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Development and improvement of anti-gout property from aqueous-methanol extract of Morinda elliptica using central composite design (Article)

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Abstract

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Xanthine oxidase (XO) is a key enzyme in hyperuricemia, catalyzing the oxidation of hypoxanthine to xanthine and then to uric acid. Excess serum accumulated with uric acid leads to a type of arthritis known as gout. In this study, development of process conditions for XO inhibitory activity from the leaves of Morinda elliptica was performed by using 70% methanol. Optimization of process parameters such as extraction temperature (°C), extraction time (h), agitation speed (rpm) and ratio of sample to solvent (1g/ml) at five levels was carried out using central composite design (CCD) for the improvement of activity to treat gout. The analysis of variance demonstrated that the model F-value of 18.31 showed the significance of the model with R^2 of 97.71%. The analysis revealed that the percentage of XO inhibitory activity was improved at 32 °C, 30 h, 125 rpm and 1 g/15 ml of solvent. The optimized conditions were verified and the percentage of XO inhibitory activity obtained was 88.93%. The results are encouraging to formulate food, nutraceutical or pharmaceutical products incorporating natural xanthine oxidase inhibitor (XOI), an alternative to irresponsive synthetic XOI.

Author keywords

Central composite design | Gout | Morinda elliptica | Optimisation | Xanthine oxidase inhibitor

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