

[Electronic Supporting information](#)

Production of partially reduced graphene oxide nanosheets using a seaweed sap

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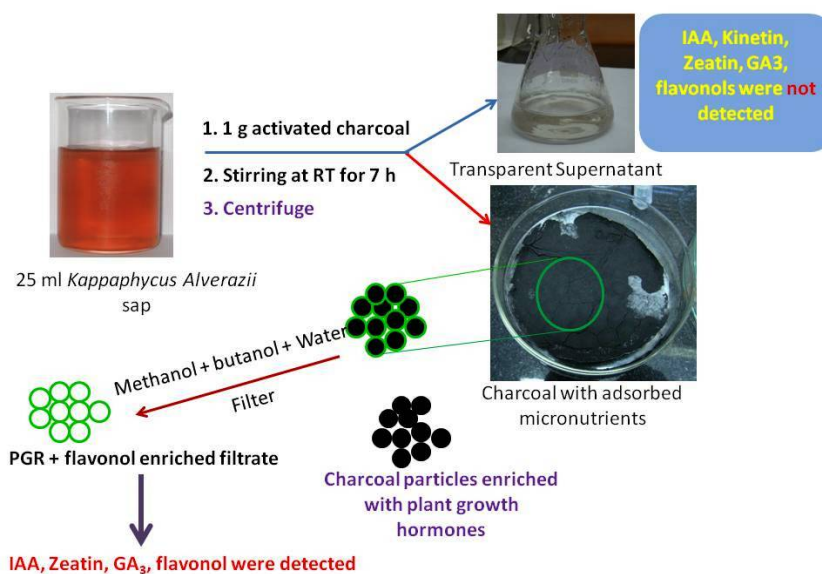
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Table S1: Constituent of *Kappaphycus* sap

Sr. No.	Constituent	Amount in ppm
1	Indole 3-acetic acid (IAA)	26.52
2	Zeatin	19.65
3	GA ₃	23.65
4	Choline	57.30
5	Glycine betaine	79.33
6	Betain aldehyde	present
7	Na ⁺	198.0
8	K ⁺	33654
9	Ca ²⁺	321.0
10	Mg ²⁺	1112.0
11	Zn ²⁺	4.7
12	Fe ²⁺	86.1
13	P ³⁺	17.45

Preparation of Plant growth hormone + flavonol free sap



Scheme S1: Preparation of plant growth hormone and flavonol free sap (2).

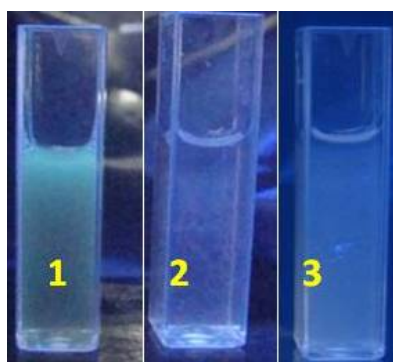


Figure S1: Qualitative phytochemical analysis of the sap to detect flavonols in the sap samples 1. pure sap. 2. Sap obtained after charcoal treatment and 3. Sap consisting of only metal salts

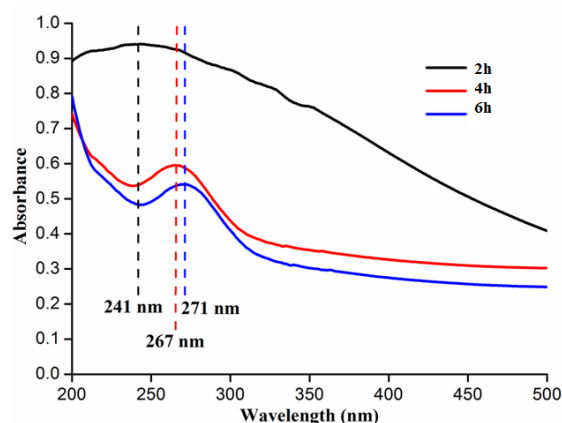


Figure S2: UV-Vis spectra of pure K-sap reduced GO with different reaction time. All spectra were recorded under similar dilution (50 µg/ml).

