Table S1. ANOVA (showing lack of fit calculation) for mixture using the proposed conventional and green HPLC method

Method	Comp.	Source of	Sum of	degree of	Mean sum	F-Ratio
Conventional	AS	Total	1.2×10^{10}	6	5.8×10^{8}	2.07
		Regression	1.2×10^{10}	1	6.1×10^{9}	
		Residual	8.9×10^{5}	5	4.7×10^{4}	
		Replicate	1.9×10^{5}		2.8×10^{4}	
		Lack of fit	6.9×10^{5}		5.8×10^{4}	
	AR	Total	4.99×10^{11}	6	2.4×10^{10}	2.84
		Regression	4.99×10^{11}	1	2.497×10^{11}	
		Residual	4.6×10^{7}	5	2.4×10^{6}	
		Replicate	7.9×10^{6}		1.1×10^{6}	
		Lack of fit	3.9×10^{7}		3.2×10^{6}	
	CH	Total	1.3×10^{11}	6	6.2×10^{9}	1.35
		Regression	1.3×10^{11}	5	6.5×10^{10}	
		Residual	9.6×10^{6}	1	5.07×10^{5}	
		Replicate	2.9×10^{6}		4.2×10^{5}	
		Lack of fit	6.7×10^{6}		5.6×10^{5}	
	QU	Total	5.3×10^{11}	6	2.5×10^{10}	2.38
		Regression	5.3×10^{11}	5	2.67×10^{11}	
		Residual	3.8×10^{7}	1	2×10^{6}	
		Replicate	7.56×10^{6}		1.1×10^{6}	
		Lack of fit	3.1×10^{7}		2.57×10^{6}	
Green	AS	Total	6.05×10^{10}	6	2.9×10^{9}	2.81
		Regression	6.05×10^{10}	1	3.02×10^{10}	
		Residual	2.6×10^{6}	5	1.4×10^{5}	
		Replicate	4.5×10^{5}		6.4×10^{4}	
		Lack of fit	2.2×10^{6}		1.8×10^{5}	
	AR	Total	1.4×10^{12}	6	6.8×10^{10}	2.82
		Regression	1.4×10^{12}	1	7.2×10^{11}	
		Residual	3.99×10^{7}	5	2.1×10^{6}	
		Replicate	6.8×10^{6}		9.8×10^{5}	
		Lack of fit	3.3×10^{7}		2.8×10^{6}	
	CH	Total	3.98×10^{10}	6	1.89×10^{9}	1.75
		Regression	3.98×10^{10}	5	1.99×10^{10}	
		Residual	1.02×10^{6}	1	5.37×10^{4}	
		Replicate	2.6×10^{5}		3.6×10^{4}	
		Lack of fit	7.7×10^{5}		6.38×10^{4}	
	QU	Total	1.46×10^{12}	6	6.96×10^{10}	2.99
		Regression	1.46×10^{12}	5	7.3×10^{11}	
		Residual	1.7×10^{8}	1	8.98×10^{6}	
		Replicate	2.78×10^{7}		3.97×10^{6}	
		Lack of fit	1.4×10^{8}		1.2×10^{7}	

The critical value of F-Ratio is 3.57 at $\alpha = 0.05$

Table S2. Analysis of variance for repeatability and intermediate precision of the studied drugs by the proposed green and conventional HPLC method.

