The Pharma Innovation Journal 2022; 11(3): 2209-2211

www.ThePharmaJournal.com

The Pharma Innovation

ISSN (E): 2277- 7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2022; 11(3): 2209-2211

www.thepharmajournal.com
Received: 11-12-2021
Accepted: 18-02-2022

Ankita Sagar
Department of Biochemistry, Narendra Deva University of Agriculture and Technology Narendra Nagar Kumarganj, Faizabad, Uttar Pradesh, India

Shilpa Singh
Department of Biochemistry, Narendra Deva University of Agriculture and Technology Narendra Nagar Kumarganj, Faizabad, Uttar Pradesh, India

RP Singh
Department of Biochemistry, Narendra Deva University of Agriculture and Technology Narendra Nagar Kumarganj, Faizabad, Uttar Pradesh, India

Corresponding Author:
Ankita Sagar
Department of Biochemistry, Narendra Deva University of Agriculture and Technology Narendra Nagar Kumarganj, Faizabad, Uttar Pradesh, India

Evaluation of proximate and fat composition in kernel of Indian mango (*Mangifera indica*)

Ankita Sagar, Shilpa Singh and RP Singh

Abstract
Mango belongs to the genus *Mangifera* of the cashew family *Anacardiaceae*. Mango consists of between 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. Major waste products were obtained after processing. In the present investigation proximate composition of mango kernel showed that the percent moisture, carbohydrate and fat content varied from 27.5-55.02, 36.36-57.14 and 7.84-14.84.All collected varieties showed that significant variations for moisture, carbohydrate, protein, and crude fiber, ash and total fat content. Mango seed is a nutritional promising seed. Therefore, exhausting this waste for its nutritional and medicinal value could help to fill the scarcity and competition problems of feed both for livestock and industry use; and reduce waste of these seeds in regions of production.

Keywords: Mango, kernel, proximate composition, fat, waste

Introduction
Mango is a seasonal fruit and cultivated throughout the tropical and subtropical regions of world. 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). Therefore, mango seed is a nutritional promising seed and earlier, seeds and peel of fruits of some other crops was analysed and as unconventional source of energy both for industrial applications and human consumptions (Saiprabha and Goswami-Giri, 2011) [14].

The processing of agro product results the formation of waste (leaves, pulp, seed and peel) materials in high amount creating environmental pollution. Effective studies for their re-utilization as potent antimicrobial agent, (Chandra *et al*., 2013) [15], nutritional compound, (Bandyopadhyay *et al.* 2014) [3] and medicinal value (Alok *et al*., 2013) [15] could have an important element to fill the scarcity and competition problems of feed both for livestock and industry use; and reduce waste of these seeds in regions of production. It is believed that information on the biochemical properties of mango kernel would help to identify the potential benefit of the kernel.

This study was therefore carried out to evaluate the proximate and fat component of seed kernel of some mango varieties.

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-fatting 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 contentand was estimated by drying the known amount of sample in an oven,it was maintained at 55±2˚Ctill 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 (Mccreddy *et al*., 1950) [11]. Protein content in grain was determined by the Lowery's method (1951) [10]. The content of crude fiber in dried peel powder was analysed by the method as described by Hart and Fisher (1971) [9]. Ash content was estimated by the method as described by Hart and Fisher (1971) [9] and total fat content was analyzed by A.O.A.C (1965) [2]. The statistical analysis of data obtained was carried out by Gomez and Gomez (1984) [8] method.

Results and Discussion

Table: 1 shows proximate composition of three Indian varieties mango kernel. The percent moisture content varied from 27.5-55.02%. These result showed that close agreement with Dhingra and Kapoor (1985) [5] and Nzikou *et al*. (2010) [12]. Dhingra and Kapoor (1985) [5] reported that percent moisture content 38.55 and 50.98 in two native Indian varieties Chausa and Dashehri variety respectively while Nzikou *et al*. (2010) [12] reported it was 45.2 in Kibangou variety of France. The percent carbohydrate content varied from 36.36-57.14% and it was highest carbohydrate range in safeda i.e. 57.14%.Similar results were observed by Bandyopadhyay *et al.* (2014) [3] and Nzikou *et al*. (2010) [12]. Bandyopadhyay was reported that percent carbohydrate73.10 in chausa variety while Nzikou reported 32.24% carbohydrate content in Kibangou variety of France. Percent crude fiber and total ash content ranged between 1.50-1.58 and 1.0-3.0 respectively. Highest value reported in Banganpalli variety i.e.1.78 and 3.0 respectively for crude fiber and ash content. Results showed that close agreement with Fowomola (2010), Nzikou *et al*. (2010) [12], Bandyopadhyay *et al.* (2014) [3] and Abdalla *et al.* (2007). Total fat content showed that promising ranged from 7.84-14.84 in mango kernel. Lowest percent fat reported in desi variety *i.e.*7.84.While Safeda and banganpalli reported that almost same and high value fat content *i.e.*14.84 and 14.50 respectively. Similar results were obtained by Abdalla *et al.* (2007), Bandyopadhyay *et al.* (2014), Nzikou *et al*. (2010) [12]. Abdalla, Bandyopadhyay and Nzikoureported that fat in mango kernels as 12.3, 9.8 and 13.0 respectively. Fowomola (2010) reported that very lesser oil content 2.62 which is contradictory and this may be due to environmental condition, storage condition, and extraction procedure due to different varieties used for extraction. All collected varieties showed that significant variations for moisture, carbohydrate, protein, and crude fiber, ash and total fat content.

