

Sensory Evaluation of Germinated Moth Bean Flour Incorporated Products

***Reenu Rana **Dr. Parvinder Kaur**

* Research Scholar Department of Food and Nutrition, BPS Women University, Sonapat, Haryana. Email doctorparvinder@yahoo.com

**Asstt. Prof. Department of Food and Nutrition, BPS Women University, Sonapat, 131305 Haryana. Email doctorparvinder@yahoo.com

ABSTRACT

Moth bean (Vigna aconitifolia) is an underexploited Indian legume mostly in rain fed region on low fertility soils. Mostly sprout seeds and dhal are used for preparation of different types of curries. Moth bean supplemented product was prepared by using germinated moth bean flour. Supplemented moth bean product was standardized and analyzed for their sensory evaluation. Sensory evaluation of products was made in terms of their color, appearance, aroma, taste, texture, and over all acceptability using nine point hedonic scales. The recipes for the preparation of various products from processed moth bean flour were standardized by use of various degrees (5%, 10%, and 15%). The sensory evaluation of supplemented products was significantly different compared to those of control. All supplemented product were desirable and moderately desirable in all terms.

Key words: Moth bean; Soaking; Germination; Sensory quality Biscuit; *Wadi*; *Chakli*

INTRODUCTION:

Legumes are generally grown throughout the world and their own dietary as well as economic importance is worldwide. (R.V. et al 2011) Legumes / pulses are regarded as a very important group connected with plant foods stuffs, particularly inside the developing globe. A significant section of human population relies upon legumes since staple foods for subsistence, particularly in combination with cereals(D. Kumar et al 2002) Legumes are generally consumed after processing into various products like milling into “dhal” puffing or roasting into snack foods, grinding into flour for different food preparations (Villegas. R et al 2008). It is widely accepted that simple and inexpensive traditional processing techniques are effective methods of achieving desirable changes in the composition

of seeds. Processes like Soaking, cooking, fermentation and germination may improve the quality of legumes due to the removal of some anti-nutritional factors.(Avanika et al 2014) Germination is one of the most common processes for improving the nutritional quality of pulses, not only by the reduction of anti-nutritive compounds also increase protein content, dietary fiber, vitamin, and bioavailability of trace elements and minerals (Kaushik et al 2010) . Nutritional content given rise to many health benefits to the human being (Kathirev et al 2011). Moth Bean medically often known as *Vigna aconitifolia* (Sathe et al 2007). The seed are usually traditionally taken pertaining to breakfast every day, soon after currently being sprouted along with cooked properly. Fried splits chips makeup some sort of ready-to-eat solution with of India referred to as *Dalia* (Nimkar et al 2005). The seeds can

be cooked and eaten as a vegetable and can also be processed as dhal to preserve them for a long time (Agricultural products india 2008). Mainly sprouted seed along with dhal are used in preparation associated with various kinds of curries (B.N. et al 2010). Moth bean seed contained 24.1 % protein, 0.8 % crude fiber, 1.3 % fat, and 3 % ash. It is rich source of iron which about 9.6 % mg/100 mg (R.V. et al 2011). India has rich dietary resources and a combination of different foodstuff can provide adequate quantity. Simply there is a need to supplement these moth bean flour in various recipes to make them popular among vulnerable group.

Cakes prepared by using 10 % moth bean flour in 200 g of maida were organoleptically acceptable. Prepared cakes were subjected to sensory analysis based on 9 –point hedonic scale (R.V. et al 2011).

Three types value added spread mix (dried curry leaves, dried coriander leaves and balanced carrots) was prepared by using germinated moth bean and B-carotene rich vegetables. The developed instant mix sample (procured from the local market) served to the panel member in powder and product forms for organoleptically evaluation. The calculated overall mean organoleptic scores for the control instant mix was to be ranging between 7.0 to 7.2 or compared to 8.2 to 8.7 scores for developed instant mix on nine point hedonic ranking scale. The statistical analysis also showed significant difference between the control and developed instant mix at one per cent level of significance. (Ruma et al 2009)

The current investigation was set up the sensory evaluation of traditional recipes

designed underutilized cereal as well as pulse moth bean.

MATERIALS AND METHODS:

The seed involving moth bean (*vigna aconitifolia*) were purchased from the town market of Gohana, Sonapat, Haryana.

Soaking in addition to germination:

Moth bean seed were cleaned, make out free from dust as well as other foreign materials then seed were soaked in sufficient water for 12 hours. After soaking the seeds were washed with distilled water and then germinated for overnight.

