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Analysis of chlorophyll content in six traditional medicinal plants as an alternative food supplement

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Abstract

Chlorophyll can be found on almost every green plant, it is because chlorophyll is the main pigment of plants. Chlorophyll has a lot of important benefits such as helping optimize metabolic function and immune system. But the source of chlorophyll which is usually consumed today is usually derived from algae that are difficult to obtain. Because of that we need to find the source of chlorophyll from plants which are easily obtained. This study aims to determine the chlorophyll content of some medicinal plants that are easily found. To analyze the chlorophyll content we used Arnon (1994) method. The statistical test used was analysis of variance (ANOVA) with a complete random design (CRD) at 95% confidence level, if the results of ANOVA showed real difference, we continued the analysis using Duncan test. The results showed that the content of chlorophyll-a was highest in grass jelly leaves and the lowest was in the green betel leaves, while the highest chlorophyll-b was found in screwpine leaves and the lowest was found in green betel leaves, the highest total chlorophyll was contained in screwpine leaves and the lowest was found in the leaves of binahong. In conclusion then pandan leaves and grass jelly leaves are potential to be used as an alternative for chlorophyll supplements.

Keywords chlorophyll, food supplement, medicinal plants

1. Introduction

Chlorophyll is the main pigment of plants, so we can be found on almost every green plant. Chlorophyll has a lot of important because chlorophyll is chlorophyll is a vital factor of the place during the process of photosynthesis. All green parts, including the stem and fruit have chloroplast is the main place during photosynthesis (Campbell, 2002; Hopkins, 2008; Motten, 1995). Currently many chlorophyll as a food supplement, because it can help optimize metabolic function, detoxification, immune system, relieves inflammation (inflamatorik) and balance the hormonal system (Limantara, 2007; Marliani, 2011; Setiari, 2009; Lestari, 2008). Besides chlorophyll can stimulate the formation of blood and providing basic materials shaper haemoglobin (anonymous, 2008).

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Chlorophyll has a lot of important benefits such as helping optimize metabolic function and immune system. But the source of chlorophyll which is usually consumed today is usually derived from algae that are difficult to obtain. Because of that we need to find the source of

chlorophyll from plants which are easily obtained, for example are screwpine, grass jelly, red-betel, green-betel, binahong and sugar-apple.

This study aims to determine the chlorophyll content of some medicinal plants that are easily found, that is the type of medicinal plants such as green betel leaf (*Piper betle*), betel leaf (*Piper crocatum*), screwpine (*Pandanus amaryllifolius*), sugar-Apple (*Annona squamosa*), binahong (*Anredera cordifolia*), and leaves of grass jelly (*Premna Serratifolia*).

2. Materials and methods

2.1 Sample

The research was carried out in the laboratory of Plant Structure and Function of the Department of Biological Science, Tadris IAIN Syekh Nurjati Cirebon in April-June 2015. The materials used in this research is the screwpine, grass jelly, red-betel, green-betel, binahong, and sugar-apple, acetone, akuades, filter paper, paper labels. For samples taken leaves the order of 2, 3 or 4 randomly.

2.2 Analisis of the experiment

Leaf samples were extracted with acetone 85% 10 mL sample weight by comparison and acetone is 1:100. The extract obtained is filtered with a filter paper and analyzed using UV Vis spectrophotometer at a wavelength of 660 nm and 810 nm. Counting of the chlorophyll content (mg/L) is determined by the formula from the original method of Arnon (1949), Chlorophyll a = $1.07 (OD\ 659) - 0.094 (OD\ 645)$, Chlorophyll b = $1.77 (OD\ 645) - 0.28 (OD\ 659)$ total Chlorophyll = $0.79 (OD\ 659) + 1.076 (OD\ 645)$.

To analyze the chlorophyll content we used Arnon (1994) method, that is to determine the content of chlorophyll a, chlorophyll b, and total chlorophyll. The statistical test used was Analysis of Variance (ANOVA) with a complete random design (CRD) at 95% confidence level, if the results of ANOVA showed real difference, we continued the analysis using Duncan test.

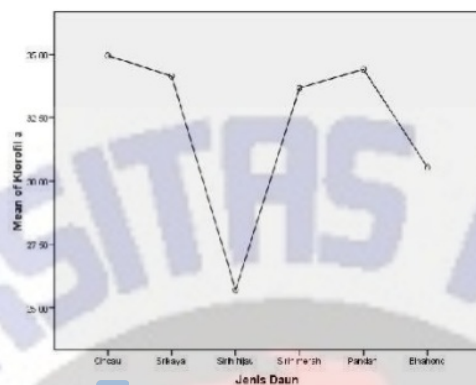
3. Results and discussion

The results showed that the content of chlorophyll-a was highest in grass jelly leaves and the lowest was in the green betel leaves, while the highest chlorophyll-b was found in pandan leaves and the lowest was found in green betel leaves, the highest total chlorophyll was contained in screwpine leaves (74.81 mg/g) and the lowest was found in the leaves of binahong (42.3767mg/g). For more details can be seen in Table 1.

Table 1. Average of total chlorophyll, chlorophyll a, and chlorophyll b.

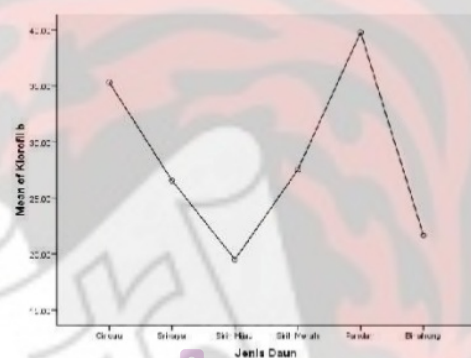
Leaf of	total chlorophyll	chlorophyll a	chlorophyll b
Grass jelly	70.9433	34.9500 *	35.3333
Sugar-apple	61.2922	34.1400	26.5533
Green-betel	45.6633	25.7033	19.5100
Red-betel	61.7900	33.6800	27.5167
Screwpine	74.8100 *	34.4067	39.7833 *
Binahong	52.7400	30.5433	21.6667

Note: *the highest amount of chlorophyll a test based on Duncan.



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Figure 1. Level of chlorophyll a.



9

Figure 1. Level of chlorophyll b.

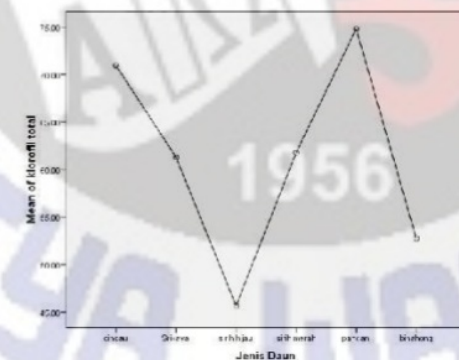


Figure 1. Level of the total chlorophyll.

1

The amount of chlorophyll a, chlorophyll b, and total chlorophyll from the sixth type of leaves showed significant differences. The graph shows the green betel leaves have chlorophyll lowest among others.

4. Conclusion and remarks

Six types of leaves of medicinal plants (leaves of grass jelly, sugar-apples leaves, green-betel leaves, red-betel leaves, screwpine leaves, and the binahong leaves), the average content of chlorophyll is quite high. Of the six types of medicinal plants, grass jelly and screwpine leaves have chlorophyll was higher compared to the other. Thus the leaves of screwpine leaves and grass jelly can be an alternative food supplement containing chlorophyll.

The conclusion then screwpine leaves and grass jelly leaves were potential to be used as an alternative for chlorophyll supplements.

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