Supporting information

Fig. S1 DPV curves of the bare GC electrode (a), the CB-nafion/Fc/CB/GC electrode (b), the MWNT-nafion/Fc/MWNT/GC electrode (c), and the modified CB-MWNT-nafion/Fc/CB-MWNT/GC electrode (d) in 250 μM IAA and 250 μM SA in PBS (pH=7.4, 10 mM).

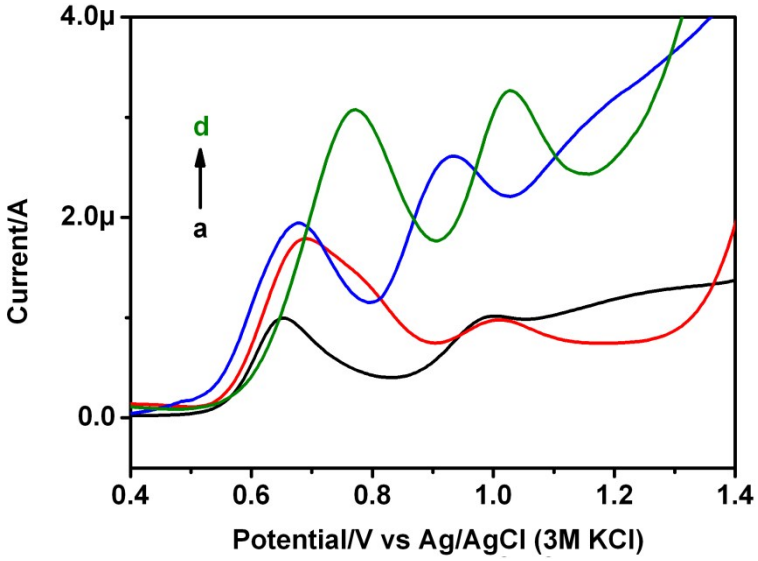

Fig. S2 Optimization of the modification process with different concentrations of CB using 250 μM SA.

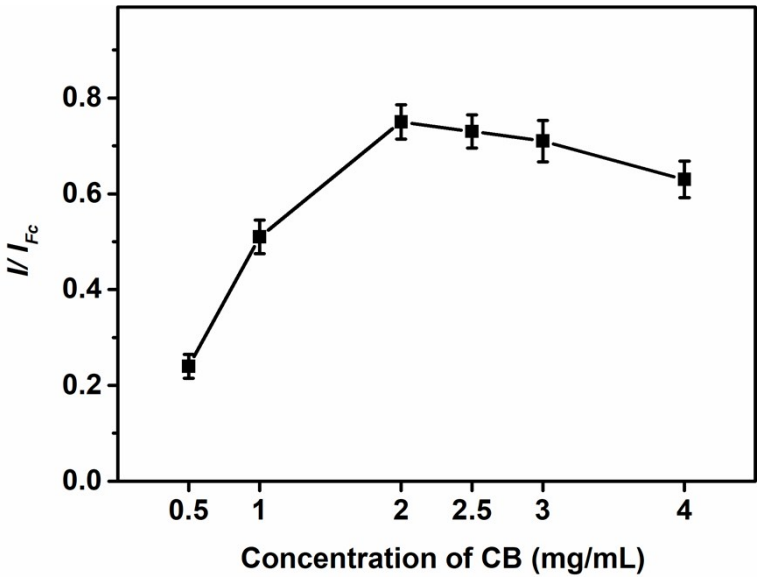

Fig. S3 Optimization of the modification process with different concentrations of MWNT using 250 μM IAA.

