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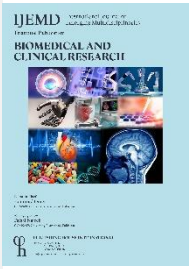

# Histological Assessment of Cannabis Sativa on the Lungs of Neonatal Albino Wistar Rats

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## Abstract

Cannabis is used for treating a wide range of medical conditions. It is an extraction of plant with psychoactive properties. This study investigated the histological outcome of cannabis on the lungs of albino rats. The research used 25 rats weighing 50-100g and were divided into Group A, Group B, Group C and Group D. Group A was the control group; unexposed to any form of inhalation. Group B were exposed to the flame from 0.5g of cannabis burnt in a closed chamber for only 30 minutes. Group C were exposed to the flame from 0.5g of cannabis burnt in a closed chamber for 30 minutes in the morning and 30 minutes exposure after (6) six hours. Group D were exposed to the flame from 0.5g of cannabis burnt in a closed chamber for 30 minutes in the morning, 30 minutes by noon and 30 minutes by evening. In the end, the rats were sacrificed and the lungs were removed and fixed in 10% formal saline solution. The lungs were stained with hematoxylin and eosin. Results show no adverse effects on the lungs of group B and group C but showed effects on group D which was the high dose group. Therefore, cannabis can damage the human lungs.

***Keywords***: *Cannabis; Eosin; Hematoxylin; Histology; Marijuana*

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# 1. Introduction

Cannabis exists as a set of three plants with psychoactive properties, known as Cannabis sativa, Cannabis indica, and Cannabis ruderalis.[1-2] The flowers of these plants are got and dried to get one of the most common drugs in the world. Majority name it weed, some see it as 'pot', and others name it as marijuana.[3-5] As weed gains popularity in many areas, the name for it becomes a more acceptable social expression in the society. Presently, more and more people are using the term cannabis to refer to weed. Cannabis is commonly used as a relaxant due to its pacifying properties. [6,7] In some countries, it's also used for the treatment of a wide range of medical conditions. Like chronic pain, glaucoma, and poor appetite. It is worthwhile to note that cannabis is extracted from a plant that is the rationale for considering it as a natural product with a very strong effect, either positive and negative. The Δ-9 tetrahydrocannabinol (THC) is principal psychoactive constituent in cannabis.[8-10] Compounds which are structurally similar to THC cited as cannabinoids. [11] Cannabis is made up of more than 120 components, which are known as cannabinoids. Most experts are still unsure what each cannabinoid does, but they have a good understanding of two of them which are cannabidiol (CBD) and tetrahydrocannabinol (THC).[12] The personal experience of users of these substances, are multivariate. This will depend upon the dose, method of administration, prior experience, any synchronous drug use, personal expectations, mood state and the social environment in which the drug is used.[4]

**Materials and Methodology**

Twenty-five neonatal albino wistar rats were purchased from National Veterinary Research Institution) Vom, Plateau State were used for the experiment. Plastic cages with iron wire netting, saw dust, animal feed, latex laboratory gloves, weighing balance, dissecting set and board, measuring cylinder, sample bottles, cotton wool, glass slides and slide rack, cover slips, light microscope and microtome. The animals were grouped by their weight into four (4) groups and expose to inhale the flames from the burnt leaves of cannabis. Group A (control) were not expose to inhale from the flame, Group B (Morning) were expose to inhale from the flame in a closed chamber for 30minutes only once in the morning. Group C (Morning and afternoon) expose to inhale the flame for 30minutes in the morning and 30minutes in the afternoon, Group D (Morning, afternoon and evening) to inhale the flame from the burnt cannabis for morning, afternoon and evening for 30minute each time of exposure.

**Animal sacrifice and tissue collection**

At the end of the administration, the rats were sacrificed applying the chloroform inhalation technique in a closed chamber and then the lungs were dissected out following an abdominal incision. The lungs were then fixed in 10% formal saline fluid for Hematoxylin and Eosin staining. Afterwards the organs were histological analyzed.

