

Specification of Ma Kiang leaf extract (Manose RM-010)

1. **Name of the raw material** : Ma Kiang leaf extract
2. **Active components** : Anthocyanins, glycosides, vitamin C and flavonoids⁽¹⁾
3. **Scientific name of the plant / Family** : Ma Kiang leaf (*Cleistocalyx nervosum* var. *paniala*)/ MYRTACEAE
4. **Physical appearance of the raw material** : Dark brownish solid with specific odor
5. **pH of the raw material** : 4
6. **Standardization of the raw material** : HPLC fingerprint using cyanidin 3-glucoside as a marker⁽²⁾
7. **Solubility** : Soluble in water and ethanol
8. **Microbial contamination** : None
9. **Biological activities** : Anti-oxidant (DPPH, lipid peroxidation and chelating activity)⁽¹⁾, MMP-2 (collagen degradation enzyme) inhibition⁽¹⁾ and whitening effect by tyrosinase inhibition⁽¹⁾
10. **Safety** : No skin irritation in human volunteers
11. **Animal / human performance test** : Anti-oxidant in animals⁽³⁾
12. **Pharmaceutical, food supplement or cosmetic applications** : Whitening and anti-wrinkle cosmetic and food supplement products
13. **Recommended concentrations in the product (%)** : 0.1-5 %
14. **Storage** : Keep in tight and light protection container at room temperature
15. **Precautions (if any)** : None

16. Cost per kg : -

References

1. Manosroi J, Chankhampan C, Kumguan K, Manosroi W, Manosroi A. *In vitro* anti-aging activities of extracts from leaves of Ma Kiang (*Cleistocalyx nervosum* var. *paniala*). *Pharmaceutical Biology* 2015, 53(6): 862-869.
2. Jansom C, Bhamarapravati S, Itharat A. Major anthocyanin from ripe berries of *Cleistocalyx nervosum* var. *paniala*. *Thammasat Medical Journal* 2008, 8(3): 364-370.
3. Taya S, Punvittayakul C, Chewonarin T, Wongpoomchai R. Effect of aqueous extract from *Cleistocalyx nervosum* on oxidative status in rat liver. *Thai Journal Toxicology* 2009, 24(2): 101-105.