

Supplementary Materials

for

**A Comparative Study on Inhibition of Breast Cancer Cells and Tumors in Mice
by Carotenoid Extract and Nanoemulsion Prepared from Sweet Potato
(*Ipomoea batatas* L.) Peel**

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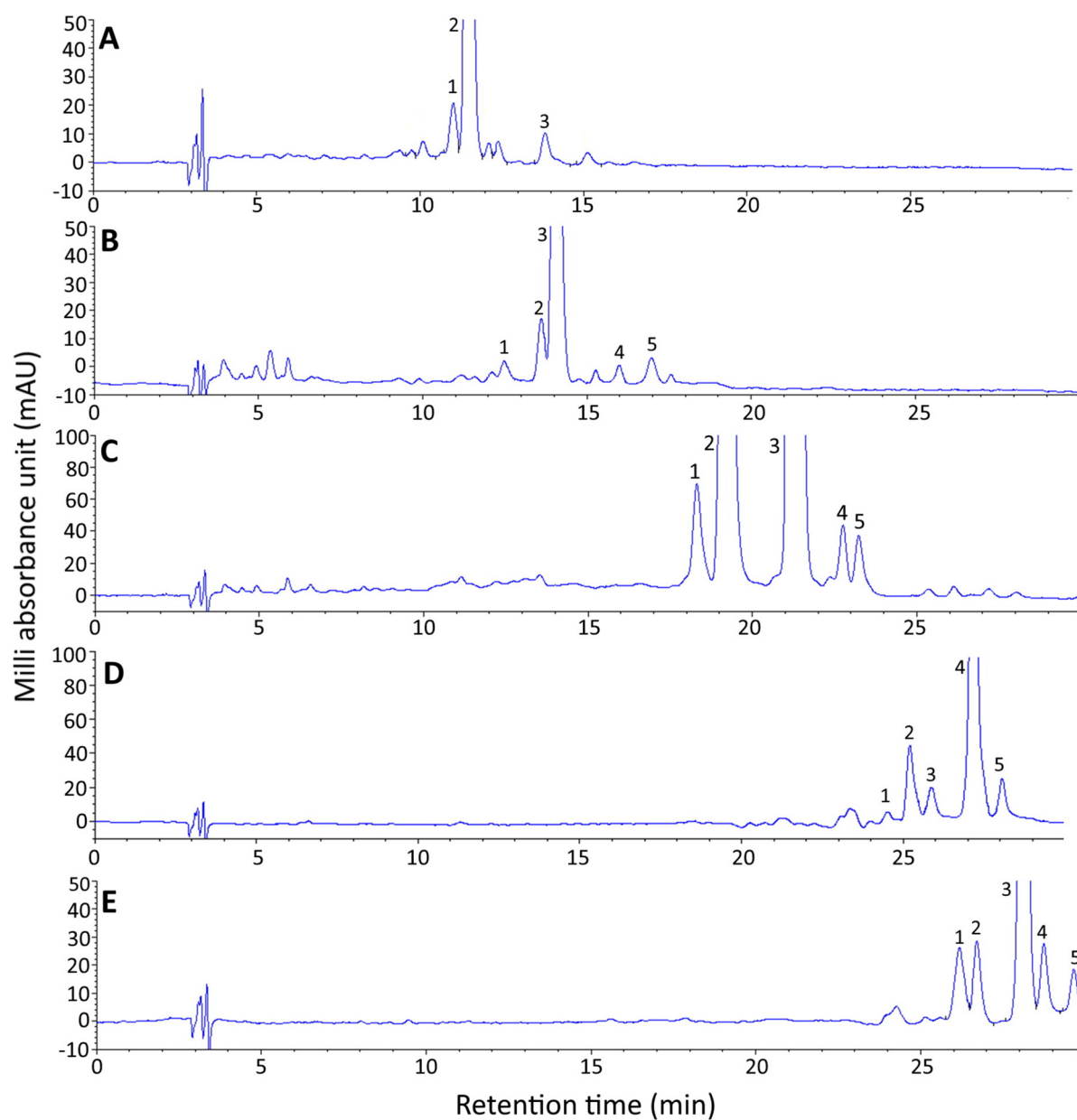


