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Jackfruit seed powder supplementation attenuates high sugar diet-induced hyperphagia and hyperglycemia in mice

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https://www.medicinalplantsanduses.com/jackfruit-health-benefits-nutrition-facts

Introduction

- Jackfruit ranks third in area of cultivation and second in production among the fruits of Bangladesh.
- Jackfruit seeds are normally discarded or sometimes kept for consumption. As jackfruit is highly seasonal and seeds have a shorter shelf life, hence go waste during the seasonal glut.
- Jackfruit seeds are a rich source of carbohydrates, protein, fat, vitamins, minerals, and fiber (Goswami et al., 2010).
- High sugar diets consumption and sedentary lifestyle may induce an excessive body weight gain which accelerates the obesity development (Torres-Villalobos et al., 2015).
- Consuming high-sugar drinks and fast foods frequently could increase the risk of having obesity and diabetes in humans (Oo et al., 2017, El-Wakkad et al., 2012).
- Resistant starch present in jackfruit seeds may control blood sugar and keep the gut healthy (Waghmare et al., 2019).

Objectives of the research

Jackfruit seed powder

Blood Glucose ↑

Body Weight gain ↑

Diabetes

Obesity

The present study was conducted-

- to evaluate the potential benefits of jackfruit seed powder (JSP) supplementation to maintain glucose and lipid homeostasis.
- to reveal whether the jackfruit seed powder could prevent the development of metabolic dysregulation caused by high-sugar diet.

Materials and Methods

1. **Jackfruit seed powder preparation:** Jackfruit seeds were cleaned, dried and ground to prepare jackfruit seed powder (JSP).

Mature Jackfruit

Jackfruit seeds

Dried Jackfruit seeds

Jackfruit seed powder

2. **Experimental animal:** 4/5 weeks old healthy adult male mice from ICDDR,B.

A Swiss albino mouse

Methodology

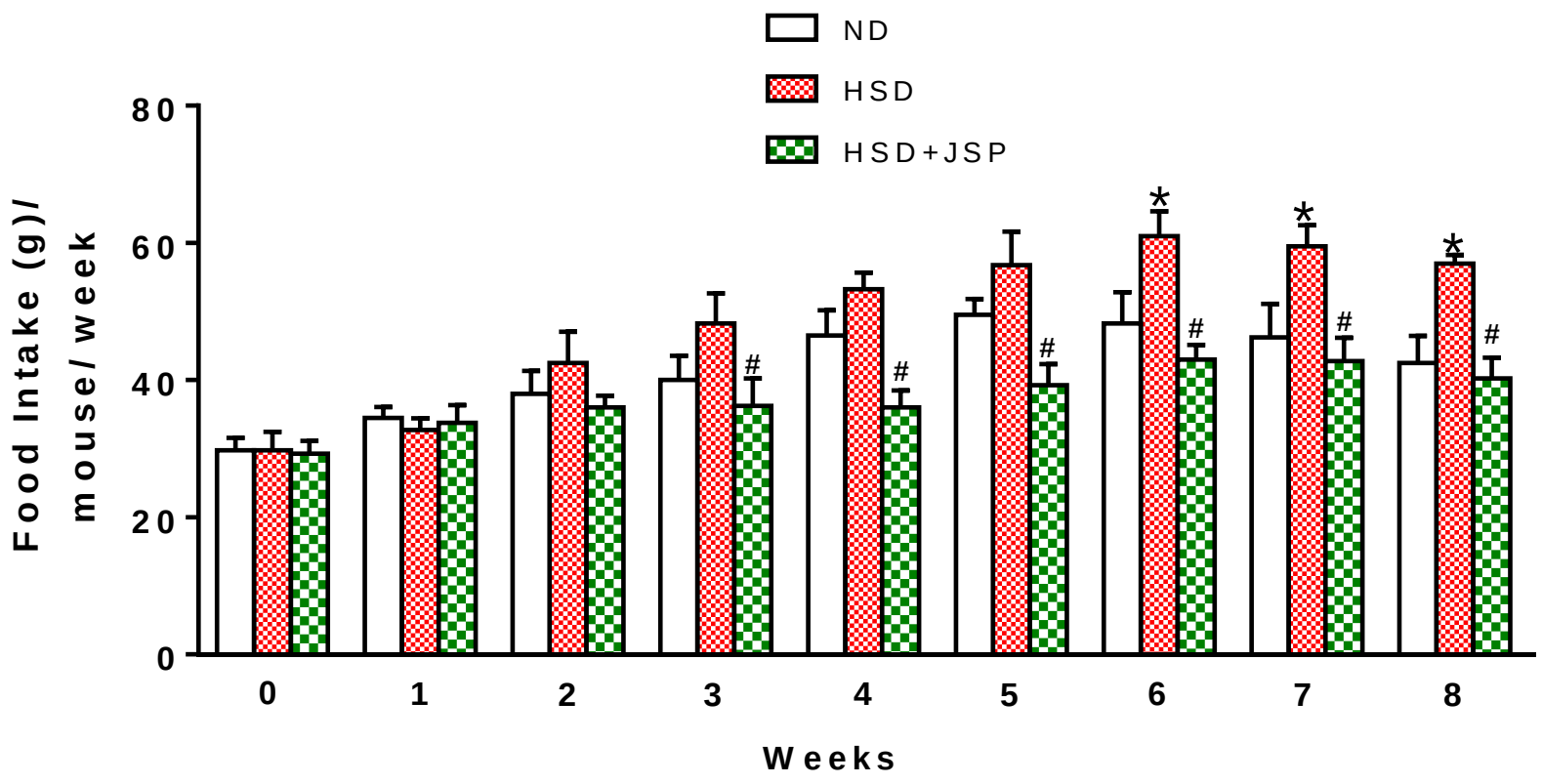
3. Formulation of different types of food: The following food groups were employed for feeding trial (8 weeks).

