

SUPPLEMENTARY MATERIAL TO  
**Stability of carotenoids toward UV-irradiation in hexane solution**

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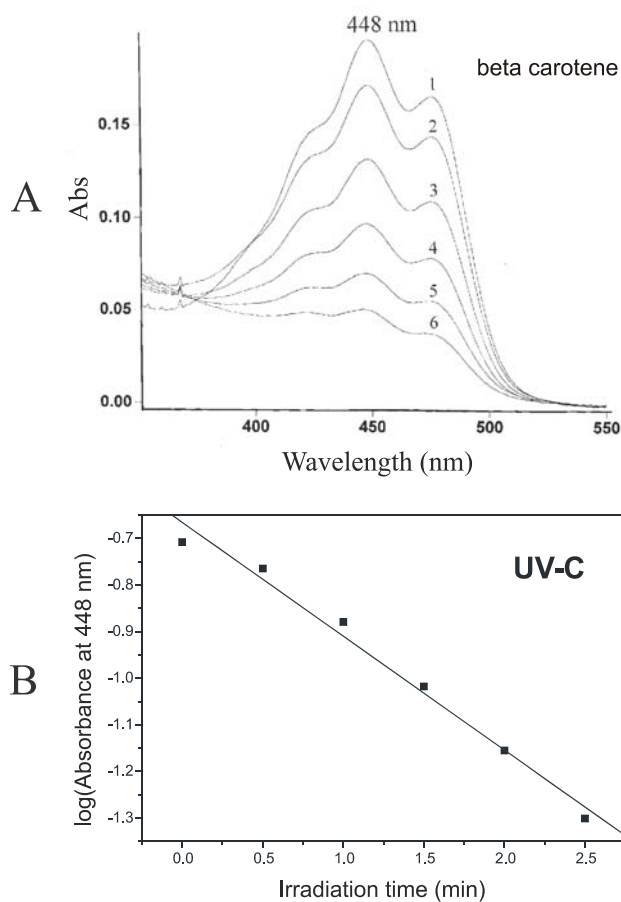


Fig. S1. (A) Changes in the absorption spectra of  $\beta$ -carotene exposed to UV-C radiation (254 nm) in hexane. The exposure time periods were: (1) 0 min; (2) 0.5 min; (3) 1 min; (4) 1.5 min; (5) 2 min; (6) 2.5 min. The approximate concentration of  $\beta$ -carotene was  $1.3 \times 10^{-6}$  mol dm<sup>-3</sup>; (B) The kinetic log absorbance plot of  $\beta$ -carotene bleaching in hexane vs. UV-C irradiation time. The absorbance of  $\beta$ -carotene was followed at 448 nm.

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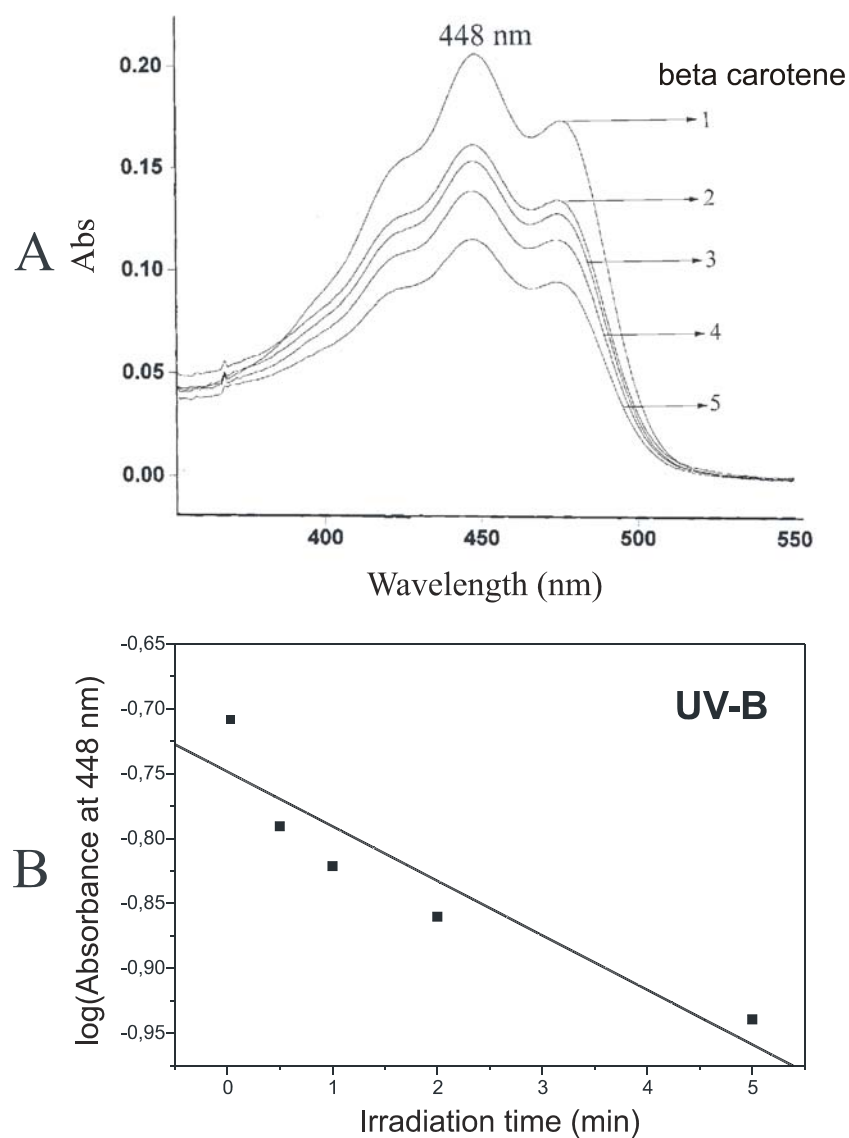


