



# Indian Journal of Agriculture and Allied Sciences

A Refereed Research Journal

ISSN 2395-1109

Volume: 1, No.: 4, Year: 2015

Received: 18.10.2015, Accepted: 25.11.2015

## EFFECT OF BHAVANA WITH AMLA JUICE ON IN-VITRO ANTIDIABETIC AND ANTIOXIDANT ACTIVITY OF AMALAKI (*Emblica officinalis* Gaertn.)

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### Abstract

**Objective:** Amalaki (*Emblica officinalis* Gaertn., Fam: Euphorbiaceae) is a well known and potent rasayanas drug and increases our defense mechanism. The drug is included in best antidiabetic drugs mentioned in Ayurvedic text. According to Acharya charaka mentioned bhavana (trituration) with fresh juice of itself increases drugs potency by many fold so that the dose of medicine reduces. The aim of present study was to explore the effects bhavana on in-vitro hypoglycemic activity and in-vitro antioxidant activity.

**Methods:** 500g of powder *E. officinalis* was triturated with fresh fruit juice of *E. officinalis* 21 times. 20g of the triturated material were collected after 5<sup>th</sup>, 10<sup>th</sup>, 15<sup>th</sup> and 21<sup>st</sup> trituration and hydroalcoholic extract (methanol:water::80:20) of each sample was used for experimental purpose.

**Results:** The result shows that the raw and processed possess  $\alpha$ -glucosidase and  $\alpha$ -amylase inhibition activity which was increases with the number of trituration and dose. The  $IC_{50}$  value of 21<sup>th</sup> triturated amalaki was found to be 32.74  $\mu$ g/mL and 48.22  $\mu$ g/mL respectively and was comparable with standard drug acarbose. The in-vitro antioxidant potential of *E. officinalis* and effect of processing (bhavana) was investigated three in-vitro methods viz. DPPH free radical scavenging, scavenging of hydroxyl radical by deoxyribose method and nitric oxide scavenging. The results demonstrate that the free radicals were scavenged by the drug in dose dependent manner. Moreover the potency increases as number of trituration increases. The  $IC_{50}$  values for *E. officinalis* were found to be 38.68  $\mu$ g/mL, 43.04  $\mu$ g/mL and 55.85  $\mu$ g/mL respectively.

**Conclusion:** These findings reveal that bhavana increses in-vitro antidiabetes as well as in-vitro antioxidant activity of *E. officinalis*.

**Keywords:** *Emblica officinalis*, Bhavana, Hypoglycemic, Antioxidant, Free Radical.

**Introduction:** World's most serious health concerns diabetes mellitus (DM) is a chronic disease the prevalence of which is rapidly increasing in the current scenario with the increase in obesity and advancing age in the general global population. It is estimated that the number of persons in the world suffering from Type 2 DM will reach at least 380 million in 2025 <sup>[1]</sup>. Type 2 DM is primarily caused by defective glucose absorption, insufficient insulin production and its resistance. It is considered to be a preventable disease. In DM, the postprandial phase is characterized by a rapid increase in plasma glucose levels <sup>[2]</sup> and this postprandial "hyperglycemic spikes" play an important role in the progress of type 2 DM and leads to several micro- and macro-vascular, complications such

as retinopathy, nephropathy, and neuropathy <sup>[3]</sup>. Moreover, postprandial state also contributes in the development of atherosclerosis and cardiovascular disease <sup>[2]</sup>. Controlling postprandial hyperglycemia plays an important role in delaying or preventing Type 2 DM and its micro- as well as macro-vascular complications <sup>[4]</sup>. Dietary control is the best way to control the postprandial hyperglycemia and it has synergistic effect with oral hypoglycemic agents (OHA) <sup>[5]</sup>. However, it depends upon depend on types and quantity of food consumed and such type of dieatery control is not seem to be possible in the present life style. Another possible therapeutic approach for decreasing postprandial hyperglycemia involves the retardation of fast uptake of glucose in the intestine <sup>[6]</sup> which is