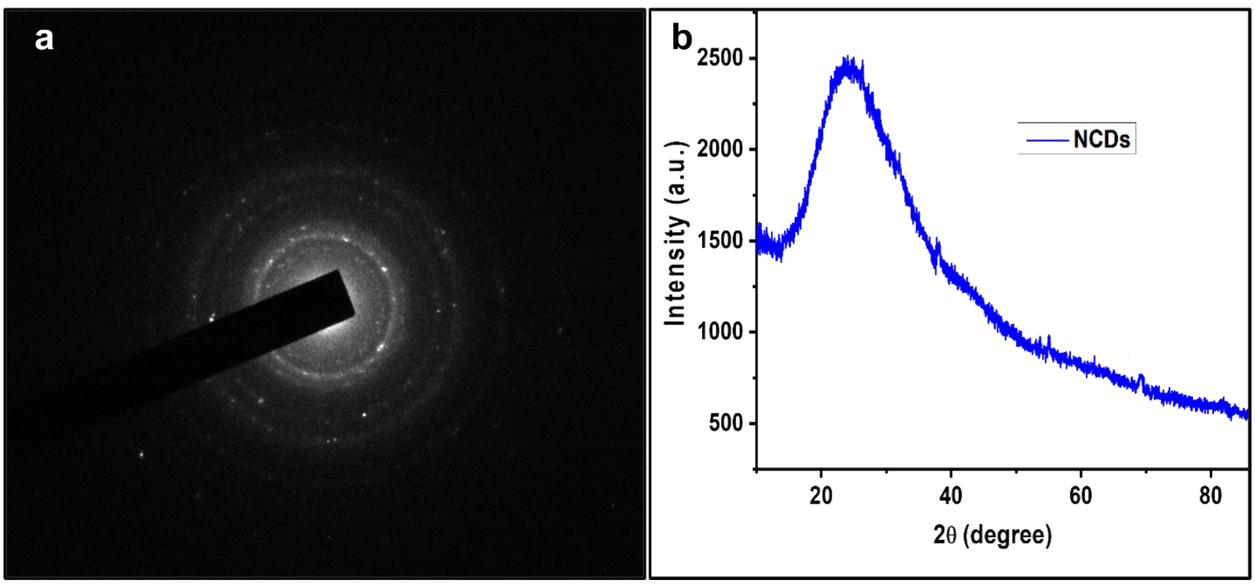

Fig.S1 (a) Selected areas electron diffraction (SAED) pattern of NCDs, (b) XRD spectrum of NCDs.

