

Supplementary Information

Carbon Nanotubes-Based QuEChERS Extraction and Enhanced Product Ion Scan-Assisted Confirmation of Multi-Pesticide Residue in Dried Tangerine Peel

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Table S1 Method validation results including linearity, LOD and LOQ, precision ($n=3$), recovery (%) and relative standard deviation (RSD, %) of dried tangerine peel fortified with 10, 50, 100 and 500 $\mu\text{g}\cdot\text{kg}^{-1}$ ($n=3$, respectively).

Pesticide (<i>n</i> =104)	Linearity		LOQ ($\mu\text{g}\cdot\text{kg}^{-1}$)	LOD ($\mu\text{g}\cdot\text{kg}^{-1}$)	Precision		Recovery% (<i>RSD</i> %)(<i>n</i> =3)			
	Range ($\text{ng}\cdot\text{mL}^{-1}$)	<i>r</i>			<i>RSD</i> (%)		$10\mu\text{g}\cdot\text{kg}^{-1}$	$50\mu\text{g}\cdot\text{kg}^{-1}$	$100\mu\text{g}\cdot\text{kg}^{-1}$	$500\mu\text{g}\cdot\text{kg}^{-1}$
			Intra-day	Inter-day						
Carbendazim	1~200	0.9964	1	0.4	6.6	9.1	79.3(3.0)	83.0(8.1)	90.5(9.0)	95.8(6.3)
Thiabendazole	1~100	0.9979	5	2	2.8	5.4	63.9(15.0)	64.4(4.1)	74.4(5.0)	80.8(4.4)
Thiophanate-methyl	1~50	0.9938	1	0.4	8.3	3.2	96.3(7.4)	97.9(4.5)	72.8(7.4)	90.0(2.7)
Chlorfluazuron	2~200	0.9996	5	0.2	2.1	6.1	104.1(6.4)	79.5(3.0)	97.9(6.4)	91.3(5.2)
Flufenoxuron	2~200	0.9987	5	2	1.9	3.2	117.0(3.8)	110.8(7.3)	79.5(3.8)	94.7(11.1)
Hexaflumuron	50~200	0.9743	10	4	2.5	13.4	68.0(6.1)	69.8(8.4)	74.7(6.1)	70.8(5.2)
Teflubenzuron	10~200	0.9975	5	2	10.8	9.3	64.7(3.9)	66.7(8.3)	89.5(3.9)	105.7(3.8)
Triflumuron	10~200	0.9992	50	20	2.6	3.9	109.7(2.0)	110.0(3.6)	91.0(5.0)	97.2(6.6)
Aldicarb	20~200	0.9975	5	2	1.9	6.9	74.7(14.0)	103.7(9.3)	102.1(3.6)	97.9(4.4)
Aldicarb-sulfone	20~200	0.9997	10	4	5.6	0.9	71.5(13.6)	80.7(5.5)	85.0(4.0)	90.9(2.4)
Bendiocarb	5~200	0.9991	5	2	4.6	15.9	100.7(3.2)	109.8(8.3)	90.3(3.2)	95.6(3.2)
Carbaryl	5~100	0.9995	5	2	9.6	11.2	79.9(5.2)	71.1(15.0)	79.3(5.2)	93.0(10.8)
Carbofuran	0.1~100	1.0000	1	0.4	1.2	0.7	117.2(1.9)	104.7(7.4)	85.3(6.9)	97.4(5.8)
Carbosulfan	5~100	0.9996	0.5	0.2	6.8	12.1	79.9(3.2)	113.4(8.9)	88.2(3.2)	104.7(6.9)
Fenobucarb	5~200	0.9999	5	2	3.8	1.2	78.7(2.9)	77.5(8.8)	71.9(2.9)	95.9(6.2)
Furathiocarb	1~100	0.9964	0.5	0.4	1.1	7.5	95.0(1.4)	99.3(8.5)	82.3(5.4)	98.0(3.7)
Indoxacarb	10~200	1.0000	5	2	2.5	6.2	88.9(14.8)	108.6(5.9)	84.8(7.8)	81.0(8.3)
Isoprocarb	5~200	0.9999	5	0.2	12.2	5.2	111.8(1.9)	89.6(14.7)	101.5(1.9)	102.8(7.9)