Fig. S2. (A) Changes in the absorption spectra of  $\beta$ -carotene exposed to UV-B radiation (300 nm) in hexane. The exposure time periods were: (1) 0 min; (2) 0.5 min; (3) 1 min; (4) 2 min; (5) 5 min. The approximate concentration of  $\beta$ -carotene was  $1.3 \times 10^{-6} \text{ mol dm}^{-3}$ ; (B) The kinetic log absorbance plot of  $\beta$ -carotene bleaching in hexane vs. UV-B irradiation time. The absorbance of  $\beta$ -carotene was followed at 448 nm.

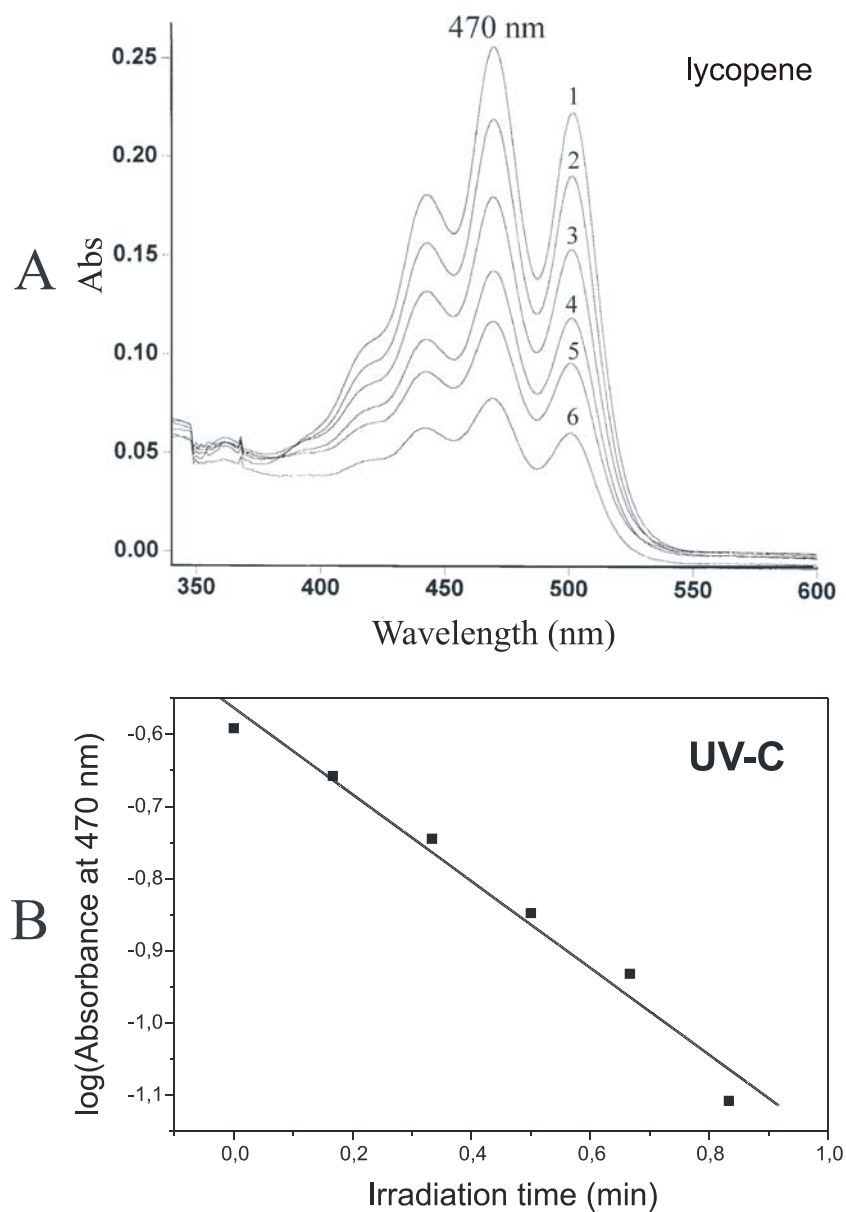


Fig. S3. (A) Changes in the absorption spectra of lycopene exposed to UV-C radiation (254 nm) in hexane. The exposure time periods were: (1) 0 min; (2) 0.17 min; (3) 0.34 min; (4) 0.5 min; (5) 0.67 min; (6) 0.84 min. The approximate concentration of lycopene was  $1.3 \times 10^{-6} \text{ mol dm}^{-3}$ ; (B) the kinetic log absorbance plot of lycopene bleaching in hexane vs. UV-C irradiation time. The absorbance of lycopene was followed at 470 nm.

