Original Research Article

Mineral and Vitamin Compositions Contents in Watermelon Peel (Rind)

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A B S T R A C T

Recently, it has taken a boom the use of fruit and vegetable waste to reduce environmental pollution. The aim of this work was to evaluate some physical and chemical properties of watermelon rind, the mineral and vitamin compositions of the rind of watermelon (Citrullus lanatus) were investigated, using standard methods. in the peel, Iron 1.29, manganese 1.42, phosphorus 135.24, calcium 29.15, sodium 12.65, copper 0.45, zinc 1.29, magnesium 1.48, potassium 1.37 are showed in table-1 and as shown in Table 2, composition of vitamin composition in mg/100 g, vitamin A -52.13, vitamin B1-1.23, vitamin B2-2.71, vitamin B3-4.25, vitamin B6- 5.34, and vitamin C-8.46, The preponderance of these nutrients in the, especially rind samples, may be of nutritional and physiological importance warranting further studies to increase the dietary use of these food wastes and reduce the attendant burden in the environment. The aim of this research work is to determine some functional properties of the rind and chemical properties of the dried power extract with a view of harnessing it for consumption and possible industrial usage.

Keywords: Watermelon, wastes, mineral, vitamin, rind, dietary use

Introduction

Watermelon (family Cucurbitaceae and species Citrullus lanatus) is a major fruit widely distributed in the tropics and sub-tropic regions (Yamaguchi, 2006). It is one of the most important vegetable crops and has large, round, oval or oblong fruit shape, the skin is smooth, with dark green rind or sometimes pale green stripes that turn yellowish green when ripe with very rich source of vitamins (Vitamin A 590 IU, Niacin 0.2 mg/100g and Vit. C 0.7-7.0 mg/100 g), and also serves as a good source of phyto-chemicals (Perkins-Veazie and Collins, 2004). It can be used for breakfast as appetizer or snack (Salk et al., 2008), and (Citrulus lanatus) is a popular thirst-quencher during hot summer weather, it has source of carotenoid and lycopene, Lycopene has been found to be protective against a growing list of cancer (Cho, et al., 2004), and is delectable, thirst-quencher which helps quench the inflammable that contributes to conditions like diabetes, atherosclerosis, arthritis, asthma, and colon cancer (Jian et al., 2007). Cucurbit seeds are source of food particularly protein and oil (Hassan et al., 2008). Watermelon is also expectedly high in citrulline, an amino acid the body make use of to make another amino acid, arginine (used in the urea cycle to
remove ammoniacal from the body) (Collins et al., 2007), and contained many smooth compressed seeds that thickened at the margin and of black or yellow-white colour (Sodeke, 2005 & Achu, et al., 2005), reported high lipid level seeds from different regions.

The therapeutic effect of watermelon has been reported and has been ascribed to antioxidant compounds (Leong and Shui, 2002; Lewinsohn et al., 2005).

The studies on watermelon fruits have focused on the anti-nutritional (Johnson et al., 2012), phyto-chemical and anti-oxidant properties (Oseni et al., 2013), also to increase shelf-life (Hanan et al., 2013) and the fruit juice having the nutritional/quality (proximate) contents (Fila et al., 2013), the rind (peels) which could encourage their consumptions or further use. The aim of this research work is to determine some functional properties of the peel (rind) dried power extract with a view of harnessing it for consumption and possible industrial usage.

**Materials and Methods**

Collection and preparation of samples: Watermelon fruits were bought from market. The watermelon was thoroughly washed to remove sand particles after which it was sliced using a home choice knife. The pulp was carefully scraped off to obtain the rind which was chopped into pieces with a chipping machine. The rind chips were weighed. The rind (wet weight = 200 g) and sundried to obtain the corresponding dry weight for the rind (100 g).

Chemicals and reagents: All chemicals used, including those used in the preparation of reagents, were of analytical grade and products of reputable companies.

**Determination of the vitamin, mineral and amino acid compositions**

Vitamin A, B1 (thiamine), B2, B3 (niacin) and B6 were variously determined by the spectrophotometric methods reported by Onwuka (2005) whereas; vitamin C (ascorbic acid) was determined by the method described by Okwu and Josiah (2006).

