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Nutraceutical Aspects of Arabic Gum (*Acacia nilotica*) and Gond Babool (*Acacia arabicae*): A Review

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Abstract: Phytochemical potential of different plant resins that can be used for various useful purposes such as natural food preservatives, antioxidant agent and antimicrobial agents in food and pharmaceutical industries. Some essential bioactive compounds in plant resins help them in retarding microbial growth and make them capable of their use as natural preservatives. These phytochemicals are used in medicinal as well as in pharmaceutical industries for various purposes.

INTRODUCTION

Arabic gum tree (Kiker): Arabic gum tree (*Acacia nilotica*) is a flowering plant tree that belongs to the Fabaceae family (Commonly referred to as the gum arabic oak, babul, thorn mimosa, acacia or acacia.). It is locally based in Africa, India, the Middle East and the subcontinent. In Australia (Australia's biggest introduced species) and in the United States, it is also a weed of great importance[1].

Arabic gum tree (*Acacia nilotica*) is a 5-20 m tall tree that have a large top crown, tree stems and roots that normally develop into dark, black, gray-pink bark, excudes a reddish gum that is low in quality. In axillary pairs there are small grey colored, straight spines, typically 3-12 pairs and in young trees between 5 and 7.5 cm (3 in) tall, with tall trees, sometimes with no thorn. The leaves are bipinnate, tomentose and rachis, with 5-9 pairs of leaflets and 8-28 pairs of leaflets at base of the last group of small pinnules. Flowers with a diameter of 1.2-1.5 cm globular heads, light golden-yellow with axillary or whorly peduncles 2-3 cm long, on ends.

The 31st Codex Committee on Food Additives, conducted from 19-23 March 1999 in the Denmark and Acacia Senegal and Vachellia (Acacia) branches of the Fabaceae family were identifying gum arabic as the dry exudate from the trunks[2]. Protection re-appraisal The EFSA (European Food Safety Authority-European Food Additives and Nutrient Sources committee) has declared the word "gum arabic" does not specify any specific plant source.

Gum arabic which mainly consists of Galactose and Arabinose, is a complex glycoprotein-polysaccharide mixture. With E number E414, it is water-soluble, edible and often used as a stabiliser in the food as well as in soft drink industries (I414 in the US). Gum arabic is used in printing, painting, packaging, glue, cosmetic goods and other industry uses including ink viscosity control but is much more cost-effective than other components in conventional lithography.

Usage in food industry: It is used in the icing, stuffing, soft candies, chewing gums and other textile items, Arabic gum is used as a stabilising agent in the food industry., emulsifying agent and thickening agent and in soft drinks to bind sweeteners and flavours[3]. Water soluble gum Arabic solution are frequently used in beverages to avoid crystallisation and to ensure smooth texture of the sugar. Gum-arabic has been generally recognised as safe for human use, a complex and soluble dietary fibre and polysaccharide. Strong doses of 30 g or >30 g a day are taken by any person for an indication of healthy flatulence[4]. In the intestine, it is not degraded or fermented, in the presence of microorganisms. It has pre-biotic effect, which is (as isolated from a probiotic compound). No Theoretical or Legislative consensus was reached on its caloric importance; a level of 2 kcal/g in rats has identified but it is not human. The US FDA originally set a 5 kcal/g value for food labelling. But no interest was given for soluble dietary fibres in Europe. The 1998 study argued that only subjective value can be used for legislative purposes based on current scientific evidence[5]. In 2008, the USFDA submitted the request to reduce the rated caloric content of gum arabic to 1.8 kcal/gum arabic by a letter of no objection[6].

Composition: Arabinogalactan is a biopolymer that is composed of of galactose monosaccharides and arabinose. In many herbal gums including Arabic gum, it is an essential factor. The 8-5 'Noncyclic diffulic acid was recognised As covalently paired with arabinogalactan-protein proportion moieties of carbohydrates[7].

Pharmacology: Gum arabic reduces the absorption rate of many medications from the intestines including amoxycillin[8]. Nomad communities from the Sahel as well as Arabia have recognised to have The positive effects of Arabic gum for decades. Pharmaceutical applications were among the first applications in Europe[9].

Gond babool (*Acacia arabicae*): The use of herbal remedies has been in use from ancient times, for the diagnosis and therapy of different health problems. It has been stated that Acacia arabica is protective against a number of conditions, that includes diabetes, viral infection and cancer-related disorders. Acacia arabica's new plant components in the traditional Indian medicine system are known as disinfectant, diaphoretic, aphrodisiac, anthelmintic, antimicrobial, antidiarrhoeal, with high nutritional value.

A portion of the plant is used in asthma, leukorrhoea and skin disorders. That can contain antidysenteric, antidiabetic and antidiagnostic medications. Stem bark being astringent, demulgent, is used as astringent, antihelmenic as gonorrhoea and anti-asthmatic for dysentery diabetes and diarrhoea. While their thorns are used for joint pain, their tender branches have been used as toothbrushes[10]. Gum is used as a tonic, anti-asthmic analgesic and oral cavity lesion with diarrhoea, dysentery, and diabetes, dry cough in amibal dysentery[11]. GA has been believed to work pharmacologically as an antioxidant and to shield rats from experimental hepatic, kidney and heart toxicity. These arguments may not be confirmed by anyone.