Method	Green method							Conventional method						
Comp.	Conc. Level (µg mL^{-}	Source of variation	Sum of squares	DF	MS	F- ratio	P-value	Conc. Level (µg ml^{-1})	Source of variation	Sum of squares	DF	MS	F-ratio	P-value
QU	1.0	Between	138.00	7	19.71	0.69	0.68	1.0	Between	65.76	7	9.39	0.98	0.50
		Within	227.97	8	28.50				Within	76.66	8	9.58		
		Total	365.97	15					Total	142.42	15			
	10.0	Between	91.41	7	13.06	0.61	0.74	10.0	Between	52.90	7	7.55	0.87	0.56
		Within	172.41	8	21.55				Within	69.12	8	8.64		
		Total	263.82	15					Total	122.03	15			
	20.0	Between	90.40	7	12.91	2.21	0.14	20.0	Between	77.16	7	11.02	0.84	0.58
		Within	46.68	8	5.83				Within	105.05	8	13.13		
		Total	137.08	15					Total	182.21	15			
AR	1.0	Between	29.33	7	4.19	0.4	0.88	1.0	Between	54.06	7	7.72	0.77	0.63
		Within	83.68	8	10.46				Within	80.11	8	10.01		
		Total	113	15					Total	134.17	15			
	10.0	Between	60.4	7	8.63	0.76	0.64	10.0	Between	41.35	7	5.91	0.63	0.73
		Within	90.94	8	11.37				Within	75.60	8	9.45		
		Total	151.34	15					Total	116.95	15			
	20.0	Between	102.06	7	14.58	0.95	0.52	20.0	Between	186.40	7	26.63	1.27	0.37
		Within	122.30	8	15.29				Within	168.05	8	21.01		
		Total	224.36	15					Total	354.45	15			
AS	1.0	Between	238.46	7	34.07	1.07	0.46	1.0	Between	157.10	7	22.44	1.03	0.48
		Within	253.82	8	31.73				Within	174.93	8	21.87		
		Total	492.28	15					Total	332.02	15			
	10.0	Between	239.43	7	34.20	1.18	0.40	10.0	Between	75.80	8	9.47	0.68	0.70
		Within	230.98	8	28.87				Within	98.23	7	14.03		
		Total	470.40	15					Total	174.02	15			
	20.0	Between	258.03	7	36.86	1.58	0.27	20.0	Between	73.45	7	10.49	1.09	0.45
		Within	186.98	8	23.37				Within	76.83	8	9.60		
		Total	445.00	15					Total	150.27	15			
CH	1.0	Between	16.59	7	2.37	0.14	0.99	1.0	Between	50.15	7	7.16	0.88	0.56
		Within	132.1	8	16.5				Within	65.35	8	8.17		
		Total	148.68	15					Total	115.50	15			
	10.0	Between	23.44	7	3.35	0.67	0.69	10.0	Between	25.46	7	3.64	0.14	0.99
		Within	39.9	8	4.99				Within	213.44	8	26.68		
		Total	63.36	15					Total	238.90	15			
	20.0	Between	138.00	7	19.71	0.69	0.68	20.0	Between	92.53	7	13.22	0.75	0.64
		Within	227.97	8	28.50				Within	140.63	8	17.58		
		Total	365.97	15					Total	233.15	15			

Where DF is the degree of freedom and MS is the mean square.

The critical value of F-ratio is 3.5 and P-value is 0.05

Table 3. The mean percentage recoveries and standard deviation for determination of QU,AR,AS and CH in laboratory-prepared mixtures using the proposed green and conventional HPLC method.

Method		**% Recovery**			
		QU	**AR**	**AS**	**CH**
Green	Mean	100.14	100.20	100.10	99.03
	± S.D.	2.14	1.89	1.97	1.46
Conventional	Mean	100.1	99.84	100.29	100.01
	± S.D.	1.3	1.34	1.39	1.36

Table S4. Application of standard addition technique to the analysis of QU, AR, AS and CH using the proposed green and conventional HPLC methods.

HPLC method	Comp.		% Recovery of added	Comp.		% Recovery of added
Green	QU	**Mean[a]**	101.0	AS	**Mean[a]**	100.4
		± S.D.[a]	2.35		**± S.D.[a]**	2.5
	AR	**Mean[a]**	100.1	CH	**Mean[a]**	100.2
		± S.D.[a]	1.44		**± S.D.[a]**	2.3
Conventiona	QU	**Mean[a]**	100.9	AR	**Mean[a]**	98.9
		± S.D.[a]	1.2		**± S.D.[a]**	1.37
	AS	**Mean[a]**	100.4	CH	**Mean[a]**	100.8
		± S.D.[a]	2.88		**± S.D.[a]**	0.98

[a] Mean and S.D., percentage recovery from the added amount.

Table S5. A comparison of figures of merit between proposed green HPLC and the previously reported HPLC methods for the single determination of the selected drugs.

Compound	Method	Linearity range (µg mL^{-1})	LOD (µg mL^{-1})	LOQ (µg mL^{-1})	Matrix	Ref.
QU	Proposed	0.1-20	0.04	0.13	Dosage form	
	Reported	0.17-1.5	0.037	0.17	Dosage form	[7]
	Reported	2.01-50.2	0.1	0.2	Dosage form	[8]
	Reported	0.2-3	0.03	0.19	blood	[9]
AR	Proposed	0.1-20	0.03	0.11	Dosage form	
	Reported	50-150	0.25	0.5	Dosage form	[10]
	Reported	20-60	0.41	1.25	Dosage form	[11]
	Reported	0.05-2.5	0.01	0.05	Dosage form	[12]
AS	Proposed	0.1-20	0.03	0.12	Dosage form	
	Reported	0.1-20	0.05	0.1	Dosage form	[16]
	Reported	0.1-20	0.029	0.089	Lipidic nano formulations	[17]
	Reported	2.3-150	0.7	2.3	Dosage form	[18]
	Reported	0.5-100	0.08	0.28	Dosage form	[19]
CH	Proposed	0.1-20	0.4	0.14	Dosage form	
	Reported	2-150	0.63	2.10	Dosage form	[20]
	Reported	10-300	3.09	9.39	Dosage form	[21]