Methiocarb	10~200	0.9999	10	4	14.0	10.0	72.3(18.1)	75.3(13.9)	81.1(11.8)	116.4(12.8)
Methomyl	20~200	0.9999	10	4	1.9	5.4	68.7(1.6)	69.4(13.3)	99.0(1.6)	84.6(4.9)
Metolcarb	10~200	0.9997	20	8	7.8	10.1	90.9(15.6)	96.9(2.2)	73.0(11.6)	76.8(6.8)
Oxamyl	10~200	0.9999	10	4	13.9	6.8	79.4(11.1)	112.1(7.5)	77.7(11.1)	81.8(15.5)
Pirimicarb	1~100	1.0000	5	2	2.8	6.9	71.5(4.2)	72.0(4.0)	84.9(4.2)	94.3(4.4)
Propoxur	5~200	1.0000	2	0.8	9.8	7.3	104.4(6.8)	79.8(15.9)	109.0(6.8)	90.8(10.8)
Thiodicarb	1~200	0.9988	2	0.8	0.8	19.6	76.4(6.8)	99.9(10.1)	83.3(6.7)	99.0(8.9)
Diethofencarb	2~200	1.0000	5	2	6.5	2.7	101.3(5.1)	106.4(5.8)	101.0(5.1)	107.4(3.6)
Acephate	20~200	0.9992	10	4	15.3	7.8	86.2(9.7)	80.9(14.3)	87.9(4.0)	114.8(4.8)
Azinphos-ethyl	5~200	0.9994	10	4	1.5	15.5	107.7(8.3)	87.2(15.0)	80.9(9.7)	112.5(10.5)
Azinphos-methyl	5~200	0.9995	20	8	11.8	14.2	73.6(13.9)	76.3(4.3)	75.1(5.9)	110.7(6.0)
Chlorfenvinphos	2~200	0.9999	10	20	1.6	7.9	103.6(7.7)	103.7(3.9)	84.9(8.3)	111.5(17.2)
Chlorpyrifos	1~100	0.9994	0.5	0.2	7.1	7.0	74.2(8.8)	97.2(2.6)	76.9(7.7)	88.3(2.5)
Chlorpyrifos-methyl	20~200	0.9992	100	40	1.4	8.4	76.3(13.4)	113.9(2.0)	74.2(8.8)	89.9(2.7)
Coumaphos	10~200	1.0000	20	8	1.4	5.7	113.1(16.2)	104.2(15.1)	74.4(13.4)	78.3(5.8)
Demeton	1~200	0.9977	5	2	0.7	13.6	91.8(5.9)	106.2(2.9)	78.3(7.2)	108.8(8.7)
Diazinon	0.5~100	1.0000	2	0.8	7.5	6.0	81.5(4.1)	110.8(6.0)	84.9(10.9)	94.4(3.4)
Dichlofenthion	10~200	1.0000	20	8	4.4	7.7	116.0(11.4)	96.9(7.2)	78.7(4.1)	85.1(14.4)
Dichlorvos	10~200	1.0000	10	4	0.3	1.0	95.9(1.4)	79.8(2.2)	89.8(11.4)	102.0(10.5)
Dicrotophos	1~200	0.9997	5	2	5.9	2.5	90.2(1.6)	78.2(10.6)	76.6(6.4)	75.1(3.0)
Dimethoate	1~200	0.9974	5	2	5.2	9.8	83.3(4.7)	110.6(8.9)	73.7(7.6)	106.9(7.3)
Disulfoton	5~200	0.9993	10	4	2.6	14.4	78.5(2.6)	71.2(7.1)	97.4(4.7)	96.4(12.9)
Ethion	0.5~200	0.9995	2	0.8	1.0	5.1	103.3(7.5)	97.7(7.8)	75.7(5.6)	101.1(2.8)

Ethoprophos	2~200	1.0000	5	2	3.5	5.2	71.9(9.6)	109.2(8.6)	101.6(7.8)	114.6(14.8)
Etrinfos	1~200	0.9999	5	2	2.2	6.0	117.6(9.2)	100.9(6.2)	99.6(9.6)	113.9(4.8)
Fenamiphos	1~200	1.0000	5	2	3.4	13.4	108.5(8.2)	90.8(10.6)	103.4(9.2)	112.3(12.1)
Fenitrothion	20~200	0.9996	100	40	2.1	2.2	86.4(13.0)	80.4(6.8)	80.0(8.2)	94.6(5.8)
Fensulfothion	2~200	0.9989	2	0.8	5.3	10.1	102.0(12.8)	75.9(7.8)	109.1(3.3)	75.5(4.4)
Fenthion	10~200	0.9999	10	4	6.7	8.0	110.2(9.7)	76.9(4.4)	73.4(7.0)	83.2(10.3)
