Table S1. Chromatographic conditions tested

No	Stationary phase	Mobile phase	Volume composition of mobile phase
1	RP18W do HPTLC	acetonitrile + buffer pH=5.0	22.5:77.5
2	Silica gel 60F_{254}	acetone + chloroform + ammonia	10 : 40: 0.5
3	Silica gel 60F_{254}	n-hexane + acetone + ammonia	25 : 25: 0.5
4	Silica gel 60F_{254}	chloroform + toluene + ethyl acetate + methanol + acetic acid 80%	6:6:1:2:0.1
5	Silica gel 60F_{254}	chloroform + toluene + ethyl acetate + methanol + acetic acid 80%	6:6:2:2:0.1
6	Silica gel 60F_{254}	chloroform + toluene + ethyl acetate + ethanol + acetic acid 80%	6:6:6:2:0.2
7	Silica gel 60F_{254}	chloroform + toluene + ethyl acetate + ethanol + acetic acid 80%	18: 18: 7.5: 5.0: 0.3
8	Silica gel 60F_{254}	chloroform + toluene + ethyl acetate + ethanol + acetic acid 80%	3:3:3:2:0.1
9	Silica gel 60F_{254}	chloroform + toluene + ethyl acetate + ethanol + acetic acid 80%	6:6:2:2:0.1
10	Silica gel 60F_{254}	chloroform + toluene + ethyl acetate + ethanol + acetic acid 80%	1:3:3:2:0.1
11	Silica gel 60F_{254}	chloroform + toluene + ethyl acetate + ethanol + acetic acid 80%	3:1:3:2:0.2
12	Silica gel 60F_{254}	chloroform + toluene + ethyl acetate + ethanol + acetic acid 80%	3:3:3:2:0.1
13	Silica gel 60F_{254}	chloroform + toluene + ethyl acetate + ethanol + acetic acid 80%	6:6:2:2 :0.1
14	Silica gel 60F_{254}	chloroform + toluene + ethyl acetate + ethanol + acetic acid 80%	6:6:2.5:2:0.1
15	Silica gel 60F_{254}	chloroform + toluene + ethyl acetate + ethanol + acetic acid 80%	5.5:6:2.5:2:0.1
16	Silica gel 60F_{254}	chloroform + toluene + ethyl acetate + ethanol + acetic acid 80%	2:3:3:2:0.1
17	Silica gel 60F_{254}	chloroform + toluene + ethyl acetate + ethanol + acetic acid 80%	1:3:2:2:0.1
18	Silica gel 60F_{254}	chloroform + toluene + ethyl acetate + ethanol + acetic acid 80%	2:3:2:2:0.1
19	Silica gel 60F_{254}	chloroform + toluene + ethyl acetate + ethanol + acetic acid 80%	1:3:1.5:2:0.1

20	Silica gel 60F_{254}	chloroform + toluene + ethyl acetate + ethanol + acetic acid 80%	6:6:2.5:1.5:0.1
21	Silica gel 60F_{254}	chloroform + toluene + ethyl acetate + ethanol + acetic acid 80%	6:6:2:2:0.1
22	Silica gel 60F_{254}	chloroform + toluene + ethyl acetate + methanol + glacial acetic acid	6:6:1:2:0.1

Table S2. The factors and their levels investigated in robustness test.

Symbol	Factors	Method Condition	Levels	
			+	-
X_1	Temperature of plate activation [^oC]	120	130	110
X_2	Extraction time [min]	30	31	29
X_3	Saturation time of the chamber [^oC]	15	18	12
X_4	Volume of chloroform [mL]	18.0	18.2	17.8
X_5	Volume of toluene [mL]	18.0	18.2	17.8
X_6	Volume of ethyl acetate [mL]	7.5	7.6	7.4
X_7	Volume of ethanol [mL]	2.0	2.1	1.9

Table S3 Experimental design matrix (2^3) for robustness test.

Experiment No	X_1	X_2	X_3	X_4	X_5	X_6	X_7
1	+	+	+	+	+	+	+
2	+	+	-	+	-	-	-
3	+	-	+	-	-	+	-
4	+	-	-	-	+	-	+
5	-	+	+	-	+	-	-
6	-	+	-	-	-	+	+
7	-	-	+	+	-	-	+
8	-	-	-	+	+	+	-

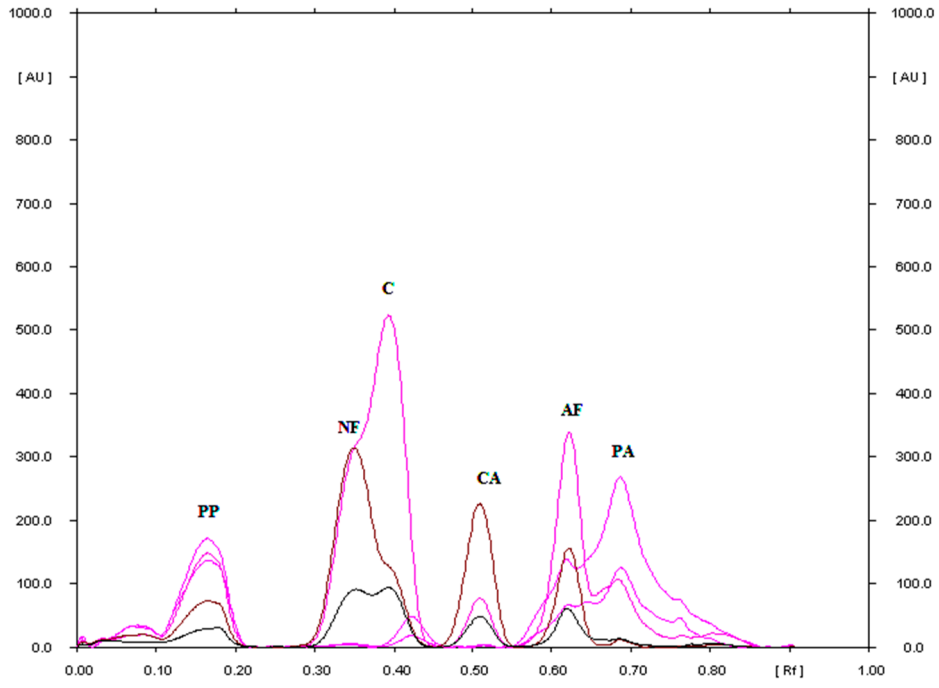

Figure S1. Densitogram of a mixture of standard substances: propyphenazone (PP), paracetamol (PA), caffeine (C), 4-chloroacetanilide (CA), 4-aminophenol (AF), and 4-nitrophenol (NF) made in the range of 250-350 nm, using RP18W plate and mobile phase: acetonitrile + buffer pH=5.0 (22.5:77.5, v/v).