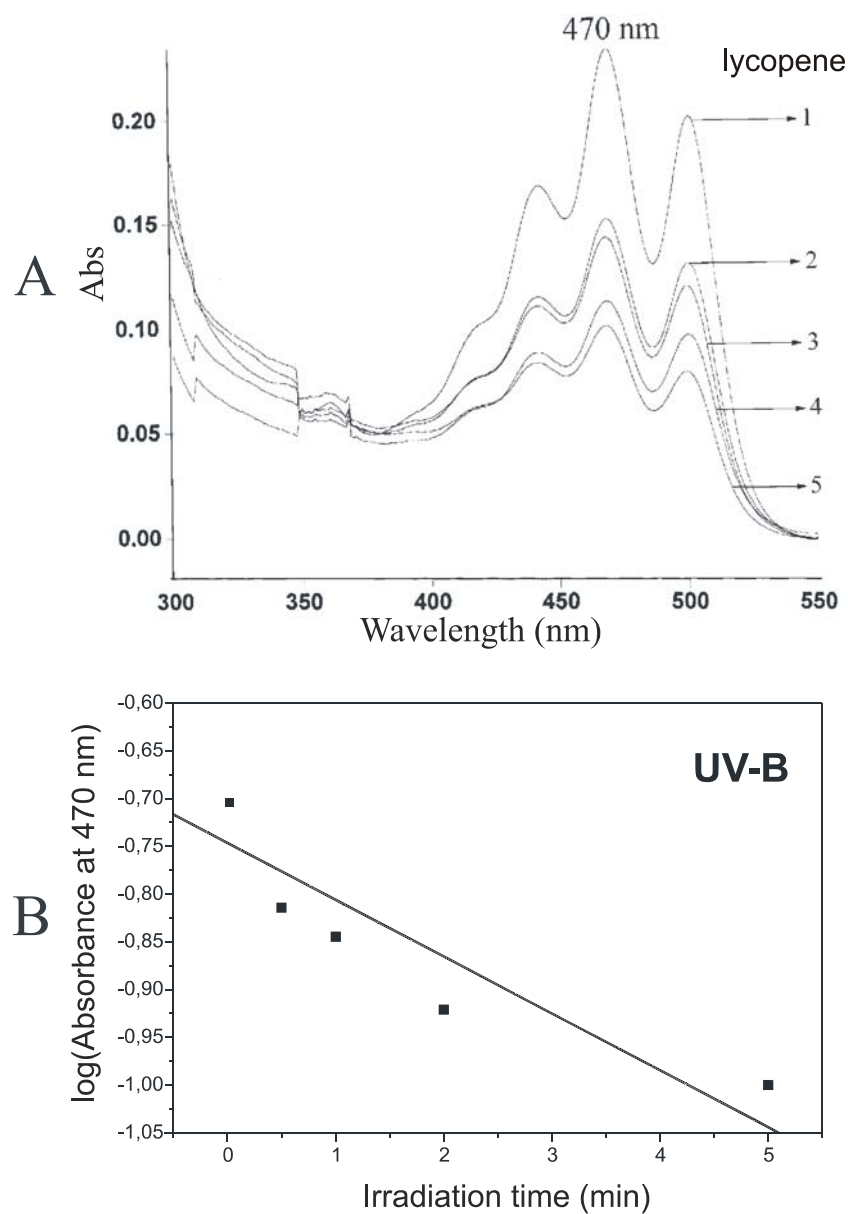


Fig. S4. (A) Changes in the absorption spectra of lycopene exposed to UV-B radiation (300 nm) in hexane. The exposure time periods were: (1) 0 min; (2) 0.5 min; (3) 1 min; (4) 2 min; (5) 5 min. The approximate concentration of lycopene was  $1.3 \times 10^{-6} \text{ mol dm}^{-3}$ ; (B) The kinetic log absorbance plot of lycopene bleaching in hexane vs. UV-B irradiation time. The absorbance of lycopene was followed at 470 nm.

