

Pengaruh Pemberian Ubi Jalar Ungu (*Ipomoea Batatas* Var *Antin 3*) dan Vitamin E terhadap *Catalase*, *Glutathione Peroxidase*, dan TNF- α dari Serum Darah Tikus dengan *Overtraining Exercise*

Siti Khadijah¹, Jajar Setiawan², Dwi Aris Agung N³

Korespondensi: sitikhadijahali96@mail.ugm.ac.id

¹Mahasiswa Program Pascasarjana Magister Ilmu Biomedik Fakultas Kedokteran, Kesehatan Masyarakat dan Keperawatan Universitas Gadjah Mada, Yogyakarta

²Departemen Fisiologi Fakultas Kedokteran, Kesehatan Masyarakat dan Keperawatan Universitas Gadjah Mada, Yogyakarta

³Departemen Kedokteran Molekuler Fakultas Kedokteran, Kesehatan Masyarakat dan Keperawatan Universitas Gadjah Mada, Yogyakarta

ABSTRAK

Latar belakang: *overtraining exercise* adalah latihan fisik berlebihan sehingga membentuk *Reactive Oxygen Species* (ROS). Pencegahan dengan ubi jalar ungu (*Ipomoea Batatas* Var *Antin 3*) yang mengandung antosianin dan vitamin E (tokoferol) yang dapat meningkatkan fungsi mitokondria dan penekanan sitokin pro-inflamasi.

Tujuan: mengetahui perbedaan efek pemberian ubi jalar ungu dan Vitamin E terhadap kadar CAT (*catalase*), GPx (*glutathione peroxidase*), dan TNF- α (*tumor necrosis alpha*) dari serum darah tikus.

Metode: jenis penelitian *true experimental* secara *post test only control group design* (n= 25 ekor Tikus Galur Wistar). Semua kelompok diberikan aktivitas prakondisi yaitu renang. K1 ialah kelompok kontrol. K2 ialah kelompok perlakuan (*overtraining exercise*). K3 ialah pemberian ubi jalar ungu dosis 0,63 g/ekor/hari. K4 ialah pemberian ubi jalar ungu dosis 1,26 g/ekor/hari. K5 ialah vitamin E 1,44 mg. Analisis data menggunakan uji *one way anova*.

Hasil: rerata Kadar CAT K1= $5,86 \pm 0,19$, K2= $1,73 \pm 0,04$, K3= $3,43 \pm 0,07$, K4= $4,40 \pm 0,08$, K5= $5,34 \pm 0,14$. Hasil analisis dengan tes anova yaitu $p=0,000$. Secara statistik terdapat perbedaan rerata kadar CAT dengan tes post hoc tamhane's K4 VS K5 $p=0,000$. Rerata kadar GPx pada K1= $71,30 \pm 2,08$, K2= $22,22 \pm 2,14$, K3= $49,69 \pm 2,08$, K4= $60,04 \pm 2,20$, K5= $70,38 \pm 1,84$. Hasil analisis dengan tes anova yaitu $p=0,000$. Secara statistik terdapat perbedaan rerata kadar GPx dengan tes Post Hoc LSD K4 VS K5 $p=0,000$. Rerata kadar TNF- α pada K1= $6,85 \pm 0,59$, K2= $22,97 \pm 1,17$, K3= $11,15 \pm 0,81$, K4= $8,37 \pm 0,48$, K5= $8,02 \pm 0,67$. Hasil analisis dengan tes anova $p=0,000$. Tidak terdapat perbedaan rerata kadar TNF- α dengan tes Post Hoc LSD K4 VS K5 $p=0,481$.

Kesimpulan: Ada perbedaan efek pemberian ubi jalar ungu dosis sedang dan tinggi dibandingkan vitamin E dalam rerata kadar CAT dan GPx yang lebih tinggi pada Tikus Galur Wistar yang diberikan perlakuan *overtraining exercise*. Kemudian, hanya terdapat perbedaan efek pemberian ubi jalar ungu dosis sedang, dan pada dosis tinggi tidak terdapat perbedaan efek dibandingkan vitamin E dalam rerata kadar TNF- α .