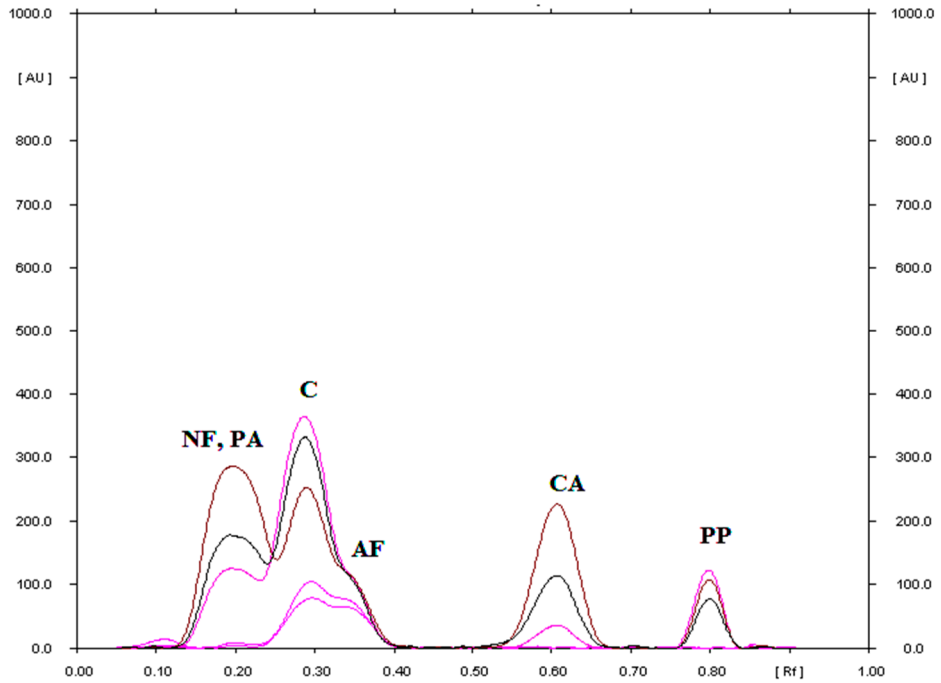

Figure S2. Densitogram of a mixture of standard substances: propyphenazone (PP), paracetamol (PA), caffeine (C), 4-chloroacetanilide (CA), 4-aminophenol (AF), and 4-nitrophenol (NF) made in the range of 250-350 nm, using silica gel $60F_{254}$ plate and mobile phase: acetone + chloroform + ammonia (10 : 40: 0.5, v/v).

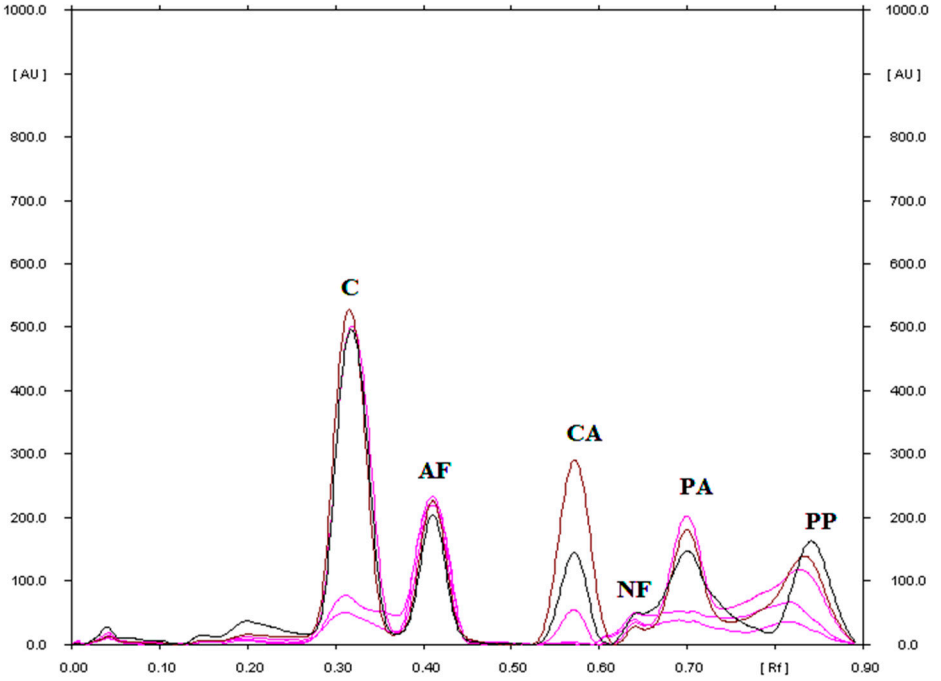

Figure S3. Densitogram of a mixture of standard substances: propyphenazone (PP), paracetamol (PA), caffeine (C), 4-chloroacetanilide (CA), 4-aminophenol (AF), and 4-nitrophenol (NF) made in the range of 250-350 nm, using silica gel $60F_{254}$ plate and mobile phase: *n*-hexane + acetone + ammonia (25 : 25: 0.5, v/v).

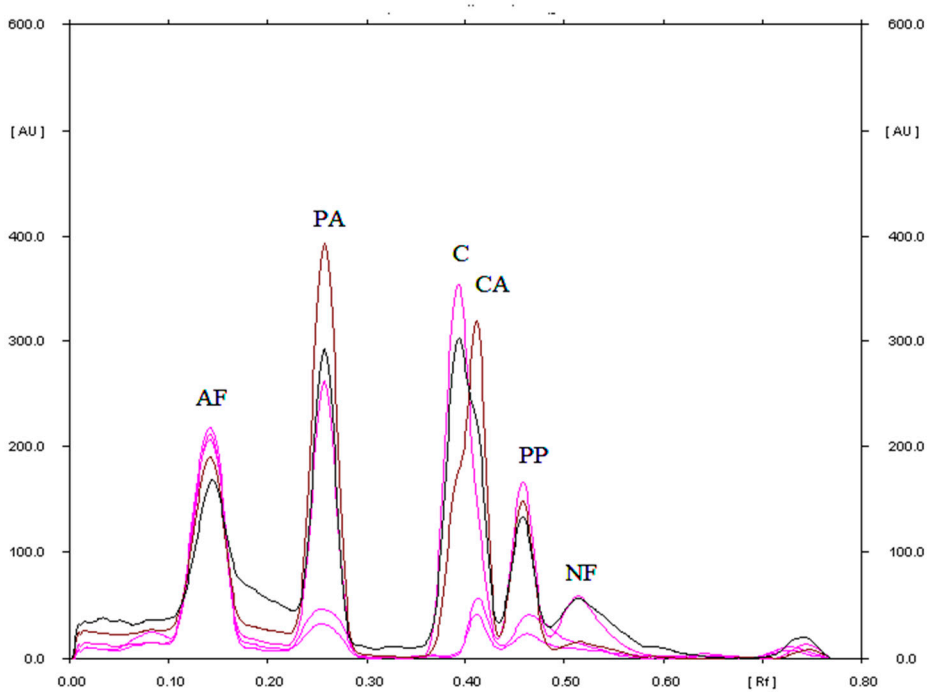

Figure S4. Densitogram of a mixture of standard substances: propyphenazone (PP), paracetamol (PA), caffeine (C), 4-chloroacetanilide (CA), 4-aminophenol (AF), and 4-nitrophenol (NF) made in the range of 250-350 nm, using silica gel 60F_{254} plate and mobile phase: chloroform + toluene + ethyl acetate + methanol + acetic acid 80% (6:6:1:2:0.1, v/v).

