

Specification of Pineapple extract (Manose RM-022)

1. **Name of the raw material** : Pineapple extract
2. **Active components** : Phenolic acids, flavonoids and bromelain^{(1), (2)}
3. **Scientific name of the plant / Family** : Pineapple (*Ananas comosus* (L.) Merr.)/
BROMELIACEAE
4. **Physical appearance of the raw material** : Brown-yellowish solid with specific odor
5. **pH of the raw material** : 5
6. **Standardization of the raw material** : HPLC fingerprint using bromelain as a marker⁽²⁾
7. **Solubility** : Soluble in water
8. **Microbial contamination** : None
9. **Biological activities** : Anti-cancer⁽²⁾, immunomodulatory effect⁽²⁾,
fibrinolytic effect⁽³⁾ and anti-inflammation
10. **Safety** : No skin irritation in human volunteers
11. **Animal / human performance test** : Anti-cancer in animals⁽⁴⁾ and platelet aggregation
protective in heart disease patient⁽³⁾
12. **Pharmaceutical, food supplement or cosmetic applications**
: Anti-cancer, immunomodulatory and
cardioprotective food supplement products / anti-
wrinkle cosmetic 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. Yapo ES, Kouakou HT, Kouakou LK, Kouadio JY, Kouame P, Merillon JM. Phenolic profiles of pineapple fruits (*Ananas comosus* L. Merrill) influence of the original sucker. Australian Journal of Basic and Applied Sciences 2011, 5(6): 1372-1378.
2. Manosroi W, Chankhampan C, Manosroi J, Manosroi A. *In vitro* anti-cancer activity comparison of the freeze-dried and spray-dried bromelain from pineapple stems. Chiang Mai Journal of Science 2015, 42: 1-13.
3. Heinicke RM, van der Wal L, Yokoyama M. Effect of bromelain (Ananase) on human platelet aggregation. Experientia 1972, 28(10): 844–845.
4. B´eez R, Lopes MTP, Salas CE, Hern´andez M. *In vivo* antitumoral activity of stempineapple (*Ananas comosus*) bromelain. Planta Medica 2007, 73(13): 1377–1383.