Research Article

Nutritional Value of Selected Edible Ficus Fruit in Kuantan

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ABSTRACT

Interest in the nutritional value content in food had been increasing as one of the ways to reduce the disease among the human being. *Ficus* is one of the fruit that contained high in major source of nutrients. Considering the important towards the mankind, this study was conducted to evaluate the nutritional content of *Ficus* fruit. There were six species and varieties of *Ficus* used in this study. The fresh sample was collected from selected area in Kuantan, Pahang. The major proximal components such as moisture content, crude fibre, crude lipid, total ash, crude protein, carbohydrate and energy was analysed using AOAC method. Based on this study, the moisture content ranges from 36.33 % - 49.67 % in *F. carica* cv. BTM6; crude protein 2.3 % - 4.58 % in *F. carica* cv. TGF; crude lipid 0.01 % - 0.11 % in *F. carica* cv. BTM6; total ash 14.94 % - 21.22 % in *F. carica* cv. Alma and crude fiber 0.88 % - 3.36 % in *F. carica* cv. BTM6. The highest value of carbohydrate and energy content was found in *F. hispida* with 43.86 % and 175.44 kJ, respectively. According to our findings, consumption of *Ficus* fruit is recommended for commercialized in green industry based on its nutritional content that was crucial for human health.

Keywords: Nutritional value, Wild *Ficus*, Cultivated *Ficus*, Planting medium

Introduction

In recent years, food had become a major source of human problem due to its excessive unhealthy content. In order to overcome this problem, the wild food source such as fruit had chosen to substitute the unhealthy food that contains synthetic chemicals. Fruit consumption get attention worldwide because of its taste, disease prevention and health benefits. It was due to the existence of nutrients such as carbohydrate, fibre and proteins that needs for human body [1, 2, 3]. The food with plant based are believed to be helpful in preventing many diseases. One of the ways to maintain the body weight and energy regulations is by control the estimated calories content in food [4]. Among of the edible fruit, *Ficus* fruit was reported to had rich and good in nutritional content [5].

Ficus are perennial woody trees categorized under mulberry family [6, 7]. It had the adventitious roots important for support system and some

of this species are hemi- epiphytes and root – climbers. *Ficus* can be classified based on its vegetative and reproductive morphology [8]. The inflorescence of *Ficus* had the specific term that was synocia, unique as they enclose both staminate and pistillate flower during anthesis. Commonly, the ripen *Ficus* becomes yellow to orange or red, or pink to red based on its species and varieties.

Ficus fruit are used as traditional medicine to treat various diseases such as gastrointestinal (coli, indigestion, loss of appetite and diarrhea), respiratory (sore throats, coughs and bronchial problem), inflammatory (cardiovascular disorder, ulcerative disease and cancer [9, 10]. In Japan, the dried leaves, aerial roots and bark of *F. microcarpa* have been widely used as folk medicine for controlling perspiration, alleviating fever and relieving pain [11]. *F. carica* enriched with many elements such as calcium, iron, strontium, phosphorus, magnesium, potassium,

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Vitamin C and Vitamin B [12]. It is also high in fibre and highest in overall mineral content [13].

F. carica fruits can also be prepared as jam has excellent source of minerals, vitamins, carbohydrate and dietary fibre because it is fat and cholesterol free and contain high content of amino acids [14, 15]. *F. carica* was widely develop as food product. However, only *F. carica* are widely commercialized as a major of food product compare to other *Ficus*. Therefore, this study was conducted to determine the nutritional value of selected edible *Ficus* fruit in Kuantan. The information about the nutritional value can give the knowledge about the *Ficus* fruit nutrient content. It was supported by study from Sadia et al. (2014) that even the wild species are lack in taste, it has high in several nutritional value [16].

Material and Methods

The ripen fruits of *Ficus* were collected from selected area in Kuantan. The fruit part was oven dried to undergo further nutritional value analysis.

Moisture content were determined by weighing 5 g of fresh sample before and after oven dry at 65°C until the weight become constant. The crude protein content was analysed by using Kjeldahl method and crude protein were calculated as $N \times 6.25$. The ash content was done by incineration in a muffle furnace at 600°C for 3 hours. Crude lipid was done by extract the sample with petroleum ether in a Soxhlet apparatus. Crude fibre was extracted with 1.25% NaOH, drying the residue for an hour at 105°C followed by muffle incineration at 600°C. Total carbohydrate was calculated by using formula $[100 - (\text{moisture} + \text{protein} + \text{fat} + \text{ash})]$ while gross food energy was calculated using formula $[4 \times \text{protein}, 4 \times \text{carbohydrate}, 9 \times \text{fat}]$. Lastly, the ANOVA analysis was done by using SAS version 9.4 and means was compared by Duncan's multiple range test.

Results and Discussion

Nutritional value of ripens fruit for selected *Ficus* species were recorded to reveals its potential health benefits [26]. It is important to get the idea about the preferable *Ficus* fruit that can give the highest nutritional values in the ripens fruit content. The analyses showed a significant difference of nutritional content among *Ficus* species (Table 1).

The results show that the *F. carica* resulted highest in crude protein, crude fibre, crude lipid, moisture content and total ash compared to others *Ficus*. Based on this study, the highest crude protein was observed in *F. carica* cv. BTM6 (4.58%) whereas the lowest one was observed in *F. carica* cv. Alma (2.30%). Proteins are important component of diet needed for survival of animals and human beings to supply adequate amounts of required amino acids for nutrition [17]. The insufficient amount of protein in human body can causes many health problems such as kwashiorkor, marasmus, impaired mental health, edema, organ failure, wastes and shrinkage of muscle tissue and weakness of human system [18].

