

Antioxidant activity, phenolic and flavonoid contents in the leaves extract of purple sweet potatoes (*Ipomoea batatas* L.) Antin-3 variety in different ethanol concentration as a solvent

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Introduction:

The Antin-3 variety of purple sweet potato (*Ipomoea batatas* (L.)) is the newest variety cultivated by Balitkabi Malang, East Java. The total of both phenolic and flavonoid content of the 70% ethanol extract of young Antin-3 leaves was higher than the old one (1). The air-drying method produces a total polyphenol 1.3 times higher than the dried through the freeze-drying method (1). Antin-3 leaf extract can be used as a source of natural antioxidants (2). It is necessary to investigate further at what concentration of ethanol as a solvent that produces optimal total polyphenol and flavonoids content of Antin-3 leaves; 50%, 70%, and 96%. Also, the antioxidant activity was tested.

Methods :



- 4,5 months old of Antin-3 young leaves
- Air dried at room temperature and spared from direct

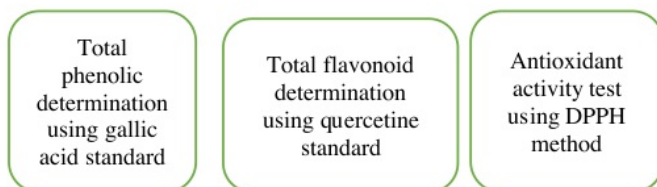


Picture 1. Preparation of Antin-3 leaves powder (3)

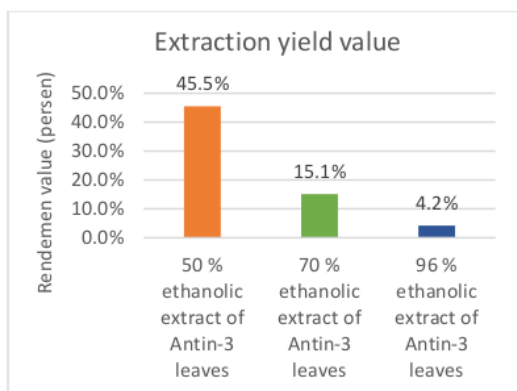


- Kinetic re-maceration at room temperature using magnetic stirrer at 200 rpm for three hours
- The comparison of the leaf powder to the solvent = 1:10
- Maserated in rotary rotavapour at 40 °C

Picture 2. Preparation of Antin-3 leaves extract (1)

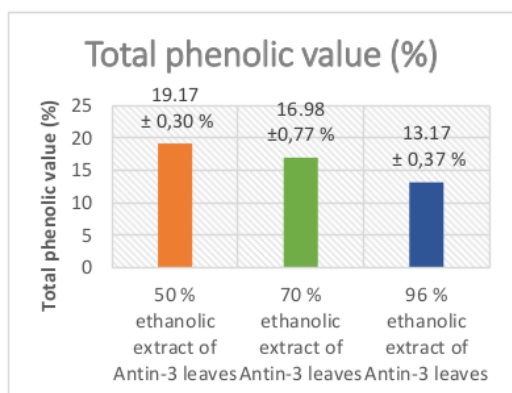


Picture 3. Determination methods of polyphenol, flavonoid and scavenging free radical (DPPH) (4)



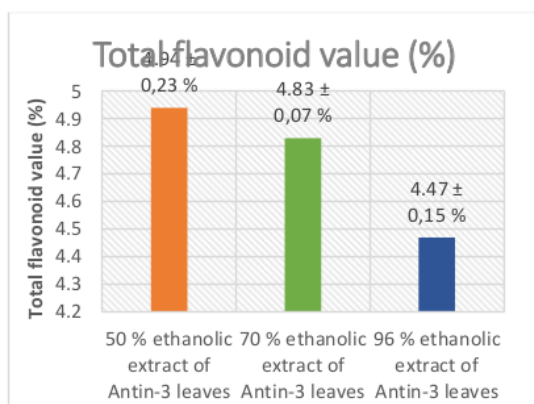
Picture 4. Extraction yield value of Antin-3 leaves extract

1. Total phenolic determination



Picture 5. Total phenolic content of Antin-3 leaves extract

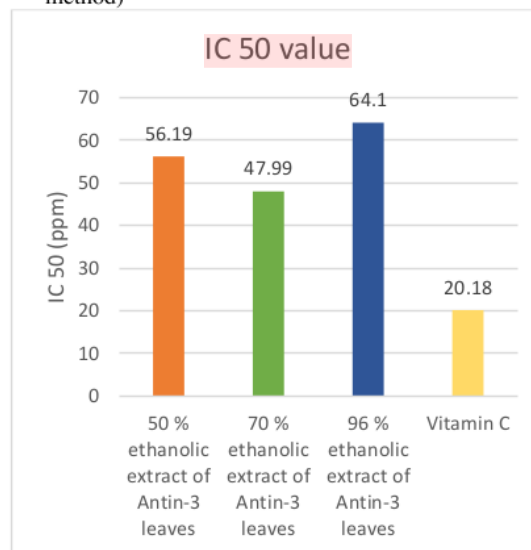
2. Total Flavonoid Determination



Picture 6. Total flavonoid content of Antin-3 leaves extract

From picture 5 and 6, it is known that the highest concentration of total phenolic and flavonoid compounds were yielded from 50% ethanolic extraction of Antin-3 leaves. Compared to other concentrations, the high polarity of 50% ethanol enables to extract both polar phenolic and flavonoid groups.