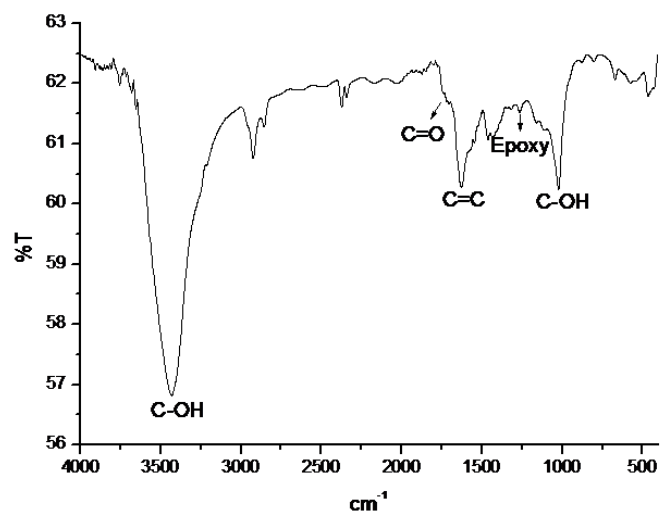


Figure S3: FT-IR spectra of reduced GO using K-sap (3).

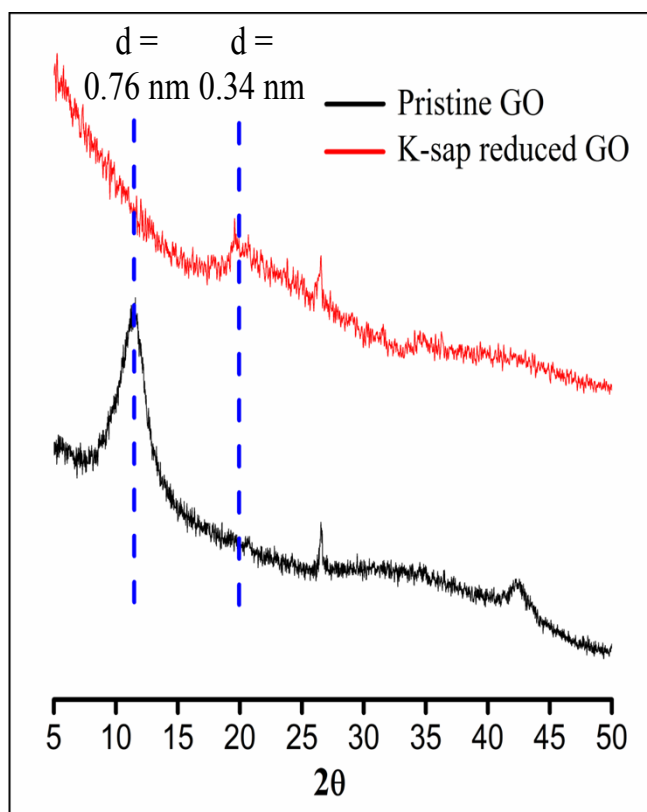


Figure S4: Powder X-ray diffraction pattern of pristine GO (black) and GO reduced by 1 (red).

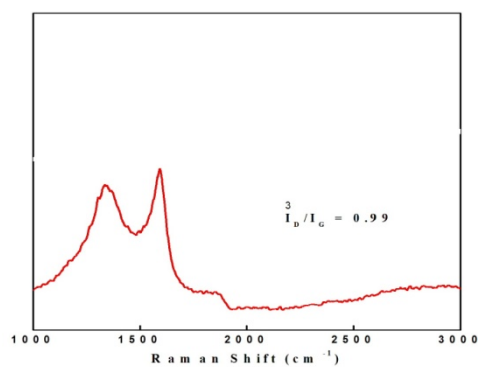


Figure S5: Raman spectra of GO reduced by K-Sap (3)

