酸桔（Citrus sunki Hort.）及扁實檸檬（Citrus depressa Hayata）果實萃取物對發炎生化指標的影響

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本篇利用12-O-tetradecanoylphorbol-13-acetate (TPA) 誘導老鼠耳朵持續發炎之模式，探討阿斯匹靈、酸桔（Citrus sunki Hort.）果實和扁實檸檬（Citrus depressa Hayata）果實萃取物對發炎生化指標的差異。使用1.0 mg aspirin / ear塗抹於TPA誘發發炎的小鼠耳朵，對耳朵組織內血栓素 (thromboxane B2; TXB2) 抑制率為80.08%，且對前列腺素E2 (prostaglandin E2; PGE2)、P-Selectin和VCAM-1 (vascular cell adhesion molecule-1) 分別顯著抑制111 、50.23及73.14%（p < 0.05）。然該劑量對TPA誘發之腫脹和與心血管疾病相關的生化指標如：白三烯B4 (leukotrienes B4; LTB4)、促發炎激素 (TNF-α, IL-1β, IL-6)、E-Selectin、ICAM-1、血管細胞黏附蛋白 (MCP-1) 和基質金屬蛋白酶 (MMP-9) 等皆無顯著作用。使用相當於200 mg freeze-dried peels of Sunki (Citrus sunki Hort.) 和 Hirami lemon (Citrus depressa Hayata) 果實萃取物塗抹耳朵，對TXB2 抑制率分別為84.06及94.71%。該劑量之酸桔果皮萃出物除對E-Selectin、P-Selectin無顯著抑制外，對腫脹、PGE2、LTB4、促發炎激素 (TNF-α, IL-1β, IL-6)、ICAM-1、VCAM-1、MCP-1和MMP-9等皆有顯著作用（p < 0.05）。該劑量之扁實檸檬果皮萃出物對上述生化指標皆有顯著作用，顯然果皮萃出物對這些生化指標的作用比阿斯匹靈均衡。酸桔果肉或扁實檸檬果汁萃出物也具有抑制發炎指標的能力，只是作用劑量大，能作用的生化指標較少。扁實檸檬果皮經殺菁及漂洗後，對其抗發炎能力影響不大。

關鍵字：阿斯匹靈，酸桔，扁實檸檬，果皮，果肉，抗發炎，心血管疾病，生化指標。

Effects of the Sunki (Citrus sunki Hort.) and Hirami lemon (Citrus depressa Hayata) Fruit Extracts on the Inflammatory Biomarkers

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The inhibitory effects of aspirin, Sunki fruit extract and Hirami lemon fruit extract on inflammation were evaluated using a mouse model with the 12-O-tetradecanoylphorbol-13-acetate (TPA) treatment to induce inflammation on ears. Topical application of 1.0 mg aspirin / ear significantly inhibited TPA-induced increase of thromboxane B2 (TXB2), prostaglandin E2 (PGE2), P-Selectin and VCAM-1 by 80.08, 111, 50.23 and 73.14% (p < 0.05), respectively. The same treatment with the extract did not significantly inhibit TPA-induced edema and increase of the biomarkers associated with cardiovascular diseases, such as leukotriene B4 (LTB4), pro-inflammatory cytokines (TNF-α, IL-1β and IL-6), E-Selectin, ICAM-1, MCP-1 and MMP-9. However, topical application of the extracts from 200 mg freeze-dried peels of Sunki (Citrus sunki Hort.) and Hirami lemon (Citrus depressa Hayata) significantly inhibited TPA-induced increase of TXB2 levels by 84.06 and 94.71%, respectively. The effects were similar to that of 1.0 mg aspirin / ear. The extracts also significantly inhibited TPA-induced edema and increase of pro-inflammatory cytokines (TNF-α, IL-1β and IL-6), adhesion molecules (E-Selectin, P-Selectin, ICAM-1 and VCAM-1), MCP-1 and MMP-9 (p < 0.05), except the extract of Sunki peel for E-Selectin and P-Selectin. In additional studies, there was also anti-inflammatory effect in the extracts of Sunki pulps and Hirami lemon juice, but the effective dosages of the pulp and juice extracts were higher than peel extracts. The anti-inflammatory effect of the Hirami lemon peel extract was not affected after being blanched and leached.

Key words: Aspirin, Sunki (Citrus sunki Hort.), Hirami lemon (Citrus depressa Hayata), Peels, Pulp, Juice, Anti-inflammation, Cardiovascular disease, biomarkers.

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