GA is thought to act pharmacologically as an anti-oxidant as well as to guard against experimental hepatic, renal and cardiac toxicity in rats. Others were unable to validate these claims.

The symptoms of progressive renal disease in humans are considered to be minimised by GA. This cannot be experimentally confirmed in rats. Different research have been performed on the effect of GA on the metabolism of human and rat lipids but mainly show that ingestion of GA in rats could minimise the level of plasma cholesterol. GA has properties that are pro-absorbing and diarrhoeal. It improves remineralization and has an antimicrobial activity level that suggests potential application in dentistry. It was found that GA had a harmful impact on the balance of electrolytes and vit D in mice and caused hypersensitivity among humans[12].

The flowers will decrease the temperature of the body[13]. They are also used as a tonic, antidiarrhoeal, antidysensary and in earaches. It has been shown that fruits are beneficial for diarrhoea, dysentery and diabetes. In dry cough, impotence and urino-genital illness, the pods are used. For general body vigour, extracts from seeds and leaves are used. For diarrhoea, 3,1 dysentery for migraine, abcess and eczema, the leaves are included[14]. The roots can be used for wound healing and burning feeling.

Acacia nilotica plant bark and gum is used in West Africa for the treatment of ear, eye or testicles, cancer and/or tumour. In West Africa, indurations, condylomas and excess flesh are also used to treat liver and intestinal tracts. The bark is chewed as an antiscorbutic in Senegal, with leaves and young cocks. The leaves can be treated and used for wound care. Orange is infused in Lebanon to treat *Acacia nilotica's* typhoid rehabilitation. The root is

used by the Chipi and the Tonga tribes for treating tuberculosis. The Egyptians believe that diabetics should consume unlimited sugars when eating dried acacia nilotica pods. For the prevention of mini pox, Italian Africa uses bark blend. *Acacia nilotica* (booni) can also be used in Ethiopia lactogog (to increase the milk supply). In Australia the Acacia nilotica bark is a high tannic acid antiseptic which helps to stop the bleeding, release and surplus mucus of tannins. This especially astringent herb extract inhibits the causes of corporeal pain. Plant barks or pods are internally used in Ayuvedic Medicine for the treatment of dysentery and chronic diarrhoea (In 1995). The prevention of haemorrhages, skin rases, leg sores, body ulcers, sore throat and dental infections is effective in avoiding nasal bleeding outside of the bone. Acacia nilotica is considered to be an early ejaculation treatment for ayurvedic disease.

Nutritional value: The leaves comprise 2.3-2.8% N, 16.7-20.2% NDF, 13.5-14.8% ADF, 7.4-8.7% MJ/kg energy, 11-22% crude fibre and 3-9% concentrated tannins. The pod and seed produce 1.5-2.3% N, 8 MJ/kg energy, 13-19% crude fibre and 5-8% concentrated tannins. Pods generate 3% N, 28% NDF, 16% ADF by default. In Zimbabwe's digestibility tests, multiple species browse test species, intake of *A. nilotica* was the smallest one.

In rats, bioassay experiments are conducted and monitored by the use of peanut oil for the nutritional benefit. The 10% diet of seed oil has been fed by animals with slow growth and a low feed volume. Compared with 93% for peanut oil, the digestibility of seed oil was 90%. Similarly, the 4 weeks rat diet did not show any irregular serum lipids or histopathological results. Apparently, the seed oil was not poisonous. 21.6% protein and similar amino acids comprise the deoiled seed cake but also anti-food elements, tannins (46%) (2.5%).

The nutritive and amino acid content of detoxified seed meal (PAM), besides antinutritional influences was approximately the same as the non processed meal of seed. In a comparative study of Cesain as normal, PAM was nutritionally tested by using rat bioassay materials. Nutritional indicators, biochemical parameters and histological studies have shown that PAM could be used as supplemental feed in livestock animals.

Antimicrobial: Methanol extracts taken from C. As an antimicrobial, Reflex is involved. With the use of aqueous and various organic solvents, plant extracts of C-reflex were prepared, namely, on the basis of different sources (*Acacia arabica* and *Zizyphus jujube*. Methanol, benzene and acetone. The Agar well diffusion procedure was used to assess the antimicrobial potential of plants against gram-positive bacteria from various sources Gram-negative bacteria *(Escherichia coli* and *Pseudomonas aeruginosa)* and *fungi (Staphylococcus aureus* and *Staphylococcus epidermidis) (Aspergillus niger).*

CONCLUSION

The phytochemical and antimicrobial potential of plant resins. Both plant resins have a good amount of phytochemicals as well as antimicrobial activity. Industries will use these plant resin extract as antioxidant and antimicrobial in many food and other products because of a natural source and easy availability having health beneficial attributes thus indirectly contribute to national economy and alternatively reduce the risk of many diseases in our community.

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