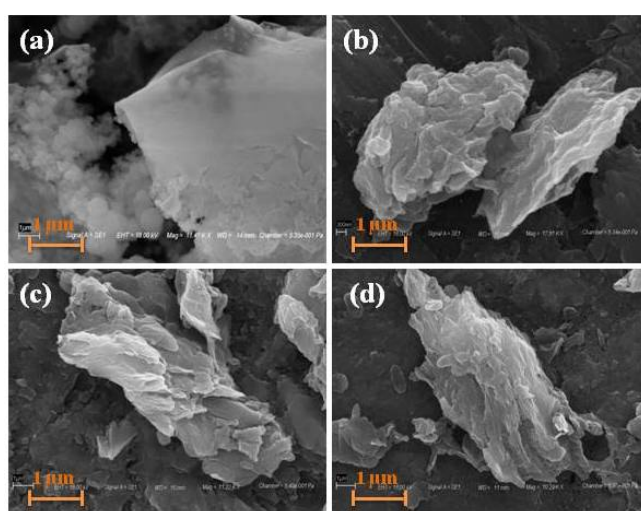


Figure S6: SEM images of (a) HGO and reduced GO with (b) pristine *K*-sap (1), (c) charcoal treated *K*-sap (2) and (d) *K*-sap containing only metal salts (3).

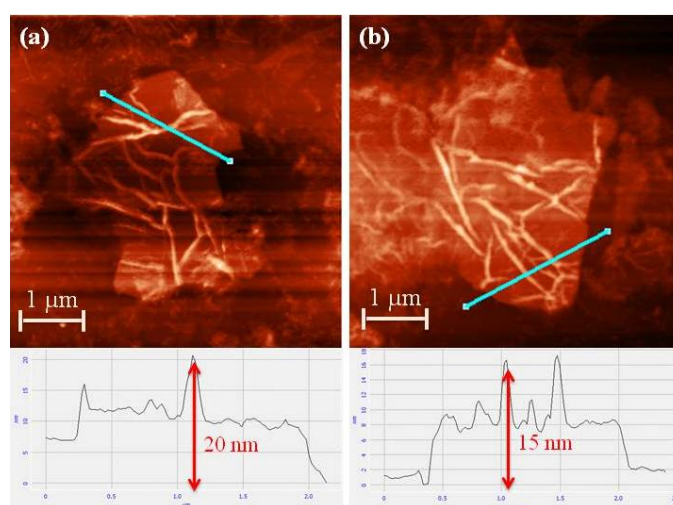


Figure S7: AFM images of (a) Pristine HGO and (b) reduced GO with pristine *k*-sap.

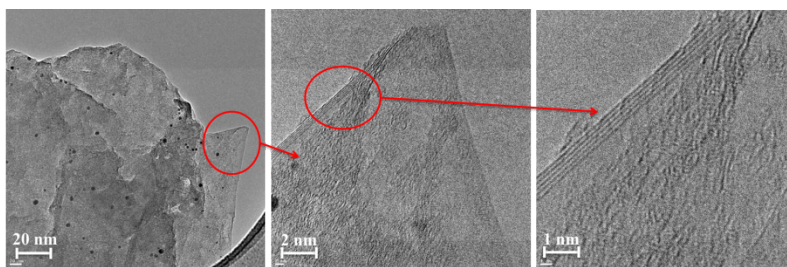
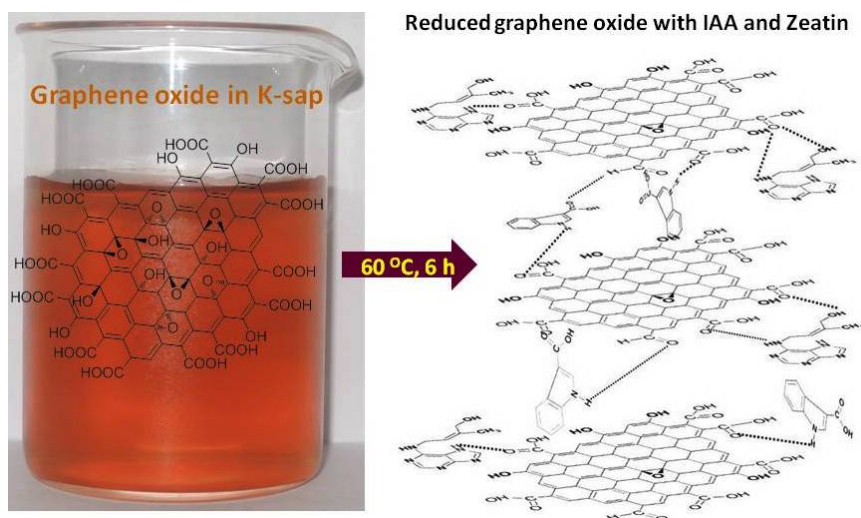


