Biochemical estimation of nutritive parameters in waste seed kernel of Mango (*Mangifera indica L.*)

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**ABSTRACT**

“Super fruit” mango is luscious and most celebrated tropical fruit. It belongs to genus *Mangifera* and family Anacardiaceae. Mango consists of 33-85 % edible pulp and 9-40 % inedible kernel. Wide varieties of processed products derived from mango pulp. These products are of world wide popularity. Mango kernel is a major waste product obtained after processing. In the present investigation moisture, carbohydrate, protein, crude fiber, ash, and fat content was analyzed in mango kernel. Moisture, carbohydrate, protein, crude fiber, ash, and fat content found were 43.22, 46.85, 4.99, 1.60, 2 and 12.39 respectively in mango kernel. Therefore, it could be utilized as feed stuff and certain processing techniques could help us to enhance quality of feed stuff prepared from mango kernel.

**KEYWORDS**

*Mangifera indica*, Seed Kernel, Proximate Composition, Feed Stuff, Protein

**HOW TO CITE THIS ARTICLE**


The Mango (*Mangifera indica L.*) often called “super fruit” is luscious and most celebrated tropical fruit. Mangoes belong to genus *Mangifera* and family Anacardiaceae. Mango has been cultivated, praised and even revered in its homeland since Ancient times but is now found naturalized in most tropical countries. Processed products from mango are of world-wide popularity. Major waste product in the form of peel and kernel were obtained after processing because of this, a huge amount of waste is generated during industrial processing which are serious disposal problems. Mango kernel analysis showed that it contains carbohydrate in range of (69.2-80 %), protein (7.5-13 %), Total fat (7.3-14.4 %), fibre (2.0-4.6 %), Total ash (2.2-2.6%) depending on the variety (Fowomola, 2010). Mango seed kernels have long been used as food in certain parts of India particularly in scarcity. Flour has been made from kernels of ripe mango seed kernel were dried and made chapattis in North West provinces or boiled/ roasted and eaten. Therefore, it is a nutritional promising seed and estimation of its proximate composition would help to identify the potential benefit of the kernel, to fill the scarcity and competition problem of feed both for livestock and industry use (Saiprabha and Goswami-Giri, 2011).

**MATERIALS AND METHODS**

Mature mango fruits were collected from local market, Kumarganj (Narendra Nagar), Faizabad (U.P.), India. The parts were separated, washed thoroughly with tap water, shade and sun dried. The kernels were removed from their tenacious leathery coat. These kernels were chopped into fine pieces and dried in hot air oven for eight to twelve hours at 60 °C temperature for complete removal of moisture. Then after finely ground into kernel flour. De-fattning of kernels was done soxhlet method by using petroleum ether boiling point 40-60 °C. Defatted cakes was analysed for following parameters such as moisture content and was estimated by drying the known amount of sample in an oven, it was maintain at 55±2 °C till it attained a constant weight. It was calculated by subtracting the dried...
weight from the fresh weight and expressed as percentage of fresh weight (Ranganna, 1986). Carbohydrate content was analysed by the method of (McCreedy et al., 1950). Protein content in grain was determined by the Lowery’s method (1951). The content of crude fiber in dried peel powder was analysed by the method as described by Hart and Fisher (1971). Ash content was estimated by the method as described by Hart and Fisher (1971) and total fat content was analyzed by A.O.A.C (1965). The statistical analysis of data obtained was carried out by Gomez and Gomez (1984) method.

RESULTS AND DISCUSSION

Table 1. Biochemical Parameters of Mango Kernel

<table>
<thead>
<tr>
<th>Proximate Composition</th>
<th>Mango seed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moisture (%)</td>
<td>43.22</td>
</tr>
<tr>
<td>Carbohydrate (%)</td>
<td>46.85</td>
</tr>
<tr>
<td>Protein (%)</td>
<td>4.99</td>
</tr>
<tr>
<td>Crude fiber (%)</td>
<td>1.60</td>
</tr>
<tr>
<td>Ash (%)</td>
<td>2.00</td>
</tr>
<tr>
<td>Total fat (%)</td>
<td>12.39</td>
</tr>
<tr>
<td>Energy content (KJ100g)</td>
<td>318.87</td>
</tr>
</tbody>
</table>

Table 1 shows proximate composition of Indian variety mango kernel. The percent moisture content found was 43.22. These result showed that close agreement with Dhingra and Kapoor (1985) they reported that percent moisture content 38.55 and 50.98 in two native Indian varieties Chausa and Dashehri variety respectively. The percent carbohydrate content was reported as 46.85. Similar results were observed by Bandyopadhyay et al. (2014) and Nzikou et al. (2010). Bandyopadhyay was reported that percent carbohydrate 73.10 in chausa (Indian variety mango kernel) variety while Nzikou reported 32.24 percent carbohydrate content in Kibangou (France variety mango kernel). Percent crude fiber and total ash content was reported as 1.60 and 2.00 respectively. Results showed that close agreement with Fowomola (2010), Nzikou et al. (2010), Bandyopadhyay et al. (2014) and Abdalla et al. (2007). Total fat content showed that promising ranged from 12.39 in mango kernel. Similar results were obtained by Abdalla et al. (2007), Bandyopadhyay et al. (2014), Nzikou et al. (2010). Abdalla and Nzikou reported that fat in mango kernels as 12.3 and 13.0 respectively. Dakare et al. (2012), Ashifat et al. (2012) and Okpala (2015) reported the similar observation for mango kernel of different regions. Ashifa and Dakare reported it as 234 KJ/g and 3,275 Kcal/Kg respectively. While, Okpala studied two India and Indochinese varieties and reported energy (kcal/100g) as 420.64 and 411.72 respectively.

CONCLUSION

The results of this experiment revealed that mango kernel has comparative nutritive value to other feed stuff like for carbohydrate composition of each variety reported is good comparable to copra meal 45.75%, water fern 34.10%, Cassia fistula seed meal 50.53%. Protein content reported is quite low. The fat content i.e. 12.39 percent is not comparable to oil seeds like ground nut (46 %) but could be utilized as non-conventional source of fat extraction. Food processing procedure like fermentation could help in enhancing the protein quality and hence the nutritive value of mango kernel. Therefore it could be utilized as potential substitute feed stuff production for marine and poultry animals.

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