研究業績　英文表記

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Title	Effect of emulsifiers on the discoloration of chlorophyll and their potential for use in green beverages
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Abstract	The discoloration of chlorophyll (Chl) by light is an ongoing issue for green beverages in the food industry. To suppress the discoloration of Chl in aqueous solution, the effects of different emulsifiers were investigated on the discoloration of Chl under ultraviolet (UV) irradiation to determine their potential application for use as food additives. Sucrose fatty acid ester (SE), sorbitan fatty acid ester (TW), and quillaja saponin (QS) were used as emulsifiers, while Triton X-100 (TX) was used for reference. The discoloration of Chl was measured using a color difference meter. The species of Chl in solution were determined using ultraviolet-visible (UV-Vis), fluorescence, and circular dichroism (CD) spectroscopy, and the particle size of Chl in solution was determined using dynamic light scattering. The Chl aggregates were observed by the observation of increased peak areas at longer wavelengths in the UV spectra of Chl, in addition to a reduced fluorescence intensity. The CD spectra showed that the Chl aggregates were arranged in a random structure. Furthermore, the average particle size of the Chl aggregates was determined to be approximately 100 nm. SE and QS were found to significantly enhance the formation of self-aggregates due to their high hydrophilicities compared to those of TW and TX. As a result, SE and QS protect themselves from light to suppress the discoloration of Chl. The present results therefore suggest that SE and QS are suitable emulsifiers to address the problem of Chl discoloration in beverages, such as green tea and vegetable juices.
keyword	Chlorophyll, Discoloration, Emulsifier, Self-aggregates

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