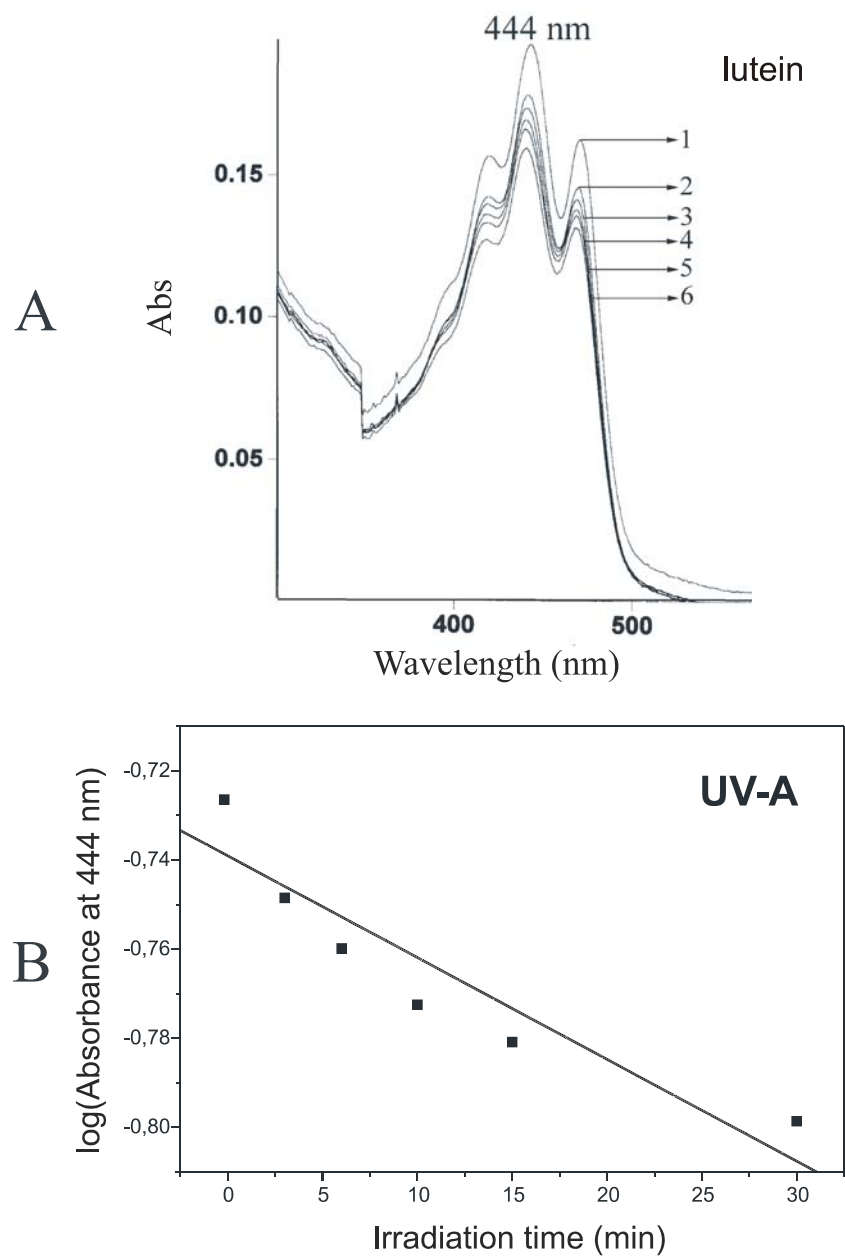


Fig. S5. (A) Changes in the absorption spectra of lutein exposed to UV-A radiation (350 nm) in hexane. The exposure time periods were: (1) 0 min; (2) 3 min; (3) 6 min; (4) 10 min; (5) 15 min; (6) 30 min. The approximate concentration of lutein was  $1.3 \times 10^{-6} \text{ mol dm}^{-3}$ ; (B) the kinetic log absorbance plot of lutein bleaching in hexane vs. UV-A irradiation time. The absorbance of lutein was followed at 444 nm.