Figure S8. HR-TEM image of reduced GO obtained using K-sap (3).



Scheme S2: Selective partition of plant growth regulators in GO reduced using K-sap (1).

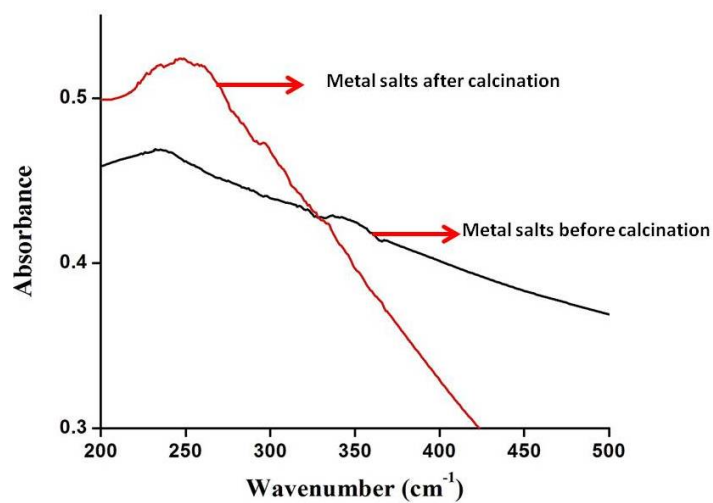


Figure S9: UV-Vis of GO reduced using mixture of metal salts pre and post calcination

Table S1: Constituent of *Kappaphycus* sap after the recovery of rGO

Sr. No.	Constituent	Amount in ppm
1	Indole 3-acetic acid (IAA)	19.00
2	Zeatin	11.65
3	GA ₃	14.11
4	Choline	58.00
5	Glycine betaine	74.21
6	Na ⁺	191.0
7	K ⁺	33895
8	Ca ²⁺	345.0
9	Mg ²⁺	1212.0
10	Zn ²⁺	3.9
11	Fe ²⁺	90.1
12	P ³⁺	17.45

