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Nutritional, Phytochemical And Antinutritional Content Of Ethanol Extract Of Keladi/Talas Kimpul (Xanthosoma Sagittifolium (L.) Schott) And Keladi Togog (Colocasia Esculenta (L.) Schott) In Bali

Ni Nyoman Budiani[1] , Ni Wayan Armini[2]

[1]Politeknik Kesehatan Kemenkes Denpasar, Indonesia

[2]Politeknik Kesehatan Kemenkes Denpasar, Indonesia

ABSTRACT

Nutritional problems such as anemia in pregnancy are at risk of giving birth to babies with low birth weight and stunting. Utilization of local food ingredients can provide added value in fulfilling the nutrition of pregnant women. The stems of keladi/kimpul taro and keladi togog can be consumed but have not been studied much. The purpose of this study was to identify the nutritional, phytochemical, anti-nutritional content of keladi/ talas kimpul and keladi togog that can be consumed by humans. Methods: descriptive research. Green and fresh keladistems taken from Buleleng Regency, Bali. The keladi stems was extracted using 96% ethanol, then tested in the laboratory. Result: keladi stem and keladi togog, contain carbohydrates, protein, fat, beta carotene, vitamin C, flavonoids, saponins, and tannins. Calcium, zinc, and steroids were not detected in keladi/ talas kimpul stems. Fe and zinc were not detected in the stem of the keladi togog. Conclusion: taro stem and taro togog contain nutrients, phytochemicals, and anti-nutrients. Recommendation: further research is needed to determine the efficacy of extracts in experimental animals.

Keywords: keladi stem, nutrition, phytochemical, antinutrition

INTRODUCTION

Talaskimpul, in Bali known as Keladi.Talas grows wild, can live regardless of the season.Another Talas in Bali is Talas togog.This Talas is more difficult to grow, so it is cultivated by farmers.Talas can be

consumed by humans, starting from the tubers, stems and young leaves.Talas tubers are consumed by boiling or steaming, can be used as snacks, such as chips, cakes.The old Talas stems are used as fodder for pigs, while the young ones are used as vegetables for human consumption.However, not many people know this vegetable. Talas or Talas Kimpul (Xanthosoma Sagittifolium (L.) Schott), the young stems / midribs contain various nutrients that the body needs, including carbohydrates, protein, calcium, iron, vitamin C, fiber.[1][2]Research on giving Talas leaf extract (Colocasia esculenta), useful as a rabbit wound medicine[3] to young mice improves hematological parameters[4].Research on kimpul Talas midrib that can be consumed by humans has not been found, so it still requires further research.

The nutritional content of the midrib/stem of kimpul Talas and the benefits that have been proven, make the midrib of kimpul worthy to be used as one of the local foods that can prevent anemia, the birth of low birth weight (LBW) babies which can continue to stunting. The results of the Basic Health Research (Riskedas) in Indonesia in 2018 found that the proportion of pregnant women with anemia was 48.9%, this figure was higher than the results of the same research in 2013, which was 37.1%, the proportion of LBW was 6.2%, Bali <6% and the proportion of body length less than 48 cm as much as 22.7%, Bali Province <10%. The proportion of stunting in toddlers is 30.8%[5].Stunting reduction target in 2024 to 19%[6].

Research on keladi/talas kimpul stems that can be consumed by humans has not been found much, so it still requires further research. This study aims to identify the nutritional, phytochemical, anti-nutritional content of keladi/talas kimpul stems that can be consumed by humans.

METHOD

This research was carried out for two years. In this first year (2021), a descriptive research was conducted, which explained about the content of nutrients, phytochemicals, and anti-nutrients. The second year of research (2022) will be conducted to determine the extraction efficacy in experimental animals (female Wistar rats).

Sample collection

The samples used were keladi/talas kimpul (Xanthosoma sagittifolium (L.) Schott) stems and stems of keladi togog (Colocasia esculenta (L.) Schott) which were green, in fresh condition. Fresh keladi/talas kimpul, harvested from Banjar Kemoning, Pucaksari Village, Busungbiu District, Buleleng Regency, Bali Province. The stems of fresh keladi togog, are harvested from Banjar Sangker, Mengening Village, Kubuaddan District, Buleleng Regency, Bali Province.

