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Protective effect of silk extracts on drug-induced phototoxicity

Silk extracts, considered as a waste material in the textile industry, is mainly composed of sericin protein. Sericin has recently been shown various bioactivities and therefore has the high potential uses for skin anti-aging, skin moisturizer and wound healing1. To value added to the extracts of Thai silks, our colleagues have recently developed the purifying process2 and applied the purified silk extracts in nano-cosmeceutical products and nano-delivery system. In the present study, we further evaluated the usefulness of silk extracts by focusing on the protective effect of silk extracts on drug-induced phototoxicity. Chlorpromazine (CPZ), common used antipsychotic drug, was selected as a representative drug causing drug-induced phototoxicity. The skin epidermal cell, A431 cell line, was used as in vitro skin model of this study. Our results demonstrated that UVA treatment decreased the viability of A431 cells in UVA dose-dependent manner and treatment with CPZ following with UVA exposure dramatically decreased cell viability as shown by significant increasing of IC50 value, suggesting the CPZ-induced phototoxicity in A431 cells. These results were consistent with previous report showing that CPZ could be activated by UV irradiation to generate the free radicals and leaded to phototoxicity and photo-allergic reaction3. Interestingly, our results showed that pre- and post-treatment with silk extracts at concentration of 25 μg/mL attenuated cell viability after treatment with CPZ and UVA when compared to the cells non-treated with silk extracts. Furthermore, pre- and post-treatment with silk extracts and CPZ treatment following with UVA exposure improved the level of intracellular glutathione comparing to the cells non-treated with silk extracts. The underlying mechanism related to the protective effect of silk extracts on CPZ-induced phototoxicity will also be discussed in this study. In conclusion, our results indicated that silk extracts can attenuate the skin damage causing by drug-induced phototoxicity. These findings support the usefulness of silk extracts in novel applications especially in the protection of drug-induced phototoxicity simultaneously with using nanotechnology to improve their efficacy.

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