Fonofos	5~200	0.9991	10	4	1.1	5.9	110.5(13.2)	100.5(7.9)	103.9(9.8)	83.0(4.4)
Isazophos	1~200	0.9999	5	2	0.2	13.1	95.4(3.3)	98.5(12.0)	90.7(10.7)	104.8(6.9)
Isocarbophos	20~200	0.9999	50	20	8.3	90.1	67.7(8.9)	98.5(8.4)	89.4(13.2)	113.5(7.0)
Isofenphos- methyl	1~200	0.9937	2	0.8	9.6	10.0	105.7(5.9)	72.4(9.1)	71.7(3.3)	100.8(3.3)
Malaoxon	5~200	0.9989	10	4	2.4	16.9	99.6(5.6)	79.0(10.4)	75.2(8.9)	100.8(7.2)
Malathion	1~100	0.9987	1	0.4	8.9	4.0	105.1(12.2)	101.6(5.6)	76.7(4.6)	84.1(3.9)
Methacrifos	20~200	0.9976	50	20	2.9	12.1	78.1(2.6)	71.1(3.1)	77.0(5.6)	96.4(4.3)
Methamidophos	5~100	0.9960	10	4	14.8	15.9	102.1(14.6)	71.7(13.8)	73.1(12.2)	80.7(3.5)
Methidathion	0.2~200	0.9994	1	0.4	2.1	4.8	71.8(3.9)	77.7(9.1)	87.1(2.6)	99.4(7.4)
Mevinphos	5~200	0.9970	10	4	5.5	8.0	102.4(6.3)	90.7(12.3)	71.8(4.6)	109.3(4.6)
Monocrotophos	10~200	0.9986	10	4	1.0	3.6	97.0(2.6)	98.4(4.1)	74.7(3.9)	96.4(6.2)
Omethoate	20~200	0.9991	10	4	18.9	0.4	102.5(1.6)	115.5(6.9)	88.7(6.3)	94.3(7.7)
Parathion	20~200	0.9998	50	20	1.2	1.9	80.1(14.2)	79.9(5.2)	77.2(3.6)	71.2(2.9)
Phenthoate	20~200	0.9998	100	40	9.2	5.3	71.8(4.8)	75.4(16.0)	76.9(6.2)	80.5(8.1)
Phorate	5~200	0.9988	10	4	2.4	6.8	93.0(7.9)	85.6(4.4)	89.1(7.2)	87.8(6.8)
Phorate-sulfone	0.5~100	0.9999	2	1	2.9	2.5	84.2(9.9)	88.3(7.1)	71.7(4.8)	72.7(3.0)
Phorate-sulfoxide	1~200	0.9999	5	1	7.4	5.3	75.0(5.3)	76.3(11.0)	72.5(7.9)	92.8(5.1)
Phosalone	5~200	0.9997	5	2	5.1	6.6	92.5(10.7)	87.8(8.8)	83.5(9.9)	85.9(2.2)
Phosfolan	0.5~100	1.0000	2	0.8	0.5	7.1	90.2(6.2)	115.0(2.7)	75.6(5.3)	91.6(4.5)
Phosmet	10~200	0.9999	20	8	14.8	74.9	100.0(2.3)	110.5(9.2)	81.7(10.7)	96.8(5.5)
Phosphamidon	2~200	0.9916	1	0.4	0.4	8.4	94.4(6.5)	103.9(15.7)	71.2(6.2)	91.2(7.3)
Phoxim	2~200	0.9999	10	5	8.0	10.2	105.7(1.5)	86.8(7.1)	109.5(7.3)	97.9(6.2)
Pirimiphos-ethyl	1~100	0.9998	1	0.4	1.0	4.2	107.2(1.9)	85.8(2.7)	82.9(6.5)	102.7(4.1)
Pirimiphos- methyl	1~100	1.0000	2	0.8	2.3	7.3	100.9(1.7)	84.9(10.0)	88.7(11.5)	97.7(3.9)
Profenofos	2~200	0.9999	5	2	12.2	6.9	110.3(1.4)	102.1(10.8)	91.4(8.9)	98.1(4.9)
Propetamphos	10~200	0.9993	20	8	4.6	5.6	82.4(15.2)	74.2(11.5)	83.0(7.7)	114.0(6.4)
Quinalphos	2~200	0.9974	10	4	7.3	10.8	101.7(10.2)	111.9(14.1)	94.7(12.4)	86.6(13.0)
Sulfotep	1~100	0.9993	5	2	13.9	7.7	112.1(13.5)	101.4(11.0)	71.4(15.2)	82.6(11.6)
