

Characteristics of Phytochemical Compounds and Anthocyanin of Extract from Purple Sweet Potato

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Abstract. Purple sweet potato is a tuber, that has a purple tuber flesh. This purple color can be used as a source of natural dyes in extract form. Purple sweet potato extract is a crude extract so apart extractable of dye component can also be extracted bioactive components such as other phytochemical compounds. The aim of this research was to determine the characteristics of phytochemical compounds and anthocyanins of purple sweet potato extract. The method of research used descriptive analysis to determine the type of phytochemical compounds and anthocyanins types. Purple sweet potato anthocyanin type done by ultra high performance liquid chromatography. The results showed the type of phytochemical compounds in the extract of purple sweet potato were saponins, alkaloids and flavonoids with quantity content such as: 7.99 ppm; 35.16 ppm and 182.28 ppm respectively. The types of anthocyanins were cyanidin 3-glucoside and peonidin 3- glucoside with quantity content such as: 24.43 µg/ml and 13.26 µg/ml respectively

Keywords : *Purple purple sweet potato extracts, phytochemical compounds, types of anthocyanin*

I. INTRODUCTION

Purple sweet potato is one of the types of tubers that have purple tuber flesh. Production, purple sweet potato in Bali in 2012 reach 62,352 tons (BPS Bali, 2012), the most widely spread in Bangli amounting to 24,760, Indonesia's production reached 2,366,410 tons (BPS, 2013). One type of sweet potatoes are purple sweet potato violet.

The purple color is identical to the anthocyanin content. The relationships are included in the Group of flavonoids which is one of the components of the bioactive. The red pigment anthocyanin contribute as purple and blue on the plant (Jiao et al., 2012).

Purple pigment from purple sweet potato can be used as a dye extract can improve the diversity of the sources of natural dye extracts. This adult coloring natural healthy start getting noticed. This is in line with the increased awareness of food-related health. Components in food that have health benefits known as bioactive component. Bioactive component is a component in small amounts on foodstuffs which can give good physiological effect prejudicial or benefit like health benefits on degenerative diseases, such as diabetes, heart, cancer. A degenerative disease is a disease that is caused due to the fault of life one dietary

mistakes. Bioactive component in its food very much and simply applied vary. Bioactive component found in the horticulture, provide physiological effects are known by the term phytochemical. Phytochemical compounds are very diverse so that needs to be contained phytochemicals compounds characterized on groceries. This will relate to the effect of Physiology that is favorable to the health or development of the functional food.

Based on this research aims to determine the characteristics and type of Phytochemical compounds of anthocyanin of purple sweet potato extract.

II. RESEARCH METHODS

The place and time of the research

Research done in the laboratory of Agricultural Processing, biochemistry and nutrition and Agricultural Analysis, Department of Food Science and technology, Faculty of agricultural technology, the Udayana University. The time of implementation of the research in the first year from March to August 2015.

Materials and Equipments

The raw materials used are purple sweet potato from Bangli, solvent ethanol (bataco70%), citric acid, aquades (elephant), sodium carbonate (Brand), ciocealteu Folin (Sigma), 1.1-diphenyl-2-picryl hydrazyl (Sigma), methanol (Brand), acid (Sigma) error.

Tools used in research are: blender, shake waterbath, ovens, rotary evaporator, place the reagent bottles, dropper volume, test tubes, erlenmeyer flask, a beaker, funnels, measuring cup, spatula, UV-Vis spectrophotometer (UV-Ishimatsu, 160) and Vortex (Thermolyne), pH-meters (Orion, 210 A), water bath (GFL 1083).

Implementation of the research

The research was done through identification and phytochemical compounds characterization and anthocyanin of purple sweet potato dye extract intact extraction results with maceration for 18 hours with solvent ethanol 70% technical and citric acid 3%. Identification and characteristics of purple sweet potato extracts include the types and levels of phytochemicals and anthocyanin compounds. Testing the types and levels of phytochemicals compounds includes alkaloids, flavonoids and safenin performed by spectrophotometer dang tool spectrophotometer uv/vis, whereas the type and levels of anthocyanin in chromatography with UHPLC (ultra high performance liquid chromatography) using standard cyanidin anthocyanin 3-glucosides and peonidin 3 Glycoside. Implementation of the research can be seen in Figure 1.