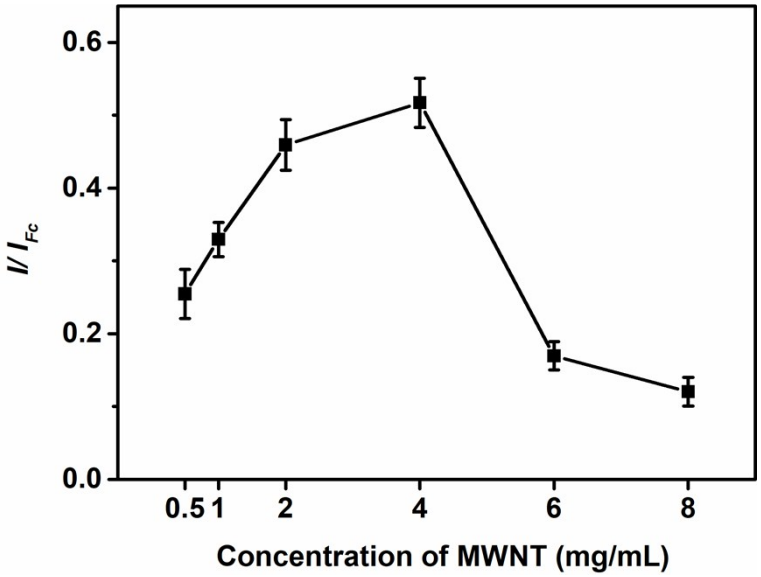

Fig. S4 The DPV curves of IAA and SA using six freshly prepared CB-MWNT-nafion/Fc/CB-MWNT/GC electrodes for 250 μM IAA and 250 μM SA in PBS (pH=7.4, 10 mM).

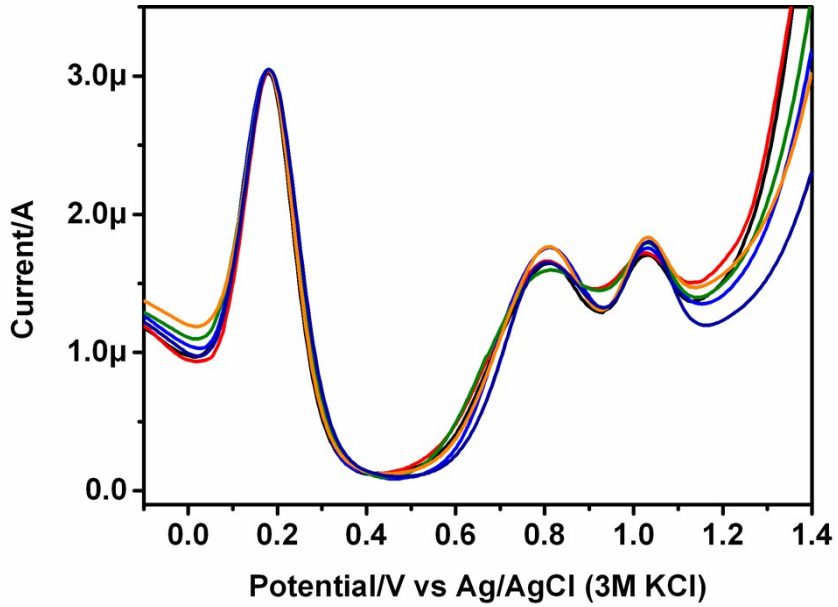

Table S1

Comparisons of the previous reported IAA detection methods.

Detector	Method	Linear range	LOD	References
Multiwalled carbon nanotubes-chitosan modified glassy carbon electrode	DPV	0.67–48.82 μM	0.1 μM	[1]
Carbon tape modified electrode	DPV	1–100 μM	0.1 μM	[2]
SiO_2@AuNPs modified glassy carbon electrode	DPV	0.2–55 μM	5.19 nM	[3]
Hemin/reduced graphene oxide composite modified glassy carbon electrode	i-t	0.1-43 μM	74.0 nM	[4]
multiwalled carbon nanotubes and sucrose derived carbon modified glassy carbon electrode	DPV	0.1-30 μM	29.6 nM	[5]
3-mercaptopropionic acid stabilized CdS/reduced graphene oxide nanocomposites modified ITO electrode	Photocurrent	0.57 nM–5.71 μM	0.29 nM	[6]
4-allyloxy-7-aminocoumarin polymer membrane	Fluorescence	1–1000 μM	0.90 μM	[7]

