Electronic Supplementary Information

Synthesis of green fluorescent carbon quantum dots via latex of ficus benghalensis for the detection of tyrosine and fabrication of Schottky barrier diode

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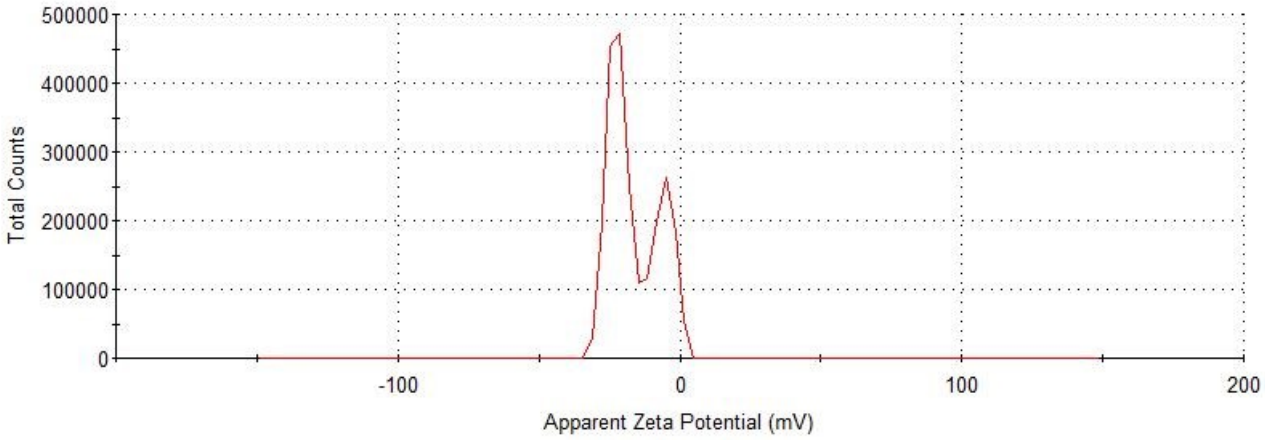

Fig. S1. Zeta potential of as-synthesized G-CQDs.

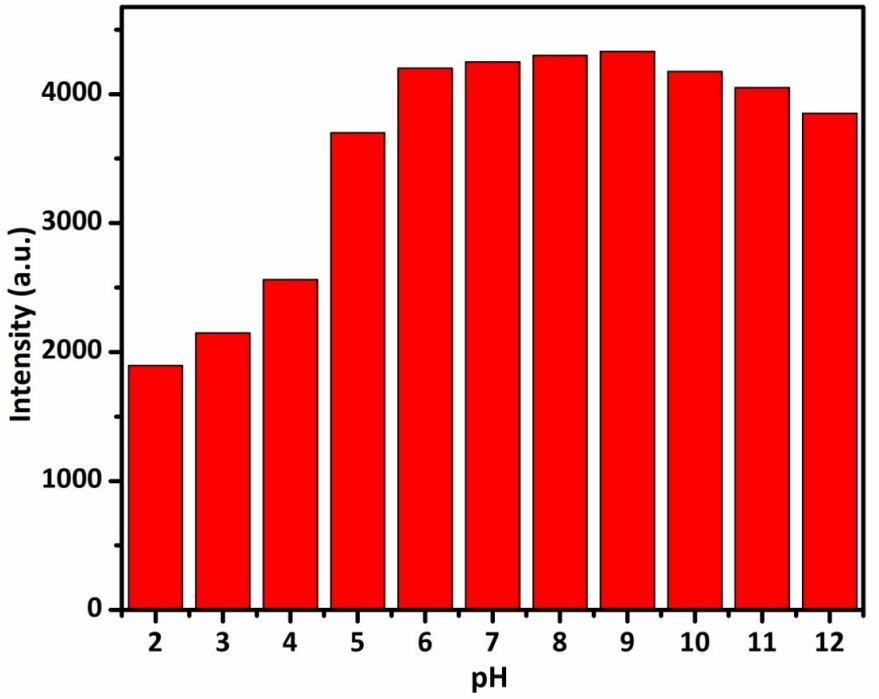

Fig. S2. Study of pH change on the fluorescent intensity of G-CQDs with corresponding photograph under UV – light (λex = 365 nm) from pH range 2 to 12.