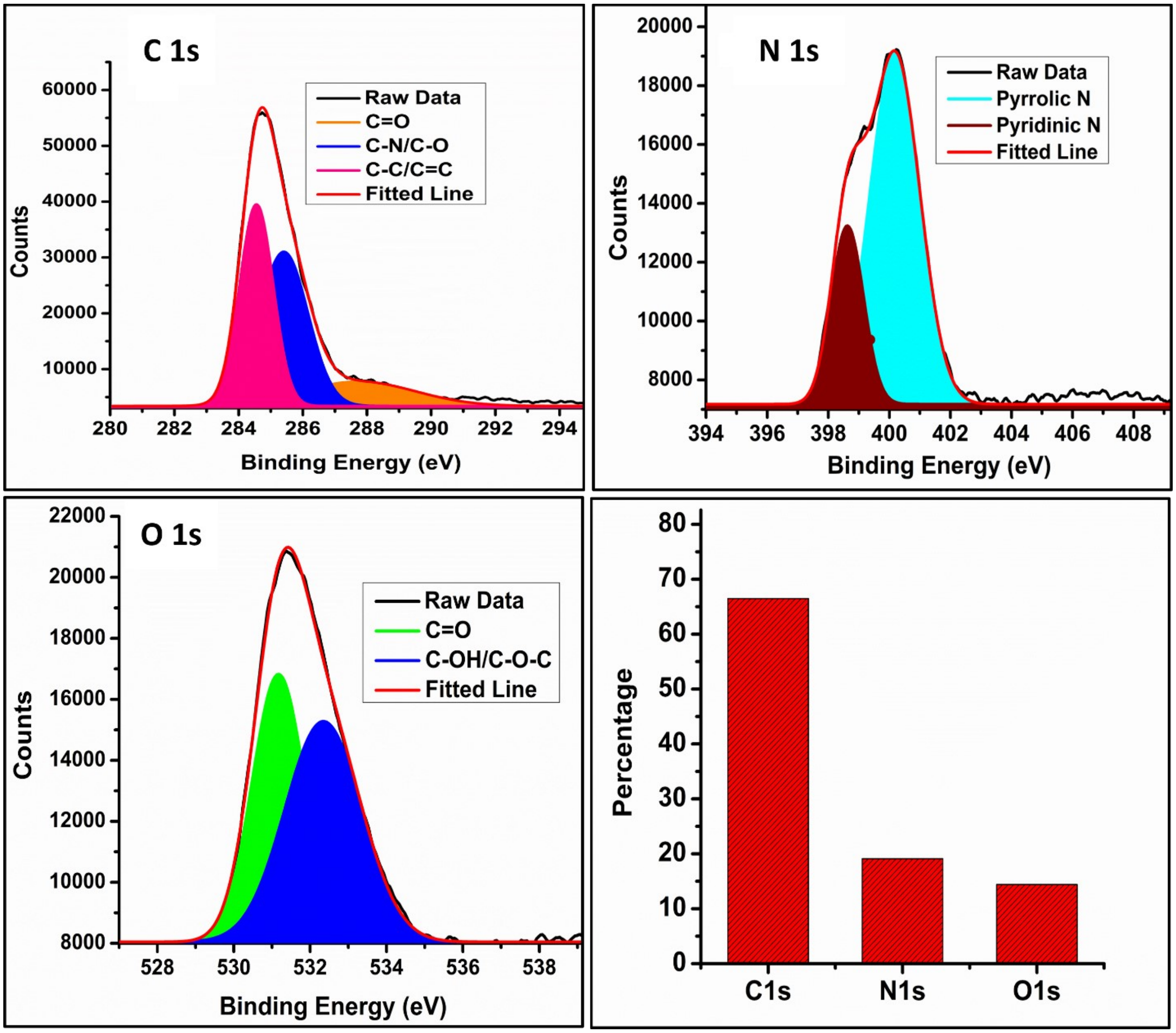

Fig. S2 High resolution XPS analysis of NCDs, C1s scan, N1s Scan, O1s Scan, and percentage composition.

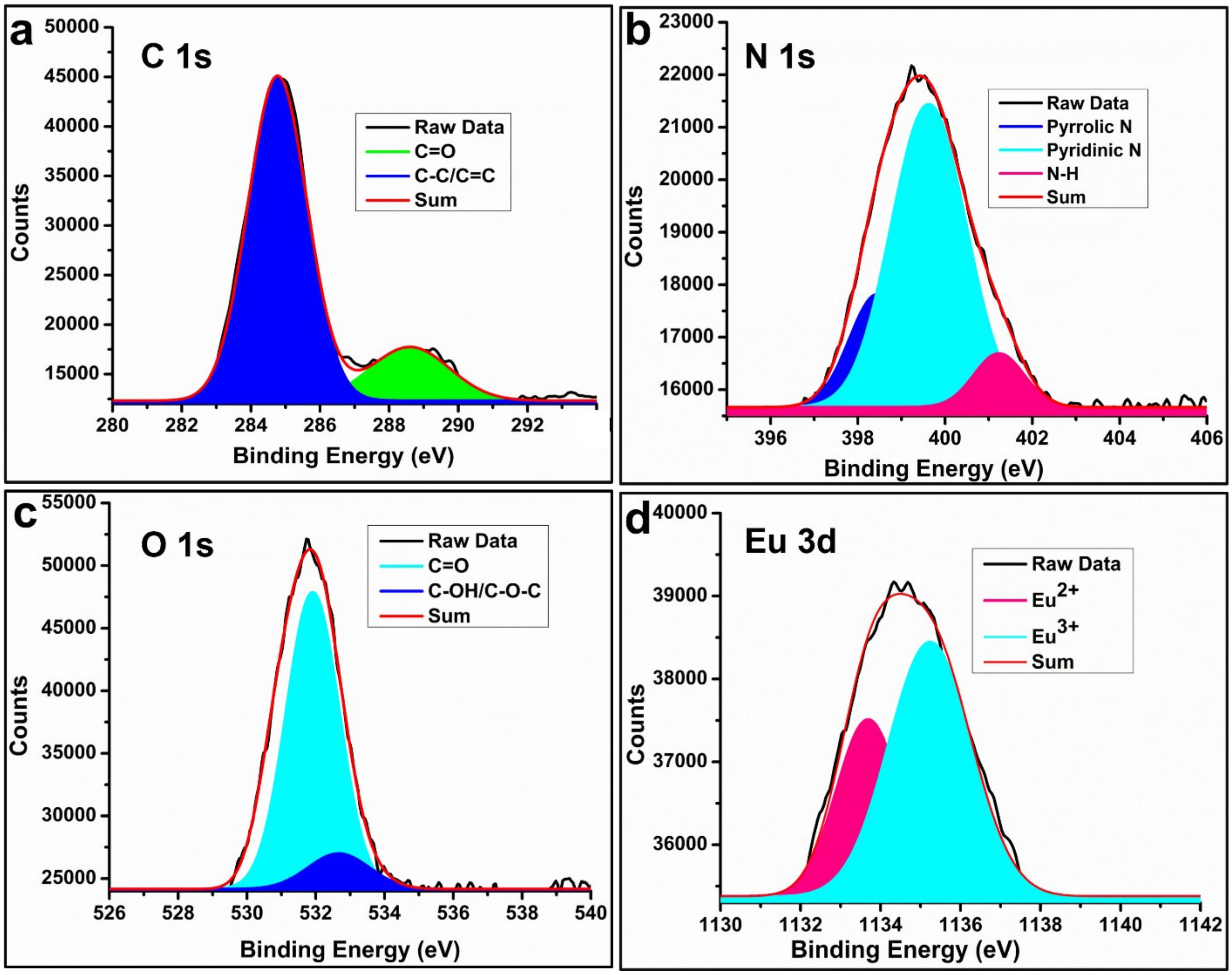

Fig. S3 High resolution XPS analysis of Eu-TCA/NCDs (a) C 1s scan, (b) N 1s Scan, (c)O 1s Scan and (d) Eu 3d Scan.

