

Formulation of chikki by using gum Acacia

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Substance frequently called gums are hydrocarbon of high molecular mass that gives viscous solution at low concentration. The most fundamental property of gums is, therefore water solubility and high viscosity in aqueous dispersion. It is very evident that gums have very vast application in pharmaceutical and food industries, as a result of this; there is increase in demand for gums globally. India with divergent food habit is having a number of traditional foods, including sweet products; chikki is one of the popular Indian traditional sweet snacks. It is prepared by mixing roasted groundnuts and other ingredients either with jaggery or sugar. In the present investigation an attempt has been made successfully to assess the physiochemical properties of gum Acacia. Further study has been carried out on the groundnut chikki, by adding the gum in the recipe of groundnut chikki at different levels, and their effects on the sensorial characteristics and physical properties of the groundnut chikki has been studied. From the investigation it is clear that chikki prepared from gum acacia is having good texture, flavour and appearance so the overall acceptability is high. The nutritive value of the chikki prepared from the gums is having high nutritional value in terms of protein content.

Key Words : Hydro carbon, Gums, Traditional food, Chikki, Jaggery

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The Joint Expert Committee on Food Additives (JECFA) defines the gum as “a dried exudation obtained from the stem and branches of *Acacia Senegal* related species of *Acacia* (Fam.Leguminosae)” (FAO, 1986). Gum Acacia is unique in natural hydrocollids due to its extremely high solubility in water. It can form a highly viscous, gel like mass similar in character to a strong starch gel, also it can use in small quantity with other gums as thickener and binders. The viscosity of the gum Acacia is depending upon the type and variety of gum used. At concentration up to 40 per cent gum Acacia shows typical Newtonian behavior. The gum Acacia is a strong monobasic acid. The viscosity of it rises sharply with increasing pH 5-7, and then falls slowly to about pH 10-14. Gum Acacia is a very effective emulsifying agent due to its protective colloid functionality (Panda, 2005).

The gum Acacia is being widely used as an experimental vehicle for drugs in physiological and pharmacological experiments, and it is supposed to be an inner substance, recent reports have confirmed that it has some biological properties as an antioxidant (Trommer and Neubert, 2005, Hinson *et al.*, 2008), cardio-vascular (Glover *et al.*, 2009) and gastrointestinal diseases.

Chikki is a sweet product prepared by mixing roasted groundnuts (*Arachis hypogae*) and other ingredients either with jaggery or with sugar. Jaggery contain protein, minerals, and vitamins and is a potent source of iron and copper (Manay and Swamy, 2001). Chikki is a popular product among all sections of population in the country; an attempt is made to further enrich it with hydrocolloids by incorporating gum Acacia which act as a stabilizer. Gum Acacia (*Acacia Senegal*) has been used as food additives, thickener, stabilizers (Yaseen *et al.*, 2005 and Elnour *et al.*, 2009). In the present work gum Acacia is incorporated in chikki formulatin and its sensory characteristics is evaluated. Chikki can also be made with other ingredient such as groundnut or cashewnut, sesame seeds, pieces of dried coconut, dry fruits and so on.

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Sample no	Roasted groundnuts (50 g)	Jaggery (g)	Acacia gum(g)
Control (S ₁)	50	50	-
S ₂	50	50	1
S ₃	50	50	2
S ₄	50	50	3

The study was carried out in the Department of Food Technology, M.I.P. College of Food Technology, Hingoli (M.S.), India during the year 2013-2014. Physio-chemical analysis of sample under study was done in laboratory.

The samples of gum Acacia were collected from the Forest Department of Gadchiroli division of Government of Maharashtra. A study was conducted to assess physical and chemical properties of the sample.

The instruments, glassware and chemicals were used which are available in the department of food technology, MIP College of food technology.