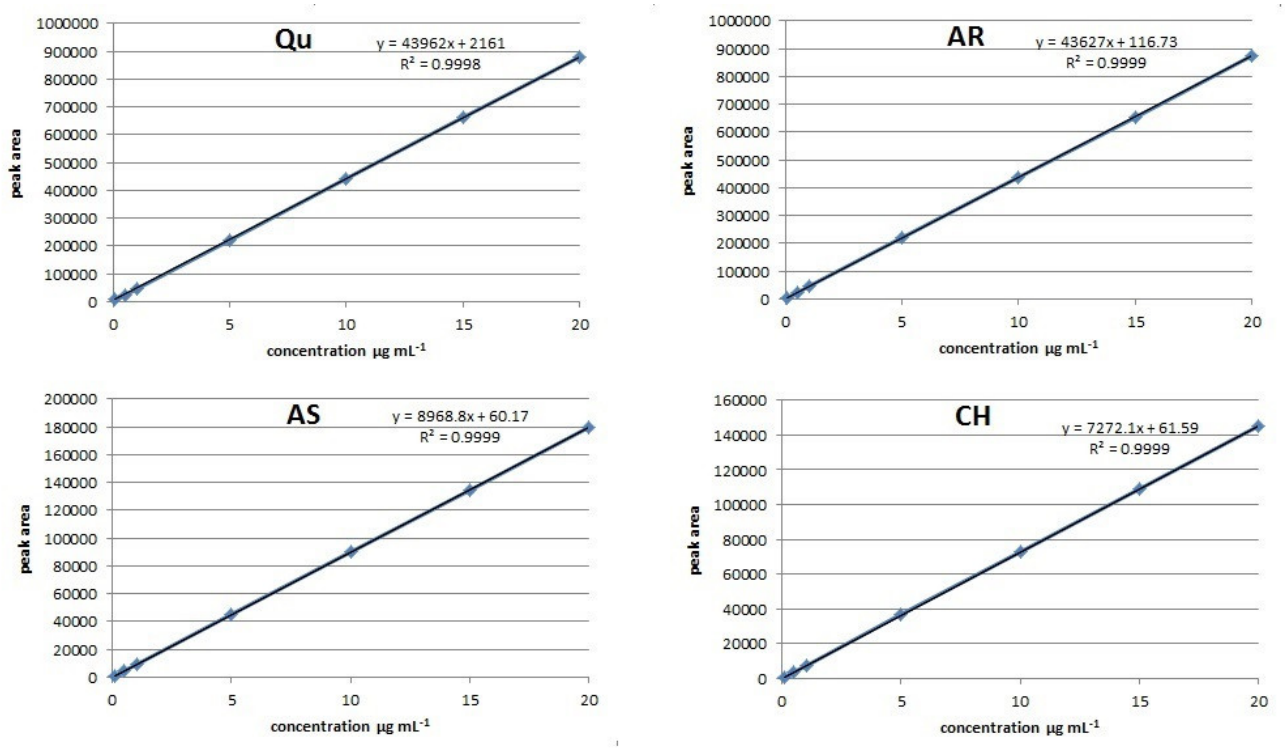


Figure S1. The standard calibration curves for the selected antipsychotics using the green proposed method.

