Effect of raw coconut blossom powder (Raw Coconut Blossom Powder/Paste – RCBP) on glycaemic and insulinemic response: A non-interventional study using a pharmacogenomic approach

Genomed Research Group
Clinical Pharmacology & Pharmacogenomics Research Group, Department of Pharmacy, National and Kapodistrian University of Athens
Principal Investigator: Nikolaos Drakoulis

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Abstract

Raw organic coconut blossom powder (Raw Coconut Blossom Powder/Paste, RCBP) is marketed as a natural sweetener with a low glycaemic index (Low Glycaemic Index – LGI, GI < 55), promising a mild effect on postprandial glucose levels and increased compatibility with diets designed to prevent metabolic diseases. Although its consumption has increased significantly in recent years, to date there has been no scientifically substantiated assessment of its actual glycaemic and insulinemic profile.

The glycaemic behaviour of the natural sweetener derived from coconut blossoms, marketed under the trade name 'Bloss – Raw Coconut Blossom Powder/Paste', was assessed in comparison with pure glucose as part of an acute response experimental study. Ten healthy volunteers (aged 20–40) consumed equivalent amounts of carbohydrates (50 g) in the form of two different preparations: (a) a solution of pure glucose (control) and (b) a solution of raw organic coconut blossom powder (Raw Coconut Blossom Powder/Paste – RCBP). Participants arrived having fasted for at least 10 hours prior to each visit, and samples were collected at seven time points (0, 15, 30, 45, 60, 90 and 120 minutes).

Capillary blood glucose concentrations were determined using the glucose oxidase method. The glycaemic index (GI) was calculated based on the incremental area under the curve (iAUC), excluding sections below the baseline value, and expressed as a percentage of the mean iAUC for glucose.

The results clearly showed a lower glycaemic response for coconut blossom powder and paste compared with pure glucose. The GI value for RCBP was **51.2**, officially classifying it as **a low-glycaemic index (GI ≤ 55) food**. The peak glucose concentration was recorded at **30 minutes**, whilst the overall curve showed a gentle rise and a faster decline back to baseline levels, suggesting a reduced postprandial glycaemic load.

Materials AND METHODS

A non-interventional efficacy study was conducted in 10 healthy adults (mean age 27.4 ± 4.3 years). On two separate days, the participants consumed two different preparations: 50 g of glucose dissolved in water (control) and
50 g of raw coconut blossom powder/paste (RCBP), also dissolved in water. Capillary blood glucose and serum insulin concentrations were measured at 0, 15, 30, 45, 60, 90 and 120 minutes. The glycaemic and insulinemic indices were calculated using the area under the curve (iAUC). Participants also underwent genetic analysis for polymorphisms associated with glycaemic control.

Results

Glycaemic index – GI

The consumption of 50 g of pure glucose caused the expected sharp rise in blood glucose concentration, peaking at 30 minutes (160 mg/dL), followed by a gradual decline back to fasting levels. In contrast, the consumption of 50 g of raw organic coconut blossom powder/paste (RCBP) resulted in a milder rise in glucose, peaking at 30 minutes (114 mg/dL), and a more rapid stabilisation at 90–120 minutes (Figure 1).

The glucose curve following consumption of RCBP remained at significantly lower levels at all time points compared with that of pure glucose, a finding also reflected in the calculation of the area under the curve (iAUC). Specifically, the iAUCs for glucose and RCBP were 3937.5 and 1785.0 mg·min/dL, respectively. The calculated **glycaemic index (GI)** for RCBP was **51.2,** officially classifying it as **a low glycaemic index (LGI) food**.

These findings indicate that the coconut blossom sweetener induces a clearly milder postprandial glycaemic response compared with the reference glucose, which supports its suitability as a natural sweetener in dietary regimens aimed at glycaemic control.

