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제비꽃 발효추출물의 항산화활성 및 미백효과

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Antioxidant activity and whitening effects of the fermented extract of *Viola mandshurica*

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Objectives

In an attempt to search for bioactive natural products exerting potent physiological activities, we identified that fermented extract and EtOAc fraction from *Viola mandshurica*l showed significant effects on physiological activities, such as antioxidant and whitening effects. Therefore, in this study, we report preliminary data on physiological activities of the extracts of *V. mandshurica*.

Materials and Methods

○ Materials

- *Viola mandshurica* : fermented extract, EtOAc fraction
- Cell lines : B16F12 cells, HeLa cells : Korean Cell Line Bank (KCLB)
- MTT(3-(4,5-dimethyl-thiazol-2-yl)-2,5-diphenyltetrazolium bromide : Sigma
- PMA(phorbol myristate acetate) : Sigma

○ Methods

- MTT cytotoxicity assay
- DPPH scavenging activity assay
- Tyrosinase assay
- Melanin content assay
- MMP-9 activity: Gelatin zymography assay

Results and Discussion

Antioxidant activity was evaluated by measuring total phenol content and DPPH free radical scavenging activity. DPPH scavenging activity of FEV (fermented extract of *V. mandshurica*) were 82% at the concentration of 1 mg/ml. Furthermore, FEV effectively inhibited melanogenesis stimulated with α-MSH in B16F10 melanoma cells. Mushroom tyrosinase activity as control *in vitro* was also inhibited by treatment with FEV. From these results, we suggest that *Viola mandshurica* may be useful as new antioxidant and whitening agent to inhibit melanogenesis. Therefore, there is a need for further research focusing identifying effective components in *Viola mandshurica*.

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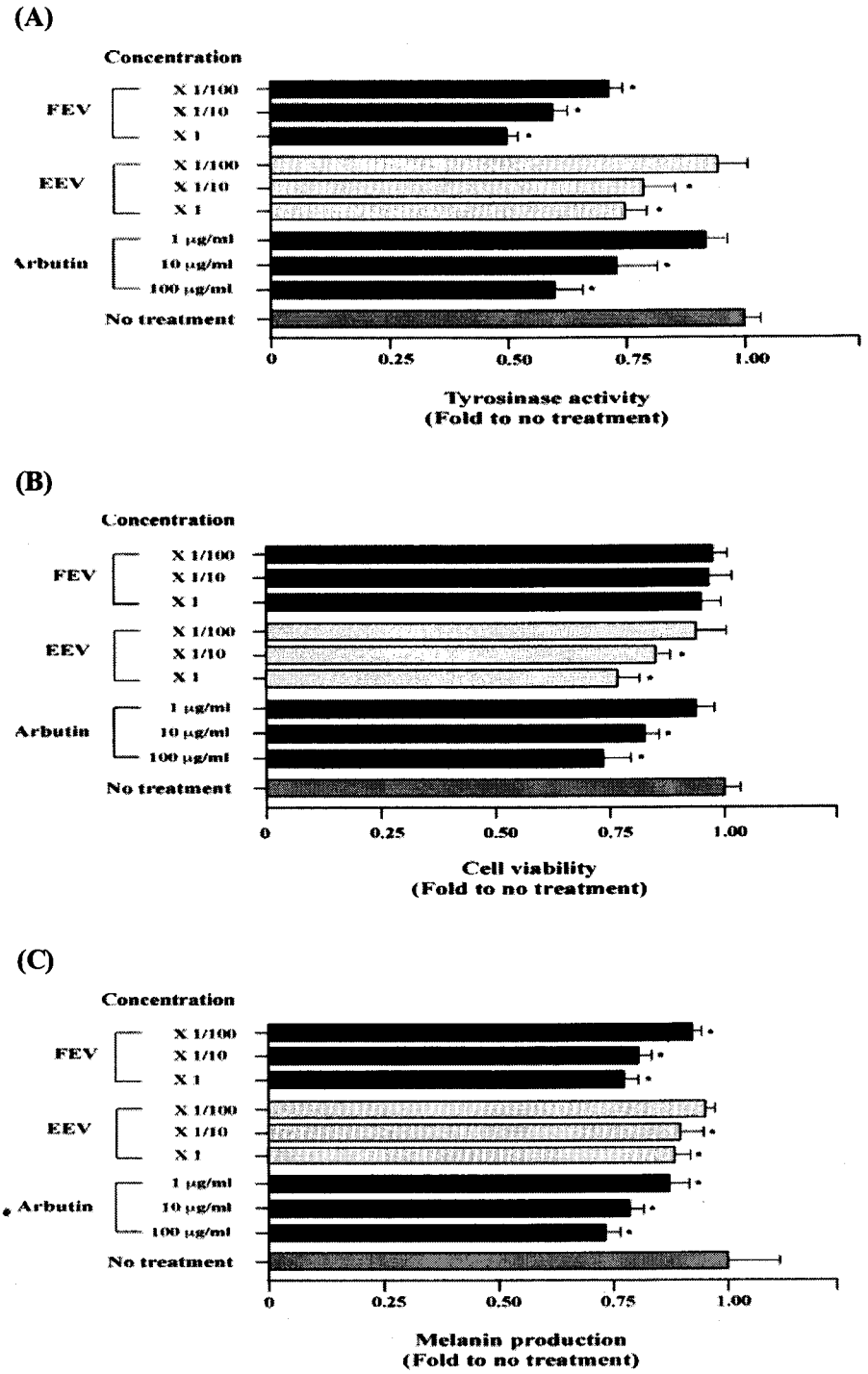

Fig. 1. Whitening effects of *Viola mandshurica* in B16 F10 melanoma cells. Cells were treated without and with various concentrations of FEV (fermented extract of *V. mandshurica*) and EEV (ethylacetate extract of *V. mandshurica*) in the presence of a-MSH (200 nM) for 24h. The cytotoxic effect of extracts of *V. mandshurica* were measured by the MTT assay (A). Tyrosinase activity from cell lysate was analyzed spectrophotometerically by following the oxidation of DOPA to DOPAchrome at 475nm (B). Melanin content was measured by absorption at 405 nm, and exhibited as fold to control (C).