

PENGEMBANGAN SENYAWA KOMPLEKS KROMIUM (III) DENGAN ASAM AMINO DAN UJI AKTIVITASNYA SEBAGAI KANDIDAT SUPLEMEN ANTIDIABETES.

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Abstrak

Salah satu upaya pengelolaan kesehatan bagi penyandang diabetes mellitus tipe 2 adalah konsumsi suplemen yang mengandung kromium trivalen, Cr(III). Dalam penelitian ini telah disintesis beberapa kompleks dari Cr(III) dengan asam amino : L-asam glutamat, glisin dan L-sistein, dengan metode refluks. Rendemen produk berkisar antara 40.08-87.50%. Karakterisasi yang telah dilakukan adalah dengan Spektrofotometri Inframerah (FTIR) Spektrofotometri Uv-Vis, dan Elemental Analysis. Struktur molekul dari kompleks yang dihasilkan adalah $[\text{Cr}(\text{glu})_2(\text{H}_2\text{O})_2] \cdot x\text{H}_2\text{O}$, $\text{Cr}(\text{gly})_3 \cdot x\text{H}_2\text{O}$ and $\text{Cr}(\text{cys})_3 \cdot x\text{H}_2\text{O}$. Keempat sampel kompleks telah diinvestigasi secara in vivo pada tikus putih (*Rattus novvergicus*) galur Wistar yang diinduksi diabetes mellitus dengan nicotinamide-streptozotocin secara intraperitoneal. Subyek uji diberi perlakuan suplemen per-oral dengan dosis 100-400 μg per hari, dengan kontrol positif Cr-Pic dan kontrol negatif plasebo (Na-cmc).. Sampai pekan ke 9, terjadi penurunan kadar gula darah yang signifikan hingga angka kadar gula darah normal. Aktivitas antihiperqlikemia dinyatakan dalam %GL (*glucose lowering*). Hasil penelitian menunjukkan %GL dalam penelitian ini mencapai 44.44 sampai 57.56%. Seluruh sampel perlakuan menunjukkan perbedaan penurunan kadar gula darah yang signifikan ($p < 0.05$) dengan kelompok kontrol.

Kata kunci : Kompleks, Cr(III)-asam amino, induksi Stz-nicotinamide, antihiperqlikemia, % *glucose lowering*.

Abstract

The management of type 2 diabetes mellitus involved the consumption of Cr(III) in nutraceutical/food supplement. Some Chromium (III) complexes were synthesized with three amino acids: L Glutamic Acid, Glycine, and L-cysteine as the ligands, The complexes have been prepared by refluxing a mixture of Chromium(III) chloride in aqueous solution with L-glutamic acid, Glycine, and L-cysteine. These complexes were characterized by Infrared and Uv-Vis spectrophotometer and Elemental analyzer. The product yields of four products were 40.08- 87.50 %. The predicted structure of the complexes are $[\text{Cr}(\text{glu})_2(\text{H}_2\text{O})_2] \cdot x\text{H}_2\text{O}$, $\text{Cr}(\text{gly})_3 \cdot x\text{H}_2\text{O}$ and $\text{Cr}(\text{cys})_3 \cdot x\text{H}_2\text{O}$., respectively.

Investigation of an in vivo application of all chromium- amino acid complexes was conducted on nicotinamide-streptozotocin induced diabetic Wistar rats. The subject were treated by these foemula by 100-400 μg / orally. The positive control was Cr-Pic and the placebo negative control was Na-cmc. 9 In 9 weeks, the blood glucose level were decreased significantly to the normal glucose level. The antihyperqlicemic activity were stated by %GL (*glucose lowering*). The study showed that % GL were 44-44% -57.56%. All formulas gave significant effect in lowering glucose level compared to diabetic rats control group ($p < 0.05$).

Kata kunci : complexes, Cr(III)-amino acids, Stz-nicotinamide induction, antihyperqlicemia, % *glucose lowering*.

