

Functional drink formulation from the fermentation of banana tree (*Musa parasidica*) rich in antioxidant and food fibre

B.J. Kepel¹, F. Nurkolis², S. Kawengian³, Y. A. Assa³, N. Mayulu³, H. Natanael⁴ and R. Rompies⁴

¹Faculty of Medicine, Sam Ratulangi University, Kampus Unsrat Bahu Street, Manado, Indonesia,

²Department of Biological Sciences, Faculty of Sciences and Technology, State Islamic University of Sunan Kalijaga, Indonesia,

³Food and Nutrition Department of Sam Ratulangi University, Kampus Unsrat Bahu Street, Indonesia and

⁴Department of Pediatrics, Sam Ratulangi University/Prof.dr.R.D.Kandou Hospital Manado, Raya Tanawangko 56 street, Manado, Indonesia

Banana tree (*Musa parasidica*) is an environmental waste that can be extracted from starch and used as an innovative product high in food fibre and potential probiotics by adding pineapple pulp (*Ananas comosus*)⁽¹⁾. This study aims to process or formulate and utilize Banana Tree Starch with the addition of pineapple pulp into a functional food product in the form of probiotic drinks. In addition, *in vitro* levels of antioxidants (especially vitamin C) and total dietary fibre were also carried out.

There are 3 variations of the formulation, Banana Tree Starch: Pineapple: CO₂ free water. Sample 1 (1: 0.5: 0.5), sample 2 (2: 1: 1) and sample 3 (3: 2: 2). Then, all product samples were inoculated with *Lactobacillus paracasei* for 60 hours and incubated in anaerobic conditions with a temperature of 30–32°C. Sample variation was carried out to determine the significance of the average antioxidant content in it. The next step is to test the analysis of vitamin C from 3 variants of beverage samples using the Iodometric Titration Method, to determine the amount of Vitamin C (mg/100g) and the antioxidant activity with 2,2-diphenyl-1-picrylhydrazyl (DPPH). Determination of dietary fibre content using the AOAC method. All with triple repeat per sample.

The amount of vitamin C obtained at S1 was 80.45±0.05 mg/100 g with 44.95±0.99% antioxidant activity and 11.01±0.01% dietary fibre. S2 respectively 65.75±0.05 mg/100 g with antioxidant activity of 30.60±0.30% and 8.90±0.10% dietary fibre. S3 was 47.02±0.02 mg/100 g with 32.10±0.20% antioxidant activity and 7.89±0.10% dietary fibre. The fermented drink sample formulation containing the highest vitamin C was S1. There was a significant difference ($P < 0.05$) which determined the vitamin C levels between the sample formulations. The average ash content of the three samples was 4.77±0.07% and the moisture content was 37.72±7.72%. The average vitamin C level in the three fermented drink samples was 64.40±16.75 mg/100g. S1 showed the best activity, namely the antioxidant activity against 2,2-diphenyl-1-picrylhydrazyl (DPPH) of 44.95±0.99% and also had high levels of dietary fibre and high vitamin C.

The formulation of a combination of banana tree starch with the addition of pineapple pulp has great potential to be developed into a health functional food. By looking at the content of vitamin C and total dietary fibre and antioxidants in the fermented products, this can be an effort to diversify local food and can be an alternative to anti-diabetic drinks and other infectious diseases⁽²⁾.

Acknowledgements

This funding is research from first author and we thank all of the contributors for their outstanding help in formatting the abstract. The authors' responsibilities were as follows—all authors: contributed to the writing and revisions contained in the abstract; and all authors have read and approved the final abstract.

References

1. Setianingsih, R. (2020). (Doctoral dissertation, UIN Raden Intan Lampung).
2. Jayedi A, Rashidy-Pour A, Parohan M, et al. (2018) *Adv Nutr*, 9(6), 701–716.
3. Jiao J, Xu JY, Zhang W, et al. (2015). *Int J Food Sci Nutr*, 66(1), 114–119.