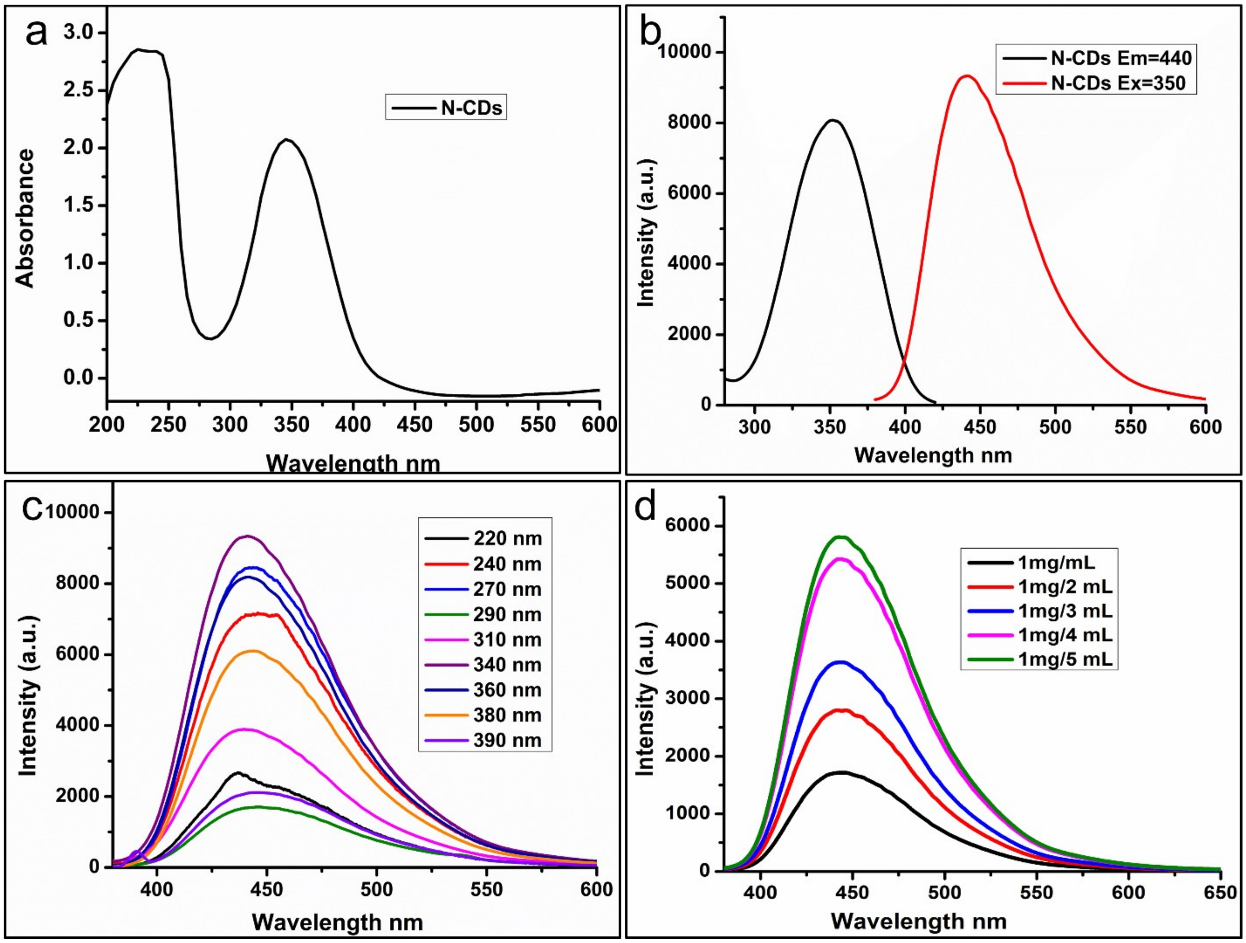

Fig. S4 Optical properties of NCDS (a) UV-visible spectrum of NCDs, (b) Excitation-Emission spectrum of NCDs, (c) Wavelength independent emission spectrum of NCDs, and (d) Concentration-dependent emission spectrum of NCDs.