Figure S1 – HPLC chromatogram of all-*trans*-lutein, all-*trans*-zeaxanthin, all-*trans*- β -cryptoxanthin, all-*trans*- β -carotene and all-*trans*- α -carotene standards along with their *cis* isomers during illumination at 25°C for 24 h. A: 1, *cis*-lutein; 2, all-*trans*-lutein; 3, 9- or 9'-*cis*-lutein. B: 1, 13- or 13'-*cis*-zeaxanthin; 2, 15- or 15'-*cis*-zeaxanthin; 3, All-*trans*-zeaxanthin; 4, 9- or 9'-*cis*-zeaxanthin; 5, 9- or 9'-*cis*-zeaxanthin. C: 1, 13- or 13'-*cis*- β -cryptoxanthin; 2, 15- or 15'-*cis*- β -cryptoxanthin; 3, all-*trans*- β -cryptoxanthin; 4, 9- or 9'-*cis*- β -cryptoxanthin; 5, 9- or 9'-*cis*- β -cryptoxanthin; D: 1, 15- or 15'-*cis*- β -carotene; 2, 13- or 13'-*cis*- β -carotene; 3, 9- or 9'-*cis*- β -carotene; 4, All-*trans*- β -carotene; 5, 9- or 9'-*cis*- β -carotene. E: 1, 13- or 13'-*cis*- α -carotene; 2, 13- or 13'-*cis*- α -carotene; 3, All-*trans*- α -carotene; 4, 9- or 9'-*cis*- α -carotene; 5, 9- or 9'-*cis*- α -carotene. The identification data for all the all-*trans* plus *cis* isomers of carotenoids are provided in the Table S2.

Table S1. Identification data for all-*trans* plus *cis* forms of carotenoids in sweet potato peel extract by HPLC-DAD-MS.

Peak no.	Compound	λ (nm, inline)	λ (nm, reported)	Q-ratio found	Q-ratio reported	m/z found	m/z reported
1	All- <i>trans</i> -violaxanthin	414, 438, 466	416,439,469 ^d	—	—	601[M+H], 583[M+H-18]	601[M+H], 583[M+H-18] ^a
2	<i>cis</i> -lutein	408, 430, 456	336, 412, 432, 456 ^a	0.08	0.12 ^a	569[M+H], 551[M+H-18]	569[M+H], 551[M+H-18] ^b
3	All- <i>trans</i> -lutein	424, 445, 472	422, 446, 474 ^a	—	0.06 ^a	569[M+H], 551[M+H-18], 533[M+H-18-18]	569[M+H], 551[M+H-18], 533[M+H-18-18] ^a
4	All- <i>trans</i> -zeaxanthin	430, 454, 476	452, 478 ^a	—	—	569[M+H], 551[M+H-18]	569[M+H], 551[M+H-18] ^b
IS	All- <i>trans</i> -canthaxanthin	478	—	—	—	—	—
5	15- or 15'- <i>cis</i> - β -cryptoxanthin	338, 423, 448, 474	340,424,446,474 ^a	0.47	0.43 ^a	553[M+H]	553[M+H] ^c
6	All- <i>trans</i> - β -cryptoxanthin	426, 452, 478	428, 450, 477 ^b	—	0.04 ^b	553[M+H], 533[M+H-18]	553[M+H], 535[M+H-18] ^b
7	15- or 15'- <i>cis</i> - β -carotene	342, 428, 452, 478	342 448 474 ^a	0.43	0.50 ^a	537[M+H]	537[M+H] ^b
8	13- or 13'- <i>cis</i> - β -carotene	342, 422, 450, 478	345,451,479 ^b	0.32	0.36 ^b	537[M+H]	537[M+H] ^a
9	All- <i>trans</i> - β -carotene	456, 482	454, 482 ^b	—	—	537[M+H]	537[M+H] ^a
10	All- <i>trans</i> - α -carotene	428, 452, 476	424, 450, 476 ^c	—	0.05 ^c	537[M+H]	537[M+H] ^b

Based on a report by ^a Kao et al. [11], ^b Strati et al. [17], ^c Kao et al. [18] and ^d Schex et al. [19]. The reference numbers are same as provided in the main text.

