



**International Journal of Biology, Pharmacy
and Allied Sciences (IJBPAS)**
'A Bridge Between Laboratory and Reader'

www.ijbpas.com

TRADITIONAL AND NUTRITIONAL PROPERTIES OF GUAR: A REVIEW

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Received 31st Jan. 2020; Revised 3rd March 2020; Accepted 8th April 2020; Available online 1st Sept. 2020

<https://doi.org/10.31032/IJBPAS/2020/9.9.5192>

ABSTRACT

The present day stressful lifestyle trending over the world makes it necessary to focus on medicinally important fruits and vegetables to minimize the risk of life. By the use of green components, the diseases can be cured without any side effects unlike the modern drug. The present review is focused on *Cyamopsis tetragonoloba* (L). Taub. or guar belongs to family Fabaceae widely used as a traditional medicine in India for curing various diseases and also finds use in modern industrial processes as a source of commercially important gum. In India, it is grown as an annual legume that is used as a vegetable, fodder, or green manure crop. It is considered to be a valuable source of food products. It shows anti-ulcer, anticoagulant, hypocholesterolemic, hemolytic, antiasthmatic, cytoprotective, antimicrobial, anti-diabetic, anticholinergic, reversible antifertility, antihelminthic, anti-inflammatory and wound healing activity. In pharmaceutical industries, it has been used in colonic drug delivery and also as the controlled-release carrier, as a binder in topical products and as a suspending, thickening and stabilizing agent. The present review is focused on the uses of guar in biosciences.

Keywords: *Cyamopsis tetragonoloba* L., Antihelminthic, Antiasthmatic

INTRODUCTION

Since decades nature has been an origin of natural products and numbers of drugs have been originated from it. About 80% of the world population depends on natural

products for their fundamental health care. In regular life, the use of medicinal plants has become a requisite element over the centuries while advancement is taken place

in pharmaceutical and biomedical research. India is the repository of around 3500 medicinal plants. In the various system of traditional medicine like Siddha, Yunani, Homeopathy and Ayurveda lots of medicinal plants are used for therapy. To secure healthcare medicinal plants requires low costs in India.

Guar belongs to family Fabaceae has mainly grown in India, china, united states and Pakistan. In India, it is mainly grown in Rajasthan, Punjab, Haryana and Gujarat. Guar is a precious plant that lives in symbiosis association with nitrogen-fixing bacteria [23]. The gelling agent of guar seeds are very important in use and shows different functions in animal and human nutrition. In southwest part of the United, State Guar is considered a cash crop, and it is also grown in South Africa, Brazil and Australia on a limited scale. Guar has originated from an African species and does not survive in a wild state. Arabian traders imported the guar in India for horse fodder purposes. During the Second World War in US it turned into a gum producing crop. The height of guar plant is ranging between 2-9 feet and it is bushy, upright, drought resistant and coarse. In guar, both tall and dwarf cultivars are found which shows variations in morphological characters. Green pods of *Cyamopsis tetragonoloba* exhibits high concentration

of ascorbic acid, thiamine, niacin, vitamin c, riboflavin, carotene and folic acid [3]. Proteins, carbohydrates, calcium, gallic acid and methionine are present in an enormous amount in guar seed. Several types of fatty acids like oleic, linoleic, plasmatic, stearic, arachidic, and linolenic acid and polyphenolics like gallic, chlorogenic, caffeic, ellagic acids, gallotannins, kaempferol-3-glucoside, kaempferol-7-glucoside-3-glycoside, kaempferol-3-rutinoside are found in guar. The seed also contains galactomannan and use as aantitryptic agent [14]. Leaves of guar, show saponins, polyphenols, flavonoids like tetra glycoside, tannins like gallic acid, gentisic and quercetin. The high concentration of calcium and galactomannan also found in leaves of cluster bean [12]. The dietary component of guar from 2000 caloric diet which is based on percent daily values is tabulated in **Table 1**.

The guar gum derivatives have various industrial applications in paper and textile industry, in ore flotation and manufacturing of explosives. To make guar more stable and heat resistant it converted in linear gel form by cross-linking with chromium and boron. This linear gel form is very helpful in the cleaning process [23].



Figure 1: Seeds of Guar



Figure 2: Pods of Guar

Table 1: Dietary Components of guar

Dietary Components	Value
Proteins	20.00 Calories
Total fat	0.00g
Saturated fat	0.00g
Trans fat	0.00g
Cholesterol	0.00g
Sodium	2.00mg
Total carbohydrate	6.00g
Dietary fiber	6.00g
Iron	1.00%
Sugar	0.00g [12].



