

ALL INDIA NETWORK PROJECT ON HARVESTING PROCESSING AND VALUE ADDITION OF NATURAL RESINS AND GUMS

Project objectives

1. To study production, processing, marketing and utilization of Guar Gum
2. To develop and standardize protocols for harvesting and collection
3. To improve/refine the present primary processing techniques for enhanced recovery and quality
4. To improve the process and machinery for making value added products in collaboration with IINRG, Ranchi
5. To transfer the guar gum specific technologies in the region.

Year of start: 2009

Associated Research Scientist

Sr. No	Name of Scientist	Designation
1	Prof. Dr. R. B. Kshirsagar	Principal Investigator
2	Dr. B. A. Jadhav	Research Associate
3	Dr. N. M. Deshmukh	Senior Research Fellow

Background :

The Network Project on Harvesting, Processing and Value Addition of Natural Resins and Gums was launched on 9th February, 2009 to carry out the location-specific and multidisciplinary research on different aspects of resins and gums. Natural gums come out as exudates from the trunk of gum producing tree as a response to injury. Gums are also extracted from seeds, seed coats, micro-organisms etc. Indonesia, India and China are among the World's major producers of gums and resins. India is major exporter of guar.

The gums and gum-resins are mostly used in food (thickening/ gelling agents, stabilizers, emulsifiers), pharmaceuticals, cosmetics, textiles and chemical industries. In several application areas there are no substitutes for these natural products while in some synthetic alternatives are available and used. In recent years, due to back to the nature trend there has been a revival of

interest in natural resins and gums extracted from forests by rural and tribal people who depend on these resources to sustain their livelihood. Two-fold increase in demand is expected due to realization for eco-friendly and safe natural materials for human contact and consumption. Keeping in view the immense potential of these natural, non-toxic and bio-degradable products of social, livelihood and industrial importance, the ICAR decided to include these as part of the regular research programmes at Indian Institute of Natural Resins and Gums, Ranchi.

In order to address the harvesting, processing and value addition of region-specific gums and resins, an outreach programme in a Network mode was sanctioned during XIth Plan with IINRG, Ranchi as lead center and six other Network co-operating centers. The Network project in XIth Plan covered the aspects of harvesting/tapping, processing and value addition of three gums (Guar Gum, Karaya Gum and Gum Arabic), one resin (Pine resin) and one oleo gum-resin (Guggul).

College of Food Technology, Vasantnaik Marathwada Krishi Vidyapeeth, Parbhani is one of the co-operating center imparting extensive technical knowledge and also providing human resource to the food processing industry. The mandate of this center is post harvest processing and value addition of guar gum.

According to mandate of the Network Project, Department of Food Chemistry and Nutrition in the faculty had the entire quality analytical and product development facilities equipped with sophisticated equipment's and machineries which developed the method of extraction and purification of guar gum on lab scale, rheological study and utilization of guar gum in different commercially value added food products.

Research Highlights:

Utilization / Incorporation of Guar Gum and its Fraction in Different Value Added Food Products as a thickener, stabilizer and emulsifier. Now days guar gum has become a prominent additive which is used in food products to improve the quality parameters of the product.

1. Incorporation of Guar Gum in Tamarind Ready to Serve (RTS) Beverage
2. Addition of Guar Gum (hydrocolloid) in Tamarind Fruit Leather
3. Utilization of Guar Gum in Preparation of Tamarind Squeeze
4. Nutritional Enhancement of Cookies by Addition of Guar Germ Meal
5. Influence of Incorporation of Guar Germ Meal in Bread

