IJMPR 2019, 3(6), 113-114

International Journal of Modern Pharmaceutical Research
www.ijmpronline.com

ISSN: 2319-5878
IJMPR
Research Article
SJIF Impact Factor: 5.273

ENERGY VALUE AND ANALYSIS OF HEAVY METALS IN PULP OF *CANTHIUM PARVIFLORUM*

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Received on: 23/11/2019
Revised on: 13/12/2019
Accepted on: 02//01/2020

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ABSTRACT

The aim of the present study was to analyse energy value and heavy metals in the famine fruit *Canthium parviflorum*. The processed dried pulp contained 42, 27 and 18 mg/g of carbohydrate, protein and fat respectively. It holds 43.8 kcal of energy. It also contained 4.2 and 0.8 mg/ kg of Nickel and lead and there is no Cadmium. This study indicates presence of plenteous of carbohydrate and protein and pleasant amount of heavy metals. Therefore this material would solve nutritional deficiency and also save the organisms from dangerous situations.

KEYWORDS: Pulp, heavy metals, carbohydrate, protein, fat.

INTRODUCTION

The herb *Canthium parviflorum* belongs to the family Rubiaceae. It is a thorny shrub. It occurs in all dry plains districts, in scrub, especially on laterite and very common near the coast.[1] Both fruits and leaves are astringent and antispasmodic. They show the ability to relief cough. The extracts from root and leaves are remedy for flu and bark is used to control dysentery.[2] Siddhars make rasayanam using this fruit along with cowsmilk, ghee and canesugar. It is remedy for common cold, running nose, cough and nasal block in children.[3] The indigenous reside around the sacred groves of east Godavari use extracts of leaves and bark to control blood motions and diarrhoea. They use 15-25g /day.[4] The bark and leaves show free radical scavenging and reducing power assay.[5,6] Leaves contain 5.345 and 7.30 % of protein and fat and thorn contains carbohydrate and fat and devoid of protein.[7,8] Therefore the present study aims to analyse energy value and heavy metals in the pulp of *Canthium parviflorum*.

MATERIALS AND METHODS

Collection of material

The ripe fruits were collected at Sokkalapuram, Karur district during December 2018. They were rinsed gently and dried in shade. Then they were deseeded and again allowed to dry (Figure 1). Then they were ground with the help of mortor and pestle and stored in cleaned silver container.

Fig. 1: Fruits of *Canthium parviflorum* a:entire fruits b:deseeded fruits.

Analysis of energy value and heavy metals

Energy sources like carbohydrate, protein and fat were analysed using the procedure of AOAC.[9] This same method was followed to analyse Nickle, lead and cadmium.

RESULTS

The quantity of carbohydrate, protein and fat and heavy metals like Nickle, lead and cadmium in the pulp are listed in Table 1 and 2. The dried pulp of *Canthium parviflorum* contained 42, 27 and 18 mg/g of carbohydrate, protein and fat respectively. It comprised 43.8 kcal of energy. Regarding heavy metals it showed 4.2 and 0.8 mg/ kg of Nickle and lead. But there was no cadmium.

Table 1: Energy value in the pulp of *Canthium parviflorum*.

Sl.No	Name of the tests	Quantity (mg/g)
1.	Carbohydrate	42
2.	Protein	27
3.	Fat	18
4.	Energy	43.8kcal

Table 2: Heavy metal composition in the pulp of *Canthium parviflorum*.

Sl.No	Name of the metal	Quantity (mg/kg)
1.	Nickel	4.2
2.	Lead	0.8
3.	Cadmium	Nil

DISCUSSION

This study analyses the amount of carbohydrate, protein, fat, energy, nickel, lead and cadmium in the dried pulp of *Canthium parviflorum*. Among the energy components carbohydrate is in highest range followed by protein and fat (carbohydrate > protein > fat). This similar order and dissimilar in quantity was observed in leaves of this plant.[10] When compared to carbohydrate and protein amount of fat is meagre. But the results of petroleum ether, chloroform and methanolic fruit extracts of this plant did not contain proteins and fats.[11] In this study pulp of *Canthium parviflorum* contains highest amount of nickel followed by lead. This similar result was observed in fruits samples collected from both main market of Addis Ababa and Awassa market of Ethiopia.[12] In this study there is no cadmium. This similar result was reported in *Artemisia vulgaris* and *Galium aparine*[13] and mint.[14] In this study the amount of nickel is 4.2 mg/ kg. The more or less similar quantity was observed in skin of tomato and marrow.[15] In this study the amount of lead is 0.8 mg/kg. The root and rhizome of *Asparagus recemosus* and *Piccorhiza kuroa* also contained 0.94 and 0.96 ppm of lead.[16]

CONCLUSION

The present study evaluated energy value and heavy metals in the pulp of *Canthium parviflorum*. This material contains highest amount of carbohydrate followed with protein and fat. When compared to lead Nickel is as dominant and there is no cadmium. Therefore, the presence of carbohydrate and protein offer energy and retard malnutrition.

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