Ionic liquid-modified silica sorbent	HPLC	1–200 μM	0.91 μM	[8]
Carbon felt detector	HPLC with electrochemical detection	1-100 mM	1.1 mM	[9]
Symmetry C8 column	Reversed phase high performance liquid chromatography (RP-HPLC) with fluorescence	0.36-71.4 μM	85.6 nM	[10]
6-Oxy-(acetyl piperazine) fluorescein label	Capillary electrophoresis with laser-induced fluorescence (CE–LIF)	0.02–1.0 μM	4.8 nM	[11]
Tetraazacalix[2]arene[2] triazine-modified silica gel	Open-tubular capillary electrochromatography	0.29-11.4 μM	45.7 nM	[12]
Modified CB-MWNT-nafion/Fc/CB-MWNT/GC electrode	DPV	25.0–1000.0 μM	1.99 μM	This work

Table S2

Comparisons of the previous reported SA detection methods.

Detector	Method	Linear range	LOD	References
Multiwalled carbon nanotubes-chitosan modified glassy carbon electrode	DPV	0.67–48.82 μM	0.1 μM	[1]
Carbon tape modified electrode	DPV	1–100 μM	0.1 μM	[2]
Pt nanoparticles modified Pt disk electrode	i-t	20–500 μM	6.4 μM	[13]
Nickel titanate nanoceramic modified carbon paste electrode	DPV	3.0–40.0 μM, 40.0–1000.0 μM	68.0 nM	[14]
Screen printed electrodes	SWV	16–300 μM	5.6 μM	[15]
Pencil trace modified carbon tape electrode	SWV	0.1–100 μM	0.1 μM	[16]
Nucleosil 100-5 C18 column	Liquid chromatographic–tandem mass spectrometric (LC–MS/MS)	0.72–7.2 μM, 72–360 μM	0.36 μM	[17]

Agilent Eclipse C18 analytical column	Liquid chromatographic–tandem mass spectrometric (LC–MS/MS)	36.2–362 nM	22 nM	[18]
Polymeric adsorbent (Super Q) filters	Vapor-phase extraction and gas chromatography-positive ion chemical ionization-mass spectrometry	36.2 nM-7.24 μM	3.6 nM	[19]
ProntoSIL 120 C18 ace-EPS column protected by C8 guard column	Isocratic high-pressure liquid chromatography with post-column hydrolysis and fluorescence	0.36–144.8 μM	0.11 μM	[20]
Mercaptopropionic acid (MPA)–capped cadmium telluride (CdTe) quantum dot (QDs) fluorescent probes	Fluorescence	3.62–289.6 μM	1.09 μM	[21]
Disposable terbium (III) salicylate complex imprinted membrane	Solid phase surface fluorescence	144.8 μM–3.62 mM	0.1 μM	[22]
Modified CB-MWNT-nafion/Fc/CB-MWNT/GC electrode	DPV	25.0–1000.0 μM	3.3 μM	This work

Table S3

Intra-assay (six measurements for one modified electrode) and inter-assay (six freshly prepared electrodes) of IAA and SA.

IAA	Intra-assay		Inter-assay		SA	Intra-assay		Inter-assay	
(μM)	Mean	CV	Mean	CV	(μM)	Mean	CV	Mean	CV
50	49.18	2.47	48.89	3.63	50	49.08	3.08	48.91	4.02
250	241.13	3.32	238.77	5.18	250	245.88	3.12	246.76	4.95

CV represents coefficient of variation.

Table S4

Results obtained by the developed microsensor for detecting IAA and SA in the stem of soybean seedlings.

Time (h)	Control				Salt stress			
	IAA (μM)	SD	SA (μM)	SD	IAA (μM)	SD	SA (μM)	SD
0	69.98	6.59	317.89	18.12	64.08	6.28	314.91	19.32
12	61.11	6.05	324.28	19.18	124.69	6.67	336.83	14.04
24	77.52	7.13	300.96	17.88	40.35	3.11	427.40	19.12
36	73.75	6.28	302.25	14.20	33.56	1.63	740.30	15.47

SD represents standard deviation.

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