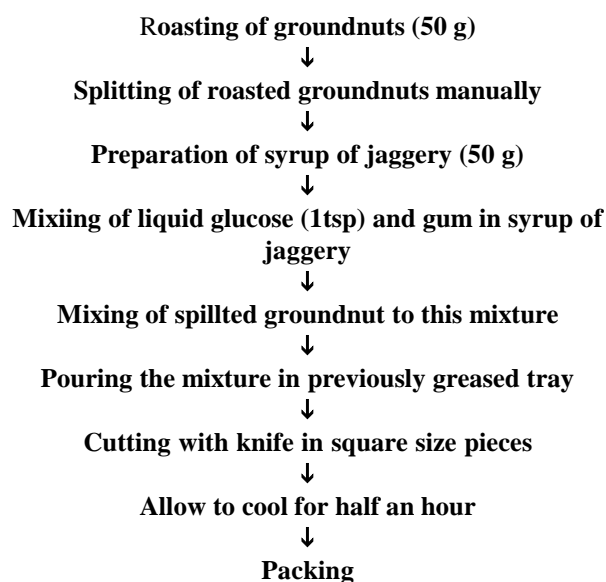
Good quality groundnuts, jaggery (grated) free from dirt, ghee and liquid glucose was procured from the local market of Hingoli.

Preparation of chikki with acacia gum :

The process is very simple, chikki was prepared by taking equal proportions of jaggery and roasted groundnuts. Roasted groundnuts outer skin was removed, and then cooled. The grated jaggery was heated in pan until the temperature reaches 120⁰ C, to see the soft ball consistency the jaggery syrup was dropped in cold water and further it was cooked for 2 minutes and add liquid glucose which is used to thicken the syrup immediately pre-weighed roasted and dehusked peanuts were added and mixed thoroughly till nuts get coated with jaggery syrup.

Then this hot mixture was poured to tray, which was smeared with ghee. The product was then spread uniformly by rolling it with the help of roller. Vertical and horizontal lines were marked with a cutter to make individual slabs then cooled to room temperature and were packed in plythene pouches.

The process flow chart with Acacia gum is as follows :



Physico-chemical analysis characteristics of gum Acacia :

The physico-chemical analysis of gum Acacia viz., moisture content, ash content, nitrogen and protein content, specific gravity and density determination was determined as per standard method (AOAC, 1990).

Organoleptic evaluation of gum Acacia :

The organoleptic evaluation in respect of colour, flavor, texture, was evaluated by trained/semi-trained judges using nine point Hedonic Scale (Amerine *et al.*, 1965).

The results obtained from the present investigation as well as relevant discussion have been summarized under the

Table 1: Score of organoleptic evaluation of groundnut chikki

Sr. No.	Parameters	S ₁	S ₂	S ₃	S ₄
1.	Appearance	8	6	7	8
2.	Colour	7	6.5	8	9
3.	Flavour	7	5	7	8
4.	Texture	7.5	5.5	8	8
5.	Taste	7	7	7	7
6.	Aftertaste	7	7	7	6.5
7.	Overall acceptability	7.25	6	7.33	7.75

following heads :

product consistency.

Organoleptic evaluation of groundnut chikki :

The prepared groundnut chikki was evaluated by a panel of judges on 9 point hedonic scale of different scale of four samples as given in the table below. The mean value of score given to each parameter under investigation for organoleptic attributes like, appearance, color, texture, taste, aftertaste, overall acceptability are presented in table.

The table shows that score for sample S₄ recorded highest (7.75). Scores for other parameters like appearance (8), Colour (9), Flavour (8), Texture (8), Taste (7), Aftertaste (6.5), and overall acceptability (7.75) were also found. So the sample S₄ was organoleptically better than other sample.

Conclusion :

The study was carried out with the view to study the physico-chemical properties of the gum Acacia and its effect on groundnut chikki in different proportions. In conclusion the use of gum Acacia in groundnut chikki has its usefulness in increasing the sensory qualities of the chikki. The results from this studies support the gums suitability for industrial applications especially in areas where commercial gum acacia is traditionally used. It is found that force required for breaking the groundnut chikki is higher with Acacia gum compare to control sample. The texture of groundnut chikki with Acacia gum is better with respect to texture and overall acceptability. Gums are extremely cost efficient and will have a much quicker and sharper flavour release profile, great source of dietary fibre and used extensively in diet control foods. Gums are used in the industry for its ability to bond and immobilize large amount of water, thereby contributing to viscosity and modifying product texture and stabilizing

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