Figure 3: State wise production of Guar in India

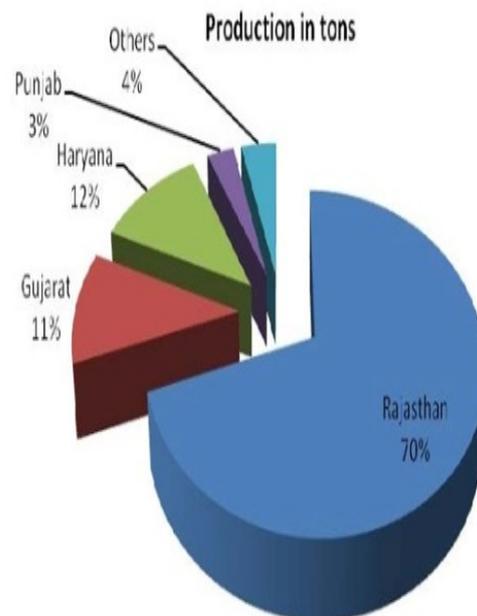


Figure 4: Production in Tons

Traditional uses

Its fruits are used in treatment of night blindness (biliousness) due to antioxidant, antibilious, and laxative properties of guar seed it is used for treatment of arthritis, swellings and sprains. The boiled seeds of guar used as an ointment in enlarge liver, head swellings, plague and swellings due to fractured bones. Guar is used as a substitute for locust bean gum. Guar is chiefly utilized as a bonding agent, stabilizer, hydrocolloid, gelling agent, emulsifier, natural fiber, soil natural thickener, fracturing agent and flocculants. Guar is easily diffused and swells in cold and hot water and form a viscous thyrrotrophic sol. Leaves of guar and pods can be used like spinach, salad or vegetables. While guar beans are very nutritive but their protein cannot be directly consumed by a human being without toasted because it has trypsin inhibitor. It is used in cheese industries as dough improver and texture improver [23].

Nutritional uses

After a study of six weeks on hyperlipidemic patients, low LDL and plasma cholesterol levels were observed in comparison to patients of the controlled group by using guar extract [15]. The study reported low pH, high fecal weight and output frequency in disease patients studied for 4 weeks with partially hydrolyzed guar gum [13]. Anti-diabetic potential of the

petroleum ether extract of guar gum in diabetic rats induced with streptozotocin [8]. Hypocholesterolemic response of guar beans also has been reported in cholesterol-fed rats [9]. Hypoglycemic and hypolipidemic effects of guar gum have been reported on streptozotocin-induced diabetic male rats [10]. Guar gum can cause changes in insulin and corticosterone level in rats has been reported [4]. Aqueous extract of guar has been showed the effect on blood glucose levels in both alloxan-induced diabetic rats and normal rats [7]. The mixture of xanthan gum and guar gum can lower the lipid profile in rats fed high sucrose diet was examined by the study [16]. Marginal hypoglycemic effects of guar on blood glucose level in normal fasted rats also reported [10]. The gum obtained from the endosperm of guar seeds showed the effect on protein absorption, their utilization with antidiabetic and anti hypercholesterolemic potential. Diet of guar gum significantly lowered the serum concentration of triglycerides and cholesterol and increase high-density lipoprotein levels in diabetic patients where blood lipid profile already increased [1]. The antihelminthic activity also reported in ethanolic and aqueous extract of leaves and fruit of Guar against test worms [11]. Low molecular weight sulfated derivatives of galactomannan from guar has anticoagulant

activity [5, 6]. Anticholinergic activity was observed in ileum of a guinea pig by using guar extract which inhibits acetylcholine induce contraction [2]. He also reported the cytoprotective effect of Guar against necrotizing agents which were used in the study. They also observed that guar extract significantly increase the mucus of gastric wall and re-established the ethanol which is induced by depletion of non-protein sulfhydryl content in rat stomach.

Other uses

Guar seed is utilized as a constituent in the petroleum industry in many preparations like viscosity improvers, fracturing fluids, corrosion inhibition. It also used as oil recovery enhancers and as a dispersant prepared by hydrophobically modified guar gum [17]. Guar gum and its derivatives show various pharmaceuticals applications and also use as dietary fiber, control release agent and drug binder [18]. For targeting drug delivery guar gum its derivatives utilized as potential carriers in many forms like nano/microparticles, hydrogels, matrix tablets and coatings [19]. Guar gum used in different applications like drug delivery, water purification, pharmaceuticals and in cosmetic and food industries, its properties will enhance while immobilized it with others [20]. Guar gum mainly used as thicker and stabilizers in industries because it shows the ability of hydrogen bonding

with water molecules [21]. Various beneficial effects against heart disease, bowel movement, and diabetes and colon cancer were observed [22].

CONCLUSION

Guar has shown cosmopolitan distribution and widely studied by various scientists. The reason for its popularity is its low cost, non-toxic nature and easy availability. Due to its phytochemical contents, it has enormous biological activities and has larger prospects to investigate it in industrial and pharmaceutical applications. However further work still needs to study the structure-activity relationship of phyto-constituents found in guar to provide convincing support for future clinical uses. This review will hopefully provide some knowledge to the researchers having an interest in natural substances.

AKNOWLEDGEMENT

We thank individuals and the institution (Department of Botany, IIS deemed to be University, Jaipur, Rajasthan) for providing their valuable advice and facility during preparation of the manuscript.

CONFLICT OF INTEREST: Nil

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