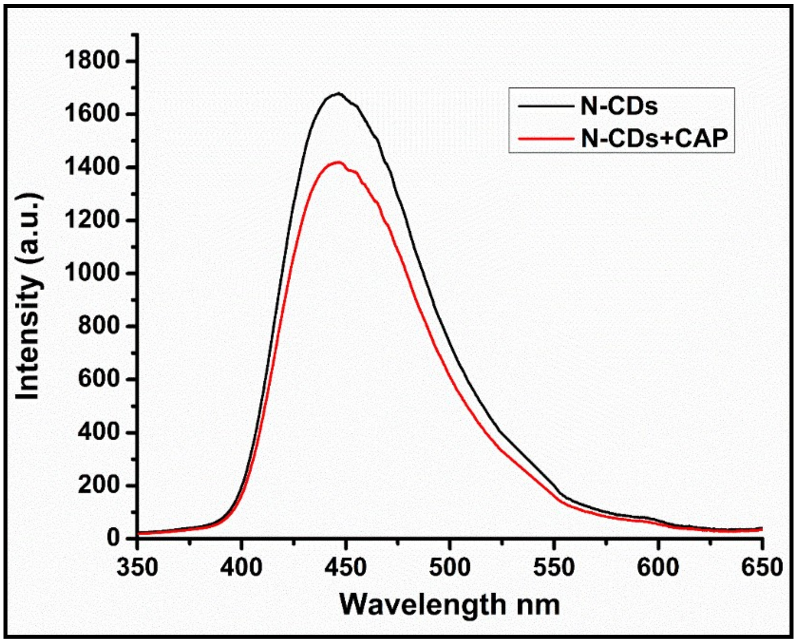

Fig. S5 Change in the fluorescence intensity of NCDs upon interaction with CAP

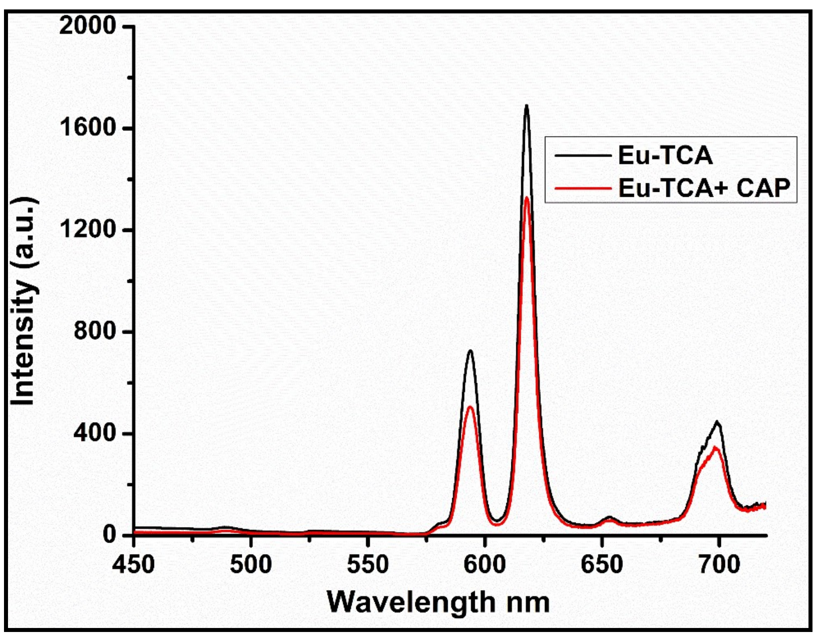

Fig. S6 Alteration in the fluorescence intensity of EU-TCA upon treatment with CAP.

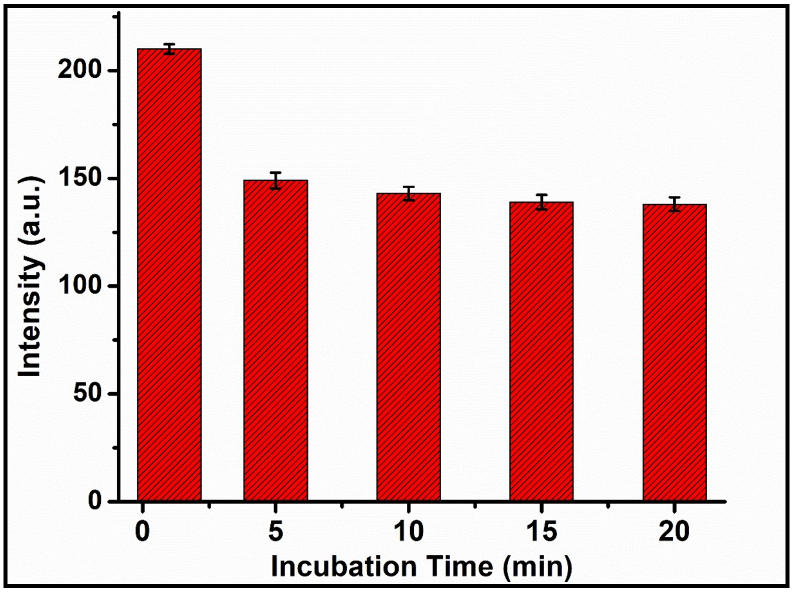

Fig. S7 Incubation time for the detection of CAP using Eu-TCA/NCDs

Table S1 Comparison of current study with reported methods.