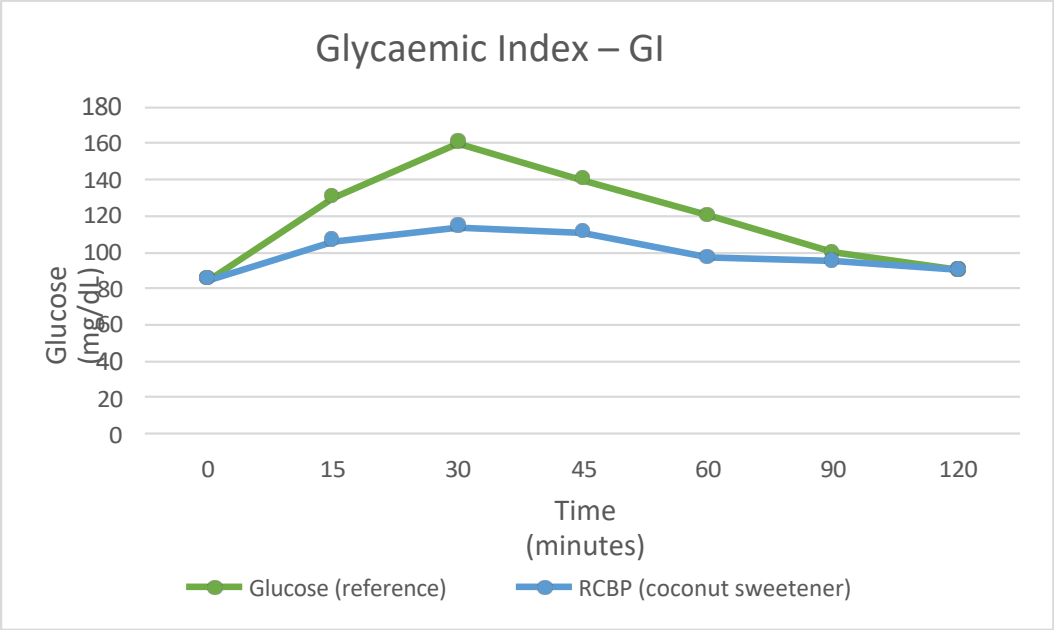

Figure 1: Glucose curve following consumption of a solution of coconut blossom and glucose (control component)

Insulin response – II

The administration of 50 g of pure glucose led to a rapid and marked increase in serum insulin concentration, peaking at 30 minutes (70 µIU/mL) and gradually decreasing at subsequent time points. The overall curve showed a typical profile of a strong insulin response, consistent with high absorption and a rapid postprandial rise in glucose (Figure 2).

In contrast, consumption of the aqueous solution of organic coconut blossom powder (RCBP) elicited a distinctly milder insulin response, with a peak value of 35 µIU/mL at 30 minutes and a smoother decline. The area under the curve (iAUC) for insulin was calculated as 3630.0 for glucose and 1695.0 µIU·min/mL for RCBP. Based on these findings, the **insulinemic index (II)** of RCBP was **46.7**, a value that confirms reduced pancreatic stimulation compared with the reference.

The insulin curve for the RCBP not only shows a lower peak but also a generally reduced amplitude, a finding suggestive of **lower postprandial insulin levels**.

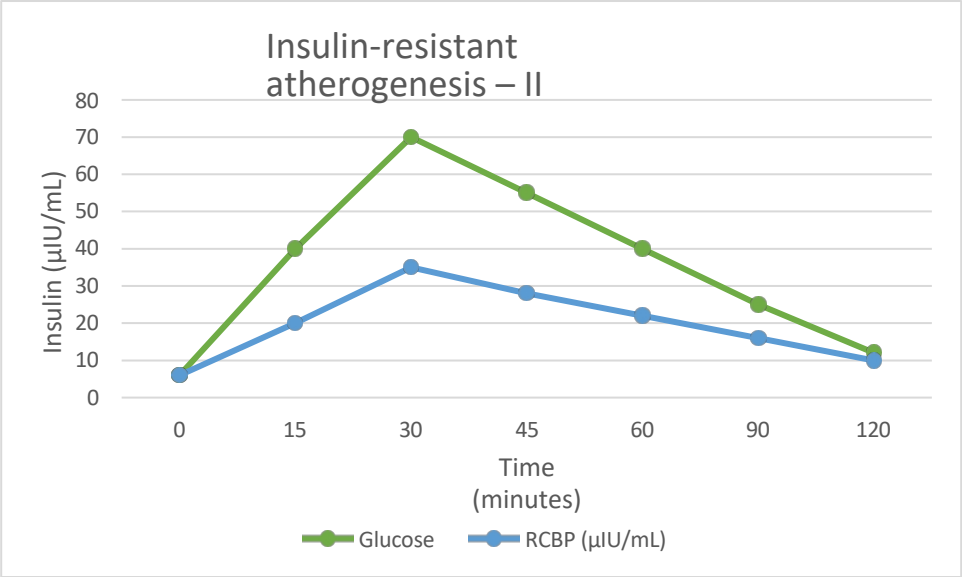

Figure 2: Insulinaemic response curve following consumption of a coconut flower and glucose solution (control)

Conclusions

This study demonstrated a clear difference in the postprandial metabolic response between pure glucose and raw organic coconut blossom powder (RCBP) when consumed as a solution with an equivalent carbohydrate load. RCBP caused a significantly lower rise in both blood glucose and insulin levels, a finding reflected in the calculation of the GI and II indices.

Specifically, the glycaemic index of RCBP was **51.2 ± 9.3**, whilst the insulinemic index was 46.7, clearly placing it in the category of foods with a low glycaemic and insulinemic index, based on internationally established thresholds (≤55). The milder postprandial response suggests that RCBP is a suitable substitute for sugar or other high-glycaemic-load sweeteners, particularly in dietary regimens aimed at glycaemic control, the regulation of insulin sensitivity or the prevention of metabolic disorders.

Further studies with a larger sample size and, potentially, in populations with impaired postprandial regulation could reinforce the present findings and substantiate the clinical utility of RCBP as a natural sweetener with a favourable metabolic profile.