

Specification : Mixed Thai Medicinal Plant Extract for Athlete No.2 /

สารสกัดสมุนไพรผสมสำหรับนักกีฬาสูตร 2 (Manose RM-0090)

(Application : An active ingredient for antioxidant, anti-inflammation and anti-fatigue in food/dietary supplement products for athlete

/ สารสำคัญในผลิตภัณฑ์อาหาร/เสริมอาหาร สำหรับนักกีฬา

เพื่อดำเนินปฏิบัติการออกซิเดชัน ด้านการอักเสบและลดความเหนื่อยล้า)

1. Name of the raw material : Mixed Thai Medicinal Plant Extract for Athlete No.2
2. Active components : Carthamin, carthamidin, yellow A, safflor yellow A, safflamin C⁽¹⁾, anthocyanins and cyanidin⁽²⁾
3. Common and scientific name/ Family of the plant : Safflower (*Carthamus tinctorius* L./COMPOSITAE) and jamun (*Syzygium cumini* (L.) Skeels/ MYRTACEAE)
4. Physical appearance : Dark yellowish brown semi-solid
5. pH : 4 – 5
6. Standardization : HPLC fingerprint using carthamin⁽³⁾ and cyanidin 3-glucoside (anthocyanins)⁽⁴⁾ as a marker
Carthamin is stable at pH 3-5.5, white light and UV but unstable at high temperature (50°C)⁽⁵⁾
Anthocyanins is unstable at high temperature, stable at room temperature for 2 months⁽⁶⁾ and pH 2.5, 3 and 8⁽⁷⁾
7. Solubility : Soluble in water and ethanol⁽⁸⁻¹⁰⁾
8. Microbial contamination : No pathogenic microorganism with less than 1,000 cfu/g of the total plate count of bacteria, yeast and fungi which is conformed to the Thai FDA regulation⁽⁸⁻¹⁰⁾
9. Biological activities : - Safflower extract showed antioxidative activity by DPPH radical scavenging with the SC₅₀ value of 0.36±0.10 mg/ml (ascorbic acid = 0.10±0.01 mg/ml)⁽⁸⁾

- Safflower extract showed melanin stimulation activity in melanoma (B16F10) with the melanin content relative ratio of $162.88 \pm 20.76\%$ at 1 mg/ml $55.32 \pm 0.86\%$ (theophylline at 0.1 mg/ml = $131.52 \pm 32.30\%$)⁽⁸⁾
- Safflower extract showed tyrosinase stimulation activity in melanoma (B16F10) with the tyrosinase content relative ratio of $150.41 \pm 28.16\%$ at 1 mg/ml (theophylline at 0.1 mg/ml = $116.58 \pm 41.25\%$)⁽⁸⁾
- Safflower extract showed lipase inhibition activity with the IC_{50} value of 3.05 ± 1.32 mg/ml (orlistat = 8.59 ± 1.51 mg/ml)⁽⁹⁾
- Safflower extract showed α -glucosidase inhibition activity with the IC_{50} value of 2.39 ± 0.31 mg/ml (orlistat = 0.20 ± 0.03 mg/ml)⁽⁹⁾
- Jamun fruit extract showed antioxidative activity by DPPH radical scavenging with the SC_{50} value of 0.39 ± 0.00 mg/ml (ascorbic acid = 0.08 ± 0.01 mg/ml)⁽¹⁰⁾
- Jamun fruit extract showed anti-inflammatory activity of inhibiting denaturation by heat of albumin from egg white with the IC_{50} value of 1.00 ± 0.06 mg/ml (diclofenac diethylammonium = 0.24 ± 0.04 mg/ml)⁽¹⁰⁾
- Jamun fruit extract showed anti-inflammatory activity in macrophage cells at 0.1 mg/ml by inhibiting nitric oxide production of $19.67 \pm 1.34\%$ (triamcinolone acetonide = $17.20 \pm 2.25\%$)⁽¹⁰⁾

- Jamun fruit extract showed tyrosinase inhibition activity *in vitro* with the IC₅₀ value of 1.67±0.26 mg/ml (kojic acid = 0.03±0.02 mg/ml)⁽¹⁰⁾
 - Jamun fruit extract showed wound healing activity by migration of human skin fibroblasts to cover the scratch within 48 hours⁽¹⁰⁾
10. Animal / human performance test : Safflower oil reduced abdominal adiposity in male Wistar rats fed with an high-fat diet (HFD) while undergoing exercise training⁽¹¹⁾
11. Safety : Safflower and Jamun fruit extract showed no cytotoxicity on human skin fibroblasts with cell viability of 120.57±5.02 and 95.51±1.71%, respectively at 1 mg/ml^(8,10)
12. Pharmaceutical, food supplement or cosmetic applications : Cosmetic products for hair darkening⁽⁸⁾, anti-aging and whitening effect⁽¹⁰⁾ and products for anti-inflammation, dietary supplement products for body slimming⁽⁹⁾ and antioxidant, anti-inflammation and anti-fatigue
13. Recommended concentrations in the product : 1 – 5 %w/w for cosmetic products⁽⁸⁻¹⁰⁾
0.1-10% w/w for dietary supplement products (the solid crude extract 0.1%, while 10% for the 1% crude extract in propylene glycol)⁽⁸⁻¹⁰⁾
14. Storage : Keep in tight and light protection container at low temperature
15. Precautions : None
16. Cost per kg : Please request

References

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