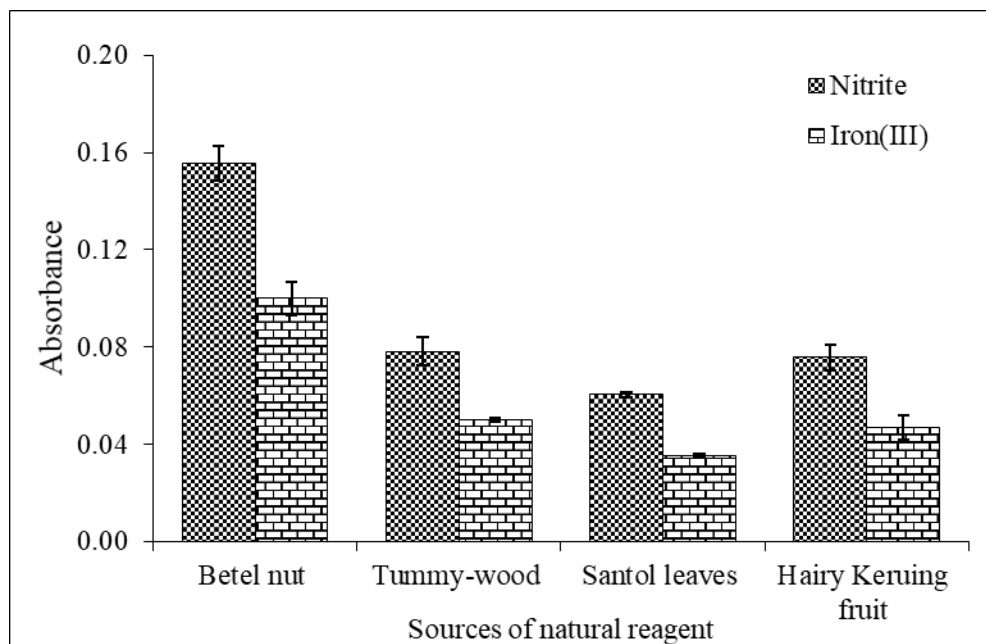


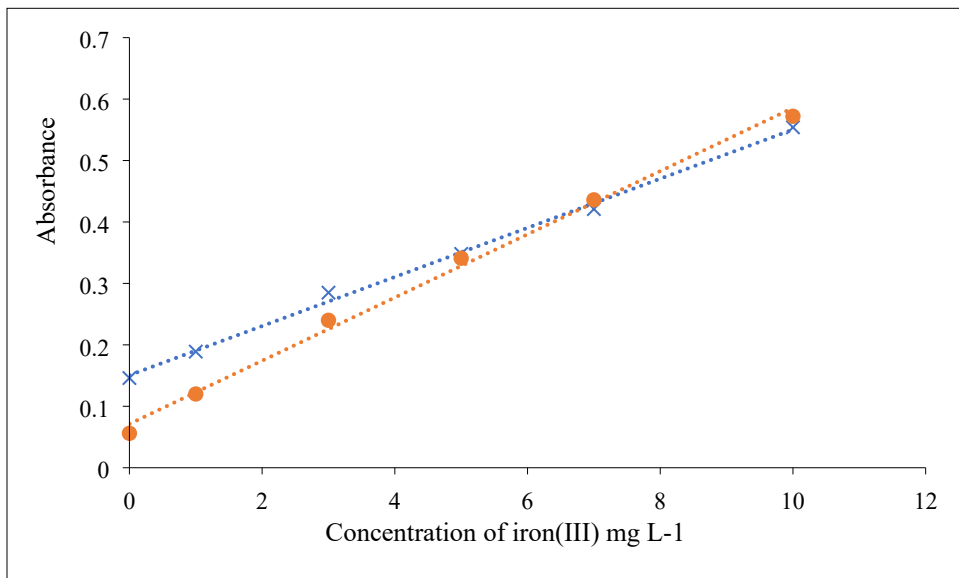
## Supplementary Materials

### Dual determination of nitrite and iron by a single greener sequential injection spectrophotometric system employing a simple single aqueous extract from *Areca catechu* Linn. serving as natural reagents