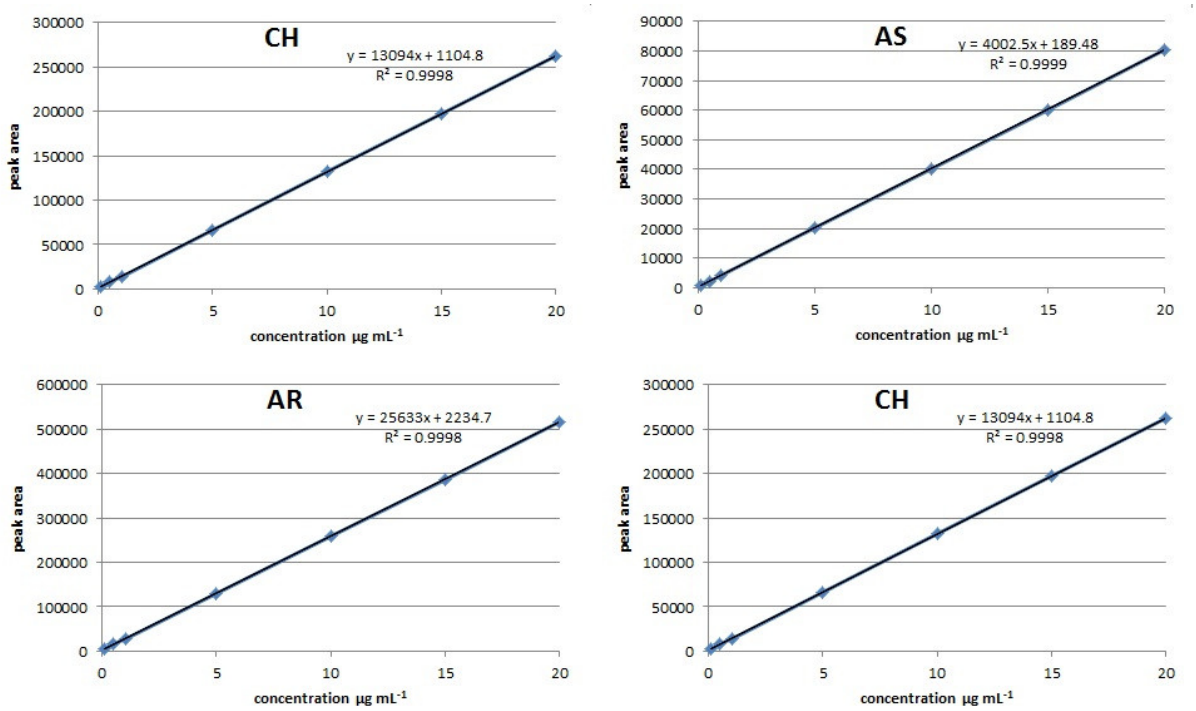


Figure S2. The standard calibration curves for the selected antipsychotics using the conventional proposed method.