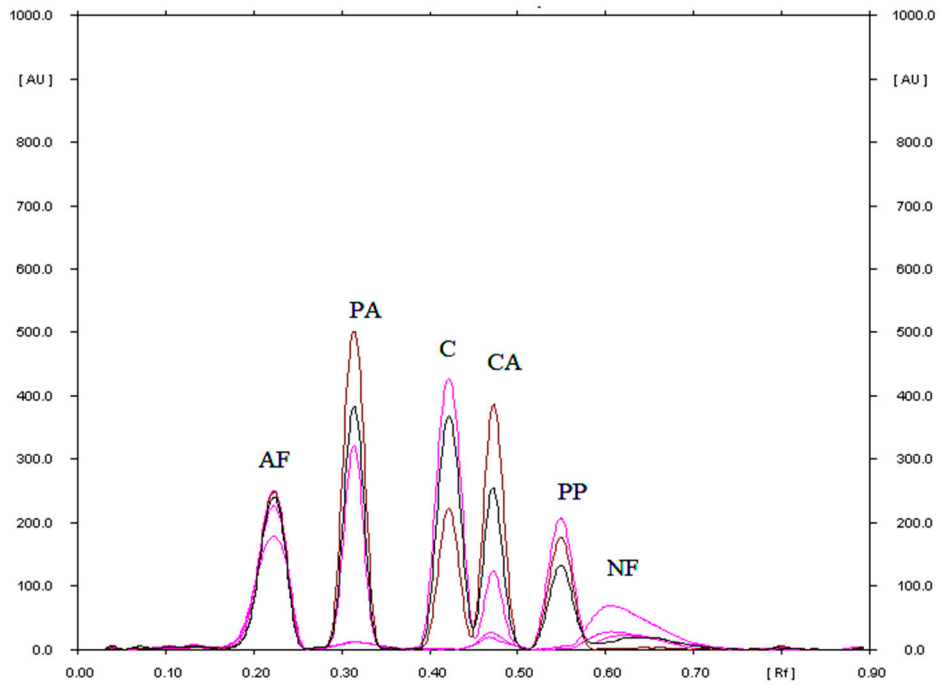

Figure S5. Densitogram of a mixture of standard substances: propyphenazone (PP), paracetamol (PA), caffeine (C), 4-chloroacetanilide (CA), 4-aminophenol (AF), and 4-nitrophenol (NF) made in the range of 250-350 nm, using silica gel 60F_{254} plate and mobile phase: chloroform + toluene + ethyl acetate + methanol + acetic acid 80% (6:6:2:2:0.1, v/v).

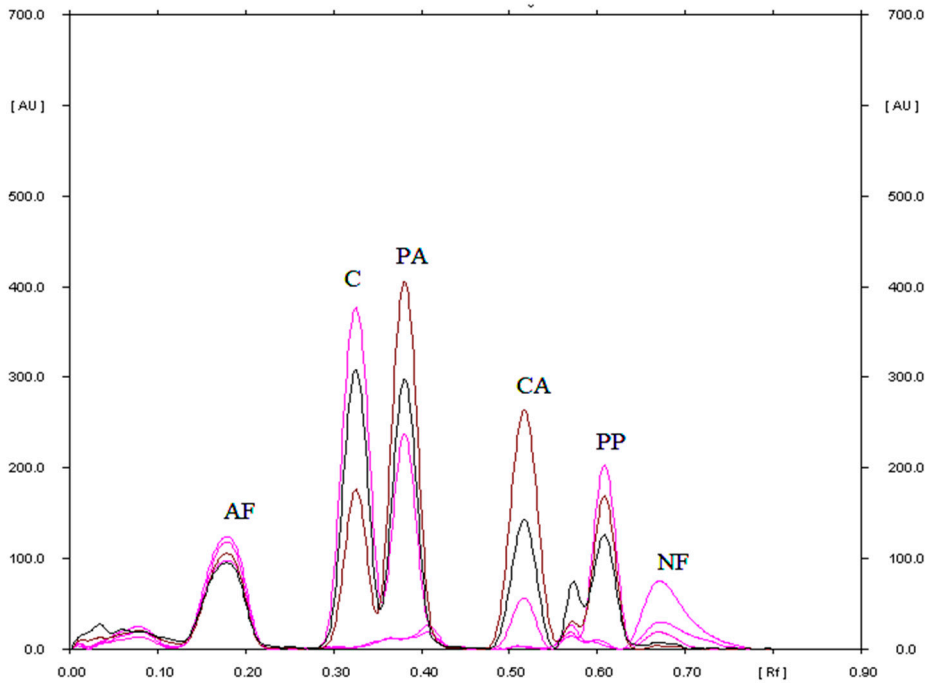

Figure S6. Densitogram of a mixture of standard substances: propyphenazone (PP), paracetamol (PA), caffeine (C), 4-chloroacetanilide (CA), 4-aminophenol (AF), and 4-nitrophenol (NF) made in the range of 250-350 nm, using silica gel $60F_{254}$ plate and mobile phase: chloroform + toluene + ethyl acetate + ethanol + acetic acid 80% (6:6:6:2:0.2, v/v).

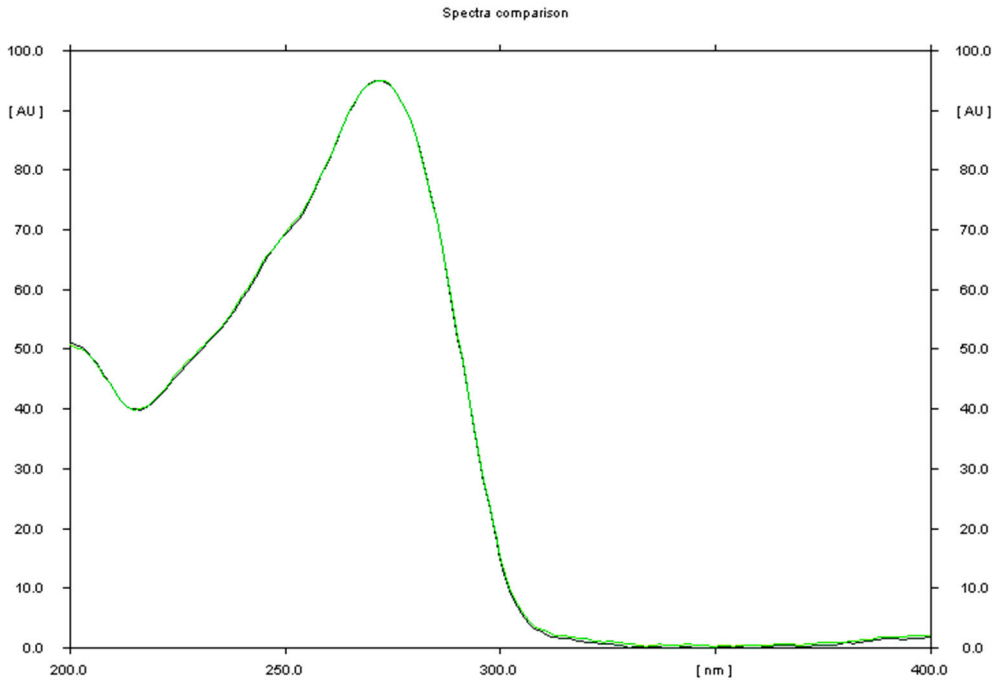

Figure S7. Comparison of the spectrodensitogram obtained for the standard substance propyphenazone with the spectrodensitogram obtained for propyphenazone, the source of which was sample of Saridon.