i)	Normal Diet (ND) Control Group (Ulla et al., 2016)
ii)	High sugar diet (HSD) with 30% sucrose
iii)	High sugar diet (HSD) + 20% Jackfruit seed powder (JSP)

4. Data collection: Body weight, food and water intake, blood glucose, glucose tolerance test (GTT), organ weight and blood parameters were measured.

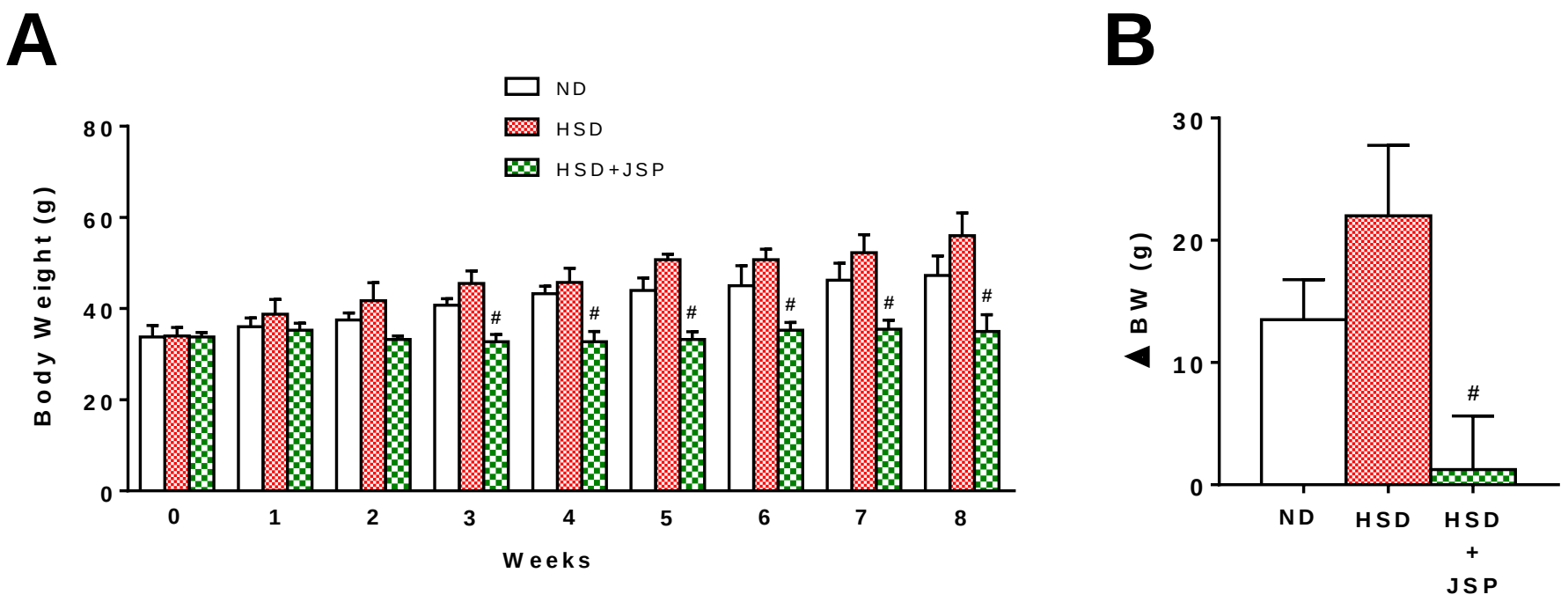
5. Data analysis: Statistical analysis was performed by using unpaired Student's t-test using Graphpad Prism Software (Graph Pad Software, San Diego, CA, USA).

