

POTENSI ANTIOKSIDAN TERIPANG LOKAL PAMURBAYA
Paracaudina australis UNTUK PERBAIKAN SENSITIVITAS ADIPOSIT DAN SEL
OTOT TERHADAP INSULIN PADA DIABETES MELLITUS

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ABSTRAK

Penelitian ini bertujuan untuk mengeksplorasi potensi teripang yang hidup di Pantai Timur Surabaya yaitu *Paracaudina australis* untuk dimanfaatkan dalam perbaikan sensitivitas adiposit dan sel otot terhadap insulin yang menurun pada diabetes mellitus tipe 2. Dinding tubuh teripang dibuat ekstrak. Ekstrak teripang yang digunakan adalah ekstrak etanol. Hewan coba yang digunakan adalah *Mus musculus* jantan strain Swiss, berumur 3-4 bulan, berat badan berkisar 30-40 g. Hewan coba dikelompokkan menjadi kelompok kontrol (tanpa ekstrak teripang) dan kelompok ekstrak (dengan ekstrak teripang). Kelompok kontrol dibagi lagi menjadi 3 sub kelompok yaitu: kontrol normal, kontrol diabetik tanpa glibenclamide dan kontrol diabetik dengan glibenclamide 7 g/kg berat badan per hari. Kelompok ekstrak dibedakan menjadi 3 sub kelompok yang diberi ekstrak teripang dengan dosis berturut-turut 0,01, 0,02, dan 0,03 g/20 g berat badan per hari. Semua perlakuan dilakukan selama 14 hari. Mencit diabetik diperoleh setelah induksi dengan streptozotocin dalam buffer sitrat pH 4,5 metode multiple low dose 40 mg/kg BB yang diberikan intraperitoneal 5 kali masing-masing sehari 1 kali injeksi. Pada hari ke 15 dilakukn pengukuran kadar glukosa darah puasa, uji toleransi glukosa per oral dan pengambilan serum serta jaringan lemak dan otot. Data berat badan, kadar glukosa darah puasa, kadar glukosa darah selama uji toleransi glukosa dianalisis menggunakan analisis varians satu arah dilanjutkan uji Duncan, atau Brown Forsythe dilanjutkan uji t untuk mengetahui pengaruh perlakuan, sedangkan untuk mengetahui adanya korelasi antara penambahan berat badan dengan kadar glukosa darah puasa dilakukan uji korelasi Pearson. Uji statistik dilakukan pada $\alpha=0,05$. Hasil penelitian menunjukkan bahwa ekstrak teripang *Paracaudina australis* dapat menurunkan kadar glukosa darah puasa mencit penderita diabetes mellitus dengan pengaruh seiring peningkatan dosis. Perubahan kadar glukosa darah puasa pada mencit penderita diabetes mellitus tidak berkorelasi dengan penambahan berat badan, dan berdasar indikator perubahan kadar glukosa darah selama uji toleransi glukosa, pemberian ekstrak teripang *P. australis* dengan dosis 0,01 hingga 0,03 g/20 g BB dapat memperbaiki sensitivitas sel terhadap insulin. (Saat laporan ini ditulis, pengukuran kadar MDA dan insulin, serta densitas GLUT 4 belum selesai dikerjakan)

Kata kunci. *Paracaudina australis*, teripang, pantai timur Surabaya, diabetes mellitus

ANTIOXIDANT POTENCY OF SEA CUCUMBER *Paracaudina australis*
FROM SURABAYA EAST COASTAL FOR IMPROVE THE SENSITIVITY OF
ADIPOCYTES AND SKELETAL MUSCLE TO INSULIN IN DIABETES MELLITUS

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ABSTRACT

This study was aimed to explore the potency of sea cucumber *P. australis* which from east coast Surabaya for improving the sensitivity of diabetic adipocytes and muscle cells to insulin. For that purpose, the body wall of that sea cucumbers were extracted and freeze-dried to gain the extract. This research was done in vivo using male mice (strain Swiss, aged 3-3.5 month, weighed 30-40 g) that were divided into 2 groups. The first group was control group (without sea cucumber extract treatment) and the other was extract group (with sea cucumber extract treatment). The control group was further divided into 3 subgroups: subgroup control normal (non diabetic), subgroup control diabetic without glibenclamide, and subgroup control diabetic which was given glibenclamide 7 mg/kg bw/day. The extract group used diabetic mice which was divided into 3 subgroups were given sea cucumber extract 0.01, 0.02, and 0.03 g / 20 g bw / day, respectively. Diabetic mice were taken 1-2 weeks after multiple low dose induction of streptozotocin I citrate buffer pH 4.5 40 mg/kg bw for 5 consecutive days. All treatments were done for 14 days. Body weight was measured at day 1 and 15. Measurement fasting blood glucose level, oral glucose tolerance test, and collection of serum, fat and muscle tissue were done at day 15. To know the effect of treatment, data were analyzed by one way anova or Brown Forsythe test followed by Duncan or t test, whereas Pearson correlation test was used to determine correlation between the change of body weight and the level of fasting blood glucose. Statistical tests performed at $\alpha = 0.05$. The results showed that the extract of sea cucumber *P. australis* (0.01-0.03 g/20 g bw/day for 14 days) could reduce fasting blood glucose levels concomitant with increase of extract sea cucumber's dose and based on glucose tolerance test, it also could improve the sensitivity of cells to insulin in diabetic mice. (when this report was finished, measurement the level of MDA and insulin, and the density of GLUT 4 have not been finished)

Keywords: *Paracaudina australis*, sea cucumber, Surabaya east coastal, diabetes mellitus