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## Flavonoids insulinogenic action” may be “A promising alternative for diabetes” management

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### ABSTRACT

Flavonoids (polyphenols) do have their entire sort of insulin inception like action genetically on  $\beta$ -cells of islets of langerhans, and then decline blood glucose level to an optimum. Researches over few flavonoids like diosmin, fisetin, morin, hesperidin, naringenin etc., perceived to have insulin secreting and utilizing action in pancreatic cells and peripheral tissues glucose respectively. For this reason only, exploitation of these polyphenols in treating diabetes is highly beneficial, and it is rarely pronounced on its experimental front in recent times. Though vincristine (vincristine tablets) a natural alkaloid obtained from periwinkle plant has been contemporary, in place for treating Hodgkin's lymphoma clinically, and found to be the most successful modern medicine. Similarly, may be flavonoids do have a very huge potential, for treating diabetes clinically with therapeutic significance, if the area of interest of flavonoids focused on diabetic management. At the same time as, fundamental research performed on these flavonoids suggests that, the flavonoids mechanisms of action are manifold. Typically mechanisms of flavonoids on glucose metabolisms are insulin uptake in skeletal muscles, regulating rate-limiting enzymes in carbohydrate metabolic pathways, insulin mimetic and secretagogue action. Hence, in this hypothesis we suggest that, managing diabetes and its complications with one or more flavonoids as a novel dosage form, having various facets of glucose metabolism regulation with regards to insulin secretion, mimic and utilization, as it would be a novel approach in treating diabetes.

**Keywords:** Flavonoids, insulinogenic action, diabetes, treatment for diabetes and dosages.

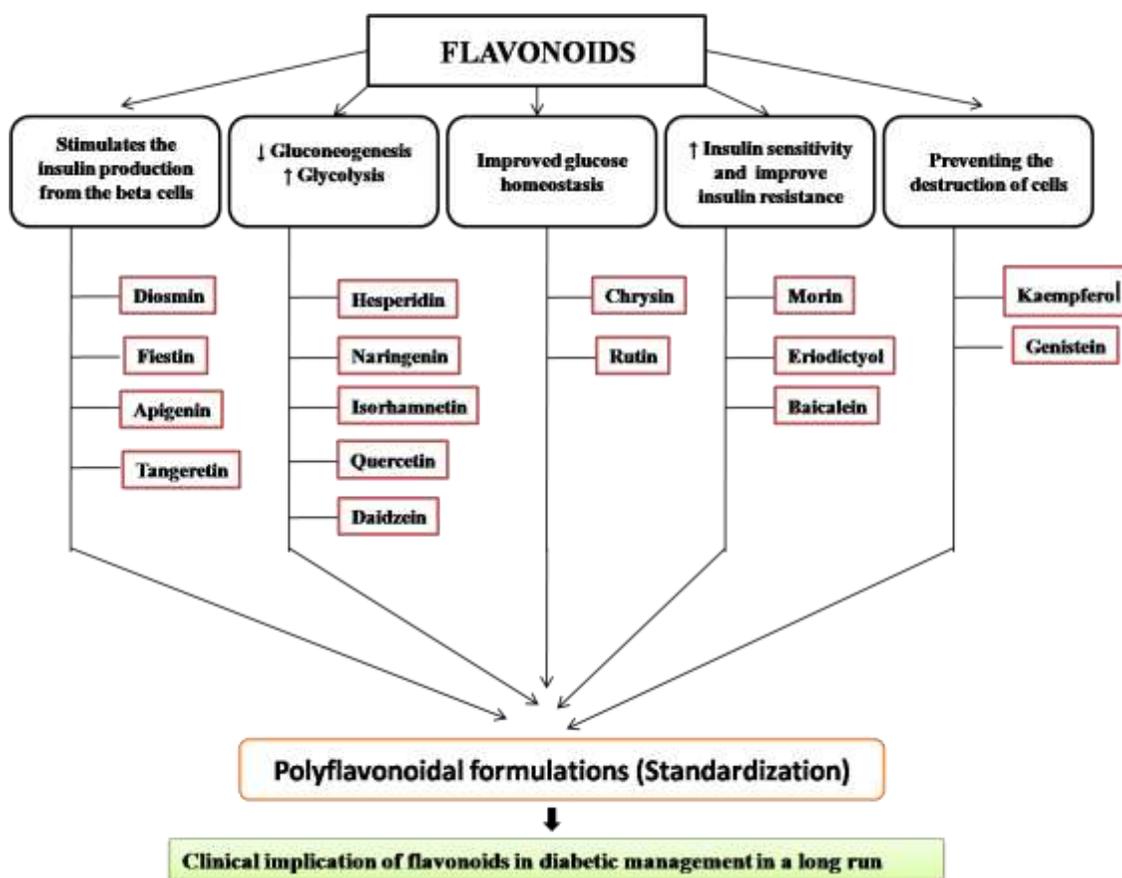
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## INTRODUCTION