Effect of JSP on food intake of HSD-fed mice



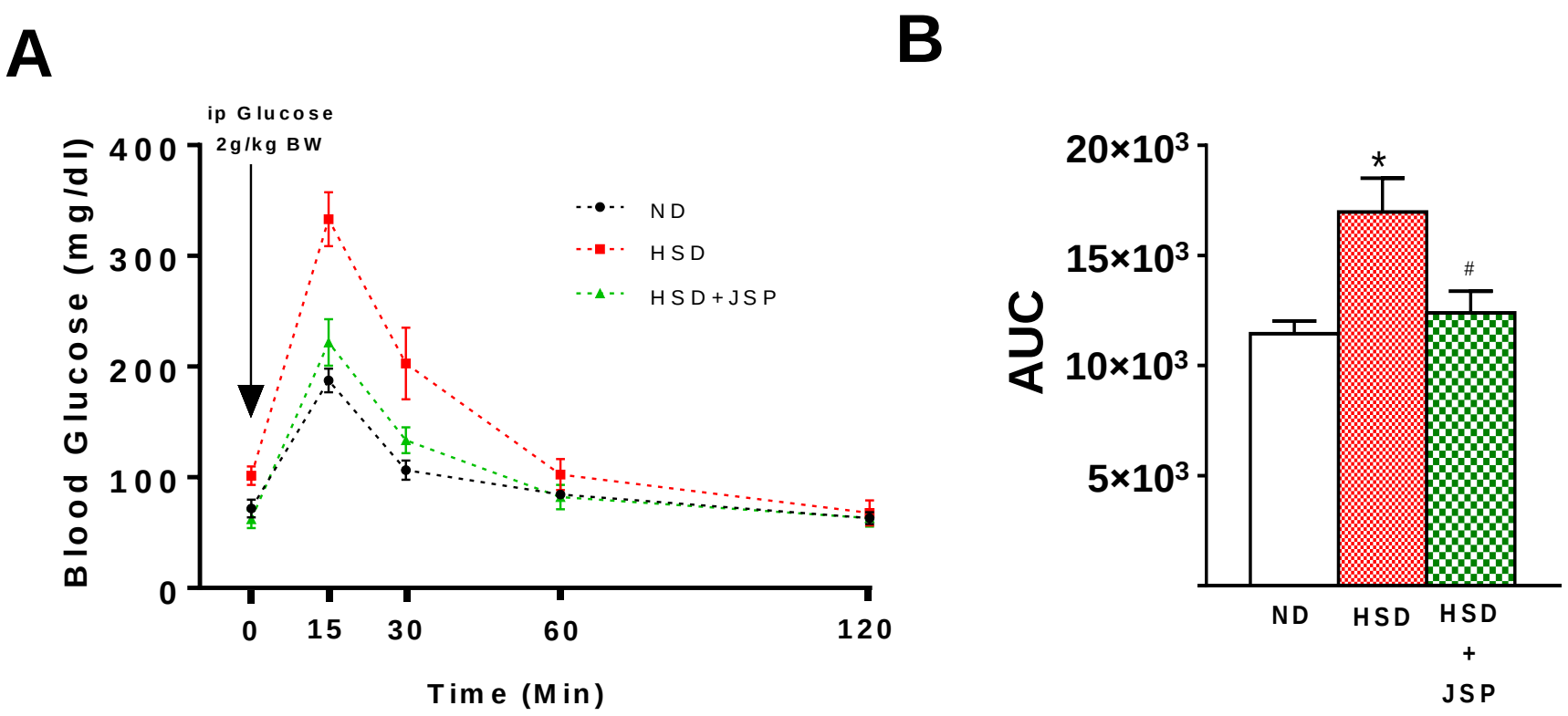
JSP supplementation attenuated HSD-induced hyperphagia