Terbufos	5~200	1.0000	5	2	6.9	14.3	83.8(17.0)	94.5(7.9)	71.2(10.2)	78.6(13.8)
Tetrachlorvinphos	5~200	0.9993	5	2	9.0	3.8	88.6(14.2)	79.8(10.0)	81.2(13.5)	81.8(8.1)
Triazophos	0.5~100	1.0000	1	0.4	4.9	5.3	91.7(5.1)	93.0(4.0)	96.7(7.0)	107.5(5.1)
Trichlorfon	20~200	0.9993	10	4	4.5	5.9	73.5(4.7)	76.0(3.5)	79.7(14.2)	85.3(8.5)
Ditalimfos	2~200	1.0000	10	4	0.2	11.9	91.4(4.2)	117.6(5.1)	84.5(5.1)	106.1(6.1)
Iprobenfos	2~200	0.9952	5	2	2.2	5.7	81.6(3.2)	82.4(7.0)	85.9(4.7)	104.6(2.6)
Pyrazophos	5~200	0.9971	10	4	4.4	12.4	80.0(9.3)	108.0(11.5)	74.6(4.2)	114.0(6.4)
Tolclofos-methyl	20~200	1.0000	50	20	1.3	2.2	94.2(4.1)	83.2(3.6)	109.6(3.2)	94.4(2.3)

Acetamiprid	0.2~100	0.9959	2	0.8	1.9	0.1	83.1(8.4)	100.7(5.5)	81.2(9.3)	112.7(5.7)
Imidacloprid	1~200	0.9980	5	2	1.0	4.0	96.5(12.4)	116.8(3.9)	85.0(4.1)	83.9(4.2)
Pymetrozine	5~200	0.9996	5	2	12.2	9.1	75.7(11.3)	90.8(10.5)	99.9(8.4)	107.4(13.1)
Tebufofenozid	20~200	0.9972	100	40	10.0	5.1	112.3(2.4)	82.2(10.9)	81.9(12.4)	103.4(2.5)
Azoxystrobin	0.5~100	0.9997	1	0.4	4.2	1.1	86.6(5.5)	89.3(6.8)	72.4(11.3)	108.1(9.5)
Isoprothiolan	2~100	1.0000	5	2	3.4	4.1	79.5(11.3)	95.6(13.8)	87.1(2.4)	115.5(8.2)
metalaxyl	0.2~100	1.0000	1	0.4	3.4	3.5	72.1(12.1)	102.0(8.0)	88.6(5.5)	84.2(10.1)
Triflumizol	1~200	0.9999	5	2	5.2	7.9	98.2(7.4)	99.1(3.2)	110.7(11.3)	111.1(16.1)
Bitertanol	10~200	0.9999	10	4	9.2	15.3	92.1(7.0)	72.0(16.9)	78.9(14.4)	110.5(11.3)
Difenoconazole	2~100	0.9991	5	2	4.3	10.8	86.9(2.6)	95.6(14.6)	86.2(5.7)	103.8(6.9)
Diniconazole	1~200	0.9997	5	2	1.2	4.1	86.3(5.0)	79.9(5.4)	99.2(7.0)	101.5(3.0)
Flusilazole	1~200	0.9976	5	2	6.4	5.4	78.4(8.8)	71.3(9.6)	75.1(4.6)	88.3(5.1)
Flutriafol	1~200	0.9990	1	0.4	0.7	8.0	73.1(1.7)	98.9(7.0)	78.3(8.3)	102.5(4.4)
Hexaconazole	5~200	0.9999	5	2	1.2	7.7	76.9(5.3)	111.4(6.2)	94.8(8.8)	98.2(6.2)
Myclobutanil	1~200	0.9998	5	2	2.8	3.2	92.9(2.2)	76.9(7.0)	74.6(6.7)	101.7(5.9)
Penconazole	2~200	0.9997	10	4	3.3	3.3	83.7(1.4)	74.4(6.2)	73.2(8.3)	101.7(9.9)
Propiconazole	2~200	1.0000	10	4	4.0	8.7	103.4(11.7)	76.5(7.5)	101.6(9.2)	84.7(6.4)
Tebuconazole	1~200	0.9995	1	0.4	2.2	4.9	72.4(14.9)	79.6(9.9)	71.3(8.2)	113.6(7.1)
Triazolone	2~200	0.9941	10	4	7.3	10.5	102.9(13.2)	72.0(8.8)	71.9(11.7)	82.9(5.6)
Triadimenol	10~200	0.9996	10	4	5.7	8.4	96.2(6.9)	108.7(7.6)	80.8(6.9)	110.3(8.5)
Fenprothrin	2~200	0.9999	5	2	1.5	6.9	73.6(7.8)	80.4(1.4)	78.1(7.4)	98.9(4.8)