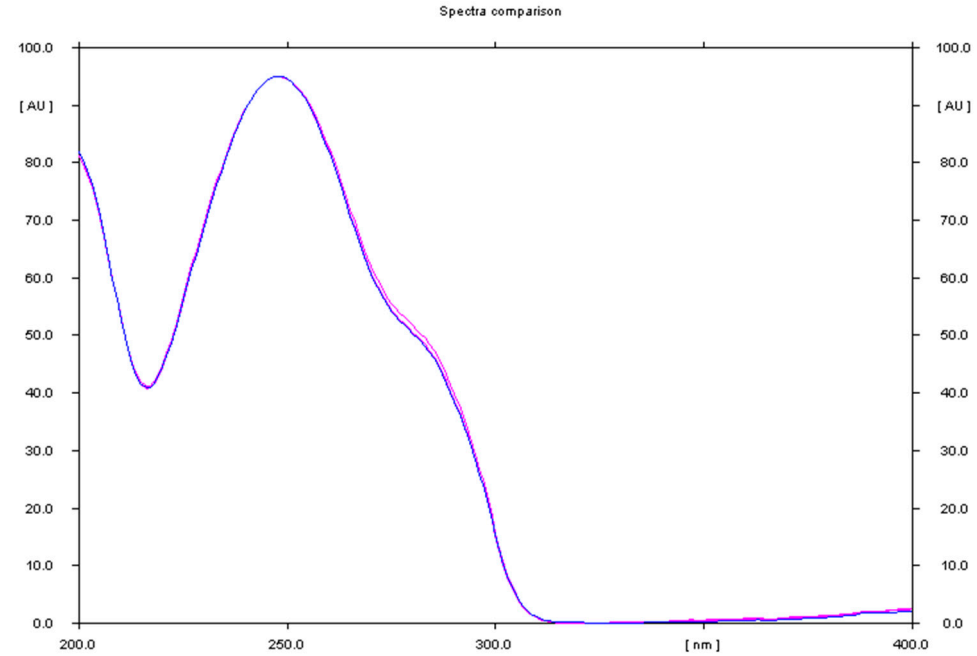

Figure S8. Comparison of the spectrodensitogram obtained for the standard substance paracetamol with the spectrodensitogram obtained for paracetamol, the source of which was sample of Saridon

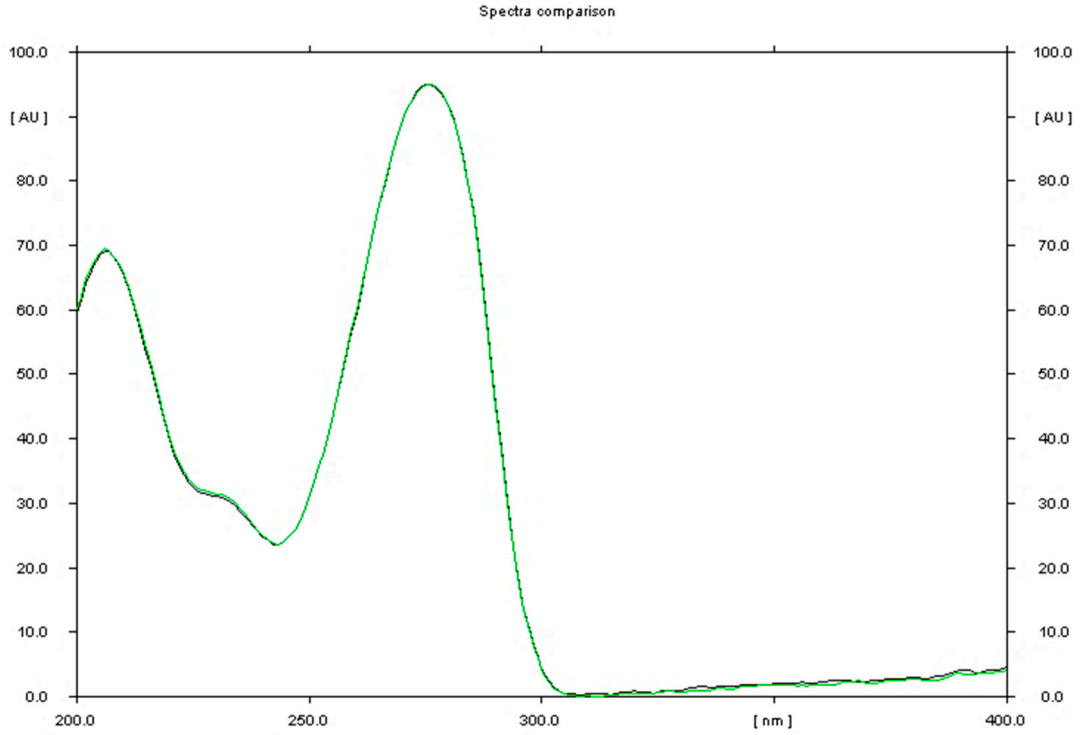

Figure S9. Comparison of the spectrodensitogram obtained for the standard substance caffeine with the spectrodensitogram obtained for caffeine, the source of which was sample of Saridon