No	Responsive Technique	Material	LOD (ng/mL)	Reference
1	Raman Spectroscopy	SERS active substrate	4.0	[1]
2	Chemiluminescence	Colloidal gold particles	6.0	[2]
3	Microfluidic Immunoassay	CAP-OVA-FITC	50.0	[3]
4	Electrochemical Assay	f–MoS_2/MWCNTs	15.0	[4]
5	Electrochemical Assay	$Sr_2Co_2O_5$	3.55	[5]
6	Immunochromatographic Assay	CAP–BSA or CAP–STI	10.0	[6]
7	Electrochemical Assay	rGO/PdNPs	16.15	[7]
8	Fluorescence Spectroscopy	TCA-Eu/NCDs	3.87	Current study

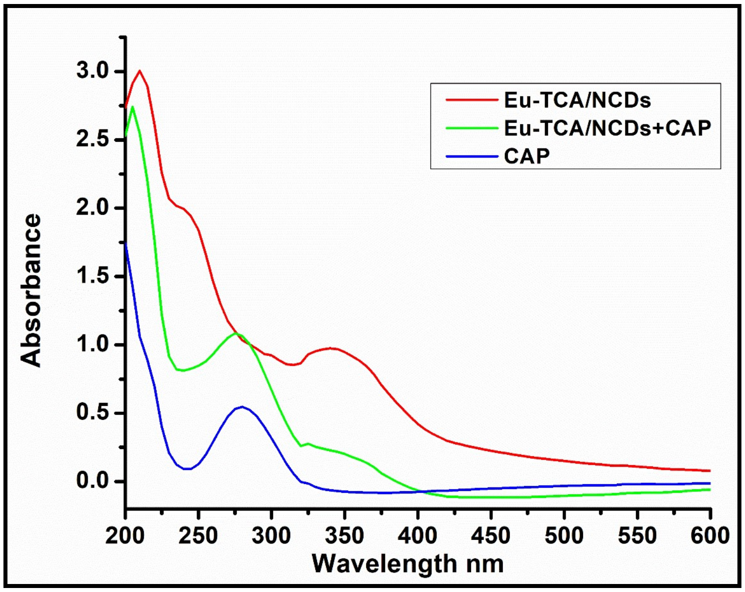

Fig. S8 The absorption spectrum of Eu-TCA/NCDs and Eu-TCA/NCDs+ CAP and CAP.