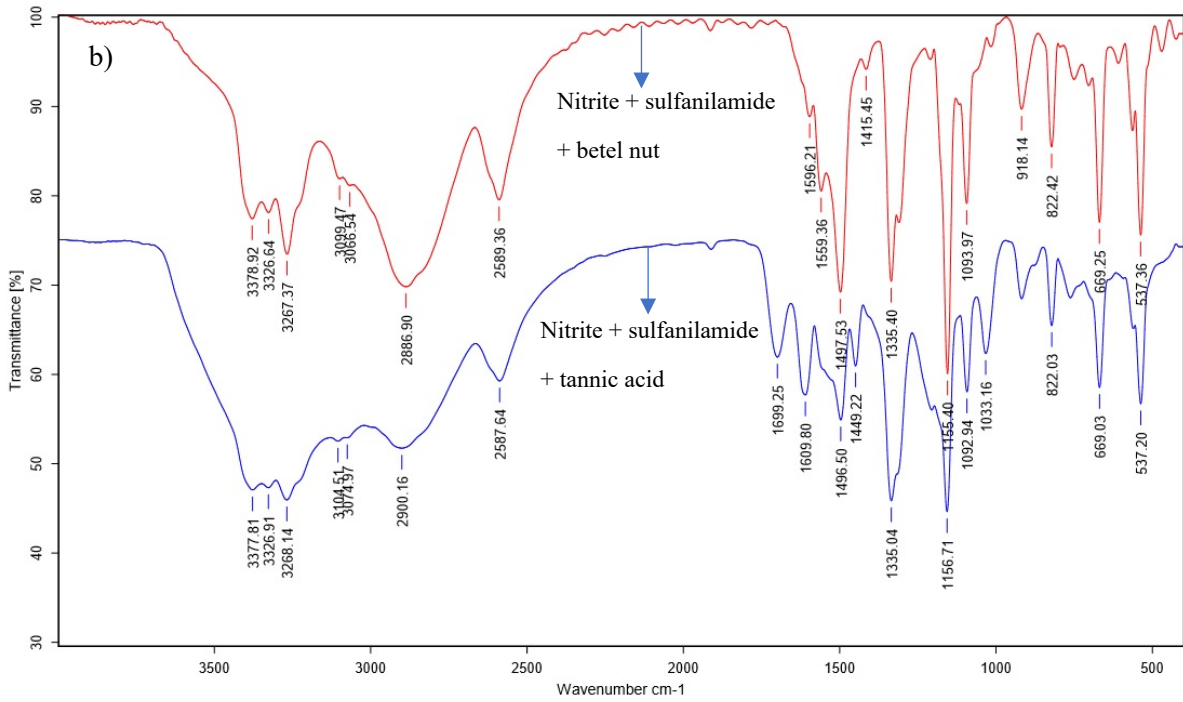
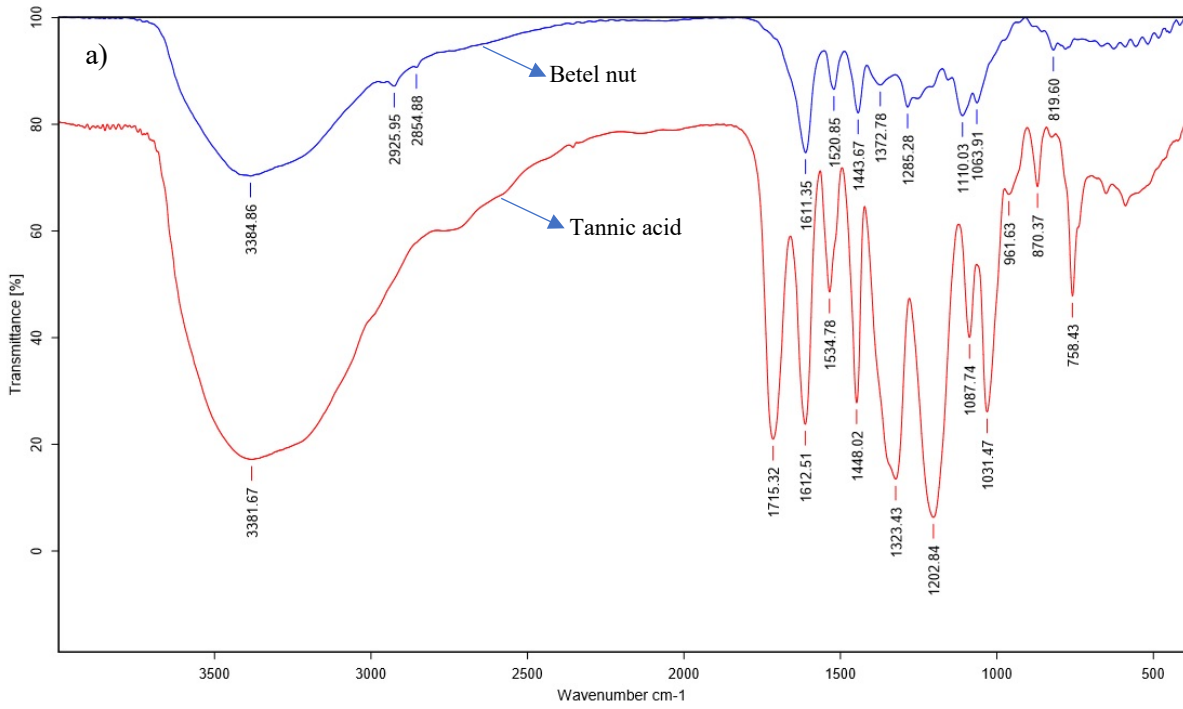
Kraingkrai Ponghong<sup>a</sup>, Watsaka Siringkhawut<sup>a</sup>, Chang Young Lee<sup>b</sup>, Norio Teshima<sup>c</sup>, Kate Grudpan<sup>d</sup>, and Sam-ang Supharoek<sup>e,f,\*</sup>