III. RESULT AND ANALYSIS

Phytochemical compound extract of purple sweet potato

Phytochemical compound extract of purple sweet potato is done using some of the methods are already common. The phytochemical compounds, namely safenin, alkaloid levels and the levels of flavonoids. The value of average levels of saponins, alkaloids da flavonoids can be seen in Figure 2.

Figure 2. describe the highest content of flavonoid phytochemicals at 182.28 ppm and the lowest are the saponins of 7.99 ppm. This is due to the extraction of anthocyanin extraction is done, so the relationships with high levels. It is seen from the color red purple sweet potato and anthocyanin extracts including the flavonoids. The flavonoids they contain anthocyanin which is the biggest part of the phenolic components (Weich et al., 2008).

Identification Of Anthocyanin Of Purple Sweet Potato Extracts Compounds

Identification of anthocyanin is done to determine the dominant type of anthocyanin in purple sweet potato by using external standards of cyanidin 3-glucosidase

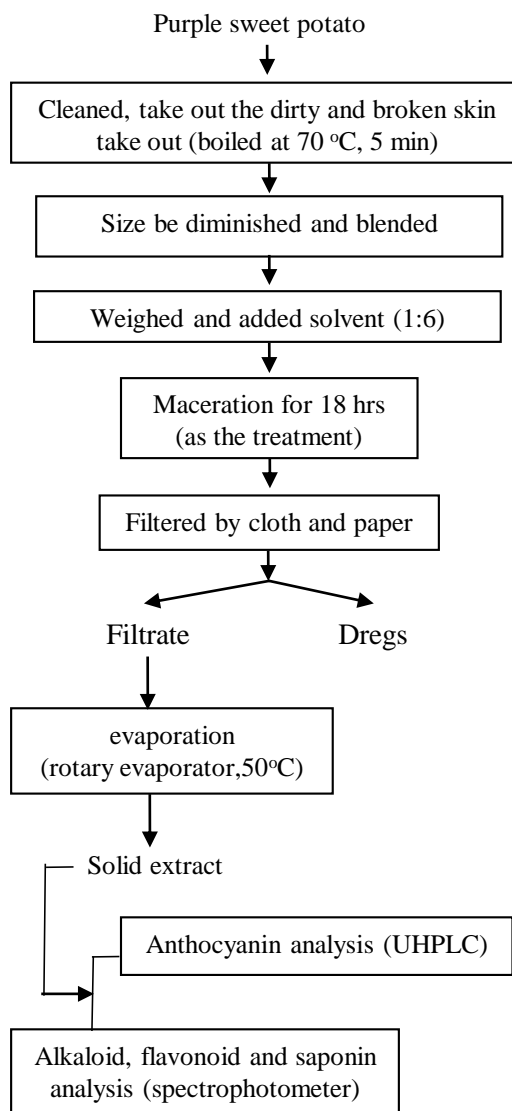


Figure 1. Research flowchart

and peonidin 3 glucosidase. The tools used are UHPLC (Ultra High Performance Liquid Chromatography). The results of the identification of anthocyanin of purple sweet potato extracts can be seen in table 1 and Figure 3. Table 1 type of antocyanin that is detected based on the standards used, namely cyanidin and peonidin 3-glukoside 3-glukoside, describe the fastest time and extensive retention areas in the smallest type of anthocyanin cyanidin 3-glukoside with the greatest levels i.e. 24.43 ug/mL, whereas in peonidin 3 Glycoside indicate retention time and area greater than cyanidin 3-glucosides with simply applied lower of 13.26 ug/mL. Figure 3 explains that the results of the chromatogram UHPLC shows 2 highest peak is indicated with 2 types of anthocyanin cyanidin 3-glucosides IE and peonidin 3-peak, peak glukoside – another possibility is the fragmentation of both types of relationships.

