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### **Role of Syzygium Jambolanum in Diabetes Mellitus- A Review**

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#### **Abstract-**

According to the World Health Organization (WHO), there are approximately 143 million people with diabetes worldwide, and this number is projected to rise to almost 300 million by 2025. Syzygium jambolanum (S. jambolanum) is widely used in homeopathy for treating patients with diabetes mellitus. Diabetes today is a very serious issue to health care professionals, because number of patient gradually has been increased worldwide in successive years. Today we say it is a life style disorder. Modern medical treatment does not insure a prolong disease free period but it mainly does palliation of the disease whereas Homoeopathic approach does not treat the disease but patient as an individual being having a disease condition.

**Key word:** Diabetes, Anti-diabetic, antihyperlipidemic, homeopathic remedy, syzygium jambolanum.

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#### **Introduction-**

The frequency of diabetes was escalating rapidly worldwide, including developed and developing countries.<sup>1</sup> In India recent projection indicate that there is an alarming

rise in prevalence of diabetes, which has one beyond epidemic form to a pandemic one.<sup>2</sup> In modern medicine, there is no satisfactory effective therapy to cure diabetes mellitus.<sup>3</sup> Synthetic oral hypoglycemic agents can

produce a series of side effects including hematological, gastrointestinal reactions, hypoglycemic coma and disturbances in liver and kidney.<sup>4</sup> Homeopathy is one of the most widespread alternative system of medicine based on the two cardinal principles “law of similarities” and “minimal dilution”<sup>7</sup>. Homeopathy seeks to cure in accordance with natural laws of healing and uses medicine made from natural substances viz. animal, vegetable and mineral<sup>8</sup>. Some important homeopathic oral hypoglycaemic drugs are Rhus aromatica, Syzygium jambolanum, Uranium nitricum, Gymnema Sylvester and Acid Phos.

In homeopathic *Materia Medica*, *Syzygium jambolanum* (*S jambolanum*) is described as a most useful remedy against diabetes mellitus. It has an immediate effect to manage the high blood sugar. No other remedy causes so marked degree in the diminution of sugar in the urine.<sup>9</sup> *Syzygium jambolanum* (Family- Myrtaceae; commonly known as ‘jambol fruit’ or ‘jamun’) is common herb found in India, Pakistan, Southern Asia and Brazil<sup>10</sup>. Mother tincture of *S jambolanum* is widely used by homeopathy practitioners for diabetes management. Mother tincture ( $\theta$ ) is defined as the original tincture prepared with the aid of alcohol, directly from the crude drug. It is the precursor for the preparation of different potencies and the starting point for the production of homeopathic medicines<sup>11</sup>. The chemical composition of the seed extract has been recently reported by a study. It contains glycoside (Jamboline), tannin, ellagic acid and gallic acid as principal ingredients.<sup>12</sup>

Over the past few years, there has been an increase in the number of preclinical (in vitro and in vivo) studies aimed at evaluating the pharmacological activity and efficacy of homeopathic remedies in diabetes mellitus.

In study of **Soumyajit Maiti, Kazi M**<sup>13</sup> Ali et.al. An attempt has been made to investigate the remedial effect of homeopathic drug *S jambolanum* on carbohydrate and lipid metabolic disorders on streptozotocin induced diabetic rat. In this study Rats were made diabetic by a single intramuscular injection of streptozotocin (STZ) at the dose of 40 mg/kg body weight in 0.1 M citrate buffer (pH 4.5).<sup>3</sup> Diabetic state was confirmed on seventh day of STZ injection considering the measurement of FBG as relevant biomarker. Animals with FBG level more than 300 mg/dL were selected for this experiment. 1 ml of mother tincture of *S jambolanum* was finally diluted with 20 ml of double distilled water to make the stock solution. Each rat were fed 1 drop (0.06 ml) of *S jambolanum* twice a day from the stock solution using gavage. Animals were divided into four groups and each groups comprising of 6 rats. The duration of the experiment was 40 days. After the treatment of homeopathic remedy *S jambolanum* to diabetic animals for 40 days, a significant reduction ( $P < 0.05$ ) of fasting blood glucose level was noted in compare with untreated diabetic animals. During experimental period, on tenth day by 19.1%, twentieth day by 47.2%, thirtieth day by 60.0% and fortieth day by 69.4% reduction of fasting blood glucose level were observed in mother tincture of *S jambolanum* treated