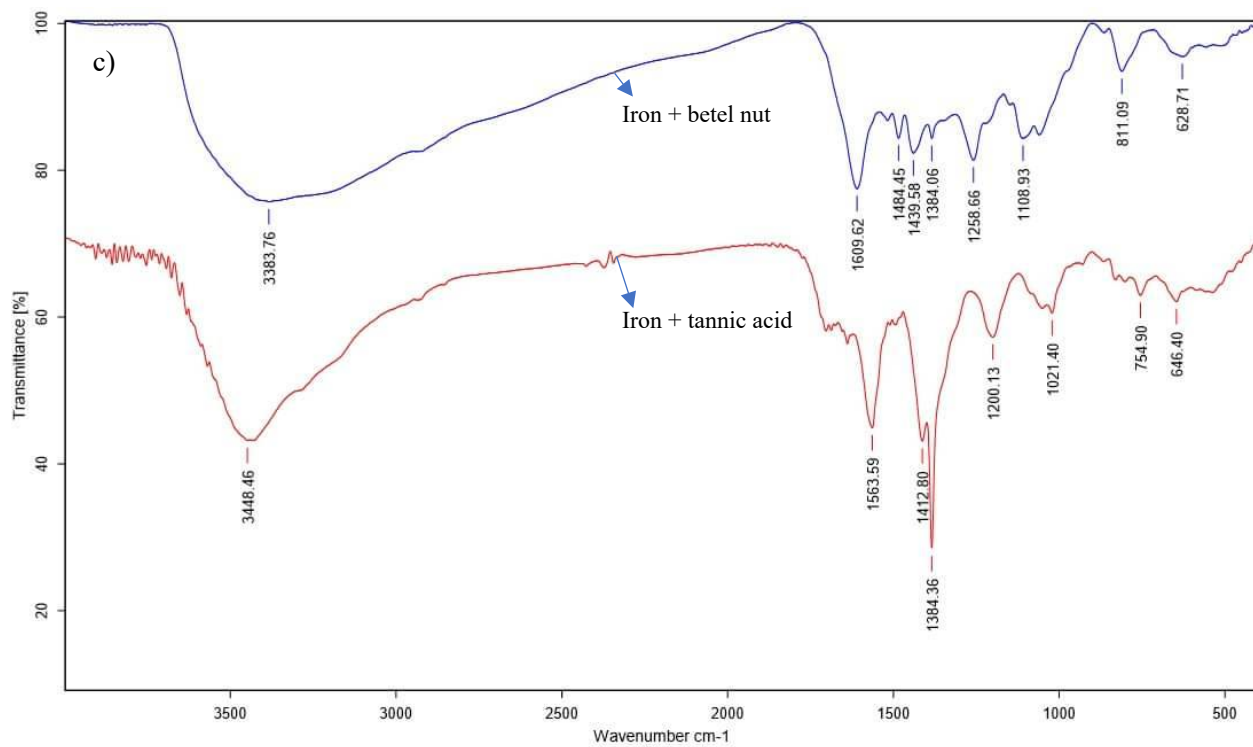


**Fig. S1** Absorbance of azo dye obtained from different plant sources



**Fig. S2** Absorbance of iron(III) complex at ○ 560 nm and □ 430 nm





**Fig. S3** FTIR spectra; a) natural reagent and tannic acid standard; b) nitrite reaction with tannic acid and c) iron(III) reaction with natural reagent.