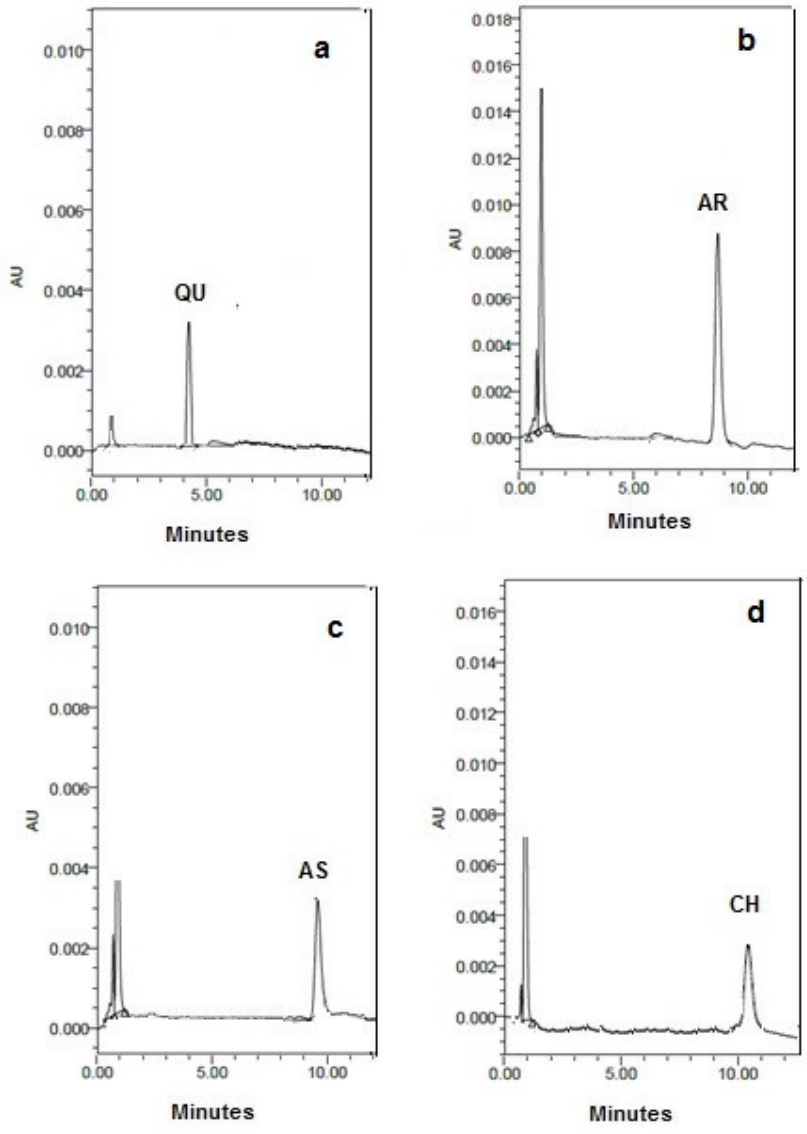


Figure S3. Typical HPLC chromatogram of 20 µl injection of a) quitapex® tablets sample containing 1µg ml^{-1} of QU ,b) aripiprazole®tablets sample containing 5 µg ml^{-1} of AR, c) Asenapine® tablets sample containing 5 µg ml^{-1} of AS and d) Neurazine® ®tablets sample containing 5 µg ml^{-1} of CH using the green HPLC method.

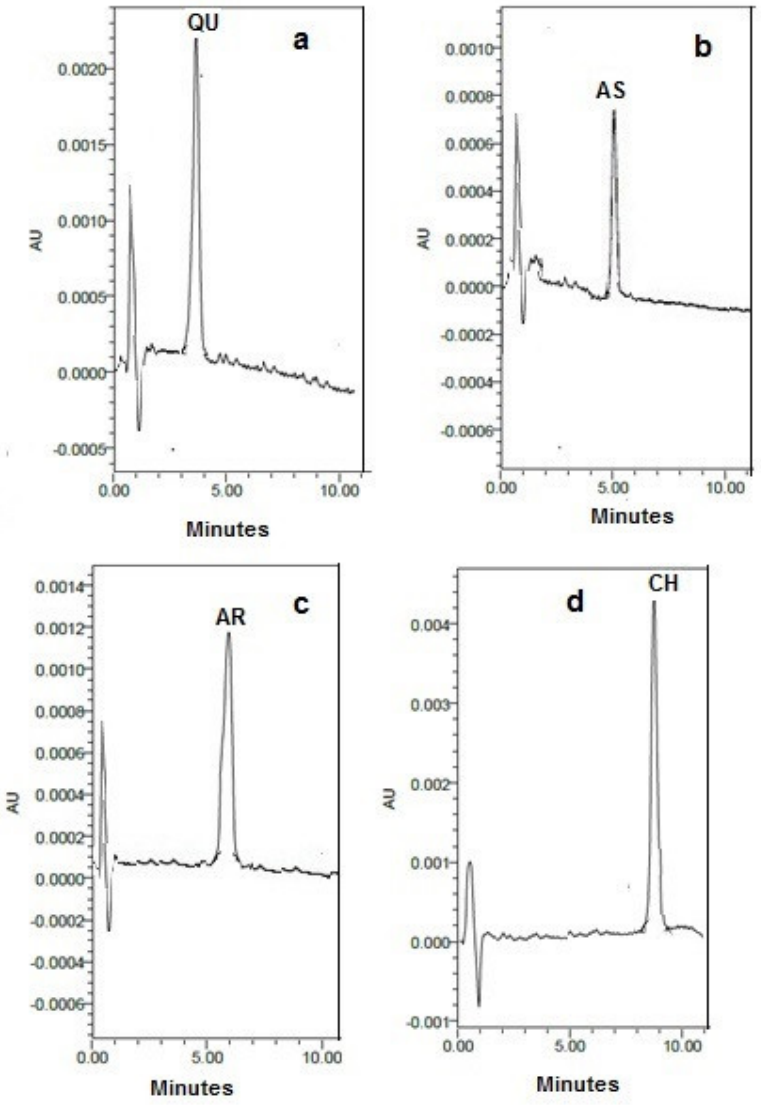


Figure S4. Typical HPLC chromatogram of 20 µl injection of a) quitapex® tablets sample containing 1 µg ml^{-1} of QU, b) Asenapine® tablets sample containing 1µg ml^{-1} ofAS ,c) aripiprazole®tablets sample containing 5 µg ml^{-1} of AR and d) Neurazine® ®tablets sample containing 10 µg ml^{-1} of CH using conventional HPLC method.