Table 1: Biochemical parameters of mango kernel.

Proximate compositions (%)	Mango varieties		
	Safeda	Desi	Baganpalli
Moisture (%)	55.02	27.5	47.14
Carbohydrate (%)	57.14	36.36	47.05
Protein (%)	5.34	5.24	4.4
Crude fiber (%)	1.53	1.50	1.78
Ash (%)	2	1	3
Total fat (%)	14.84	7.84	14.50
Energy content (KJ/100 g)	383.496	236.96	336.3

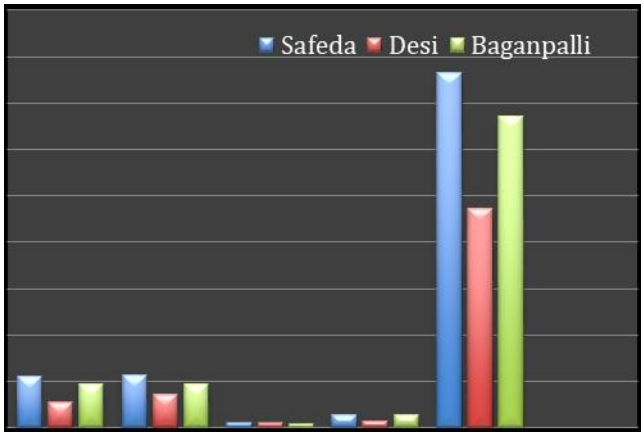

Fig 1: Biochemical parameters of mango kernel

Conclusion

The results of this investigation showed considerable variation in the proximate composition of mango kernel. The 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 in each of varieties reported is quite low. The oil content is although good but not in comparison to oil seeds like ground nut (46%). Procedure like fermentation could help in enhancing the protein quality and hence the nutritive value of mango kernel. Hence, processed mango kernel shows good potential substitute for maize in poultry rations which could reduce the competition in field of poultry feed stuff production.

References

1. Abdalla AEM, Darwish SM, Ayad EHE, Hamahmy RMEl. Egyptian mango by-product 2: Antioxidant and antimicrobial activities of extract and oil from mango seed kernel. Food Chemistry. 2010;103(4):1141-1152
2. AOAC. 10th edition, Washington, DC, 1965.
3. Bandyopadhyay K, Chakraborty C, Bhattacharyya S. Fortification of Mango Peel and Kernel Powder in Cookies Formulation. Journal of Academia and Ind. Res. 2014;2:661-664.
4. Campbell RJ, Campbell CW, Ledesma N. Tropical mangos: Growing the world's most delicious Fruit. Fairchild Tropical Garden, Coral Gables, Florida, 2002.
5. Dhingra S, Kapoor AC. Nutritive value of mango seed kernel. Journal Sci. Food. Agr. 1985;6:752-756.
6. Fasakin EA, Balogun AM, Fagbenro OA. Evalution of sundried water fern (*Azolla africana*) and duckweed (*Spirodela polyrhiza*) in practical diets for Nile Tilapia (*Oreochromis niloticus* L.) Fingerlings. J of applied aqua culture. 2001;11(48):83-92.
7. Fowomola MA. Some nutrients and Antinutrients contents of mango (*Mangifera indica*) seeds. Afri. J of Food Sci. 2009;4(8):472-476.
8. Gomez KA, Gomez AA. Statistical procedure for agricultural research Edn. 2ndSjohn Wiley and Sons. New York, 1984, 680.

9. Hart FL, Fisher HS. Modern food Analysis. *Springer Verlog*, New York, 1971.
10. Lowery OH, Rosebrough NJ, Farr AL, Randal RJ. Protein measurement with the folin phenol reagent. J. Bio. Chem. 1951;193:265-275.
11. McCready RM, Guggoli J, Silviera V, Oivens HS. Determination of starch and amylose rice. Analytical Chemistry. 1950;22:1156-1158.
12. Nzikou JM, Kimbonguila A, Matos L, Loumouamou B, Pambou-Tobi NPG, Ndangui CB, *et al*. Extraction and characteristics of seed kernel oil from mango (*Mangifera indica*). Research Journal of Environmental and Earth Sciences. 2010;2(1):31-35.
13. Rangana S. Handbook of Analysis and Quality Control for Fruit and Vegetable Products. Second Edition, New Delhi, 1994.
14. Saiprabha MM, Goswami-Giri AS. Composition and Characterization of Refined Oil Compared with Its Crude Oil from Waste Obtained from *Mangifera indica*. Asian J.Research Chem. 2011;4(9):1415-1419.
15. Chanda P, Mitra S, Sen SK. Exploration of betel leaf waste for its antibacterial activity. The Bioscan. 2013;8(2):611-615.
16. Alok P, Keerthana V, Jha CK, Ratan K, Agrawal DC. Antibacterial property of two different varieties of Indian mango (*Mangifera indica*) kernel extracts at various concentrations against some human pathogenic bacterial strains. International Research Journal of Biological Sciences. 2013;2(4):28-32