

# Preparation Of Wood Apple Seed Protein Concentrate And Study Of Its Physico-Chemical Analysis

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**Abstract**—Wood apple (*Limonia acidissima*) is highly underutilized fruit, belonging to family Rutaceae. Wood apple, it may be called as elephant apple, monkey fruit, kath bel in India. The wood apple seed are high in protein and fat. The Wood apple Seed flour (WASF), Wood Apple Seed Protein Concentrate (WASPC) having good functional properties. The protein content of wood apple seed flour is about 27.56% and wood apple seed protein concentrate is about 77%. Wood apple seed flour, wood apple seed protein concentrate is rich in protein. and hence it can find application as a protein source in various food formulation.

**Keywords**— *Malnutrition, Protein content, Wood apple seed protein concentrate*

## I. INTRODUCTION

Wood apple (*Limonia acidissima*) belongs to the family Rutaceae Swingle. The original home of wood apple is South India and Sri Lanka (Lande et al., 2010). The wood apple is native and common in dry plains of India and Ceylon. The seed composition and fatty acid profile were reported as 28% protein and 34% oil (Ramakrishna et al., 1979).

Wood apple seeds are important unconventional sources of proteins which when incorporated in food products would improve the functional properties such as absorption of water or oil and formation of stable foam. They are also good nutritional supplements. Numerous studies were reported earlier on screening various seed meals. They are also good nutritional supplements. Numerous studies were reported earlier on screening various seed meals. Most of the studies were related to determination of proximate composition, mineral content, physico-chemical and functional characteristics and protein extractability. They were based on soy flour.

## II. MATERIALS AND METHOD

The experimental studies were carried out in department of agricultural engineering, Maharashtra institute of technology Aurangabad.

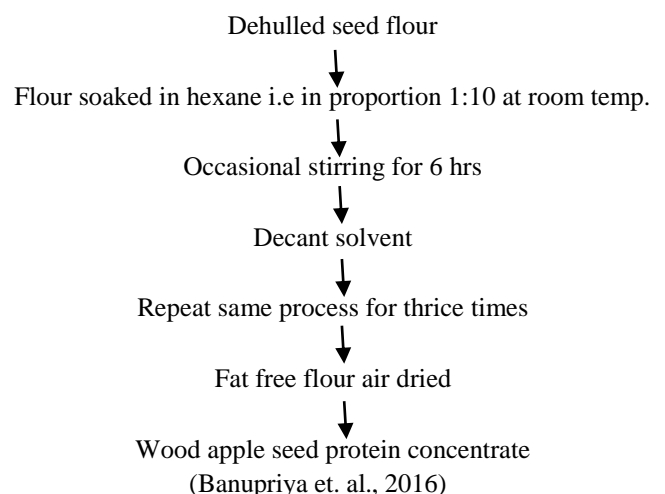
### A. Raw Materials

Wood Apple (*Limonia Assidissima*) was obtained from local market of Aurangabad which were fully matured, ripened, and uniform in size. Then they were brought to the laboratory for further experimentation. Wood apple variety was authenticated from Botany Department of Dr. Babasaheb Ambedkar University, Aurangabad by Mr. Arvind S. Dhabe. They Analyse the Sample and Identified the variety namely as *Limonia acidissima* L. Belongs to family Rutaceae.

### B. Preparation of Raw Material

1) *Preparation of Wood Apple Seed Flour*: The outer cover of wood apple fruit was broken. Then separate the pulp from the outer cover with the help of spoon. Then from pulp, the seeds were manually separated and washing under running water. Then dry seeds under sun drying. After drying of seeds, dried seeds were grind in pistal mortar for separation of outer cover. Then cotyledons were separated, again this obtained cotyledons grind in mixer/grinder to obtain the Wood Apple Seed Flour (WASF).

2) *Preparation of Wood Apple Seed protein concentrate*:



### C. Chemical Analysis

The physico-chemical analysis of basil leaves powder included the estimation of moisture content (A.O.A.C. 1990), protein (A.O.A.C. 1990), fat (A.O.A.C. 1990), dietary fiber (A.O.A.C. 1990) and carbohydrate (Ranganna. S. 1986).

