Cissus quadrangularis (CQR-300®) and *Dichrostachys glomerata* (Dyglomera®) extracts increase GLP-1 and inhibit DPP-4 in overweight and obese adults

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Background: Obesity is a health burden affecting over 2.3 billion people of all ages globally. The onset and progression of obesity involves a complex pathway, with several drugs having been developed to target these pathways. In recent years, dipeptidyl peptidase-4 (DPP-4) inhibitors or gliptins, such as sitagliptin, saxagliptin, and vildagliptin, have been considered to have potential in obesity management. Gliptins inhibit DPP-4, an enzyme known to deactivate the glucagon-like peptide-1 (GLP-1) hormone, contributing to the development and progression of obesity and other metabolic diseases.

Objective: This study aimed to investigate the effect of these extracts on blood GLP-1 levels and DPP-4 activity in overweight and obese adults.

Methods: This study involved ninety (90) overweight or obese participants ($25 \geq BMI \leq 30$), randomly divided into three groups: the placebo group, Dyglomera® group, and CQR-300® group. The study lasted 12 weeks, during which various parameters (body weight, BMI, body fat, energy intake, GLP-1 level, DPP-4 activity, blood lipids (TC, HDL, TG, and LDL), fasting

blood glucose) were assessed at baseline (week 0), week 4, week 8, and week 12. The results were expressed as the mean ± SEM, with the significance at 5 %.

Results: Dyglomera® and CQR-300® after 12 weeks of intake significantly ($p < 0.01$) increased GLP-1 levels (55.66 % and 68.31 % respectively vs 14.82 % for placebo group), inhibited DPP-4 activity (- 59.53 % and – 54.22 % respectively vs 128.90 % for placebo group), and reduced body weight (17.39 % and 14.13 % respectively vs 1.67 % for placebo), BMI (17.43 % and 14.16 % respectively vs 1.69 % for placebo group), body fat (31.13 % and 27.10 % respectively vs 1.07 % for placebo group), energy intake (24.31 % and 20.44 % respectively vs 3.27 % for placebo group) and blood glucose (18.46 % and 17.27 % respectively vs 0.21 % for placebo group) levels. Both Dyglomera® and CQR-300® significantly ($p < 0.01$) improved the blood lipids markers (HDL (20.87 % and 20.18 % respectively vs 1.68 % for placebo group), TC (- 15.12 % and -18.01 % respectively vs -4.57 % for placebo group), TG (-24.53 % and -19.51 % respectively vs -4.57 % for placebo group), and LDL (-35.77 % and -40.38 % respectively vs -9.12 % for placebo group)) after 12 weeks.

Conclusion: Our study demonstrated Dyglomera® and CQR-300® demonstrate significant potential for enhancing GLP-1 secretion and inhibiting DPP-4 activity, leading to substantial improvements in weight and cardiometabolic parameters, underscoring their promise as effective alternatives for managing obesity and related complications.

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