Effect of JSP on body weight gain of HSD-fed mice



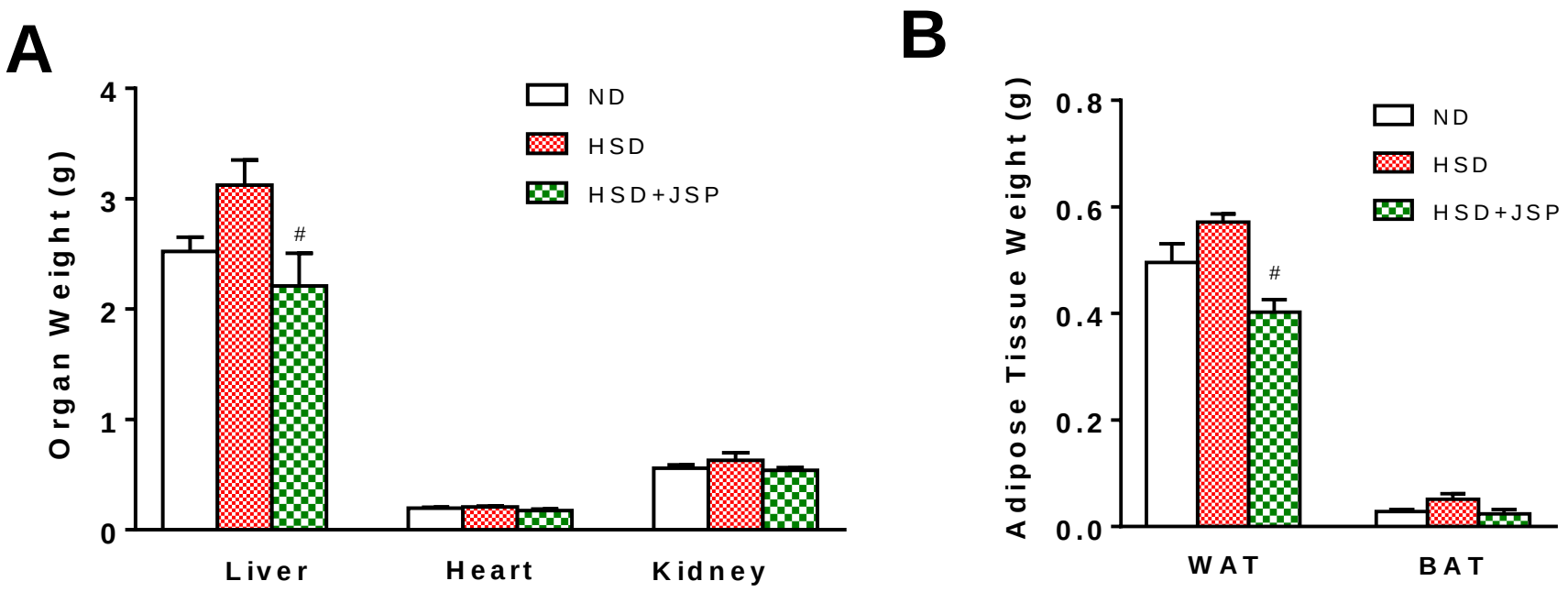
JSP supplementation counteracted the body weight gain in HSD-fed mice