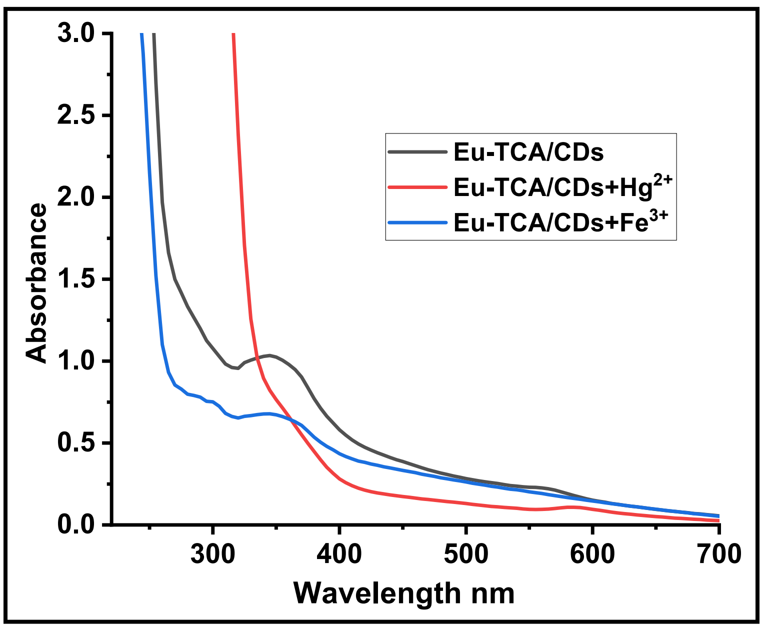

Fig.S9 UV-Visible spectrum of Eu-TCA/CDs in presence of Hg^{2+} and Fe^{3+}

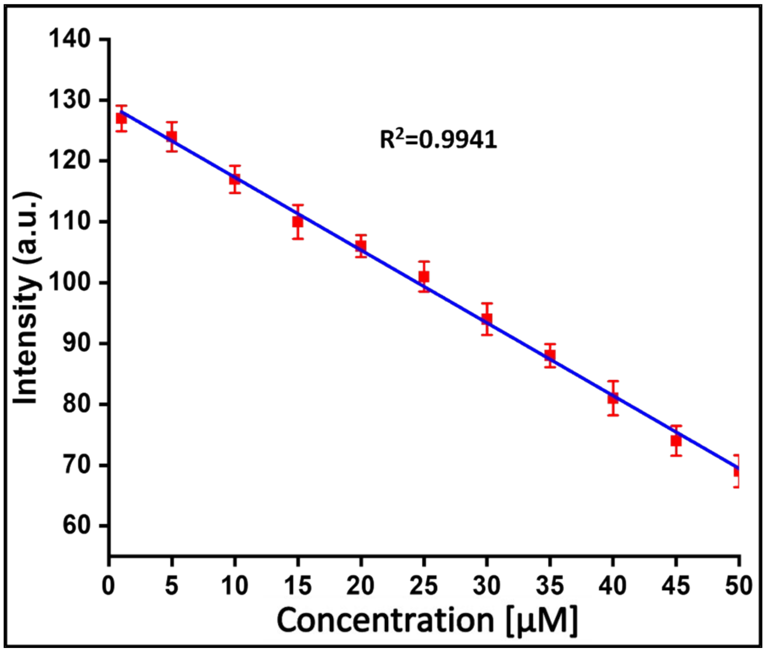

Fig.S10 Change in fluorescence intensity of Eu-TCA/NCDs as a function of different Hg^{2+} concentration at 445 nm.

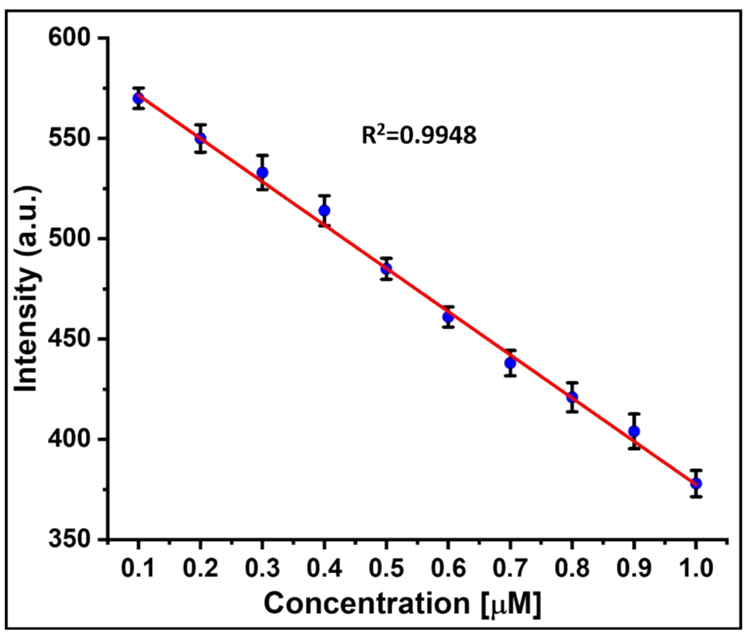

Fig.S11 The change in fluorescence intensity of Eu-TCA/NCDs as a function of different concentration of Fe^{3+} ion at 617 nm.

