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Antidiabetic Properties of *Aegle Marmelos*

SagarKoyate,SaurabhKshirsagar
Co Author- Ms.ManishaZaware
Dr.SunilNirmal
H.S.B.P.V.T's, GOI, College of Pharmacy, Kashti, Shrigonda, Ahmednagar, Maharashtra, INDIA, 414701

ABSTRACT
India is the botanical garden of the world as it is the largest producer of medicinal herbs. Bael (Aegle marmelos) has been known to be one ofthe most important medicinal plants of India since Charak (1500 B.C) Bael (Aegle marmelos) also known as Bengal quince or golden apple is medium sized, deciduous tree belonging to family Rutaceae.The active constituent of Bael is Foronium gum present in bark and branches shows helpful properties in controlling type 2 diabetes.It regulate the production of insulin from the cells into the blood stream and low glycemic index of bael maintains the blood sugar level,the edible pulp contains 61.06gm water ,3.64gm of crude protein and 78mg of calcium.Oral administration of bael fruit increases the size of pancreas and significant decrease in fasting blood glucose level.The ripe fruit is aromatic, astringent, cooling and laxative. The unripe or half ripe fruit is stomachic, anti-scorbutic, and digestive. Ripe bael fruit is regarded as best of all laxatives

Keywords- *controlling diabetes,foronium gum,low glycemic index,laxative*

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I. INTRODUCTION

India has a large variety of flora and fauna which is available from temperate to cold deserts to sub-tropical and tropical climates and regions. References of such wild varieties of herbs and shrubs with rich medicinal values us available in our epics. "Rigveda" one of the oldest repositories of human knowledge mention use of 67 medicinal plants. "Yajurveda" and "Atharveda" also mentions use of many plants for therapeutic purpose. Ayurveda and Unani type of treatments with healing touch have therapeutic and nutritional value of medicinal plants but unfortunately, the knowledge and information had not been preserved for posterity. Bael (*Aegle marmelos*) is one of the medicinal plants of India. It is also known as golden apple or Bengal quince. It is a medium sized deciduous tree belonging to family Rutaceae. Other names of bael include maredu, bill, bill patra, balwa, vilwam and kuvalam in India. Bael is native of northern India, but is found widely throughout the Indian peninsula and in Ceylon, Burma, Thailand and Indo-China. The bael tree is Indigenous to India and the history of this tree has been made in "Yajurveda" In early Buddhist and Jain literature (8000-325 B.C), methods of ripening this fruit have been described. Bael fruit has also been portrayed in paintings of Ajanta caves. It grows wild throughout the low hills of Himachal Pradesh, ascending up to 1000 meters. It is found in plenty in wild forms in the states of Uttar Pradesh, Orissa, West Bengal, and Madhya Pradesh. However, the fruits of the wild trees are considerably smaller than those of the cultivated types grown in the plains. The fruits are good to taste containing 40 per cent TSS. The bael tree is one of the most useful medicinal plants of India. Its medicinal properties have been described in the ancient medical treatise in Sanskrit, "Charaka Samhita". All the parts of this tree including stem, bark, root, leaves and fruit at all stages of maturity have medical virtues and have been used in the indigenous medicine for a long time. The ripe fruit is of considerable medical value when it just begins to ripen. The ripe fruit is aromatic, astringent, cooling and laxative. The unripe or half ripe fruit is stomachic, anti-scorbutic, and digestive. Ripe bael fruit is regarded as best of all laxatives due to its that laxative nature it is auyrvedic way to control the blood sugar level .

II. MATERIALS AND METHODS

Plant Collection: Fresh, ripen fruits of *AEGLE MARMELOS*were collected from botanical garden of HSBPVT'S, GOI, College of Pharmacy, Kashti, Shrigonda, Ahmednagar, Maharashtra, India.

Preparation of *AEGLE MARMELOS* Extract: The collected fruits were washed twice in sterile distilled water to eliminate earthy material like soil and salts. The washed fruits of plant were dried for 10 days at room temperature. The dried fruits were subjected to grind for formation of powder. Then 10 gm of fruit powder was added into 100 ml of distilled water and boiled for 5 min. The boiled extract was filtered through Whatman No. 1 filter paper and then supernatant was used for further process.

Chemical Properties of Bael Fruit -

For analyzing chemical properties of the fruit, fruit were separated, dried in the air drier and ground. Moisture, titrable acidity, sugars, crude fibre, crude fat, crude protein and ash content were estimated by employing the standard methods of analysis . pH was measured by control dynamic digital pH meter

Minerals were analyzed by acid digestion .

Iron in the digested sample was determined by atomic absorption spectrophotometer according to method of Lindsey and Norwell. Other minerals including calcium, magnesium, phosphorus, zinc and potassium etc. were determined by the flame photometer according to the method of Lindsey and Norwell.

Pharmacological Properties of Baal Fruit -

For pharmacological analysis dried and ground samples were used.

Anti - nutritional factors -

Tannins were estimated by determining their oxidisability by potassium permanganate solution by standard method of AOAC (2000) while oxalic acid was determined by method given by Italia 2002.

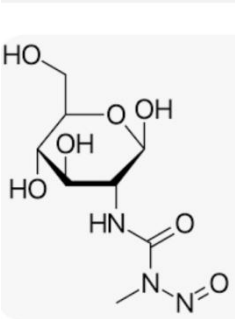
Minerals- The values for various minerals found in bael fruit as P, K,Ca, Mg, Fe, Cu and Zn were 51.6, 603, 78, 4.0. 0.55. 0.19, 0.28 mg per 100g respectively (Table 1). These values are well in agreement with the results reported .

Table 1- Mineral constituents ofbael (mg per 100 g)

Phosphorus	**51.6**
Potassium	603
calcium	78
Magnesium	4.0
Iron	0.55
Copper	0.19
Zinc	0.28

Experimental analysis –

For induction of experimental diabetis to male adult rat weighted 250 to 300 gms (75-90days).60mg/kg of Streptozotocin was injected intravenously. 3days after degradation of beta cells ,diabetes was induced.



Streptozotocin– Naturally occurring alkylating antineoplasmic agent which is toxic to the insulin producing beta cells of pancreas in mammels.

Antidiabetic Properties of *AEGLE MARMELOS*-

Bael fruit indicate antidiabetic properties this study was designed to elucidate the protective effect of an aqueous extract of *AEGLE MARMELOS*on histopathology on the pancreas Streptozotocin induced diabetic rats oral administration *AEGLE MARMELOS*fruit extract at dosage 125-250mg/kg twice daily to that rats over period of 30days. Resulted in a significant increase in body weight ,weight of pancreas and insulin level associated with significant decrease in fasting blood glucose level. The extract treated groups showed improved functional state of pancreatic ss- cells and partially reversed the damage caused by streptozotocin to the pancreatic islets.

III. CONCLUSION

Chemical analysis of Aegle marmelos fruit extract was performed also its pathological analysis was performed.As it is laxative and contains antidiabetic properties it is suitable to make various antidiabetic product as will get consider as Aurvedic product which will helps in keeping blood sugar normal.Experimental analysis proved that bael helps in controlling blood sugar level.

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