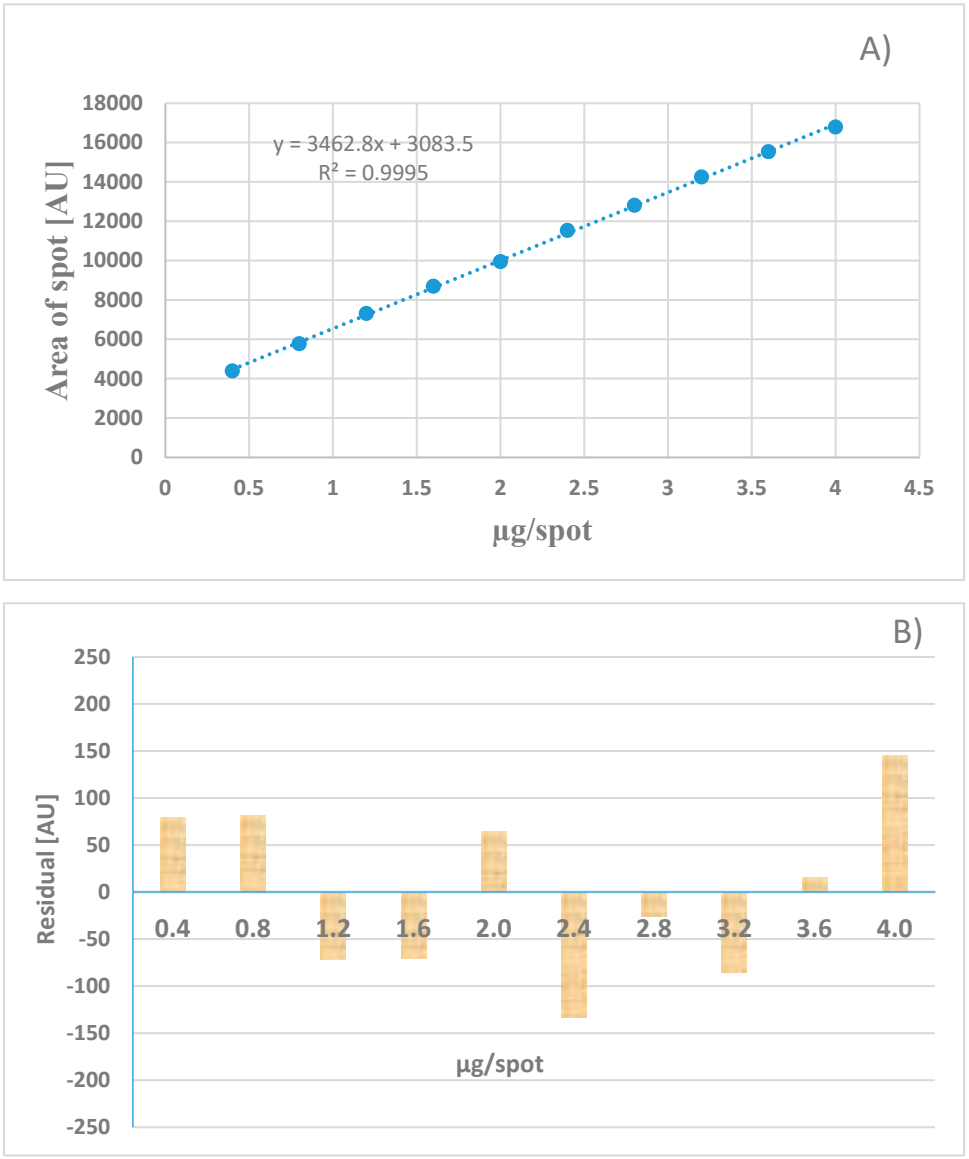

Figure S10. Calibration plot **(A)** and plot of residuals **(B)** for paracetamol (PA) in the linear working range mobile phase: chloroform + toluene + ethyl acetate + ethanol + acetic acid (80%) in a volume ratio of 18: 18: 7.5: 5.0: 0.3.

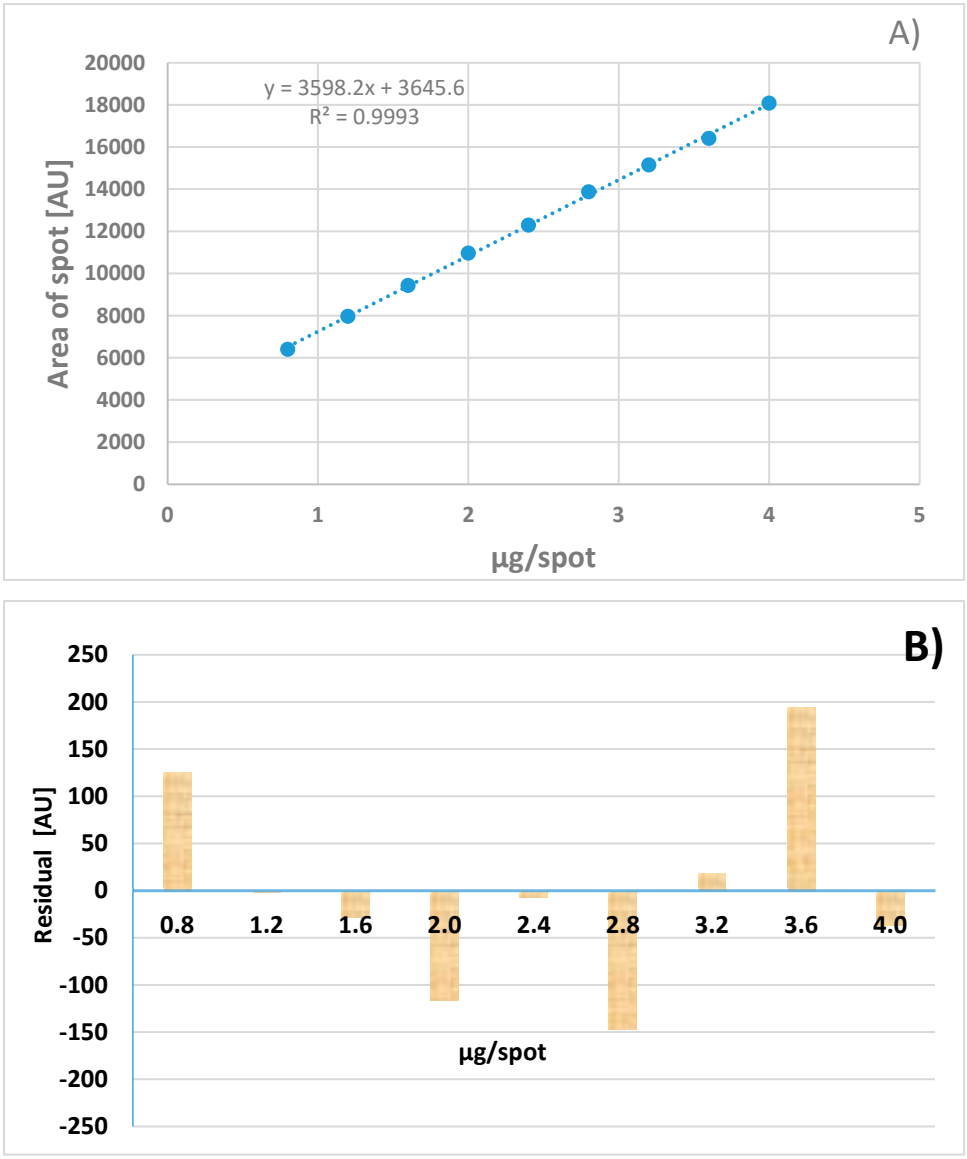

Figure S11. Calibration plot **(A)** and plot of residuals **(B)** for propyphenazone (PP) in the linear working range mobile phase: chloroform + toluene + ethyl acetate + ethanol + acetic acid (80%) in a volume ratio of 18: 18: 7.5: 5.0: 0.3.