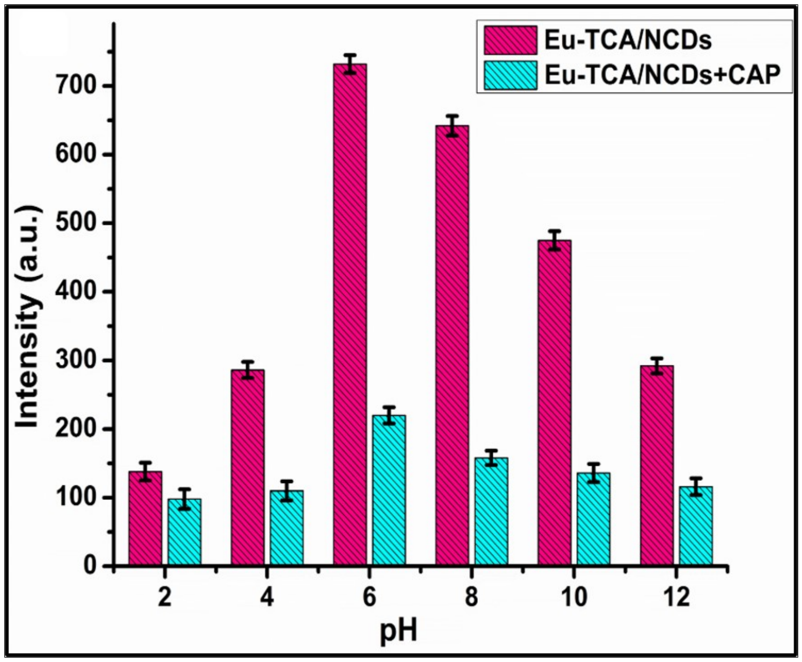

Fig.S12 Effect of pH on selective recognition of CAP

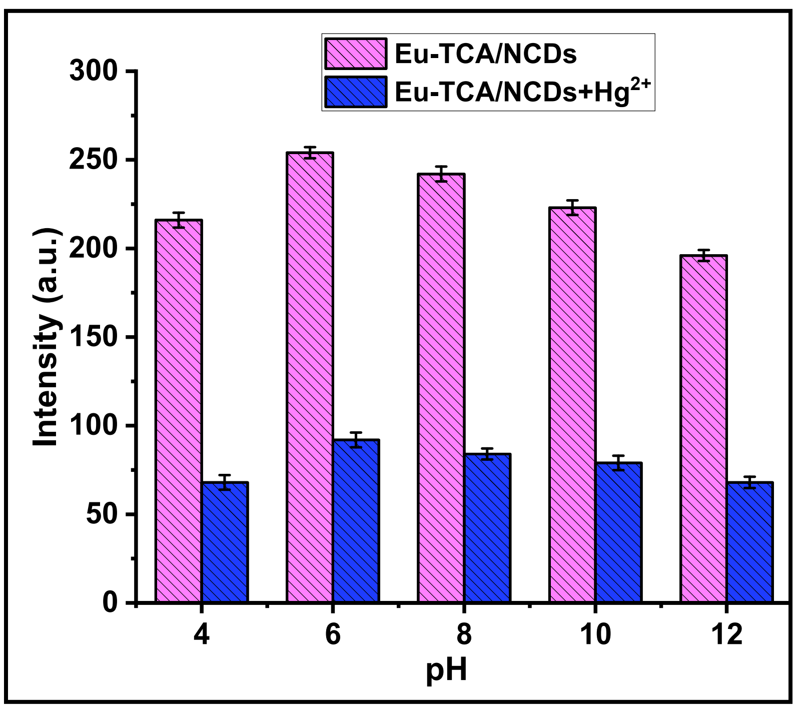

Fig.S13 Effete of pH on selective detection of Hg^{2+}at 445 nm

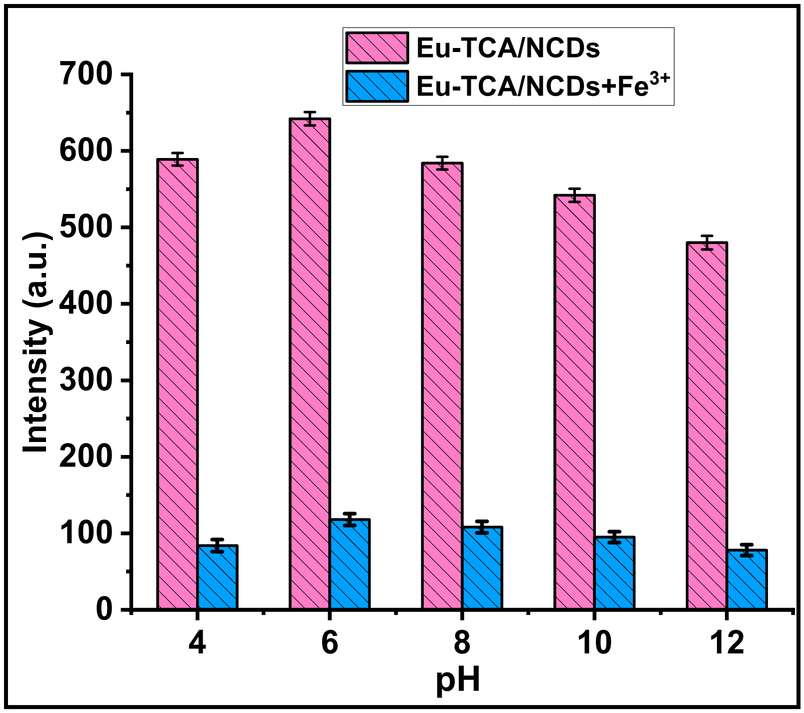

Fig.S14 Effete of pH on selective detection of Fe^{3+} at 617 nm.

