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

Damsanie Dipahyuu*, Galuh Gongco Kusumo* \n1 Department of Technology Formulation Pharmacy, Akademi Farmasi Surabaya, Surabaya, Indonesia \n2 Department of Natural Product Pharmacy, Akademi Farmasi Surabaya, Surabaya, Indonesia

Abstract

Background: Purple sweet potatoes (Ipomoea batatas L.) Antin-3 variety is the newest variety which has high anthocyanin content and can be used as an antioxidant source. The purpose of this study is to obtain data of polyphenol, flavonoid and antioxidant activity of Antin-3 leaves, which have been extracted by kinetic re-maceration using different concentration of ethanol: 50%, 70% and 96%. Methods: Total phenolic determination in this study used gallic acid as a standard, while total flavonoid determination used quercetin. DPPH was used to determine the free-radical scavenging activity of the Antin-3 leaf extract and vitamin C as a control. All of that determination using UV-Vis Spectrophotometer. Result: The results showed that the polyphenol content of 50%, 70% and 96% ethanol of Antin-3 leaf extract in row were 19.17±0.30, 16.92±0.77, 13.17±0.37 %. The flavonoid content in row were 4.94±0.23, 4.83±0.07, 4.47±0.15 %. The value of antioxidant activity was represented by IC 50 value. IC 50 of 50%, 70% and 96% ethanol of Antin-3 leaf extract in row were 58.19 ppm; 47.99 ppm and 64.10 ppm. IC 50 value of vitamin C was 20.18 ppm. Conclusion: The 50% ethanol Antin-3 leaf extract produces the highest polyphenol and flavonoid content. The higher water content in the solvent, the greater secondary metabolites are, especially for polyphenol and flavonoid. Also, the smaller IC 50 value of extract, the higher antioxidant activity could be. The 70% ethanol Antin-3 leaf extract has highest antioxidant activity. Antioxidant activity of Antin-3 leaf extract is not only from the content of polyphenol and flavonoid, but also from oil solubility nutrition such as vitamin E and beta-carotene.

Keywords: Antin-3 leaf extract, polyphenol, flavonoid, ethanol concentration, IC 50

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:

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

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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