6. Supplementation of Guar Germ Meal in Preparation of Cup Cake
7. Influence of Incorporation of Blends of Guar Gum and Acacia Gum in the Preparation of Chocolate Flavoured Milk
8. Effect of Utilization of (galactomannan) Guar Gum Blended with Acacia Gum in Yoghurt
9. Assessment of guar gum as a stabilizer in ice cream
10. Development and Standardization of Multi Millet Nutri Bar by Incorporation of Guar Gum in Combination with Acacia Gum
11. Development of Peanut Chikki by Incorporation of Guar Gum in Combination with Arabic Gum
12. Influence of Guar and Arabic Gum Blend on Dough Properties and on Quality of Bread
13. Quality Evaluation of Soy Flour Supplemented Cookies with Guar and Arabic Gum Incorporation
14. Utilization of guar gum in vegetable butter and its quality analysis
15. Studies on the by-products and Waste Utilization Obtained during Extraction of Guar Gum
16. Extraction and Characterization of Bioactive Components of Guar Seed Germ and Hull
17. Technology Development for Preparation of Nutra Laddu by Incorporation of Linseed, Amaranth and Guggul Gum
18. Comparison of Quality Parameters of Guar Meal with other Meal Like Soya Meal and Groundnut Meal
19. Preparation of high quality protein rich biscuits using detoxified guar meal
20. Utilization of guar hull and its value addition
21. Modification of native guar gum by enzymatic method and its utilization in pizza sauce
22. Extraction and quality evaluation of Protein isolate prepared from guar meal and its exploration in different value added food products. Pet dog food (crackers)
23. Studies on different particle size of guar gum yield and viscosity profile.
24. Effect of processing methods on tannin content of guar korma meal.
25. Development of instant tomato soup powder by fortification of PHGG as a soluble dietary fiber source and its characterization.
26. Development of guar seed fractions based edible film.
27. Effect of feeding different level of guar meal on growth performance on Kaveri chicken.

Worked on by products of guar gum (guar meal, guar korma and guar churi), its analysis and utilization in food products and pet foods

1. Nutritional Enhancement of Cookies by Addition of Guar Germ Meal
2. Influence of Incorporation of Guar Germ Meal in Bread
3. Supplementation of Guar Germ Meal in Preparation of Cup Cake
4. Studies on the by-products and Waste Utilization Obtained during Extraction of Guar Gum
5. Extraction and Characterization of Bioactive Components of Guar Seed Germ and Hull
6. Comparison of Quality Parameters of Guar Meal with other Meal Like Soya Meal and Groundnut Meal
7. Preparation of high quality protein rich biscuits using detoxified guar meal
8. Utilization of guar hull and its value addition
9. Effect of processing methods on tannin content of guar korma meal
10. Development of guar seed fractions based edible film.
11. Effect of feeding different level of guar meal on growth performance on Kaveri chicken.

Developed Technologies

1. Developed wet processing method for isolation and purification of guar gum from endosperm splits on lab scale.
2. Detoxification method was developed for eradication of anti-nutritional factor (hemagglutinin) in guar germ meal and assessed for its amino acid profile.
3. Indirect heating (using steam) was developed for separation of germ and hull from endosperm of guar seed which enhanced separation yield percent.

Recently research work going on modified guar gum and its utilization in food products

1. Modification of native guar gum by enzymatic method and its utilization in pizza sauce
2. Development of instant tomato soup powder by fortification of PHGG as a soluble dietary fiber source and its characterization.
3. Development of guar seed fractions based edible film.

Technologies Developed and Released in Joint Agresco Committee at State Level

1. Utilization of guar gum in tamarind squeeze - Rodge A B and Jadhav B A (2013). Technology released in Joint Agresco 2013 at VNMKV, Parbhani.
2. Development of Technology for Production of Tamarind Leather with addition of Guar gum - Jadhav B A and Pawar V S (2015). has been released in Joint Agresco Sub-committee meeting held at Mahatma Phule Krishi Vidyapeeth, Rahuri.
3. Utilization of guar gum in vegetable butter and its assessment of quality - Jadhav B A and H.M. Syed (2018), released technology in Joint Agricultural Research and Development Committee held At Dr. Balasaheb Sawant Konkan Krishi Vidyapeeth, Dapoli
4. Technology development for preparation of Nutra laddu by incorporation of Linseed, Amaranth and Guar gum- H.M. Syed, Jadhav B A and A.R. Sawate (2019). in Joint Agricultural Research and Development Committee 2019, held at Mahatma Phule Krishi Vidyapeeth, Rahuri.
5. Standardization and Technology development for preparation of healthy fiber rich cookies by utilization of guar hull in Joint Agricultural Research and Development Committee 2019, held at Mahatma Phule Krishi Vidyapeeth, Rahuri.
6. Development of technology for production of low fat chocolate flavored milk by fortification of guar and Arabic gum blend. in Joint Agricultural Research and Development Committee 2019, held at Mahatma Phule Krishi Vidyapeeth, Rahuri.
7. Standardization of pizza sauce using partially hydrolyzed guar gum in Joint Agricultural Research and Development Committee 2021, held at Vasantnao Naik Marathwada Krishi Vidyapeeth, Parbhani.
8. Development of Crackers (Pet Dog Food) by Incorporation of Guar Meal Protein Isolate in Joint Agricultural Research and Development Committee 2021, Vasantnao Naik Marathwada Krishi Vidyapeeth, Parbhani.