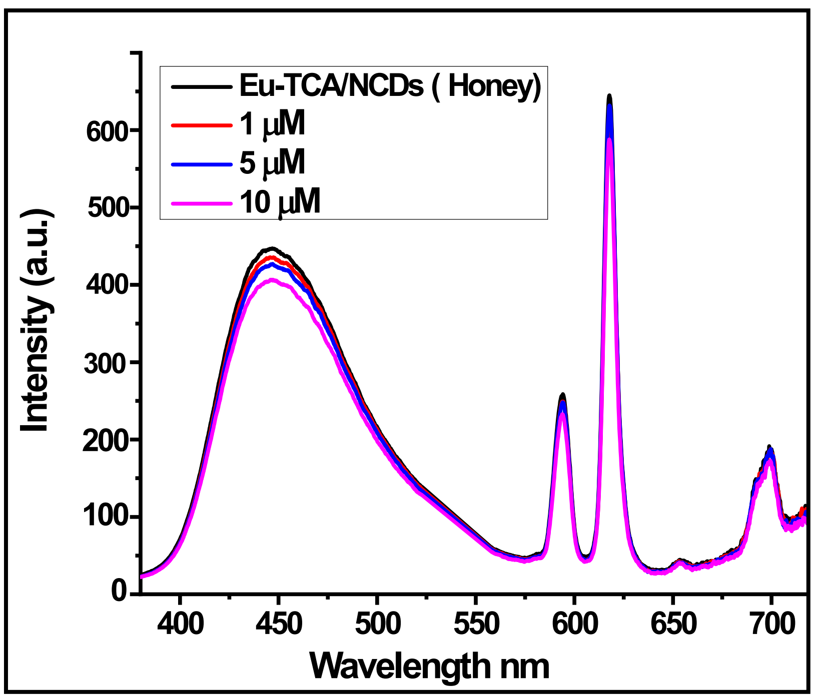

Fig. S15 Detection of CAP in honey sample using NCDs-Eu-TCA

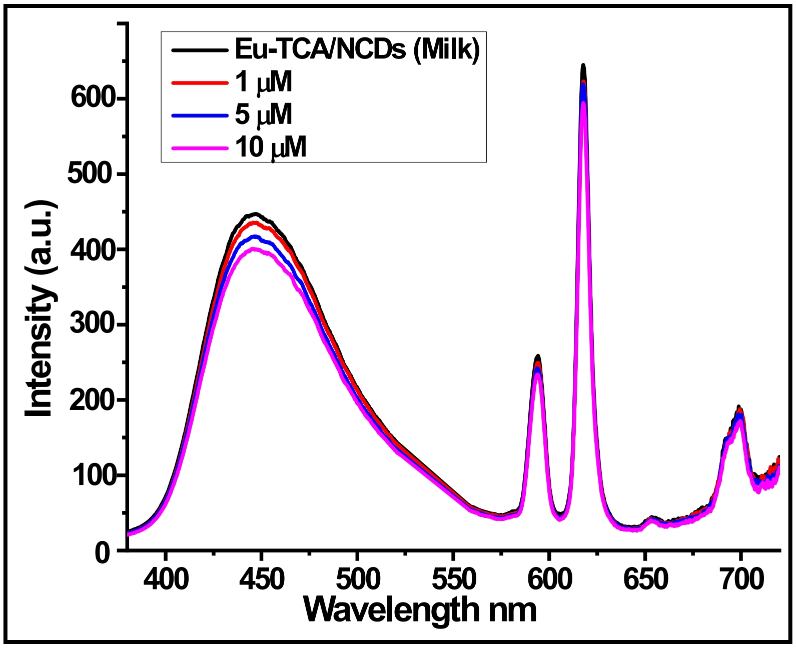

Fig.S16 Detection of CAP in Milk sample using NCDs-Eu-TCA

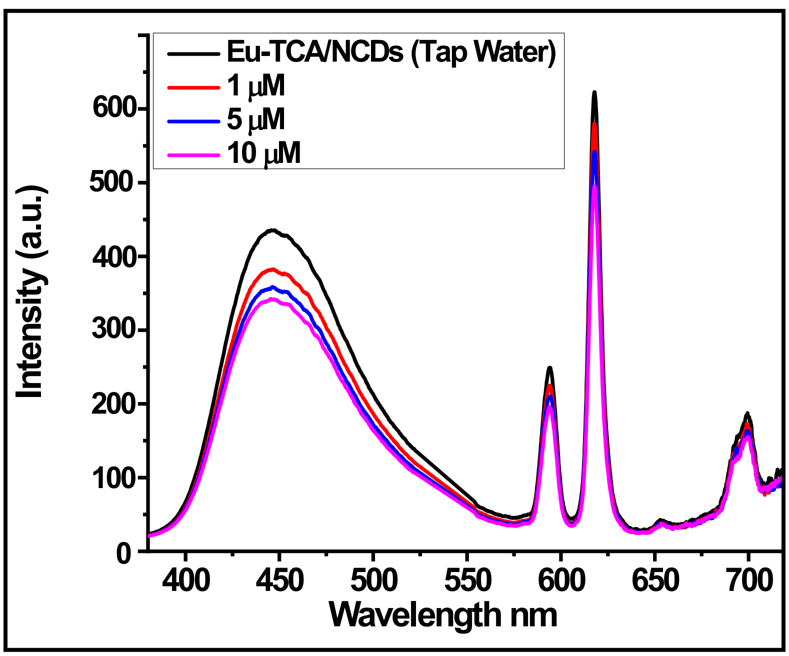

Fig.S17 Detection of CAP in tap water sample using NCDs-Eu-TCA

Table S2 Percentage recovery of Hg^{2+} and Fe^{3+} in tap water samples

Analyte	NO.	Added Con. (nM)	ICPMS		This work	
			Found Con.(nM)	Recovery %	Found Con., (nM)	Recovery %
Hg^{2+}	1	80	79.12±0.48	98.90±1.64	78.29±1.21	97.86±3.21
	2	100	102.54±0.36	101.54±0.98	96.46±0.98	96.46±1.45
	3	120	117.23±0.87	97.69±1.26	110.34±2.12	91.93±2.98
Fe^{3+}	1	80	81.45±0.53	101.81±0.87	81.14±3.64	101.42±1.64
	2	100	98.54±0.74	98.54±2.1	94.26±1.23	94.26±2.14
	3	120	124.12±0.68	103.43±1.76	116.63±4.11	97.19±3.32

References

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