### III. RESULTS AND DISCUSSION

The present investigation entitled "Preparation of wood apple seed protein concentrate and its fortification in yogurt" was carried out in the Department of Agricultural Engineering during the academic year 2017-18. During present investigation the efforts were made to assess the physico-chemical properties were observed during preparation.

#### A. Chemical analysis of Wood Apple Seed Flour (WASF)

Chemical properties of the wood apple seed flour represent extent of the perishability as well as suitability for specific product preparation. The chemical parameters of WASF viz. moisture, protein, fat, fiber, ash, carbohydrate were determined and results obtained were presented in Table 4.2.

TABLE I. CHEMICAL COMPOSITION OF WOOD APPLE SEED FLOUR (WASF)

Sr. No	Chemical properties	WASF
1	Moisture content	2.6±0.5
2	Crude protein	27.06±0.75
3	Crude fat	33.5±0.5
4	Crude fiber content	8.13±0.29
5	Ash content	6.4±0.5
6	Carbohydrate	21.88±0.5

<sup>a</sup>. Each value is a mean of three determinations.

The data depicted in above Table 1 reveals that moisture content of WASF are 2.6 percent on dry basis. Moisture content in the WASF decides the shelf life of flour. Although the protein content of WASF 27.06 percent fat content of WASF 33.5 percent, ash content of 6.4 Percent. Crude fiber content and carbohydrate of WASF were 8.06 and 21.88 percent respectively.

#### B. Chemical analysis of Wood Apple Seed protein Concentrate (WASPC)

Chemical properties of the wood apple seed protein concentrate represent extent of the perishability as well as suitability for specific product preparation. The chemical parameters of WASPC viz. moisture, protein, fat, fiber, ash, carbohydrate were determined and results obtained were presented in Table 4.2.

TABLE II. CHEMICAL COMPOSITION OF WOOD APPLE SEED PROTEIN CONCENTRATE (WASPC)

Sr. No.	Chemical properties	WASPC
1	Moisture content	3.20±0.50
2	Crude protein	75.31±0.05
3	Crude fat	NM

4	Crude fiber content	5.07±0.75
5	Ash content	5.73±1
6	Carbohydrate	12.04±0.35

<sup>a</sup>. Each value is a mean of three determinations.

The data depicted in above Table 2 reveals that moisture content of WASPC are 3.20 percent on dry basis. Moisture content in the WASPC decides the shelf life of WASPC. Although the protein content of WASPC 75.31 percent, fat content of WASPC not measured (because fat free means protein concentrate), ash content of 5.73 Percent. Crude fiber content and carbohydrate of WASPC were 8.07 and 8.44 percent respectively.

The fibre content was high WASPC 5.07 percent. The ash content was in WASPC 4.5 percent. Also similar results found with *Feronia Limonia* L. seed. The protein content was found to be 33.79 percent and 77 percent in wood apple seed meal and wood apple protein concentrate respectively (Narsing Rao et. al. , 2011) . It was also shown that defatted *L. Acidissima* seed contained 49.51 % protein (Sachin et. al., 2015). These results indicate that wood apple seeds can be included in food formulations as a source of protein.

### CONCLUSION

A study was conducted to prepare yogurt fortified with wood apple seed protein concentrate. Further study was carried out in order to evaluate their chemical parameter.

In the present investigation efforts were made to investigate physicochemical properties of wood apple fruits and also seeds. Wood apple seed having 27% protein. The Wood apple Seed flour (WASF), Wood Apple Seed Protein Concentrate (WASPC) having good functional properties. The protein content of wood apple seed flour is about 27.56% and wood apple seed protein concentrate is about 77% .Wood apple seed flour, wood apple seed protein concentrate is rich in protein. The wood apple seed flour and protein concentrate are high in protein and hence it can find application as a protein source in various food formulation. A study was conducted to prepare wood apple seed protein concentrate and there physico chemical analysis.

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