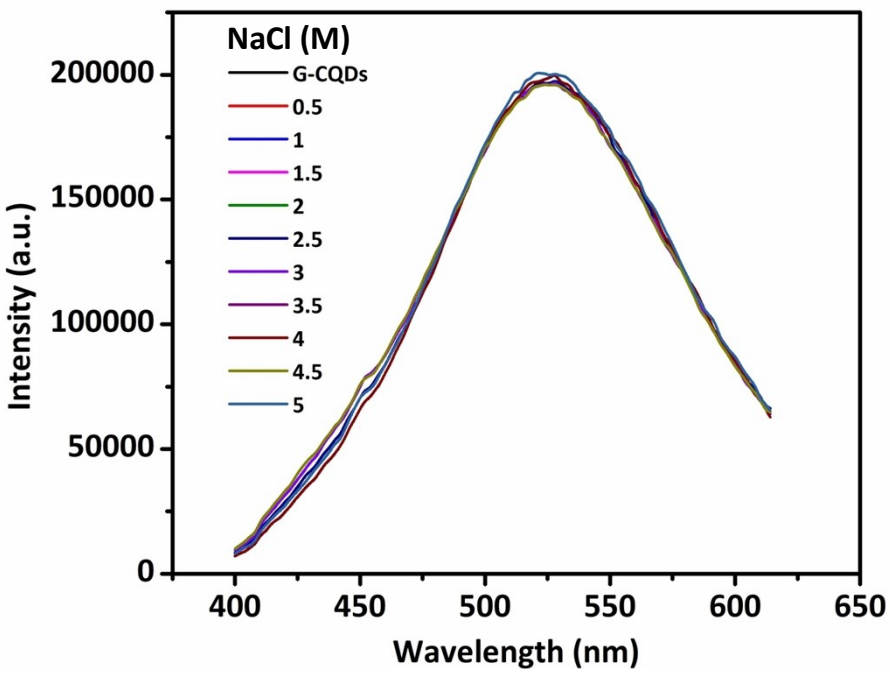

Fig. S3. Effect of ionic strength on the fluorescent intensity of G-CQDs.

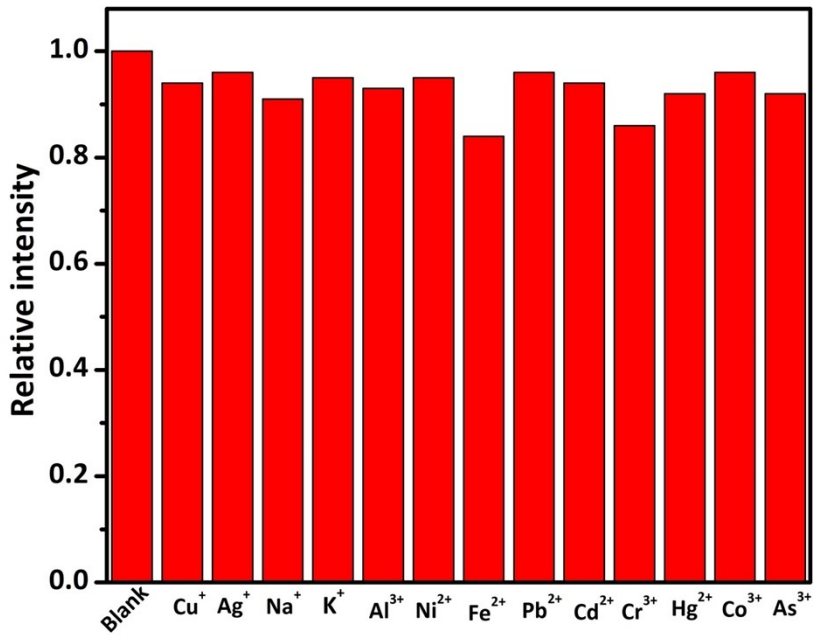

Fig. S4 Influence of metal ions on the fluorescence of G-CQDs.

Table S1. Calculation of fluorescence quantum yield with integrated intensity and absorbance of quinine sulfate and G-CQDs at excitation wavelength 360 nm.

Sample	Integrated intensity at 360 nm	Absorbance at 360 nm	Quantum yield (%)
Quinine sulphate (reference)	51246927	0.076	54
G-CQDs	38087271	0.074	41.2

Following **equation S1** was used to calculate quantum yield

$$QY = QY_{Ref} \cdot \frac{I}{A} \cdot \frac{A_{Ref}}{I_{Ref}} \cdot \frac{\eta^2}{\eta_{Ref}^2} \qquad \textbf{S1}$$

Where QY and QY_{ref} are quantum yield of G-CQDs and reference respectively, I is the integrated intensity, A is the absorbance and η is the refractive index (η^2/η^2_{ref} =1) of the solvent.

Table S2 Fluorescence lifetime measurement of G-CQDs in the presence and absence of Tyrosine.

Compound	Average life time (ns)	Chi square	Different life time (ns)	Corresponding Weight (%)
G-CQDs	5.34	1.07	τ_1 = 1.03 (B_1=5421.42) τ_2 = 4.06 (B_2=4657.10) τ_3 = 10.5 (B_3=787.87)	17.06 57.68 25.26
G-CQDs + Tyr	5.18	1.20	τ_1 = 1.02 (B_1=5323.23) τ_2 = 3.89 (B_2=4541.37) τ_3 = 9.77 (B_3=1125.83)	15.91 51.86 32.23

The fluorescence life time decay of G-CQDs was fitted by a tri-exponential role. Chi-square standards and corresponding residual division were reduced to judge the best fit. The adequate fit has a chi-square close to unity.

The fitting system of the fluorescence emission intensity decay $I_{(t)}$ uses a tri-exponential representation according to the following equation-

$$I_{(t)} = B_1 \exp(- t / \tau_1) + B_2 \exp(-t / \tau_2) + B_3 \exp(-t / \tau_3)$$

Where τ_1 , τ_2 and τ_3 represents time constants of the three radiative decays channel and B_1, B_2 , B_3 are three corresponding amplitudes.

To calculate the average life time, following equation was used -

$$< \tau > = \frac{B_1 \tau_1^2 + B_2 \tau_2^2 + B_3 \tau_3^2}{B_1 \tau_1 + B_2 \tau_2 + B_3 \tau_3}$$

Table S3. Detection of Tyr in milk sample by using G-CQDs.

Added (µM)	**Found (µM)**	**Recovery (%)**
25	22.8	91.2 **%**
50	47.3	94.6 **%**
75	68.8	91.7**%**
100	93.4	93.4**%**

RSD = 92.72 ± 1.69%