

PROXIMATE COMPOSITION AND SOME PHYSICOCHEMICAL PROPERTIES OF MORINDA PULP

Desai, Nivas* and Gaikwad, D.K** and P.D.Chavan

*Department of Botany, Shivaji University, Kolhapur (MS) India.

ABSTRACT: The present investigation was aimed to assess the nutritional value of ripened fruits of most popularly known medicinal plant *Morinda* by analyzing their proximate nutritional parameters as well as physio-chemical properties. The result showed that *Morinda citrifolia* had higher amount of proximate content than *Morinda pubescens* fruit pulp.

Keywords: *Morinda citrifolia*, *Morinda pubescens*, Proximate composition.

INTRODUCTION

Day by day increase in population results in pressure and fast depletion of natural resources. In order to meet various human needs attention should be paid on diversification of the present day agriculture. Medicinal plants and herbs are of great importance to the health of individuals and a scientific investigation of traditional herbal remedies for metabolic disorders may provide valuable lead for the development of alternative drug and therapeutic strategies (Kochhar *et al.*, 2006). In order to face the problem of food scarcity, fruits can be utilized for the good source of nutrients and food supplements. Fruits are commonly well known for the excellent source of nutrients such as minerals and vitamins; and also contain carbohydrates in form of soluble sugars, cellulose and starch (Nahar *et al.*, 1990). Fruits are very vital portion of an adequate diet and they serve as food supplement, and an appetizer. The fruits, seeds and leaves of many wild plants already form common ingredients in a variety of traditional native dishes for the rural populace in developing countries (Humphrey *et al.*, 1993).

Morinda citrifolia (L.) (Noni) and *Morinda pubescens* (J.E. Smith) (Bartondi) belongs to family Rubiaceae. Noni is one of the edible and traditional folk medicinal plants and has been used for over 2000 years, in Polynesia. This plant has broad range of therapeutic and nutritional value. The fruit of Bartondi are used as famine food in some pacific island as staple food either raw or cooked and the roasted seeds are edible (Wee, 1992). It is a popular medicinal plant among the Sidha practioners of Tamil Nadu. It has been reported to have broad range of health benefits against cancer, infections, diabetes, arthritis, asthma and pains, poor digestion and even HIV (Wang *et al.*, 2002).

Materials and Methods

Fully ripened fruits of *M. citrifolia* and *M. pubescens* were harvested from plants growing in coastal area of Dona Paula (Goa) and Osmanabad (Maharashtra) in the month of April (2008). The rind of fruits was removed using a kitchen knife. A clean white cotton cloth was used to squeeze the pulp to separate it from the fibrous components. The pulp containing some liquid syrup was stored in the refrigerator at 1°C until further analysis. Moisture percentage was determined by oven drying at 105 °C till constant weight. Crude protein and fiber were determined by the AOAC [1990] methods. All analyses were carried out in triplicate and the averages recorded. Titratable acidity, total soluble solids (°Brix) and Total sugars (as sucrose in solution) were determined by standard methods [Pearson, 1976]. Titratable acidity was determined by titrating dilute samples of the seed flour and pulp with 0.1 M NaOH to the phenolphthalein end point. Total soluble solids were estimated with the Abbe hand refractometer. Refractive index was determined by an Abbe refractometer. pH was determined using a pH meter at 20°C

Statistical analysis.

Data were subjected to Instat Graph pad to determine the significance of differences between means of fruit pulp of both fruits samples. Significance was accepted at $p \leq 0.05$.

RESULTS AND DISCUSSION

The results of proximate composition and Physico-chemical properties of fruit pulp of two species of *Morinda* are shown in Table 1. The fresh weight of *Morinda citrifolia* fruits ranges between 159 to 241 g which is almost 3-4 times greater than *M. pubescens* fruits (43-67 g). Moisture content was very high in *Morinda citrifolia* (63%) compared to that of *M. pubescens* (22%). Egbekun *et al.*, (1996) have reported 18.6% of moisture content in the pulp of *Vitex doniana*. The moisture content of *Morinda* pulp is higher than the *Vitex doniana*, but high moisture content (90.%) in African bush mango have been reported by Akubor, (1996). The crude protein content is twice in *M. citrifolia* fruits (8.32-9.13 mg g⁻¹ DW) as compare to *M. pubescens* (4.87-5.09 gm g⁻¹ DW) and these values were higher than African bush mango (0.52%) which have been recorded by Akubor, (1996], *Vitex doniana* (0.8%) (Egbekun, *et al.*, 1996), and than cashew pulp (2.92%) (Aderiye, 1991) and pineapple pulp (1.5%) (FAO,1969). In *C. sativa* Mill 4.88 to 10.87 g/100g total protein content have been reported by Ertürk *et al.*, (2006)

Table. 1. Proximate composition and some physicochemical properties of *Morinda* fruit pulp

Parameter	Species	
	<i>Morinda citrifolia</i>	<i>Morinda pubescens</i>
Fruit Wt. (g)	159-241	43-67
Moisture %	43.2	22
Juice %	45-58%	27-40%
TSS (Brix)	8.32	4.98
Total sugars (mg/g)	1.8	1.4
Lipid %	3.2	2.1
Refractive index	1.32 ± 0.01	1.28 ± 0.01
pH	4.2	3.8
Titrateable Acidity	0.14	0.09
Crud Protein (mg / g DW)	8.32-9.13	4.87-5.09
Crud fiber %	33	48

The fibre content is low in *M. citrifolia* (33%) and high in *M. pubescens* fruits (48%). Total soluble solids were 8.32 ° Brix for the *Morinda citrifolia* pulp and 4.98° Brix for *M. pubescens* pulp, which indicates that the pulp contained a considerable amount of sugar while the sugar content of the *M. pubescens* was lower than *M. citrifolia*. The refractive index for the *M. citrifolia* pulp was 0.82 and for the *M. pubescens* pulp 0.68. these values are lower than the values recorded for *Annona muricata* pulp by Onimawo (2002). The pH value of *M. citrifolia* and *M. pubescens* pulp (4.2 and 3.8 respectively) indicates the acidic nature of the pulp. similar to the pH values reported by Egbekun [1996] for *Vitex doniana* pulp (4.38). The low pH, which serves as a preservative for the pulp. The recovery of the juice from the *M. citrifolia* pulp is higher (45-58 %) than the *M. pubescens* fruit pulp (28-40 %).

CONCLUSION

It can be observed from the results that a great deal of variation occur in both physical chemical and proximate composition between the two *Morinda* species. Preference towards any of the species therefore is based on the intended function of such a fruit in the overall process. The high juice content of *M. citrifolia* pulp will be best for the juice extraction purposes. and high proximate content suggests its suitability as a food supplementation. The fruits of *Morinda* can be used as a staple food and it can be serves as good source of nutrients, since it contains quite appreciable amount of proximate compounds. Further production of wine from the pulp of *Morinda* is in process due to the favorable physicochemical characteristics of the pulp.

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