Publications during 2009 – 2022 of Parbhani Center

Extension activities	Year 2009-2022
1. Research Papers	24
2. Conferences (Posters Presented)	24
3. Books	09
4. Folders	21
5. Patents	02

Trainings conducted

Dr. R.B. Kshirsagar conducted training on **Utilization of Guar Gum in Food Processing** for **Woman's Self Help Group**



Dr. B.A.Jadhav (RA) conducted training on **Aonla processing and value addition of guar gum** for Woman's Self Help Group



Expertise one day webinar on **Utilization of Gaur gum in milk and milk products** at Department of Animal Husbandry and Dairy Science, College of Agriculture, Latur on Dated 24/03/2022.

Successful Entrepreneurs

College of Food Technology, VNMKV, Parbhani



Hon'ble Governor of Maharashtra Shri Bhagat Singh Koshyari visited Successful Entrepreneurs Melawa at College of Food Technology, VNMKV, Parbhani on 07/08/2021



TECHNOLOGY TRANSFER

Padmini Food Products (Fruits and Vegetable Processing Unit), Loni. MIDC, Udgir (M.S) -

Technology for preparation of Fruit leathers with utilization of guar gum.

PADMINI FOODS PVT LTD.
MIDC-LONI, TAL- UDGIR
DIST- LATUR (M.S).

Date 13/12/2019.

To,
Dr. Kshirsagar R.B.
Head of Dept. of Food Engineering
PI- NPHPVA of NRG, College of Food Technology
VNMKV, Parbhani

I am writing letter on behalf of the "Padmini Foods Pvt Ltd. MIDC-Loni, Tal- Udgir, Dist- Latur (M.S). We are leader in the production of fruit leather bar and their supply.

We were facing numerous technical issues in the preparation of fruit leather in concern with its texture. After visiting our firm Dr. Kshirsagar R.B. and Dr. Jadhav B.A. went through the technical issues related to fruit leather bar texture and suggested technical inputs to eradicate those problems by usage of guar gum and accordingly we followed those technical suggestions and were able to solve textural cause.

I have much deeper gratitude for your technical support and guidance. In future also we expect the same technical inputs from your side

Thanking you

Padmini Food Products

Proprietor
Proprietor



Supriya Food Products Pvt Ltd, MIDC, Parbhani - Technology for utilization of guar gum in Fruit and Vegetable Processing.

Supriya Food Products
MIDC, Parbhani - 431 401 (M.S)

"Supriya Food Products,"
Date: 10/10/2019

To,
Dr. Kshirsagar R.B.
Head Dept. of Food Engineering
PI- NPHPVA of NRG, College of Food Technology
VNMKV, Parbhani

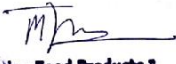
Subject: Issued technology regarding preparation and utilization of guar gum in ready to serve beverage.

Respected sir,

With respect to above cited subject, I M/s Mangal Nivruttirao Jadhav proprietor of Supriya Food Products, MIDC, Parbhani (M.S), we are processing mango and aonla into various products along with its ready to serve beverage. We were facing the problems regarding cloudiness, settlement of sediments and spoilage in ready to serve beverage of mango and aonla.

Dr. Kshirsagar R.B. and Dr. Jadhav B.A. College of Food Technology VNMKV, Parbhani visited to our industry and helped to get rid of above said problems by giving technology regarding utilization of guar gum in foresaid products.

Thank you so much for all of your help, commitment and assistance continuously to our firm.


"Supriya Food Products."