The highest moisture content was observed in *F. carica* cv. BTM6 (59.67%) whereas the lowest value was observed in *Ficus hispida* (36.33%). The water stored and nutrient uptake by the wild plant was varies according to the habitat of the plant [19]. For instance, *F. fistulosa* that can be found widely in wet area recorded higher moisture content compare to *F. hispida* due to the water uptake from its own habitat. On the other hands, the moisture content in the fruit increased the weight of fruit per gram. The lesser water contents in the fruit slower the degradation process by microorganism and chemical changes [20]. For preservation of the product, it must to be dry to remove the water and decrease the moisture content [21]. Based on this study, *F. carica* cv. BTM6 contains more than 50% of water showed that it had highest in moisture content.

Fiber and moisture content have been observed to have correlation between each other. The water in the fruit means that its own high fiber value, which could be interest to human health as the fibrous that easily digested and disintegrated [22]. The high content of fiber in human body can helps in digestion and absorption in the human small intestines [23]. Fiber content ranged from 0.08% to 3.36% with *F. carica* cv. BTM6 recorded the highest value.

Low crude lipid content means decrease in fat of the fruit can be helpful in weight loss [26]. The higher value of crude lipid content in *F. carica* cv. BTM6 (0.11%) reflect that these fruits only contain less than 0.5% of fat per meal consume. The fats need to be control and limited not more than 30%. The excessive fat content in food can lead to

Table 1. Nutritional value of selected *Ficus* fruit

Species	Moisture content (%)	Crude protein (%)	Crude Lipid (%)	Crude fiber (%)	Total ash (%)	Carbohydrate (%)	Energy (kcal/kJ)
<i>F. auriculata</i>	44.33 ± 7.4	3.19 ± 1.0	0.01 ± 0	1.82 ± 1.0	15.22 ± 3.4	35.42 ± 4.5	141.68 ± 22.7
<i>F. hispida</i>	36.33 ± 5.6	3.11 ± 1.0	0.00 ± 0	1.71 ± 1.0	14.94 ± 3.1	43.86 ± 5.3	175.44 ± 28.1
<i>F. fistulosa</i>	44.0 ± 5.3	2.90 ± 1.0	0.02 ± 0	1.61 ± 1.0	15.91 ± 3.6	35.66 ± 4.4	142.29 ± 23.4
<i>F. carica</i> cv. BTM6	59.67 ± 8.9	2.55 ± 0.8	0.11 ± 0	3.36 ± 1.0	20.54 ± 4.8	13.78 ± 2.8	55.12 ± 10.8
<i>F. carica</i> cv. TGF	47.0 ± 7.5	4.58 ± 1.0	0.03 ± 0	0.88 ± 0.3	19.34 ± 4.2	28.18 ± 3.4	112.70 ± 20.8
<i>F. carica</i> cv. Alma	49.67 ± 7.8	2.30 ± 0.7	0.08 ± 0	2.58 ± 1.2	21.22 ± 5.1	23.49 ± 3.6	96.62 ± 13.2

increase the calories in human body and also exposed human to risk health [24]. In contrast, the study conducted by Sadia *et al.* (2014) suggested that the *F. carica* crude lipid was lower in content compared to *Ficus glomerata* and *Ficus palmate* [16]. Instead of consume *F. carica*, other *Ficus* also recommended to be consumed because of its lower crude lipid content.

The ash contains inorganic material of the plant that can destroy all of the organic materials that highly found in the sample [25]. Samples with increase in ash contents are expected to have increase in concentrations of various mineral elements, which are expected to speedup metabolic processes and improve growth and development [26]. The sample ash value varied from 14.94 % to 20.54 %, were found different between all the *Ficus* species fruit. *F. carica* shows the highest ash content compared to others *Ficus*.

Food energy can also be stated as calories [4]. A calorie can be stated as the quantity of protein, fat and carbohydrate stored in the body [24]. The study conducted by Soni *et al.* (2014) reported that energy contain in *F. carica* “Anjir” varieties had highest value of energy (Kcal/100g) and carbohydrate content [12]. It can be supported by the previous study that carbohydrate can be as major components influence the energy value. Based on this study, *F. hispida* contain high value of energy (175.44 kcal/kJ) compared to other *Ficus* species fruit. It was proved that the carbohydrate content increase as the energy increases [27]. The samples with high carbohydrate and energy content might be suitable for diabetic and hypertensive patients requiring low sugar diets [28]. The high carbohydrate

and energy content in *Ficus* fruit species indicate that it contains high in nutritional value and suitable for daily consumption. Currently, *F. carica* becomes more demanding to be consume compared to other *Ficus*. The consumer prefers more on *F. carica* due to its fleshy taste of fruit.

Conclusion

In terms of nutritional content, the highest carbohydrate and energy content was recorded in *F. hispida*. However, for the moisture content, crude lipid, total ash, crude fibre, crude protein *F. carica* recorded the highest value. *F. carica* cv. BTM6 shows highest in moisture content and leads to increase in crude fibre. *F. carica* cv. TGF recorded highest in crude protein whilst *F. carica* cv. Alma gives high in crude lipid and total ash value. Based on this study, all the selected *Ficus* in this study are good in nutritional content. Thus, it had high potential to be commercialized and suitable to be introduces as a food by looking to its benefits on human health.

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