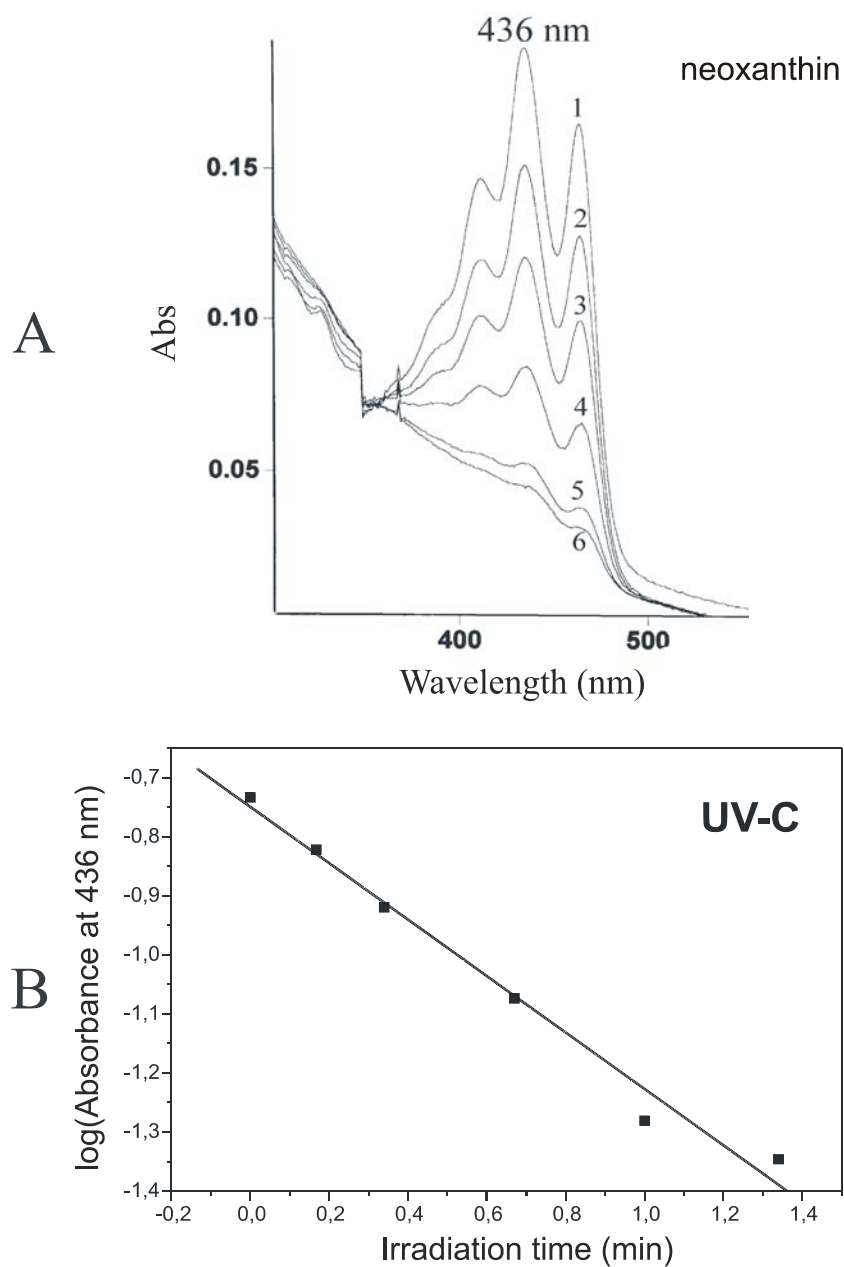


Fig. S6. (A) Changes in the absorption spectra of neoxanthin exposed to UV-C radiation (254 nm) in hexane. The exposure time periods were: (1) 0 min; (2) 0.17 min; (3) 0.34 min; (4) 0.67 min; (5) 1 min; (6) 1.34 min. The approximate concentration of neoxanthin was  $1.3 \times 10^{-6} \text{ mol dm}^{-3}$ ; (B) the kinetic log absorbance plot of neoxanthin bleaching in hexane vs. UV-C irradiation time. The absorbance of neoxanthin was followed at 436 nm.