Mineral content viz: phosphorous, iron, zinc, manganese, copper, potassium, sodium, calcium and magnesium were determined by the spectrophotometric method described by James (1995), using Jenway Digital Spectrophotometer, Model 6320D, manufactured by Jenway Equipment Company, France. Potassium and sodium were determined by the flame photometric method, using Jaway Digital Flame Photometer.

**Results and Discussion**

Generally, Minerals and vitamins are essential, but in small amounts, for the regulation of normal metabolism and as an antioxidant (Barminas et al., 1998), the ability of watermelon rind powder and synthetic antioxidants (BHA) to prevent the bleaching of b-carotene (Keyvan et al., 2007), and the watermelon rind and seed flours study were composed of the various minerals determined, concurring with that reported by Hafiza et al., 2002, the mineral composition (mg/100 g) in the peel, Iron 1.29, manganese 1.42, phosphorous 135.24, calcium 29.15, sodium 12.65, copper 0.45, zinc 1.29, magnesium 1.48, potassium 1.37 are showed in table-1 and as shown in Table 2, composition of vitamin composition in mg/100 g, retinol (vitamin A) -52.13, Thiamine (vitamin B1)1.23, Riboflavin (vitamin B2) 2.71, Niacin (vitamin B3) -4.25, Pyridoxine (vitamin B6)- 5.34,
Ascorbic acid (vitamin C) -8.46, Similar higher nutrient composition in the seed than in the rind was reported in a similar studies by Koocheki et al., 2007 and Egbuonu, 2015). In the present study, mineral contents for human diet and some important physical properties such as design of equipments for sowing, processing, transportation, sorting, separation and packaging of watermelon is very important (Mustafa et al., 2010).

<table>
<thead>
<tr>
<th>S.No</th>
<th>Mineral</th>
<th>Rind mg/100g</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Iron</td>
<td>1.29</td>
</tr>
<tr>
<td>2</td>
<td>Manganese</td>
<td>1.42</td>
</tr>
<tr>
<td>3</td>
<td>Phosphorous</td>
<td>135.24</td>
</tr>
<tr>
<td>4</td>
<td>Calcium</td>
<td>29.15</td>
</tr>
<tr>
<td>5</td>
<td>Sodium</td>
<td>12.65</td>
</tr>
<tr>
<td>6</td>
<td>Copper</td>
<td>0.45</td>
</tr>
<tr>
<td>7</td>
<td>Zinc</td>
<td>1.29</td>
</tr>
<tr>
<td>8</td>
<td>Magnesium</td>
<td>1.48</td>
</tr>
<tr>
<td>9</td>
<td>Potassium</td>
<td>1.37</td>
</tr>
</tbody>
</table>

Table.2 Vitamins composition in water melon peel

<table>
<thead>
<tr>
<th>S.No</th>
<th>Vitamins</th>
<th>Rind mg/100g</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Retinol (vitamin A)</td>
<td>52.13</td>
</tr>
<tr>
<td>2</td>
<td>Thiamine (vitamin B1)</td>
<td>1.23</td>
</tr>
<tr>
<td>3</td>
<td>Riboflavin (vitamin B2)</td>
<td>2.71</td>
</tr>
<tr>
<td>4</td>
<td>Niacin (vitamin B3)</td>
<td>4.25</td>
</tr>
<tr>
<td>5</td>
<td>Pyridoxine (vitamin B6)</td>
<td>5.34</td>
</tr>
<tr>
<td>6</td>
<td>Ascorbic acid (vitamin C)</td>
<td>8.46</td>
</tr>
</tbody>
</table>

Fig.1 Graphical representation of mineral composition in watermelon peel
Minerals in adequate amount ensure the normal physiological functions, including iron utilization (Adeyeye, 2000), in the graphical representation phosphorous is very high content and followed Calcium and sodium table-1, and the vitamin A is very high, and the abundance of these minerals and vitamins in the sample is nutritionally and physiologically noteworthy

Table 1: Some mineral composition of watermelon (Citrullus lanatus) rind and seed flours Rind Seed Difference Minerals

The result shows that the peel (rind) is a better source for the minerals and vitamins Phosphorous, Calcium, vitamin A and vitamin C are reported that waste material have had valuable contents it may be of nutritional and physiological importance. Further studies, aimed at exploiting the finding of this study to increase the dietary use of these fruit wastes thereby use to various purposes by making as powder and decrease the solid waste in the environment.

References

Barminas, J.T., M. Charles and D. Emmanuel, 1998. Mineral composition of non-


