Amelioration of hyperglycemia-induced oxidative damage in ARPE-19 cells by myricetin derivatives isolated from Syzygium malaccense

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\textbf{ARTICLE INFO}

\textbf{Keywords:}
\begin{itemize}
\item Hyperglycemia
\item Diabetic retinopathy
\item Hyperglycemia
\item Myricitin
\item Oxidative stress
\item Syzygium malaccense
\end{itemize}

\textbf{Chemical compounds:}
\begin{itemize}
\item Myricetin (PubChem CID: 5291672)
\item Myricetin 3-glucoside (PubChem CID: 44289426)
\item Myricetin 2-alpha-L-arabinofuranoside (PubChem CID: 1452491)
\item Myricitin (PubChem CID: 5261673)
\item Quercetin (PubChem CID: 5290349)
\end{itemize}

\textbf{ABSTRACT}

Myricetin derivatives (F2) isolated from leaf extract of Syzygium malaccense (Malay apple) which contains myricetin predominantly, could potentially serve as functional food ingredient based on previous findings. The present study aimed to investigate the protective effects of F2 against hyperglycemia-induced oxidative stress in ARPE-19 (retinal pigment epithelial) cells; a diabetic retinopathy (DR) model. F2 showed effective inhibition of advanced glycation end products (AGE) formation. The derivatives attenuated high glucose (30 mM)-induced stress condition in ARPE-19 cells by reducing intracellular reactive oxygen species (ROS). At transcriptional level, F2 activated Nrf2 pathway besides upregulating antioxidant enzymes and other protective factors. In addition, protective effect of F2 against formation of AGE correlated with its ability to downregulate gene expression of inflammatory factor, NLRB1 and receptor for AGE. The findings showed that F2 was effective in preventing oxidative damage-induced by high glucose in ARPE-19 and could be developed as an adjuvant to manage DR.