Table S2. Identification data for all-*trans* plus *cis* forms of lutein, zeaxanthin, β -cryptoxanthin, β -carotene and α -carotene.

Peak no.	Compound	t _R (min)	k	λ (nm, inline)	λ (nm, reported)	Q-ratio found	Q-ratio reported
1	<i>Cis</i> -lutein	11.01	2.44	336,420,442,470	332,410,434,458 ^a	0.42	0.31 ^c
2	All- <i>trans</i> -lutein	11.48	2.58	336,424,448,476	423, 447, 477 ^b	—	0.04 ^b
3	9- or 9'- <i>cis</i> -lutein	13.91	3.34	336,422,444,472	332 423 446 470 ^c	0.10	0.08 ^a
1	13- or 13'- <i>cis</i> - zeaxanthin	12.49	2.90	338 424 448 472	338 424 446 472 ^d	0.23	0.37 ^b
2	15- or 15'- <i>cis</i> - zeaxanthin	13.68	3.27	340 426 448 472	338 422 446 470 ^d	0.42	0.45 ^b
3	All- <i>trans</i> - zeaxanthin	14.16	3.42	456 480	452 478 ^a	—	0.03 ^a
4	9- or 9'- <i>cis</i> - zeaxanthin	16.02	4.00	340 426 448 478	338 422 446 474 ^d	0.09	0.12 ^b
5	9- or 9'- <i>cis</i> - zeaxanthin	16.98	4.30	340 426 448 478	338 422 446 474 ^d	0.09	0.12 ^b
1	13- or 13'- <i>cis</i> - β -cryptoxanthin	18.43	4.75	342 452 472	340 422 446 474 ^d	0.50	0.45 ^c
2	15- or 15'- <i>cis</i> - β -cryptoxanthin	19.40	5.06	342 448 472	340 424 446 474 ^d	0.30	0.43 ^c
3	All- <i>trans</i> - β -cryptoxanthin	21.38	5.68	454 482	450 477 ^b	—	—
4	9- or 9'- <i>cis</i> - β -cryptoxanthin	22.85	6.14	342 450 474	336 420 446 473 ^e	0.05	0.10 ^a
5	9- or 9'- <i>cis</i> - β -cryptoxanthin	23.42	6.31	342 452 476	336 420 446 473 ^e	0.05	0.10 ^a
1	15- or 15'- <i>cis</i> - β -carotene	24.51	6.65	342 458 480	342 448 474 ^d	0.58	0.50 ^a
2	13- or 13'- <i>cis</i> - β -carotene	25.24	6.88	344 424 448 474	344 423 446 476 ^a	0.45	0.43 ^b
3	9- or 9'- <i>cis</i> - β -carotene	25.88	7.08	344 424 450 476	344, 452, 476 ^d	0.14	0.14 ^a
4	All- <i>trans</i> - β -carotene	27.16	7.48	458 484	454 482 ^b	—	—
5	9- or 9'- <i>cis</i> - β -carotene	28.18	7.70	344 426 454 478	344, 452, 476 ^d	0.09	0.14 ^a
1	13- or 13'- <i>cis</i> - α -carotene	26.21	7.19	334 420 444 470	334 418 442 470 ^f	0.48	0.50 ^b
2	13- or 13'- <i>cis</i> - α -carotene	26.73	7.35	336 420 444 470	334 418 442 470 ^f	0.40	0.50 ^b
3	All- <i>trans</i> - α -carotene	28.17	7.80	424 452 480	424 450 476 ^f	0.06	0.05 ^b
4	9- or 9'- <i>cis</i> - α -carotene	28.73	7.97	340 422 448 474	330 419 441 469 ^e	0.09	0.08 ^a
5	9- or 9'- <i>cis</i> - α -carotene	29.60	8.25	340 424 448 474	330 419 441 469 ^e	0.09	0.08 ^a

Based on a report by ^aInbaraj et al. [12], ^bStraiti et al. [17], ^cLiu et al. [20], ^dKao et al. [11], ^eGupta et al. [21] and ^fKao et al. [18]. The reference numbers are same as provided in the main text.

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