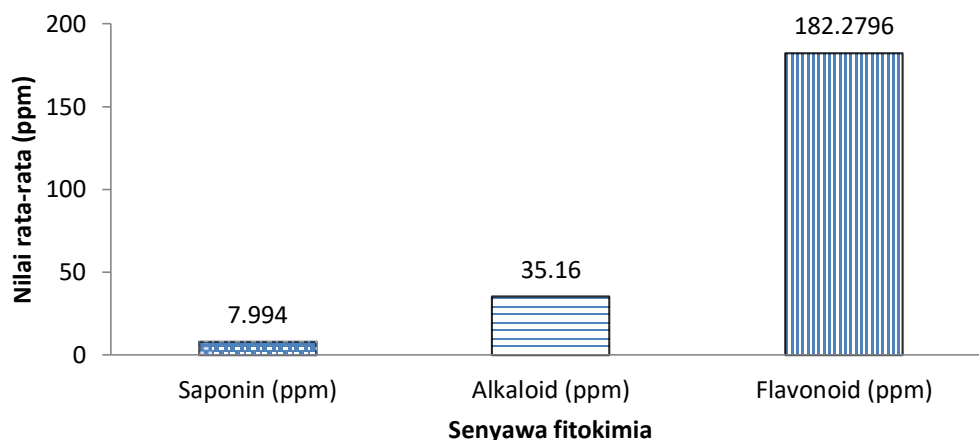


Figure 2. The average of phytochemical compound from extract of purple sweet potato

Table 1. Identification of anthocyanin from extract of purple sweet potato

Senyawa	RT*	Area	Konsentrasi (ug/mL)
Cyanidin-3-O-glucoside chloride	12.98	1280451.5	24.43
Peonidin-3-O-glucoside chloride	14.02	928053.41	13.26

*RT : Retention time (waktu retensi)

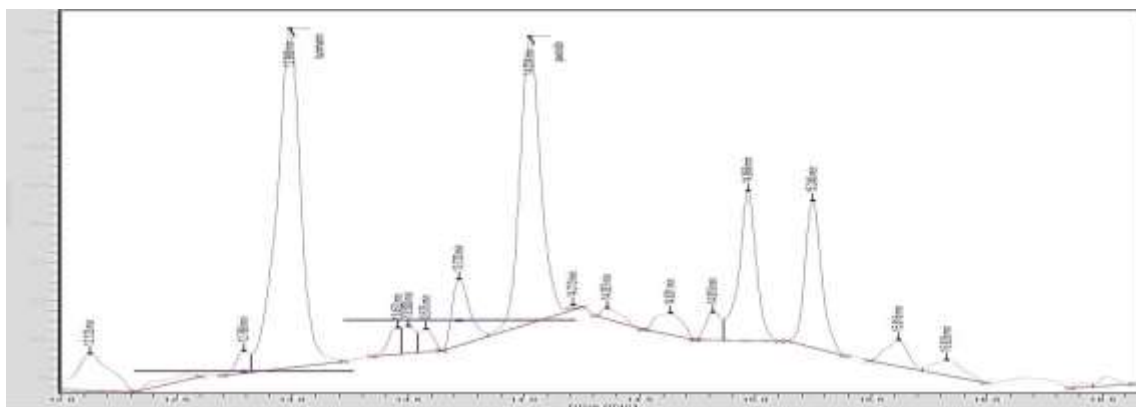


Figure 3. Identification of anthocyanin by using UHPLC from extract of purple sweet potato

IV. CONCLUSIONS

Summary of the research is the purple sweet potato extract contains the phytochemical compounds, saponin alkaloids and flavonoids, highest on the flavonoid of 182.28 ppm with kind of anthocyanin cyanidin 3-glucosides dominant and peonidin 3-glucosides. Purple sweet potato extract rich in anthocyanin and potential as a functional food and ingredient red dye natural

ACKNOWLEDGEMENTS

The authors wish to acknowledge the LLPM of Udayana University and Faculty of Agricultural

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