Kata kunci: Antosianin, *Catalase*, *glutathione peroxidase*, TNF- α , *overtraining exercise*, ubi jalar ungu, tokoferol, Vitamin E.

The Effect Of The Administration Of Purple Sweet (*Ipomoea Batatas* Var Antin 3) And Vitamin E On Catalase, Gluthathione Peroxidase, And TNF- α From Rat Blood Serum With Overtraining Exercise

Siti Khadijah¹, Jajar Setiawan², Dwi Aris Agung N³

Correspondence: sitikhadijahali96@mail.ugm.ac.id

¹Postgraduate Student Program of Master of Biomedical Sciences Faculty of Medicine, Public Health and Nursing, Gadjah Mada University, Yogyakarta

²Department of Physiology Faculty of Medicine, Public Health and Nursing, Gadjah Mada University, Yogyakarta

³Departement of Molecular Medicine Faculty of Medicine, Public Health and Nursing, Gadjah Mada University, Yogyakarta

ABSTRACT

Background: overtraining exercise is excessive physical exercise to form Reactive Oxygen Species (ROS). Prevention with purple sweet potato (*Ipomoea Batatas* Var Antin 3) which contains anthocyanins and vitamin E (tocopherol) which can improve mitochondrial function and suppress pro-inflammatory cytokines.

Objective: determine the difference in the effect of *Ipomoea Batatas* Var Antin 3 (purple sweet potato) and Vitamin E on the levels of CAT (catalase), GPx (glutathione peroxidase, and TNF- α (tumor necrosis alpha) from rat blood serum.

Method: true experimental type of research with post test only control group design (n= 25 Wistar rats). All groups were given a precondition activity, namely swimming. K1 is the control group. K2 is the treatment group (overtraining exercise). K3 is giving purple sweet potato at a dose of 0.63 g/head/day. K4 is the administration of purple sweet potato at a dose of 1.26 g/head/day. K5 is vitamin E 1.44 mg. Data analysis used one way ANOVA test.

Results: Mean CAT levels K1= 5.86 ± 0.19 , K2= 1.73 ± 0.04 , K3= 3.43 ± 0.07 , K4= 4.40 ± 0.08 , K5= 5.34 ± 0.14 . The results of the analysis with the ANOVA test are $p = 0.000$. Statistically there was a difference in the mean CAT levels with the post hoc Tamhane's K4 VS K5 test $p = 0.000$. The mean GPx levels at K1= 71.30 ± 2.08 , K2= 22.22 ± 2.14 , K3= 49.69 ± 2.08 , K4= 60.04 ± 2.20 , K5= 70.38 ± 1.84 . The results of the analysis with the ANOVA test are $p = 0.000$. Statistically there was a difference in the mean GPx levels with the Post Hoc LSD K4 VS K5 test, $p = 0.000$. The mean levels of TNF- α at K1= 6.85 ± 0.59 , K2= 22.97 ± 1.17 , K3= 11.15 ± 0.81 , K4= 8.37 ± 0.48 , K5= 8.02 ± 0.67 . The results of the analysis with the ANOVA test $p = 0.000$. There was no difference in the mean levels of TNF- α with the Post Hoc LSD K4 VS K5 test, $p = 0.481$.

Conclusion: There was a difference in the effect of giving medium and high doses of purple sweet potato compared to vitamin E in the higher mean levels of CAT and GPx in Wistar Strain rats given overtraining exercise treatment. Then, there was only a difference in the effect of medium-dose purple sweet potato, and at high doses there was no difference in effect compared to vitamin E in the mean levels of TNF- α .

Keyword: Anthocyanin, Catalase, glutathione peroxidase, TNF- α , overtraining exercise, purple sweet potato, Tokoferol, Vitamin E.