PENGARUH PEMBERIAN HIDROLISAT PROTEIN IKAN KEMBUNG DENGAN ENZIM PROTEASE TEMPE TERHADAP KADAR HDL-KOLESTEROL, LDL-KOLESTEROL, DAN RASIO LDL/HDL-KOLESTEROL PADA TIKUS DIABETES MELLITUS

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INTISARI

Latar Belakang: Prevalensi diabetes mellitus (DM) di dunia terus mengalami peningkatan. DM meningkatkan risiko penyakit kardiovaskuler. Faktor risiko utamanya adalah abnormalitas metabolisme lipid meliputi modifikasi partikel *low density lipoprotein* (LDL) dan *high density lipoprotein* (HDL), termasuk rasio LDL/HDL-kolesterol sebagai indeks aterogenik. Hidrolisat protein ikan mampu memperbaiki metabolisme glukosa dan lipid pada kondisi DM. Hidrolisat dapat diperoleh melalui proses hidrolisis enzimatis dengan enzim protease yang bisa ditemukan di tempe kedelai.
Tujuan: Mengetahui pengaruh pemberian hidrolisat protein ikan kembung dengan enzim protease tempe terhadap profil HDL-kolesterol, LDL-kolesterol, dan rasio LDL/HDL-kolesterol pada tikus Wistar jantan yang diinduksi DM.
Metode Penelitian: Hidrolisat protein diperoleh dengan menghidrolisis hasil isolasi protein dari ikan kembung (*Selar crumenophthalmus*) dengan enzim protease tempe kedelai (*Rhizopus oligosporus*). 30 ekor tikus Wistar jantan dibagi menjadi 6 kelompok: kelompok kontrol, kontrol negatif, DM+isolat protein 300mg/kg BB (IP-300), DM+isolat protein 500mg/kg BB (IP-500), DM+hidrolisat protein 300mg/kg BB (HP-300), dan DM+hidrolisat protein 500mg/kg BB (HP-500). Induksi diabetes dilakukan dengan injeksi streptozotocin (STZ) dan nicotinamid (NA). Darah diambil sesudah 28 hari perlakuan untuk dilakukan analisis kadar LDL-kolesterol, HDL-kolesterol, dan perhitungan rasio LDL/HDL-kolesterol.
Hasil: Kadar LDL-kolesterol, HDL-kolesterol, dan rasio LDL/HDL-kolesterol setelah perlakuan pada semua kelompok intervensi berbeda secara signifikan dibandingkan dengan kelompok kontrol negatif. Kelompok HP-500 memiliki kadar HDL-kolesterol paling tinggi (69,34±26,74), kadar LDL-kolesterol paling rendah (26,67±3,52), dan rasio LDL/HDL-kolesterol paling rendah (0,45±0,22) dibandingkan kelompok intervensi lain, serupa dengan kelompok kontrol.
Kesimpulan: Hidrolisat protein ikan kembung mampu memperbaiki profil HDL-kolesterol, LDL-kolesterol, dan rasio LDL/HDL-kolesterol tikus DM.
Kata Kunci: hidrolisat protein, protease, diabetes mellitus, HDL-kolesterol, LDL-kolesterol, rasio LDL/HDL-kolesterol

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EFFECT OF PROTEIN HYDROLYSATE FROM INDIAN MACAREL WITH TEMPEH PROTEASE IN HDL-CHOLESTEROL LEVEL, LDL-CHOLESTEROL LEVEL, AND LDL/HDL-CHOLESTEROL RATIO DIABETIC RATS

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ABSTRACT

Background: *Diabetes mellitus (DM) prevalence continue to increased. DM increases the risk of cardiovascular disease due to lipid abnormalities including modification of low density lipoprotein-cholesterol (LDL-c) and high density lipoprotein-cholesterol (HDL-c), also LDL/HDL-cholesterol ratio as an atherogenic index. Fish protein hydrolysate may improve glucose and lipid metabolism in DM. Hydrolisate can be obtained through enzymatic hydrolysis with protease that can be found in soybean tempeh.*
Objective: *Determine the potential effect of protein hydrolysate from Indian macarel (Selar crumenophthalmus) with protease tempeh in modulating HDL-cholesterol level, LDL-cholesterol level, and LDL/HDL-cholesterol ratio male diabetic induced Wistar rats.*
Method: *Protein hydrolysate produced by hydrolyze isolated Indian macarel protein with protease from soybean tempeh (Rhizopus oligosporus). 30 male Wistar rat devided into six groups: control, negative control, DM+protein isolate 300mg/kg BW, DM+protein isolate 500mg/kg BW, DM+protein hydrolysate 300mg/kg BW, and DM+protein hydrolysate 500mg/kg BW. Diabetes was induced by streptozotocin (STZ) and nicotinamide (NA) injection. Blood was collected after 28 days of intervention to analyze the LDL-kolesterol level, HDL-kolesterol level, and LDL/HDL-kolesterol ratio.*
Result: *HDL-cholesterol level, LDL-cholesterol level, and LDL/HDL-cholesterol ratio after intervention in all four diabetic groups was significantly different with negative control group. HP-500 group has higest HDL-cholesterol level (69,34±26,74), lowest LDL-cholesterol level (26,67±3,52), and the lowest LDL/HDL-cholesterol ratio (0,45±0,22) compare to other diabetic groups, and had no difference with control group.*
Conclusion: *Protein hydrolysate from Indian macarel had a benefical effect on modulating HDL-cholesterol level, LDL-cholesterol level, and LDL/HDL-cholesterol in diabetic rats.*
Keywords: *protein hydrolysate, protease, diabetes mellitus, HDL-cholesterol, LDL-cholesterol, LDL/HDL-cholesterol ratio*

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