Fig.1. Processing of moth bean

- Cleaning out of moth bean
- Soaking with regard 12 hours on room temperature
- Germination (in muslin fabric with regard to room temperature
- Blow Drying
- Milling (Hummer traverse
- Flour
- Sieving
- Packaging
- Storing for further use in airtight container.

Standardization of recipes

The recipes for the preparation of various products from processed moth bean flour were standardized making use of various levels (5 g, 10 g, 15 g). The processed moth bean flour incorporated products biscuits, *wadi*, and *chakli* were prepared.

Table 1: Method of preparation of products

Products	Method of preparation
Germinated moth bean flour Biscuit (sweet)	<ul style="list-style-type: none"> • Creamed ghee (60 g) and sugar (30 g) with milk (30 ml) • Added wheat flour (control =100 g sample I =95 g sample II=90 g sample III=85g) • Folded the Wheat flour and sprouted moth bean flour (control =0 g sample I=5 g sample II=10 g sample III=15 g in above mixture) • The dough was rolled and cut into biscuit shape with the help of cutter • Baked at 150⁰ C for 15-20 minute
Germinated moth bean flour <i>Wadi</i>	<ul style="list-style-type: none"> • Mix Coriander powder (2 tsp) and aniseed and red chili powder (1 tsp) with asafetida (1/4 tsp) • Added black gram dhal flour (control =100 g sample I=95 g, sample II=90 g, sample III=85 g) • Mix moth bean flour (control =0 g sample I=5 g sample II=10 g sample III=15 g in above mixture) • Made a coarse paste by added all the ingredients and mix thoroughly • Grease plates with oil and make wadi in any desires shape • keep the plates with wadi out in sun
Germinated moth bean flour <i>chakli</i>	<ul style="list-style-type: none"> • Added butter (3 tblsp) sesame seed (2 tsp) asafetida (1/4 tsp) with salt /water (as needed) • Take Bengal gram dhal flour (control =100 g sample I=95 g sample II=90 g sample III=85 g) • Added moth bean flour (control =0 g sample I=5 g sample II=10 g sample III=15 g, in above mixture) • Added all the ingredients and mixed thoroughly • Make a smooth pliable dough • Take tiny soccer ball along with complete a twist /<i>chakli</i> • Heated oil and deep fried <i>chakli</i> until golden brown in color

ORGANOLEPTIC EVALUATION:
Organoleptically evaluation was done using 9-point hedonic scale by semi trained members.

STATISTICAL ANALYSIS;

Statistical analysis of data was done by using complete randomized design (panse and sukhatme, 1961), and all work was done in

triplicates along with the data presented usually are necessarily mean \pm S.D. The data obtained in the experiments were recorded and subjected to statistical analysis using standard procedure.

RESULTS AND DISCUSSION

Sensory evaluation of germinated moth bean flour based products

Table 2: Mean scores of various characteristics of germinated moth bean flour *Chakli*

Products	Color	Appearance	Aroma	Texture	Taste	Over all acceptability
Germinated moth bean flour <i>chakli</i>						
Control	8.40 \pm 0.36	8.60 \pm 0.36	7.90 \pm 0.30	7.90 \pm 0.30	8.0 \pm 0.18	8.16 \pm 0.25
Type I	8.10 \pm 0.18	8.00 \pm 0.21	8.10 \pm 0.23	7.60 \pm 0.16	8.30 \pm 0.15	8.02 \pm 0.15
Type II	7.90 \pm 0.18	8.10 \pm 0.23	7.90 \pm 0.31	7.50 \pm 0.26	8.20 \pm 0.35	7.92 \pm 0.25
Type III	8.10 \pm 0.18	8.20 \pm 0.20	8.20 \pm 0.20	7.80 \pm 0.13	8.40 \pm 0.21	8.14 \pm 0.13
CD(P<0.05)	0.62	0.69	0.76	0.65	0.69	0.59

Values are mean \pm SE of ten panelists

Values with same superscripts do not differ significantly CD (P \leq 0.05)

Control=100% besan

I=95% Bengal gram dhal flour +5% moth bean flour

II=90% Bengal gram dhal flour +10% moth bean flour

III=85 % Bengal gram dhal flour + 15% moth bean flour

Chakli: The *chakli* prepared by incorporating moth bean flour was subjected to sensory analysis. The panel member evaluated the product for the color, appearance, flavor, texture, taste, and overall acceptability. The result of the sensory analysis is presented in table 2. The control sample was “desirable” in term of color, appearance, taste and “moderately desirable” in aroma and texture. Addition of moth bean flour brought down the score in term of color, appearance, and texture,

but taste was improved by addition of moth bean flour as compare to control.