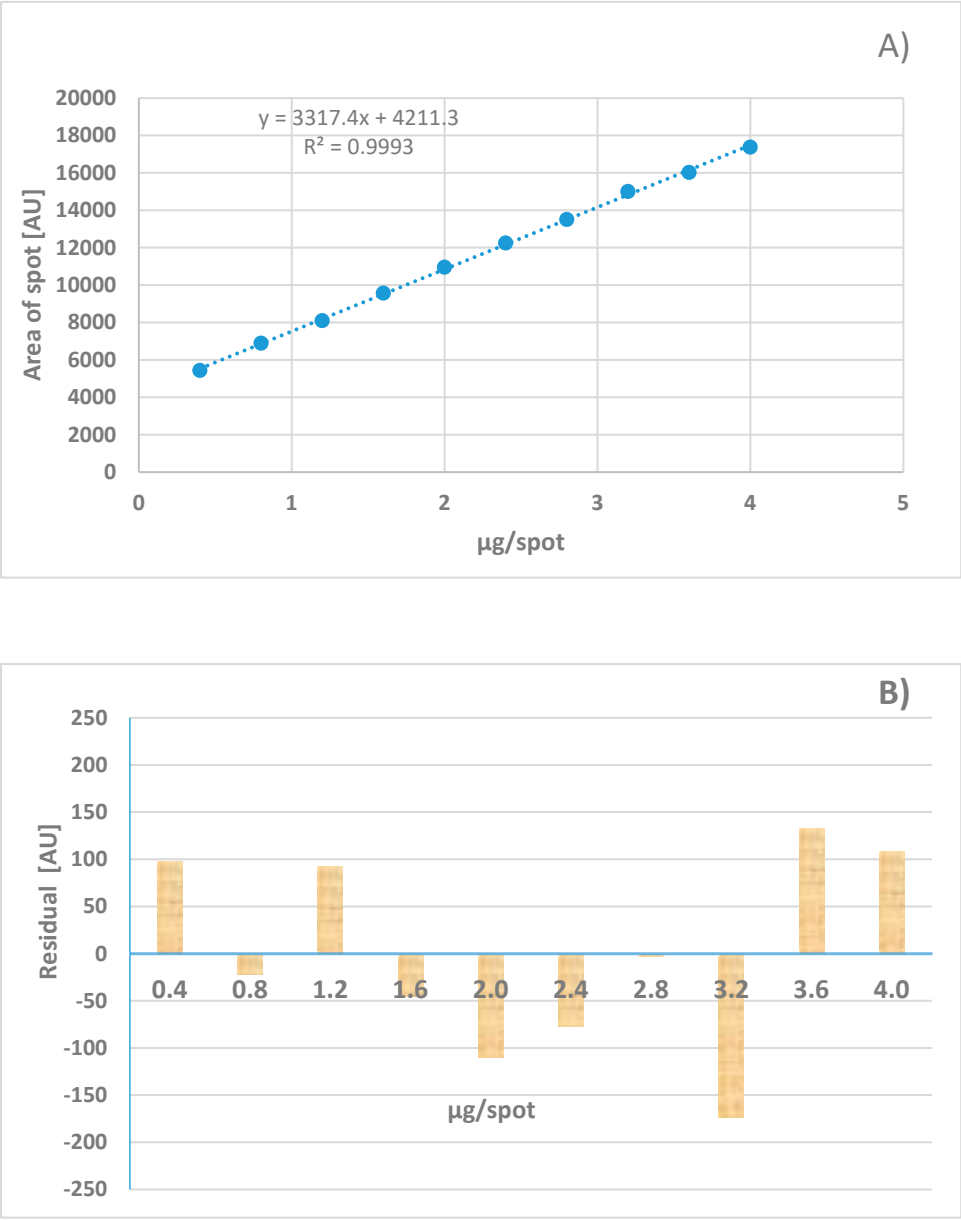

Figure S12. Calibration plot **(A)** and plot of residuals **(B)** for caffeine (C) in the linear working range mobile phase: chloroform + toluene + ethyl acetate + ethanol + acetic acid (80%) in a volume ratio of 18: 18: 7.5: 5.0: 0.3.

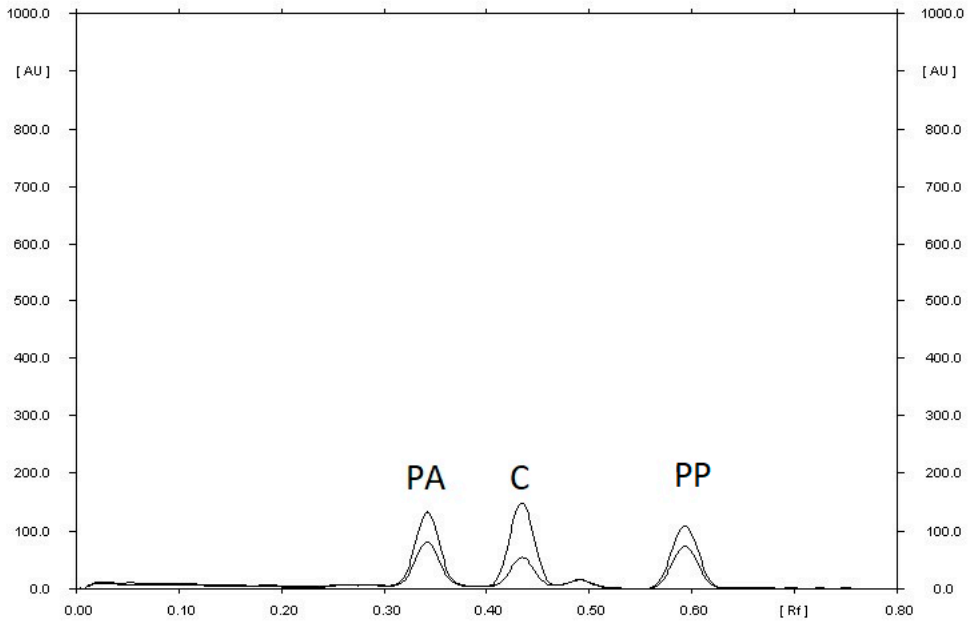

Figure S13. Densitogram of standard mixture of PA, C, PP (each standard about concentration 0.20 µg/spot).