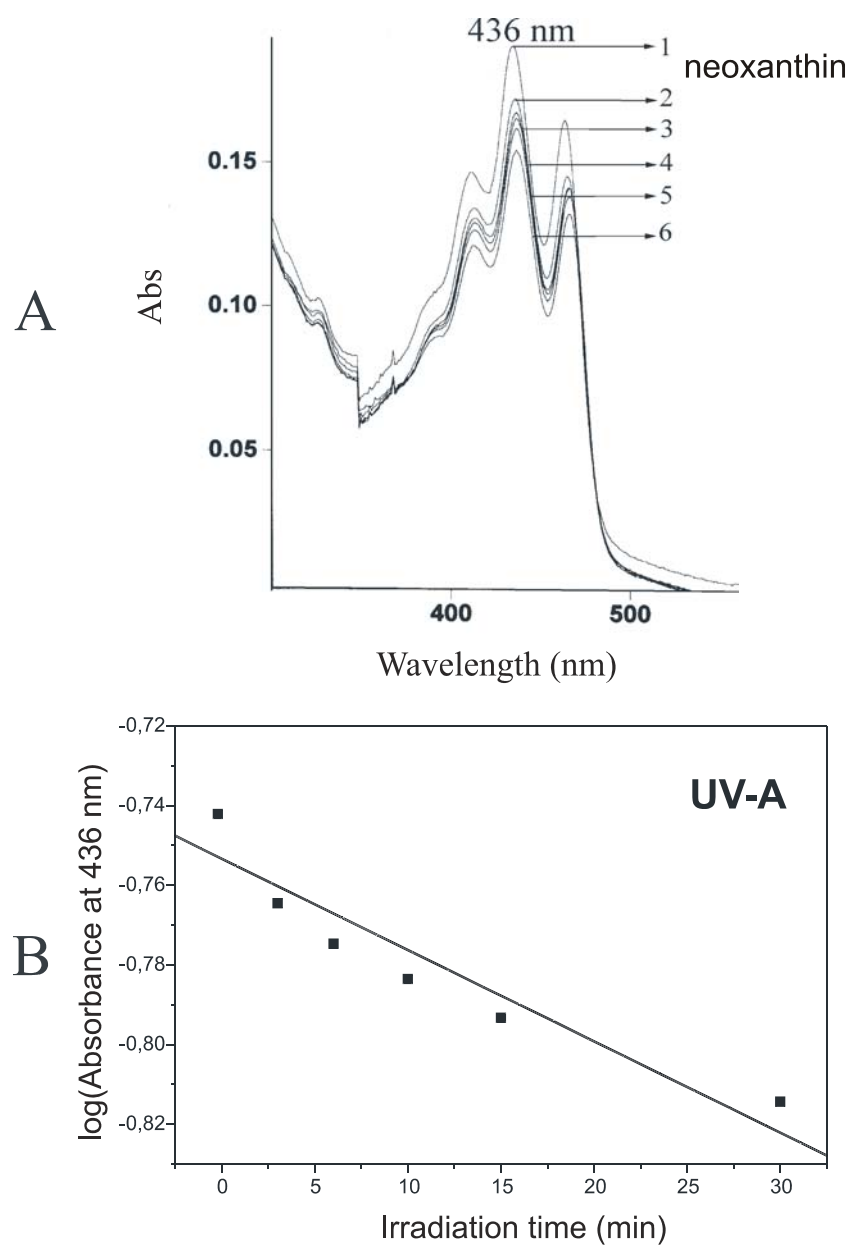


Fig. S7. (A) Changes in the absorption spectra of neoxanthin exposed to UV-A radiation (350 nm) in hexane. The exposure time periods were: (1) 0 min; (2) 3 min; (3) 6 min; (4) 10 min; (5) 15 min; (6) 30 min. The approximate concentration of neoxanthin was  $1.3 \times 10^{-6} \text{ mol dm}^{-3}$ ; (B) the kinetic log absorbance plot of neoxanthin bleaching in hexane vs. UV-A irradiation time. The absorbance of neoxanthin was followed at 436 nm.