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**UNIVERSITAS PEMBANGUNAN NASIONAL "VETERAN" JAKARTA**

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**PENGARUH PEMBERIAN LARUTAN GULA AREN (*Arenga pinnata*) TERHADAP MORFOLOGI SPERMATOZOA TIKUS PUTIH (*Rattus Norvegicus L.*) GALUR WISTAR MODEL DIABETES MELITUS**

RINCIAN HALAMAN (xvi + 80 halaman, 15 tabel, 11 gambar, 10 lampiran)

## ABSTRAK

**Tujuan**
Hiperglikemia pada pasien DM dapat meningkatkan produksi ROS yang menimbulkan stres oksidatif dan merusak sel-sel di dalam tubuh, termasuk menimbulkan dampak negatif pada fungsi reproduksi laki-laki. Salah satu tanaman herbal yakni gula aren (*Arenga pinnata*) diketahui dapat berperan sebagai antioksidan. Penelitian ini betujuan untuk mengetahui pengaruh larutan gula aren terhadap morfologi spermatozoa tikus DM, membandingkan gambaran morfologi spermatozoa tikus yang diberikan perlakuan, serta mengetahui dosis optimal pemberian larutan gula aren dalam memperbaiki morfologi spermatozoa tikus DM.

**Metode**
Penelitian ini menggunakan metode *true experiment* dengan desain *post-test-only control group*. Sampel penelitian berupa tikus putih berjenis kelamin jantan galur Wistar berjumlah 30 ekor, berat 175-350 gram, rentang usia 2-3 bulan, diambil secara *simple random sampling* kemudian dibagi ke dalam lima kelompok, yaitu kelompok kontrol negatif, kelompok kontrol positif yang diinduksi aloksan 125 mg/kgBB dan kelompok perlakuan 1, 2, 3 yang diinduksi aloksan 125 mg/kgBB serta diberi larutan gula aren dengan dosis 90, 180 dan 360 (mg/kgBB/hari) selama 28 hari. Tikus dianestesi dengan Ketamine Xylazine kemudian dibedah. Organ epididimis diambil dan dicacah, kemudian dihomogenkan dengan cairan fisiologis NaCl. Pembuatan preparat dilakukan menggunakan pewarnaan giemsa kemudian morfologi spermatozoa diamati dengan mikroskop.

**Hasil**
Uji *One Way Anova* menunjukkan bahwa larutan gula aren berpengaruh terhadap morfologi spermatozoa tikus Wistar model diabetes (p=0,001). Berdasarkan hasil uji *Post-Hoc Bonferroni*, pemberian larutan gula aren dosis 90 mg/kgBB/hari berbeda bermakna dengan kelompok kontrol positif (p=0,007), sehingga dianggap menjadi dosis paling efektif dalam meningkatkan kualitas morfologi spermatozoa tikus diabetes.

**Kesimpulan**

Berdasarkan hasil penelitian dapat disimpulkan bahwa larutan gula aren (*Arenga pinnata*) dapat mempengaruhi morfologi spermatozoa tikus putih (*Rattus norvegicus*) galur Wistar model DM.

**Daftar pustaka** **:** 45 (2007-2024)
**Kata kunci** **:** Diabetes Melitus, Ekstrak *Arenga pinnata*, Morfologi Spermatozoa, *Rattus norvegicus,* ROS

**FACULTY OF MEDICINE**
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**THE EFFECT OF GIVING PALM SUGAR SOLUTION (*Arenga pinnata*) ON THE SPERM MORPHOLOGY OF WHITE RATS (*Rattus norvegicus* L.) WISTAR STRAIN DIABETES MELLITUS MODEL**

PAGE DETAIL (xvi + 80 page, 15 tables, 11 pictures, 10 appendices)

## ABSTRACT

**Objective**
Hyperglicemia in diabetic patients can increase ROS production, which causes oxidative stress and damage cells in the body, including causing negative impacts on male reproductive function. One of the herbal plants, namely palm sugar (*Arenga pinnata*), is known to have antioxidant activity. The aim of this study is to determine the effect of palm sugar solution on the morphology of spermatozoa in diabetic rats, to compare the morphological characteristics of spermatozoa in treated rats with those in the control group, and to identify the optimal dose of palm sugar solution for improving spermatozoa morphology in diabetic rats.

**Method**
This study used a true experiment method with a post-test-only control group design. The research sample was 30 Wistar male white rats, weighing 175-350 grams, aged 2-3 months, selected through simple random sampling and then divided into five groups: the negative control group, which received standard feed; the positive control group, which was induced by alloxan; and treatment groups 1, 2, 3 induced by alloxan then given palm sugar solution at doses of 90, 180 and 360 (mg/kgBB/day) for 28 days. Rats were anaesthetized with Ketamine Xylazine and then dissected. The epididymis organs were taken and chopped, then homogenized with NaCl physiological fluid. Preparation was done using Giemsa staining, and then the morphology of spermatozoa was observed with a microscope.

**Result**
The One Way Anova test showed that there is an effect of palm sugar solution on the morphology of spermatozoa in diabetic Wistar rats (p=0.001). Based on the Bonferroni Post-Hoc test results, the administration of palm sugar solution at a dose of 90 mg/kgBW/day was significant compared to the positive control group (p=0.007), making it the most effective dose in improving the morphological quality of spermatozoa in diabetic rats.

**Conclusion**
The research findings indicate that palm sugar solution (*Arenga pinnata*) can affect the morphology of spermatozoa in Wistar strain white rats (*Rattus norvegicus*) in a diabetes mellitus model.

**Reference** **:** 45 (2007-2024)
**Keywords** **:** Diabetes Mellitus, Extract of Arenga pinnata, *Rattus norvegicus*, ROS, Sperm Morphology