3. Free radical scavenging activity test (DPPH method)

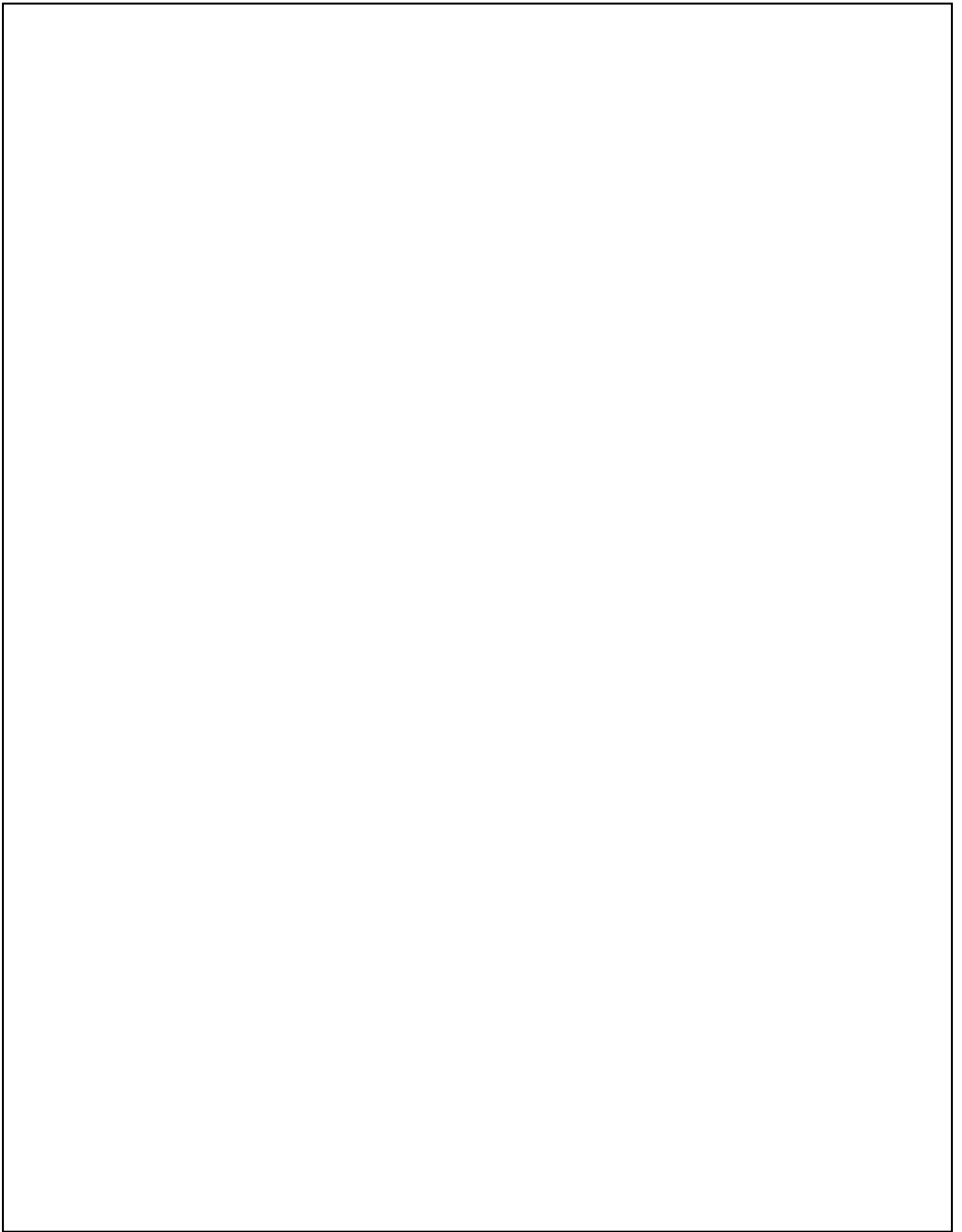


Picture 7. IC 50 value of Antin-3 leaves extract and vitamin C as a standard

Lower IC 50 value indicates higher antioxidant activity. Antioxidant activity was influenced by total phenolic levels (4). However, in this study, the extract from 70% ethanol has higher activity than the 50%-ethanol extract. In this case, the 70% ethanol extracts more non-polar components that support antioxidant properties in Antin-3 leaves, for example, vitamin E and beta-carotene (5).

Conclusion:

The 50 % ethanolic extraction of Antin-3 leaf produces the highest phenolic and flavonoid content. The higher the water content in the solvent, the greater the secondary metabolites are, especially for polyphenol and flavonoid. Also, the smaller IC 50 value of the extract, the higher antioxidant activity could be. Meanwhile, the 70 % ethanol Antin-3 leaf extract has the highest antioxidant activity. Antioxidant activity of Antin-3 leaf extract is not only yielded from the content of polyphenol and flavonoid, but also from oil solubility nutrition, such as vitamin E and beta-carotene (5).



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