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Increase in Antioxidant and Cytotoxicity Through Apoptosis-induction on HL-60 of Sweet Potato (*Ipomoea Batatas* Lam. cv. Koganesengan) by Sub-critical Water Treatment

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[Objective] The objective is to examine the effectiveness of heating process of sweet potato with sub-critical water to produce more antioxidant activity and cytotoxic and apoptosis induction activities on human promyelocytic leukemia HL-60 cells.
[Methods and Results] Sweet potato steamed at 95°C was treated with sub-critical water at 200, 230, 250, 275 and 300°C, and the extracts, referred to as A, B, C, D and E, respectively, were obtained. The antioxidant activity was low in the steamed potato (extract S). After heating by the sub-critical water treatment, the extracts showed a markedly strong antioxidant activity and high amount of phenolic content. The antioxidant activity was in the order, E,D>>C>B>A and showed a good relationship with the amounts of phenolic content (r=0.95). The extracts showed a strong cytotoxic effect on HL-60 cells in the order, E,D>>C>B>A. Moreover, the cytotoxic activity of the extracts A and B was found to be mediated through apoptosis induction on this cell.
[Conclusion] Sub-critical water treatment of sweet potato greatly promoted its antioxidant activity, cytotoxic and apoptosis induction activities on HL-60, demonstrating that this new technique could be a promising approach to promote functionality of foods.

Keywords: Sweet potato, Sub-critical water, Antioxidant, Cytotoxicity, Apoptosis

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