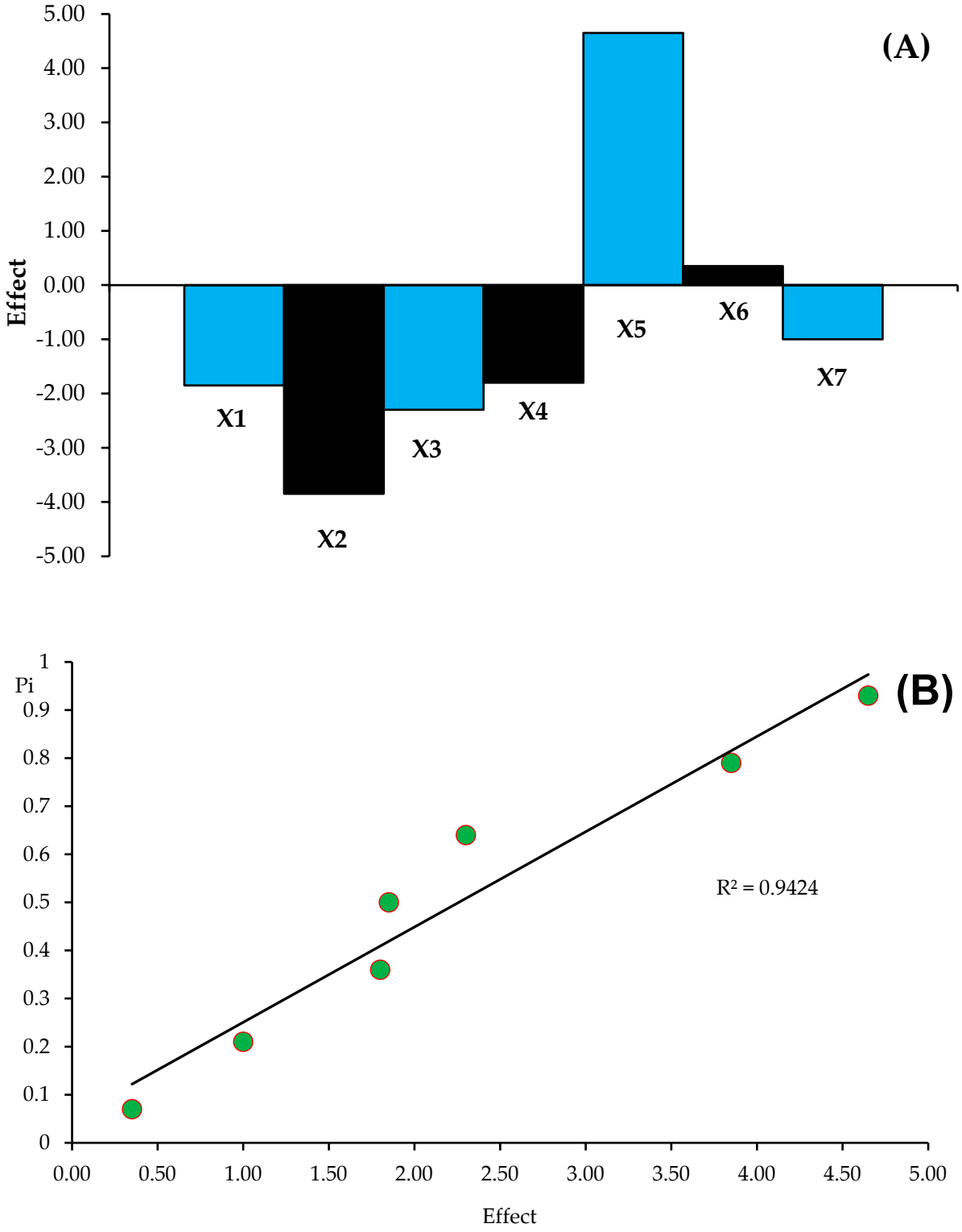

Figure S14. Robustness test: the effects of factors (A), and half-normal probability plot of effects (B) for determination of paracetamol (PA) in Saridon tablets.

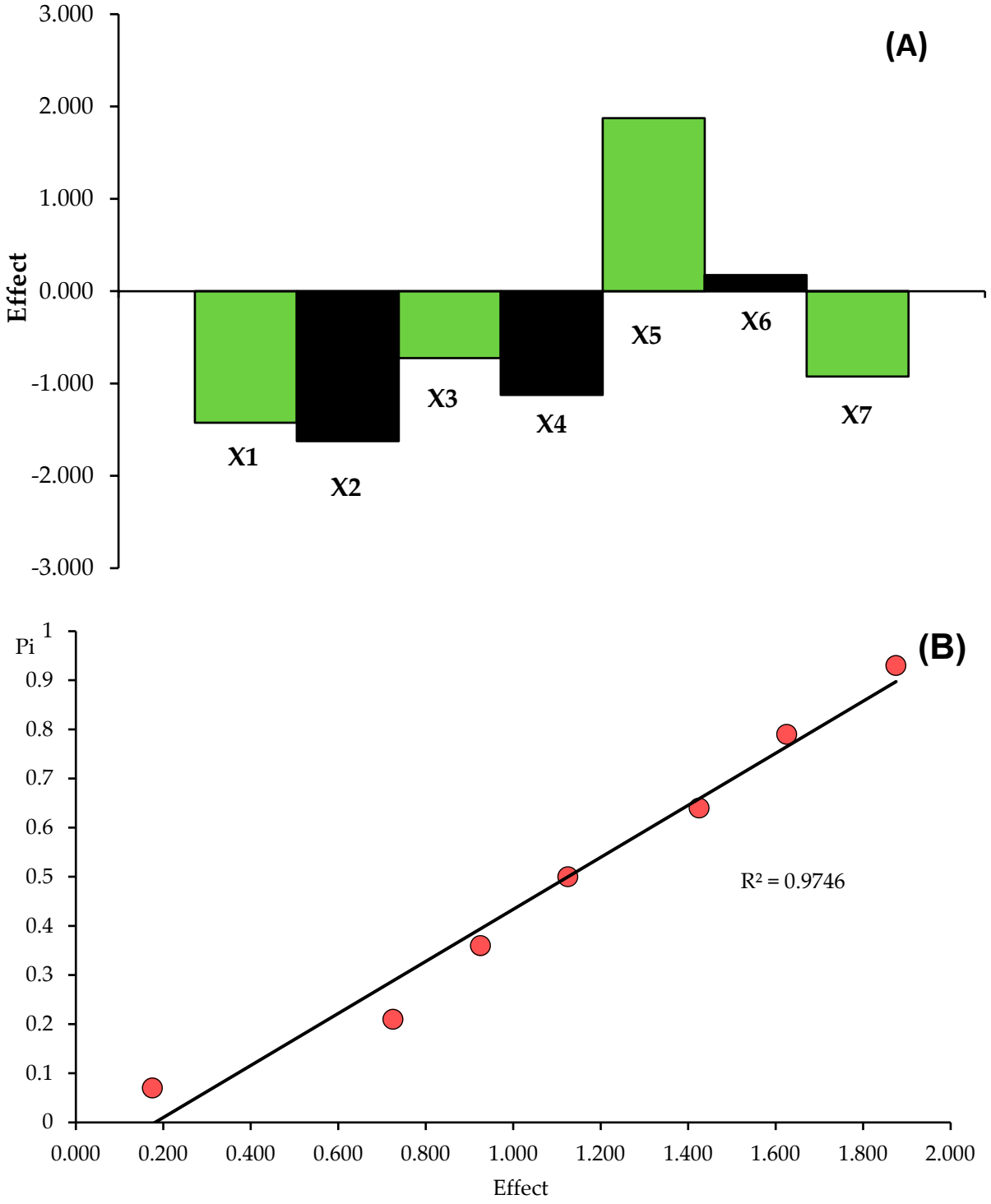

Figure S15. Robustness test: the effects of factors (A), and half-normal probability plot of effects (B) for determination of propyphenazone (PP) in Saridon tablets.

