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Anti-Melanogenic Effect of Dendropanax Morbiferus and Its Active Components via Protein Kinase A/Cyclic Adenosine Monophosphate-Responsive Binding Protein-and p38 Mitogen-Activated Protein Kinase-Mediated Microphthalmia-Associated Transcription Factor Downregulation

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Dendropanax morbiferus H. Lev has been reported to have some pharmacologic activities and also interested in functional cosmetics. We found that the water extract of D. morbiferus leaves significantly inhibited tyrosinase activity and melanin formation in α-melanocyte stimulating hormone (MSH)-induced B16-F10 cells. D. morbiferus reduced melanogenesis-related protein levels, such as microphthalmia? associated transcription factor (MITF), TRP-1, and TRP-2, without any cytotoxicity. Two active ingredients of D. morbiferus, (10E)-9,16-dihydroxyoctadeca-10,17-dien-12,14-diynoate (DMW-1) and (10E)-(?)-10,17-octadecadiene-12,14-diyne-1,9,16-triol (DMW-2) were identified by testing the anti-melanogenic effects and then by liquid chromatography-tandem mass spectrometry (LC/MS/MS) analysis. DMW-1 and DMW-2 significantly inhibited melanogenesis by the suppression of protein kinase A (PKA)/cyclic AMP (cAMP)-responsive binding protein (CREB) and p38 MAPK phosphorylation. DMW-1 showed a better inhibitory effect than DMW-2 in α-MSH-induced B16-F10 cells. D. morbiferus and its active component DMW-1 inhibited melanogenesis through the downregulation of cAMP, p-PKA/CREB, p-p38, MITF, TRP-1, TRP-2, and tyrosinase. These results indicate that D. morbiferus and DMW-1 may be useful ingredients for cosmetics and therapeutic agents for skin hyperpigmentation disorders.

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