Diabetes is metabolic disorder characterized by long term hyperglycemia which leads to baleful complications like kidney failure, blurred vision turning to be blind, neurological and cardiovascular disorders<sup>1-2</sup>. An assortment of modern drugs to treat diabetes either works on any one of the glucose regulating mechanisms to keep the blood glucose reading as normal. The polyphenols paves the way and open up a new forum to tackle the management of diabetes at different fronts. Especially these flavonoids are abundant in citrus fruits and have been perceived to have antioxidant potential<sup>3</sup>. Flavonoids denote a huge class of around more than six thousand polyphenols mostly in vegetables, nuts, grain and seeds, cocoa and certain beverages. Basically flavonoids are classified as isoflavones, anthocyanidins, flavonols, flavanones and flavones typically have antioxidant activity as well, which itself a added advantage to manage diabetes and its complications<sup>4,5</sup>.



**Figure 1: Scheme of few flavonoids depicting insulinogenic actions**

It is significant that flavonoids protecting the body against free radicals and certain pro-oxidative elements, in addition to regulating blood glucose level<sup>6-7</sup>. These functional flavonoids or polyphenols in due course play a variety of functions in regulate blood glucose level, glucose

uptake at cell site, secretion of insulin and to a certain extent immune modulating systems 8-9. Hence very obviously in this paper, we suggest to standardize flavonoids for the treatment of diabetes as a dosage form, to improve its clinical significance and utilization in future

## RESULTS AND DISCUSSION

Few polyphenols like quercetin, rutin, naringin, hesperidin are potential antidiabetic agents targets to control blood sugar level by various mechanisms similar insulin secreting (secretogogues), Insulin mimic (insulin like) and peripheral glucose utilization (glucose uptake).

Emphasizing the utilization of two or more flavonoids confronting diabetes, if these flavonoids are standardized as polyflavonoidal preparations, the aforementioned perspective would combat diabetes and its complications in various fronts collectively (insulin secretogogues, insulin mimic & peripheral glucose utilization) and that paves the way for clinical implication of these poly flavonoids in diabetic treatment schedule with lesser side effects. Especially for diabetes occurring in pregnancy, where a great care is required to minimize the side effect of the drug as well. For instance Quercetin a polyphenol comprising of 3 rings and 5 hydroxyl groups exhibits an assortment of functions like antidiabetic, anti inflammatory and antiviral activities<sup>10-12</sup>.

We hypothesize instead and strongly suggest, the management of diabetes with polyphenolic preparations would certainly controls the blood glucose metabolism with minimal side effects if treated with two or more flavonoids together as a novel formulation or dosages, moreover it also takes care of free radical generation and further reduces the diabetic complications as well<sup>13-15</sup>. A great sought is required for standardization of these polyphenols as a therapeutic dosage clinically to treat diabetes and its consequences. It is a very prominent option for approach to escalate the clinical implication of polyphenols as a dosage in treatment scheme near future.

## CONCLUSION

We suggest that flavonoids insulinogenic action would be more beneficial in combating and managing diabetes as well as its associated complications more effectively. The different traits of flavonoids action like insulin secreting, Insulin miming and peripheral glucose utilization actions would certainly increase its clinical significance in the management of diabetes with reduced side effects, minimal dose requirement and reduced frequency of administration. Enormous scope for the development of polyherbal formulation encompassing flavonoidal isolates, for the treatment of diabetes, as these polyphenols too got antioxidant activity which is an added advantage for the treatment in diabetic care. For this reason only, focusing on flavonoids is a real platform for the researchers to target the diabetes and its complications hence onwards.

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