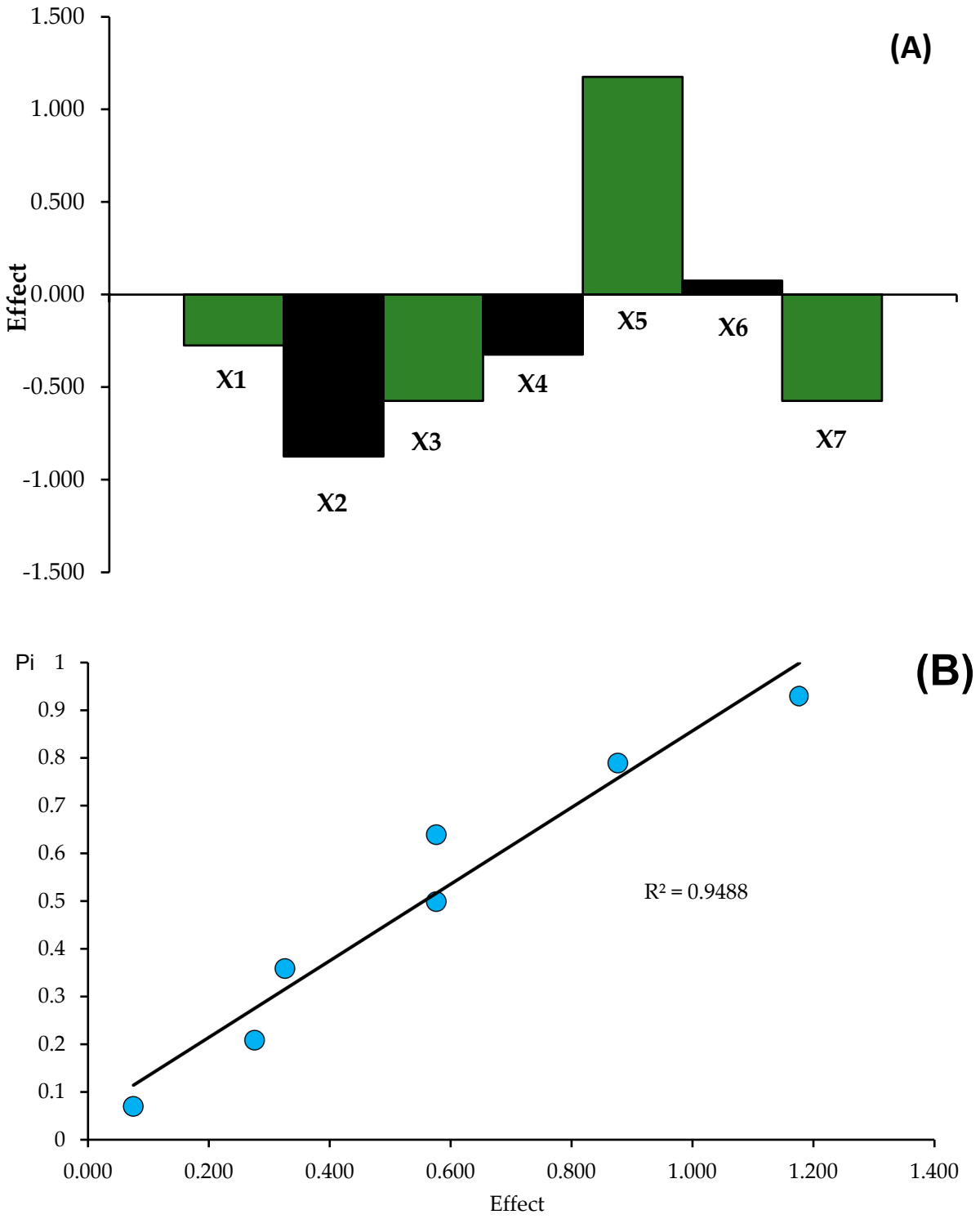

Figure S16. Robustness test: the effects of factors (A), and half-normal probability plot of effects (B) for determination of caffeine (C) in Saridon tablets.

Table S4. Literature values of LOD and LOQ of PA, PP, and C investigated by HPLC and micellar liquid chromatography techniques.

Method	Stationary phase	Mobile phase	LOD and LOQ [μg/mL] of			Ref
			PA	PP	C	
RP-HPLC	Nucleosil C18	Water + methanol, 20:80, v/v)	LOD: 0.30 LOQ: 0.88	LOD: 0.25 LOQ: 0.41	LOD: 0.36 LOQ: 0.66	[20]
RP-HPLC	ODS column	Ortho phosphoric acid 0.1% + acetonitrile, 85:15, v/v	LOD: 0.18 LOQ: 0.55	LOD: .0.05 LOQ: 0.14	LOD: .0.03 LOQ: 0.09	[22]
RP-HPLC	Hypersil C18 BDS	0.2 mol/L Tetrabutylammonium bisulphate + methanol, 100:45, v/v	LOD: 2.20 LOQ: 4.60	LOD: 0.09 LOQ: 0.12	LOD: 0.42 LOQ: 0.62	[23]
RP-HPLC	C18 column	Acetonitrile+methanol+water (25:25:50 v/v)	LOD: 6.57 LOQ: 19.90	LOD = 5.19 LOQ = 15.74	LOD: 3.098 LOQ: 0.39	[24]
RP-HPLC	Chromolith RP-18e	Acetonitrile + water (30:70 v/v/)	LOD: 0.4 LOQ: 1.2	LOD: 0.7 LOQ: 2.4	LOD: 0.5 LOQ: 1.6	[25]
RP-HPLC	C18 column	Phosphate buffer (pH 9; 0.05 M) : methanol(80:20 v/v)	LOD: 0,3 LOQ: 1	-	LOD: 0,3 LOQ: 1	[13]
RP-HPLC	C18 column	Methanol+water, 40:60, v/v	LOD: 0.01 LOQ: 0.033	-	LOD: 0.005 LOQ: 0.016	[7]
RP-HPLC	Hypersil C18 BDS	0.02 M tetrabutylammonium bisulfate : methanol (100:45 v/v)	LOD: 2.20 LOQ: 4.40	-	LOD: 0.42 LOQ: 0.62	[6]
RP-HPLC-UV	μ-Bondapak C18	Methanol+water+triethylamine (60+40+0.1, v/v)	-	LOD: 5.0 LOQ: 8.0	LOD: 1.5 LOQ: 5.0	[17]
LC	Cyanopropyl column	Acetonitrile +12mM ammonium acetate(25;75 v/v)	-	LOD: 0.0065 LOQ: 0.022	LOD: 0.004 LOQ: 0.013	[15]
Micellar electrokinetic capillary liquidchromatography	Silica capillary	20 mM borate buffer	LOD: 0.6 LOQ: 2.0	LOD: 0.8 LOQ: 3.0	LOD: 0.6 LOQ: 3.0	[31]

Micellar liquid chromatography	ODS C18	40mM sodium dodecyl sulphate + 10% propan-1-ol + 0,3% triethylamine in 0,02 M phosphoric acid	-	-	LOD: 0.6 LOQ: 0.8	[42]