Extraction Process

Fresh keladi stems are extracted. The fronds selected were the fronds that grew from the tubers of keladi/Talas kimpul, which were taken from the innermost stem to the frond wrapping I. The ribs of the keladi/kimpul Talas were washed and the skin cleaned, then dried in the oven for 48 hours at 50oC. The dried fronds were sifted and made into flour, then macerated with 96% ethanol for 24 hours, ending with filtering. The filtering results (the clear part), were evaporated to obtain the extract.

Extraction test

Extract testing for nutritional, anti-nutritional and phytochemical tests was carried out at the Food Analysis Laboratory of the Faculty of Agricultural Technology and the Analytical Chemistry Laboratory of Udayana University (Unud).

Data processing

Data The results of the study were processed and analyzed descriptively.

RESULT

Keladi / Talas kimpul stems harvested from Pucaksari Village is located at an altitude of 650 above sea level[7]. Keladi togog stems is harvested from Mengening Village which is located at an altitude of 550 above sea level[8].

The following describes the results of the study, starting with the resulting extraction

Table 1 Extraction Produced

Sample	Wet weight (g)	Extraction produced (g)
Keladi/talas kimpulstems	1000	50
Keladi Togogstems	1000	50

Table 1 shows that the fronds of keladi / talas kimpul and keladi togog produce the same extraction.

Nutritional Content of keladi/Talas Kimpul stems Extraction (Xanthosoma sagittifolium (L.) Schott) and keladi Togog Stems (Colocasia esculenta (L.) Schott)

Table 2 Nutritional Content of Keladi/Talas KimpulStems and Stems of Keladi Togog

Component	**Talas Kimpul/ Keladi Stems**	**Keladi Togog Stems**
Water (% bb)	18,1797	13,1603
Abu (% bb)	2,7491	1,3043
Calories (% bb)	326,8268	387,8133
Protein (% bb)	0,8729	0,8738
Fat (% bb)	2,1084	9,1344
carbohidrat (% bb)	76,0899	75,5272
Fe (mg/kg)	0,428	ND
Zinc (mg/kg)	ND	ND
calcium (mg/kg)	ND	6,465
Beta caroten (mg/100g)	15,19	400,95
Vitamin C (mg/100g)	7.690,03	9.824,19

Note: ND = Not detected

Table 2 shows that the protein and fat content is higher in keladi togog. The carbohydrate content is higher in the collected keladi. Fe was detected in the collected keladi, zinc was not detected in both samples. Calcium is only detected in keladi togog. The content of beta carotene and vitamin C is higher in keladi togog.

Phytochemical and Tannin content of Keladi/Talas Kimpul Stems (Xanthosoma sagittifolium (L.) Schott) extraction

Table 3 Phytochemical and Antinutritional Content of Keladi/Talas Kimpul Stems Extraction ((Xanthosoma sagittifolium (L.) Schott)

Component	Steams	Tubers
Thanin (mg/100g TAE)	140,42	ND
Flavonoid (mg/100g QE)	4930,88	1291,21
Saponin	Positif	Positif
Steroid	Negatif	Positif

Note: ND = Not detected

Table 3 shows that the stems contains phytochemicals, except for steroids, while tannins are not detected in tubers. The flavonoid content was higher in the stems.

For comparison, the following describes the results of the phytochemical analysis and the tannins of the togog Talasstems extract.

Table 4 The Results of Phytochemical and Antinutrient Keladi Togog Stems Extract (Colocasia esculenta (L.) Schott)

Component	Result
Tanin	121,46
Flavonoid (mg/100g)	257,73
Saponin	Positif
Steroid	Positif

Table 4 shows that the extraction of keladi togog stems contains flavonoids, saponins, and steroids. When compared with the content of flavonoids and tannins, the keladi/Talas kimpul stems was higher than the keladi togog.