Chakli was prepared sorghum flour was supplemented with moth bean dhal. It was standardized with different proportion of sorghum & moth bean dhal from 10g, 20g, 30g, and 40g were compared with control sorghum *chakli*. *Chakli* with 10 % moth bean with sorghum flour found superior in term of appearance, color, texture aroma and taste.

chakli prepared by moth bean flour and found desirable” for all sensory characteristics (V.B et al 2005).
sorghum chakli were liked “moderately al

Table 3: Mean scores of various characteristics of germinated moth bean flour *Wadi*

Products	Color	Appearance	Aroma	Texture	Taste	Over all acceptability
Germinated moth bean flour <i>wadi</i>						
Control	7.70±0.21	8.00±0.21	7.70±0.26	7.70±0.26	7.90±0.27	7.80±0.21
Type I	7.90±0.23	7.90±0.24	7.70±0.30	7.79±0.22	7.47±0.32	7.66±0.78
Type II	8.00±0.21	8.00±0.21	7.50±0.25	7.80±0.34	7.40±0.83	7.40±0.80
Type III	8.0±0.18	8.00±0.21	7.55±0.26	7.82±0.15	7.80±0.21	7.77±0.15
CD (P<0.05)	0.60	0.63	0.79	0.73	1.37	1.66

Values are mean ± SE of ten panelists

Values with same superscripts do not differ significantly CD (P≤0.05)

Control=100% urad dhal flour

I=95% Black gram dhal flour +5% moth bean flour

II=90% Black gram dhal flour +10% moth bean flour

III=85 % Black gram dhal flour + 15% moth bean flour

Wadi: *Wadi* prepared without use of moth bean flour (control) was “moderately desirable” in term of color, aroma, texture, taste, and over all acceptability and “desirable” in respect to appearance .Type I was “moderately desirable” in all attributes. With addition of 10 % and 15 %, moth bean flour *wadi* become “desirable” in terms of color and appearance and “moderately desirable” in rest of the sensory characteristics.

Dahiya (2005) reported that *Wadi* prepared with urad dhal was supplemented with moth bean and fenugreek flour . It was standardized with different proportion of urad dhal, moth bean and fenugreek from 5g and 10 g were compared with control urad dhal *wadi*. 10g moth bean, fenugreek , and urad dhal *wadi* were” liked moderately” for all sensory characterstics.

Table 4: Mean scores of various sensory characteristics of germinated moth bean flour biscuits

Products	Color	Appearance	Aroma	Texture	Taste	Over all acceptability
Germination moth bean flour biscuit						
Control	8.10±0.23	8.00±0.25	8.10±0.3	8.20±0.2	8.40±0.1	8.32±0.22
Type I	8.00±0.25	8.00±0.25	7.80±0.24	7.80±0.24	7.90±0.2	7.90±0.25
Type II	7.95±0.23	8.00±0.29	7.95±0.2	7.90±0.2	8.10±0.2	7.98±0.24
Type III	7.90±0.18	8.0±0.18	7.80±0.2	8.20±0.2	8.30±0.2	8.12±0.16
CD ≤0.05	0.65	0.72	0.77	0.73	0.66	0.64

Values are mean ± SE of ten panelists

Values with same superscripts do not differ significantly CD (P≤0.05)

Control=100% wheat flour

I=95% Wheat flour +5% moth bean flour

II=90% Wheat flour +10% moth bean flour

III=85 % Wheat flour +15% moth bean flour

Biscuits: Biscuits prepared without use of moth bean (control) “desirable” in term of color, appearance, aroma, texture, taste, and over all acceptability. Type I biscuits were “desirable” in color and appearance. These were “moderately desirable” in taste, texture, and aroma. Incorporation of powder brought down the score for color and aroma and for over all acceptability for appearance and taste it remains same. Dahiya (2005) found that biscuits prepared by using 5g and 10g of dried spinach powder and moth bean flour in 100g of refined flour were organoleptically acceptable. These were “liked moderately” in term of color, aroma, texture, taste, and over all acceptability

CONCLUSION

Present investigation reveals out the effect of different treatment on moth bean seeds and its utilization into products like biscuit, *chakli*, and *wadi*. The sensory characteristics of the product were analyzed by 9 point hedonic scale. This varies with respect to the different levels of moth bean flour. Quality of the biscuit, *wadi* and *chakli* could be improved by germinated moth bean flour. Moth bean products were desirable in terms of color, taste and texture. The result of sensory evaluation showed that the incorporation of germinated moth bean flour up to 15% was found to be most acceptable to obtain biscuit, wadi, chakli, with improved nutritional quality and good

sensorial attributes. It is needed to develop recipe in the form of common food products.

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