

## ABSTRAK

Radikal bebas adalah atom yang didalamnya terdapat satu atau lebih elektron tidak berpasangan yang sangat reaktif dan tidak stabil. Radikal bebas cenderung mengambil elektron dari molekul lain yang menimbulkan ketidak normalan molekul lain. Antioksidan adalah zat yang dapat memperlambat atau menghentikan radikal bebas tersebut. Antioksidan sintetik umumnya digunakan dalam industri karena harganya sangat terjangkau dan efektif untuk mencegah oksidasi dalam makanan. Antioksidan sintetik bersifat karsinogenik, artinya berpotensi menyebabkan kanker.

Penelitian ini bertujuan untuk mengetahui uji aktivitas antioksidan dan efektifitas ekstrak metanol daun sambiloto (*andrographis paniculata* pada tikus galur wistar (*rattus novergicus*) yang di papar oleh sinar ultra violet. Penelitian ini adalah penelitian eksperimental menggunakan *pre-post test control group design*. Dalam penelitian ini digunakan 24 ekor tikus Wistar jantan sebagai sampelyang dibagi menjadi 4 kelompok.

Hasil penelitian menunjukkan zat aktif yang terdapat pada ekstrak daun sambiloto (*Andrographis Paniculata*) yang diuji melalui pengujian fitokimia adalah ekstrak daun sambiloto (*Andrographis Paniculata*) terdapat kandungan metabolit skunder seperti alkaloid, flavonoid, saponin, dan tannin. Hasil pengujian antioksidan ekstrak ekstrak daun sambiloto (*Andrographis Paniculata*) melalui pengujian DPPH mendapatkan nilai IC50 pada 53,65. Maka pengujian antioksidan ekstrak bunga pagoda (*Clerodendrum paniculatum L.*) menunjukkan terdapatnya kandungan antioksidan pada ekstrak daun sambiloto (*Andrographis Paniculata*) dengan kategori kuat. Melihat aktivitas antiaging ekstrak daun sambiloto (*Andrographis Paniculata*) dengan luas kepadatan kolagen yang paling baik adalah kelompok P3 dan P2 yaitu kelompok perlakuan yang diberi krim ekstrak daun sambiloto (*Andrographis Paniculata*) dengan konsentrasi 5% dan 10% karena kepadatan kolagen yang sudah sangat banyak dan rapat pada gambaran histopatologi jaringan kulit. Disusul dengan kelompok kelompok perlakuan 1 dengan krim ekstrak daun sambiloto (*Andrographis Paniculata*) 2,5%. Kemudian rata-rata persentase luas kepadatan kolagen yang paling buruk adalah kelompok kontrol tanpa pemberian perlakuan apapun.

*Kata kunci : Antioksidan, Ekstrak Metanol Daun Sambiloto, Sinar UV.*

## ABSTRACT

Free radicals are atoms that contain one or more unpaired electrons that are very reactive and unstable. Free radicals tend to take electrons from other molecules which causes abnormalities in other molecules. Antioxidants are substances that can slow or stop free radicals. Synthetic antioxidants are generally used in industry because they are very affordable and effective in preventing oxidation in food. Synthetic antioxidants are carcinogenic, meaning they have the potential to cause cancer.

This research aims to determine the antioxidant activity test and effectiveness of methanol extract of bitter leaves (*androphis paniculata*) on Wistar rats (*rattus novergicus*) exposed to ultra violet light. This research is an experimental research using a pre-post test control group design. In this research 24 male Wistar rats were used as samples which were divided into 4 groups.

The results of the research showed that the active substance contained in the bitter leaf extract (*Andrographis Paniculata*) which was tested through phytochemical testing was the bitter leaf extract (*Andrographis Paniculata*) which contained secondary metabolites such as alkaloids, flavonoids, saponins and tannins. The results of antioxidant testing for bitter leaf extract (*Andrographis Paniculata*) through DPPH testing obtained an IC50 value of 53.65. So, antioxidant testing of pagoda flower extract (*Clerodendrum paniculatum* L.) shows that the antioxidant content in bitter leaf extract (*Andrographis Paniculata*) is in the strong category. Looking at the antiaging activity of bitter leaf extract (*Andrographis Paniculata*) with the best collagen density, the P3 and P2 groups were the treatment groups given bitter leaf extract cream (*Andrographis Paniculata*) with a concentration of 5% and 10% because the collagen density was already very high and closely on the histopathological picture of skin tissue. Followed by treatment group 1 with 2.5% bitter leaf extract (*Andrographis Paniculata*) cream. Then the worst average percentage area of collagen density was the control group without any treatment.

*Keywords: Antioxidants, Methanol Extract of Sambiloto Leaves, UV Light.*

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Diabetes Mellitus (DM) is a group of metabolic diseases characterized by hyperglycemia that occurs due to abnormalities in insulin secretion, insulin action or both. Chronic hyperglycemia in DM is closely related to dysfunction or failure of several body organs. Complications of DM can include macrovascular and microvascular disorders. Diabetes Mellitus is classified into four groups, namely type 1 DM, type 2 DM, other types of DM and gestational DM or pregnancy.

Diabetes cases are usually characterized by impaired insulin secretion or impaired insulin work (insulin resistance) in target organs, especially the liver and muscles. The liver is the largest organ in the body and is the center of the most complex metabolism in the

body.

This study aims to determine the effect of administering bitter leaf extract (*Andrographis paniculata*) on liver function and the liver histopathology of male Wistar white rats with diabetes mellitus. This research is experimental research using a pre-post test control group design. In this study, 24 male Wistar rats were used as samples which were divided into 4 groups.

The results of the study showed that the effect of administering bitter leaf extract (*Andrographis Paniculata*) at a dose of 600 mg/KgBW was effective in improving liver function in Wistar white rats (*Rattus norvegicus*) with diabetes mellitus. This improvement can be seen through the levels of ALT, AST, and the histological structure of the liver which have improved and resemble the control group. The results of histopathological observations of liver tissue in treatment group 3, namely administration of bitter leaf extract (*Andrographis Paniculata*) at a dose of 600mg/KgBW, experienced the most significant improvement and was closer to the control group than the other groups. Bitter leaf extract (*Andrographis Paniculata*) contains secondary metabolites in the form of saponins, tannins, flavonoids and triterpenoids which help repair liver cells that experience fat and necrosis due to diabetes mellitus.

Keywords: Liver, Diabetes Mellitus, Sambiloto Leaves.