diabetic group which focused the antihyperglycemic efficacy of *S jambolanum*. The homeopathic drug, mother tincture of *S jambolanum* significantly decreased fasting blood glucose levels and improved carbohydrate metabolic key enzyme activities in hepatic tissue i.e., hexokinase, glucose-6-phosphate dehydrogenase and glucose-6-phosphatase in diabetic rats. Alongside, serum lipid profile biomarkers i.e., triglyceride (TG), total cholesterol (TC), low density lipoprotein cholesterol (LDLc), very low density lipoprotein cholesterol (VLDLc) and high density lipoprotein cholesterol (HDLc) levels were significantly ameliorated in homeopathic drug supplemented diabetic animals in compared with the untreated diabetic animal. Side by side, the *S jambolanum* has the capacity to attenuate diabetes induced hepatic injury in model animal, which has been assessed here by the recovery of SGOT and SGPT activities in serum of drug treated diabetic animal. There was a clear evidence from this study that homeopathic drug *S jambolanum* indeed positively protective effects on STZ induced diabetic rats. Recently, an elegant study demonstrated that ethanolic extract of *S jambolanum* has a great potential in therapeutic use as anti-diabetic drug.

A study conducted by **Claudio Coimbra Teixeira et.al**<sup>14</sup> show that Absence of antihyperglycemic effect of jambolan in experimental and clinical models In Porto Alegre, a southern city of Brazil, the tea prepared from leaves of *Syzygium cumini* (L.) Skeels or *S. jambos* (L.) Alst has been report to be used frequently by diabetic patients. We

investigated the postulated antihyperglycemic effect of the *S. cumini* (L.) Skeels in three experiments. In the first, a randomized, parallel, placebo controlled trial; tea prepared from leaves of *S. cumini* did not present any antihyperglycemic effect in 30 non-diabetic young volunteers submitted to a glucose blood tolerance test. In the animal experiments, we tested the effect of increasing doses of the crude extract prepared from leaves of *S. cumini* administrated for 2 weeks, on the post-prandial blood glucose level of normal rats and rats with streptozotocin-induced diabetes mellitus. The treatment did not produce any antihyperglycemic effect in both models. These results do not rule out hypoglycemic effects in patients with type 2 diabetes mellitus, but strongly suggest that, for a while, the jambolan can not be recommended as an antihyperglycemic treatment.

Study conducted by **Sampath S, Narasimhan A**<sup>15</sup>,on Effect of homeopathic preparations of *Syzygium jambolanum* and *Cephalandra indica* on gastrocnemius muscle of high fat and high fructose-induced type-2 diabetic rats. Show that Diabetic rats showed a significant decrease in serum insulin and lipid profile as well as low levels of insulin receptor (IR), v-akt murine thymoma viral oncogene homolog (Akt), p-Akt(ser473) and glucose transporter-4 (GLUT4) protein expression ( $p < 0.05$ ) with a significant increase in fasting blood glucose level ( $p < 0.05$ ) compared to the control group. Treatment with homeopathic remedies significantly increased the serum insulin and expression of these proteins ( $p < 0.05$ ) with a

significant decrease in fasting blood glucose ( $p < 0.05$ ) compared to diabetic rats.

### Conclusion:

The result of the present study indicated that the homeopathic drug S. jambolanum (mother tincture) has a protective effect on diabetic induced carbohydrate and lipid metabolic disorders. S. Jambolanum has capacity to reduce fasting and post prandial blood sugar, HbA1C etc. so this medicine is useful in case of diabetes mellitus effectively and reduce the blood sugar and complication of diabetes in future.

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