**Table S1** Analytical characteristics of the proposed method and other reports for determination of nitrite and iron.

Technique	Reagent	Target	Linear range	Estimated analysis time (min/sample)	LOD	Sample	Ref.
UV-Vis micro-spectrophotometry with liquid-phase microextraction	Griess reagent	Nitrite	10-100 $\mu\text{g L}^{-1}$	7	1.5 $\mu\text{g L}^{-1}$	Environmental water	[24]
Spectrophotometry-based microplate method	Griess reagent	Nitrite	1-400 $\text{ng mL}^{-1}$	-	2.5 $\text{ng mL}^{-1}$	Urine and blood	[25]
Solid phase spectrophotometry	Griess reagent	Nitrite and nitrate	0-140 $\text{ng mL}^{-1}$ (nitrite) 0-560 $\text{ng mL}^{-1}$ (nitrate)	-	nitrite (5 $\text{ng mL}^{-1}$ ) and nitrate (40 $\text{ng mL}^{-1}$ )	Water	[26]
Vortex-assisted liquid-phase microextraction with UV-vis spectrophotometry	-	nitrite	0.1-300 $\text{ng mL}^{-1}$	-	0.035 $\text{ng mL}^{-1}$	Meat and chicken products	[27]
Sequential injection lab-on-valve spectrophotometry	2-(5-bromo-2-pyridylazo)-5-[N-n-propyl-N-(3-sulfopropyl)amino]aniline (5-Br-PSAA)	Iron(II) and copper (II)	Copper (0.1-2 $\text{mg L}^{-1}$ ) iron (0.1-5 $\text{mg L}^{-1}$ )	3 (Copper and iron)	copper (50 $\mu\text{g L}^{-1}$ ) iron (25 $\mu\text{g L}^{-1}$ )	Industrial wastewater	[41]
Spectrophotometry	Natural reagent extracted from <i>Leucaena leucocephala</i> (Lam.)	Iron(III)	0-10 $\text{mg L}^{-1}$	-	0.2 $\text{mg L}^{-1}$	Blood tonic	[42]
Colorimetric assay with ultrasound-assisted extraction	Natural reagent extracted from pomegranate peel	Iron(III)	1.0 - 10.0 $\text{mg L}^{-1}$	-	0.31 $\text{mg L}^{-1}$	Pharmaceutical formulations	[43]
Flow injection-spectrophotometry	Natural reagent extracted from <i>Phyllanthus emblica</i> Linn.	Iron(III)	0.50-20.0 $\text{mg L}^{-1}$	0.7	0.31 $\text{mg L}^{-1}$	Pharmaceutical preparations and water samples	[44]
Sequential injection spectrophotometry	Astilbin extracted from Smilax china L. root	Iron(III) and manganese	Iron(III) (1-8 $\text{mg L}^{-1}$ ) and manganese (0.5-4 $\text{mg L}^{-1}$ )	Iron(III) 5 Mn (II) 5	0.05 $\text{mg L}^{-1}$ iron(III) and 0.20 $\text{mg L}^{-1}$ manganese(II)	Groundwater	[38]
Flow injection-Spectrophotometry	Griess reagent for Nitrite/Nitrate	nitrite/nitrate and	nitrite/nitrate (50-400 $\mu\text{g L}^{-1}$ ), iron(II)/ iron(III)	1.5	$\text{NO}_2^-$ (18 $\mu\text{g L}^{-1}$ ) $\text{NO}_3^-$ (30 $\mu\text{g L}^{-1}$ ) $\text{Fe}^{2+}$ (0.5 $\mu\text{g L}^{-1}$ )	Water	[28]

Technique	Reagent	Target	Linear range	Estimated analysis time (min/sample)	LOD	Sample	Ref.
	2,2-bipyridine and 1-10-phenanthroline for Iron(II)/Iron(III)	iron(II)/iron(III)	(0.5-6.0 mg L <sup>-1</sup> )		Fe <sup>3+</sup> (0.5 µg L <sup>-1</sup> )		
This method	Natural reagent extracted from betel nut	Nitrite and iron(III)	Nitrite (1.0-5.0 mg L <sup>-1</sup> ) Iron(III) 1.0-10.0 mg L <sup>-1</sup> )	8 (nitrite and iron)	Nitrite 0.04 mg L <sup>-1</sup> Iron 0.05 mg L <sup>-1</sup>	Surface water	This method