Effect of JSP on glucose tolerance in HSD-fed mice



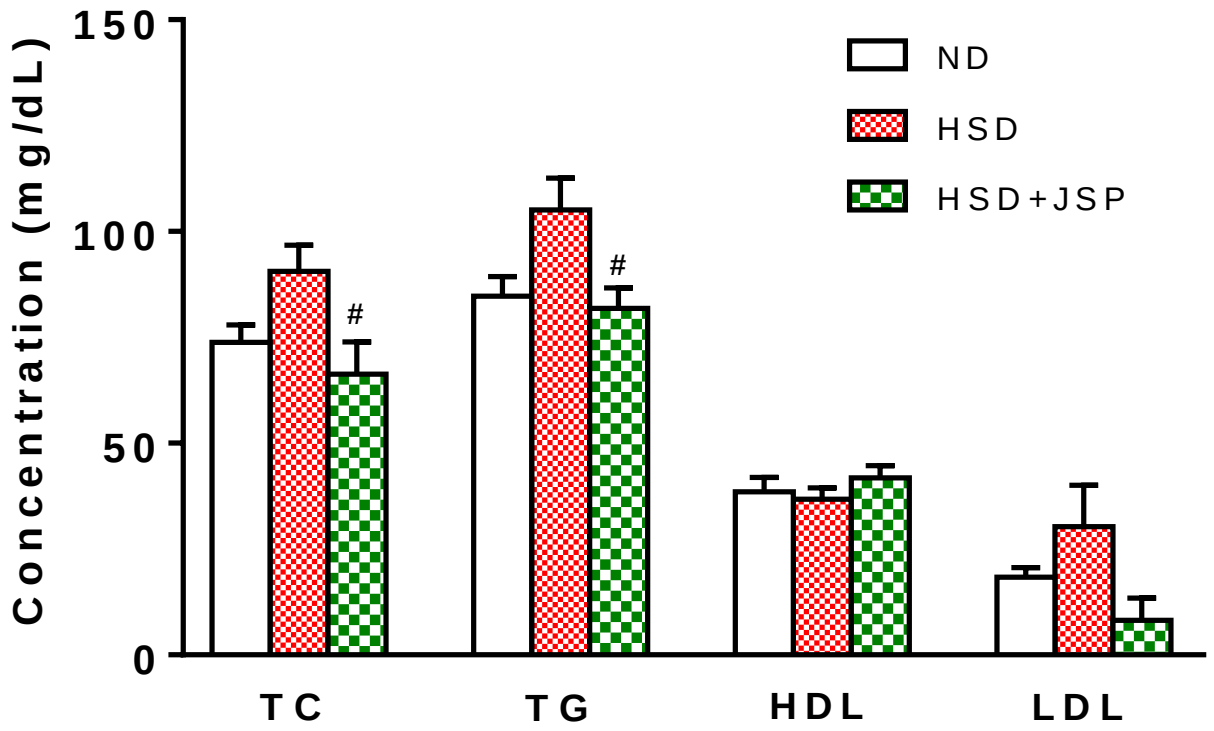
JSP supplementation with HSD improved glucose tolerance

Effect of JSP on organ weight of HSD-fed mice



JSP supplementation significantly reduced the weight of WAT and liver weight

Effect of JSP on lipid profile of HSD-fed mice



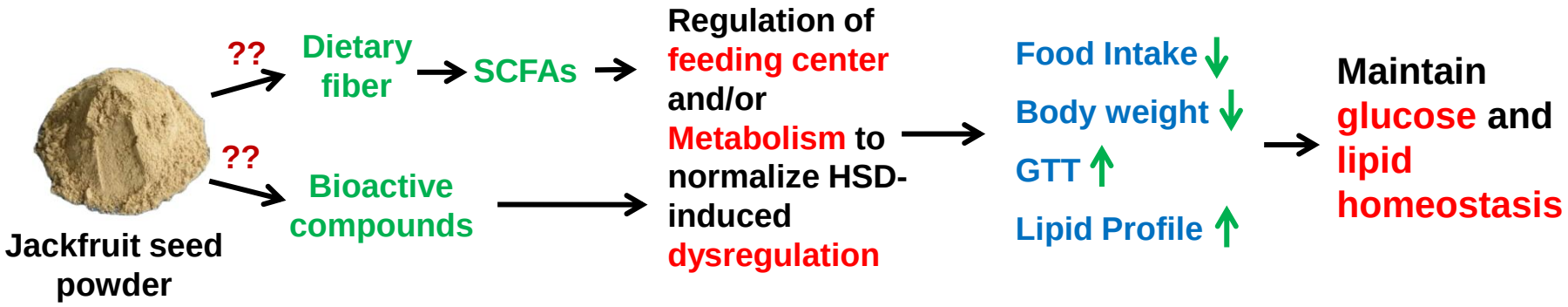
JSP supplementation significantly decreased total cholesterol and triglycerides in HSD-fed mice

Important Findings

JSP supplementation in high sugar diet-fed mice-

- ✓ significantly reduced food intake and body weight
- ✓ improved glucose tolerance
- ✓ significantly decreased the weight of liver and WAT, and
- ✓ decreased total cholesterol and triglyceride concentration significantly

Conclusions



- The jackfruit seed powder could effectively sustain a normoglycemic state against the development of diabetes and obesity.
- Jackfruit seed powder can be an alternative or complementary for wheat flour to prepare ready-made food.
- Thus, jackfruit seed powder could be potentially used as a supplemental diet to overcome the metabolic dysregulation in addition to achieve food security.