DISCUSSION

Keladi or Talas Kimpul is well known by the public. The part of the Talas that is consumed so far is the tuber. Talas stems and old leaves are used for animal feed, such as pigs. The young stems (fronds) or lompong can be consumed by humans, for vegetables. However, not many people take advantage of it.

Keladi/Talas kimpul stems contains nutrients that the body needs. The results of this study found, 100 grams of wet weight contains 0.87 g of protein; 2.11 g fat; 76.09 g carbohydrates; 2.75 g Ash,

326.84 kcal, 15.19 mg beta-carotene; and 7,690.03 mg of vitamin C. All these nutrients are needed by the body for growth (organogenesis), and development including regulating body physiology. Nutrition science in principle distinguishes two classes of nutrients, namely macronutrients and micronutrients. Macronutrients are the main components that make up body tissues, as the main energy source of the human body. Macronutrients are mainly found in carbohydrates, proteins and lipids. Micronutrients are dietary components that do not make a significant contribution to caloric intake, but are essential for health and vital function, and are required in even smaller amounts, including vitamins (both fat-soluble and water-soluble) and minerals.[9]

Protein is a source of energy. The central role of protein in the maintenance of energy balance has considerable support. Several studies have shown that rodents fed a protein-deficient diet or animals experiencing protein stress (eg, pregnancy) spontaneously choose a high-protein diet under preferred feeding conditions. Such a special appetite does not exist for carbohydrates or fats[10].

Carbohydrates are a source of calories, which are produced by staple foods that can provide a feeling of fullness. The regulation of nutrient intake begins with the recognition that the body has a limited capacity for carbohydrate storage but requires a constant supply of glucose for the central nervous system (CNS). The lateral (LH) and ventromedial (VMH) hypothalamus contain glucoreceptors that are sensitive to changes in circulating carbohydrate concentrations. Parabiotic studies in rats carried out for many years, the fat mass released in the circulation can regulate body mass in the long term. Circulating circulating leptin concentrations have been shown to correlate with fat mass in rats and humans. There is strong evidence that supports and refutes the effect of leptin on appetite, energy intake, and body weight. [10][11].

Vitamin A is a fat-soluble vitamin that is essential for embryonic development, growth, reproduction, immune function, and vision. Vitamin A is found in food as either preformed vitamin A or provitamin A carotenoids. The three main provitamin A carotenoids are -carotene, -carotene, and -cryptoxanthin. After food is digested in the stomach and exposed to bile salts, mixed micelles containing retinol and carotenoids are absorbed throughout the intestine. The absorption of carotenoids by passive diffusion, while retinol through specific transport across enterocytes. Low bioavailability of provitamin A carotenoids as a source of vitamin A in fruits and vegetables. Vitamin C is a water-soluble vitamin, essential for the biosynthesis of collagen, carnitine and catecholamines. Vitamin C is also a powerful antioxidant that protects molecules from oxidative damage. Vitamin C functions as an electron donor for enzymes involved in the synthesis of collagen, complement, carnitine, norepinephrine, and the metabolism of pyridine and tyrosine.[12]

The levels of protein, carbohydrates, fat, beta carotene and vitamins in this study were different from the research[13][14]. This is probably due to differences in temperature, humidity, and soil nutrients in each place.

The content of phytochemicals, namely saponins, flavonoids, and tannins can interfere with the absorption of iron [15][16]. But on the other hand, the content of these phytochemicals, can help the body in warding off free radicals. Flavonoids are one of the most common groups of secondary metabolites found in plant tissues. Flavonoids are found in all green plants so they can be found in every plant extract. Flavonoids have strong antioxidant properties [17], anti microba[18], anti fungi.[19]

CONCLUSION

Based on the results of the study, it can be concluded that the kimpul Talassteams and Togog Talas steams contains the following components. Keladi/talas kimpul stem and keladi togog, contain carbohydrates, protein, fat, beta carotene, vitamin C, flavonoids, saponins, and tannins. Calcium, zinc, and steroids were not detected in keladi/ talas kimpul stems. Fe and zinc were not detected in the stem of the keladi togog.

CONFLICT OF INTEREST

Conflict of Interest The author declare that we did not have conflict of interest.

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