Downregulation of Matrix Metalloproteinase-1 (MMP-1) and In Vivo skin efficacy by PBC140 Malaysian Cocoa Bean Extract

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Abstract

Flavonoids are one of the major components found in Theobroma cacao. Present evidence has suggested that major flavonoid content, including catechin and epicatechin isolated from cocoa bean extract (CBE), have many biological properties such as anti-inflammatory, antioxidant, reduction of oxidative stress, anti-aging etc. In this study, we investigated the effect of potential Malaysian cocoa bean extract, i.e. PBC140 on the inhibition of ultraviolet A (UVA)-induced matrix metalloproteinase-1 (MMP-1) expression, a major marker of skin photoaging in human dermal fibroblasts (HDF). An assessment has been conducted on the MMP-1 level using quantitative polymerase chain reaction (qPCR) in 5 J/cm² UVA-induced HDF cell lines treated with CBE in a dose-dependent manner (2.5 x10⁻² – 1.0x10³ µg/mL). Reduction of MMP-1 expression of the CBE of PBC140 at 5x10² and 1x10³ µg/mL, by 9.34- and 25-folds relative to the calibrator, respectively, have verified its significant photoprotective effect for skin anti-aging. Intervention of approximately 500 mg 0.1% (w/v) CBE formulation on 20 human subjects aged between 30 to 46 years for 2 months duration in the in vivo skin efficacy studies recorded significant (p<0.05) percent changes of skin texture parameters, namely volume (-40%), energy (46%), contrast (-18%) and variance (-21%). The skin elasticity parameter for CBE formulation recorded significant (p<0.05) increment of ten times compared to placebo group. To conclude, Malaysian CBE is a potential active material due to the encouraging results of MMP-1 down regulation and in vivo skin efficacy that meet the primary objective of producing harmless yet natural cosmeceutical with significant skin improvement.

Biography:

Norliza Abdul Wahab has completed her PhD from Halal Product Research Institute, Universiti Putra Malaysia (UPM) on 2019 in a field of Halal Product Development. She has also been serving Malaysian Cocoa Board (MCB) since 2002, specializing in cocoa-based cosmetic product development.

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