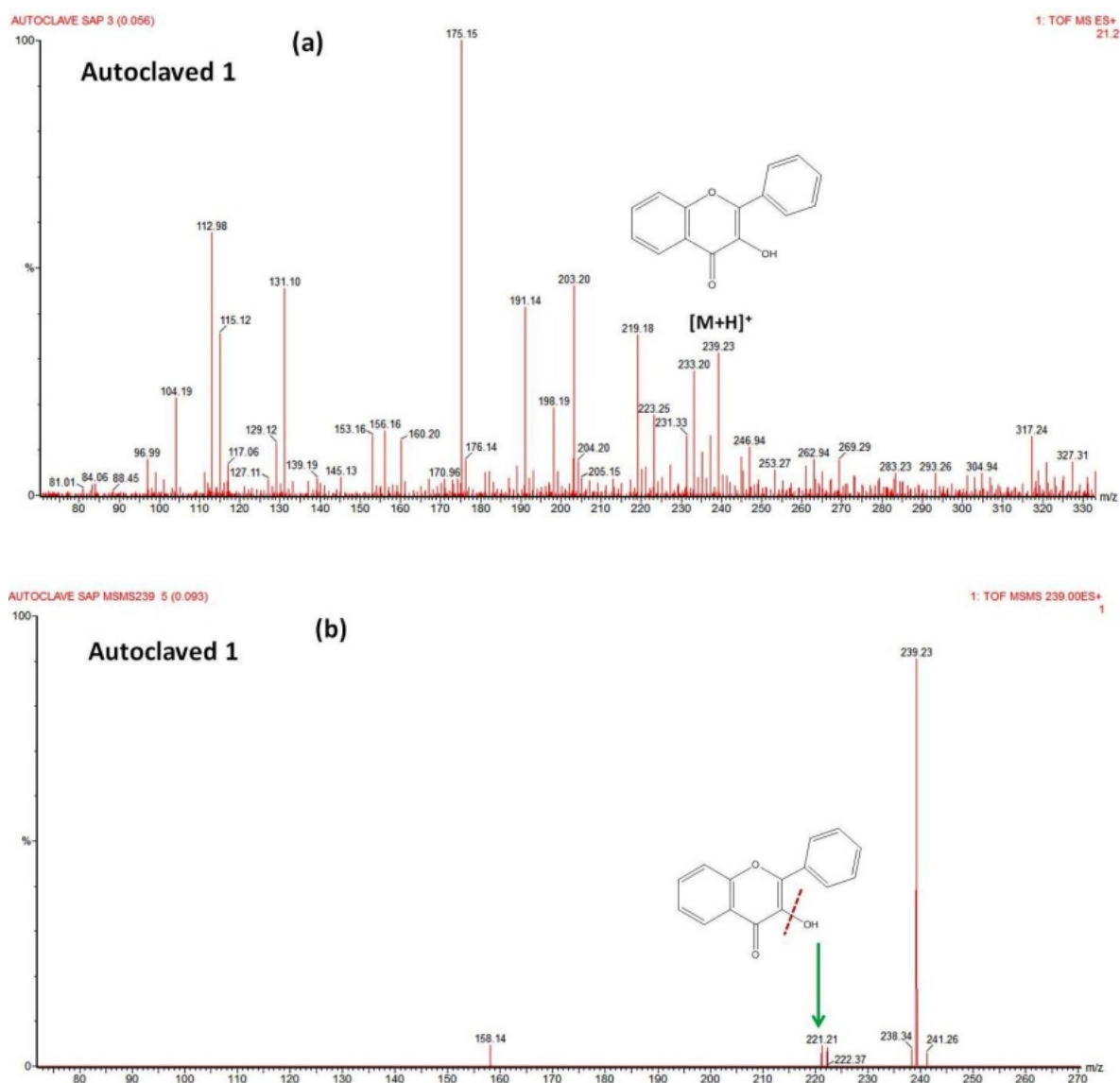
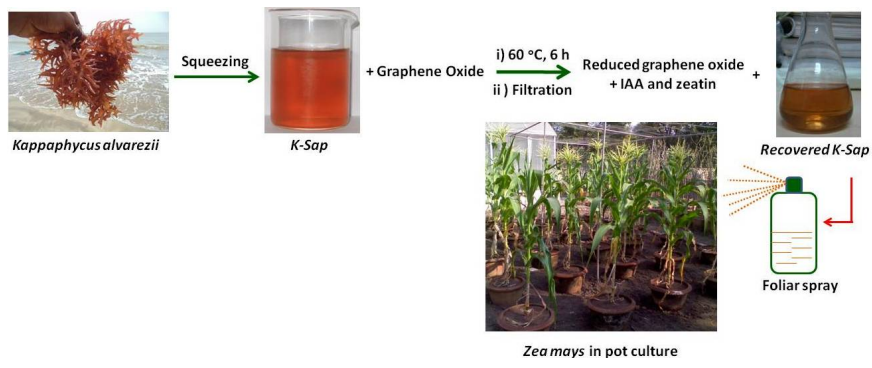


Figure S10: (a) ESI-MS analysis of autoclaved pristine sap (**1**) and MS/MS of m/z of 239 (b)



Scheme S3: Application of the sap as foliar spray after the recovery of rGO.