## Result

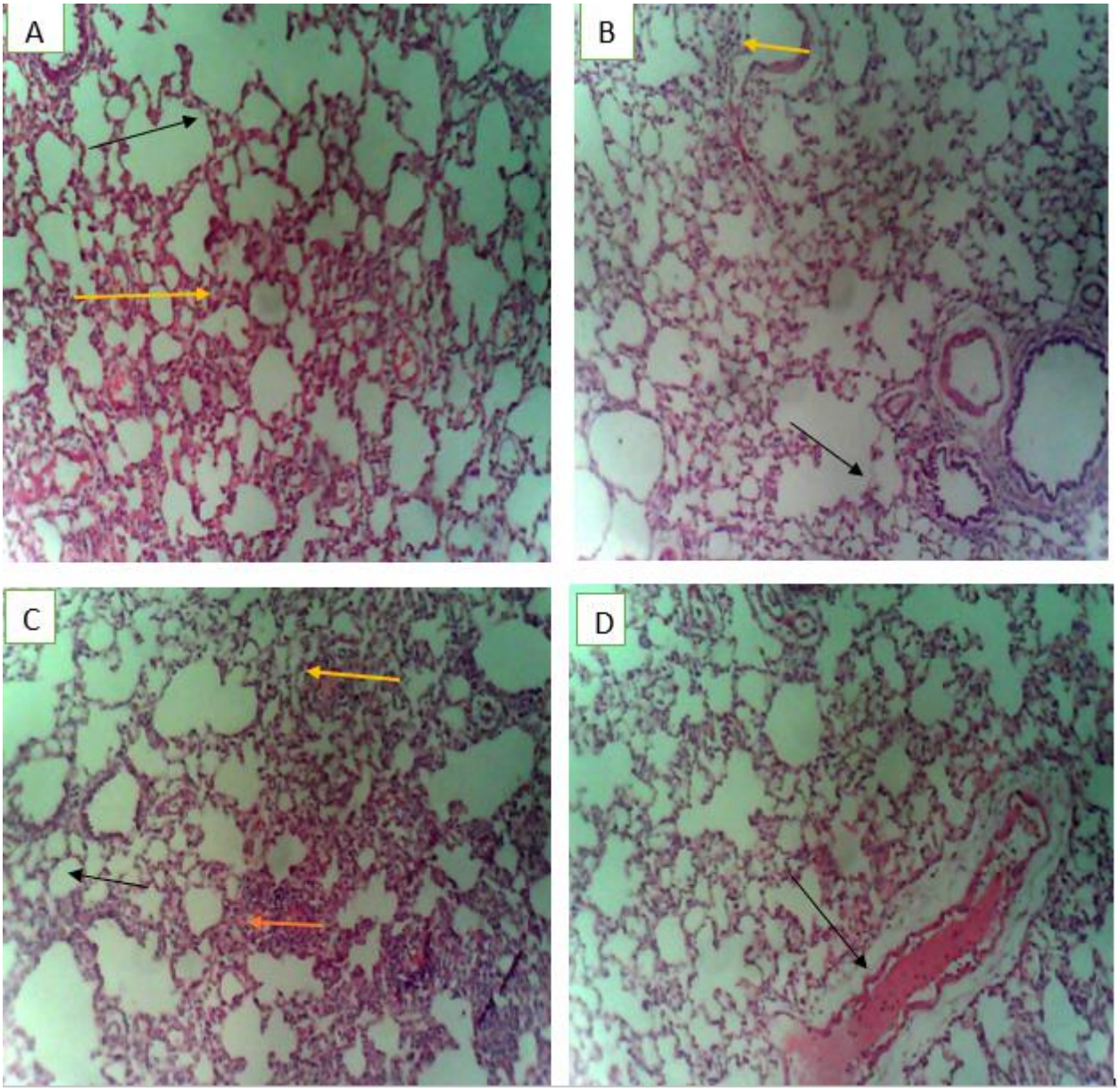


**Figure 1:** Photomicrograph **(A)** Histology of the lung from control group. Showing layers of smooth muscles (black arrow) and the alveolar sacs (yellow arrow). Photomicrograph **(B)** shows histology of the lungs from the group exposed to cannabis once a day with normal histology of the lung showing Respiratory bronchiole (black arrow) and Terminal bronchiole (yellow arrow). Photomicrograph **(C)** of the histology of the lungs from the group exposed to cannabis twice a day showing Alveolar ducts (black arrow) and Blood vessels (yellow arrow) with a mild inflame blood vessel (orange color arrow) Photomicrograph**(D)** of the histology of the lungs from the group exposed to cannabis three times a day showing histology of the lungs with Inflammation around the blood vessel.

**Discussion**

Globally, increased used of cannabis through inhalation leads to lung damage at some point in the lives of people and many young individuals are getting involve in the use of cannabis for several reasons.[2,8] There were no histological changes seen in the lungs of the low dose group compared to the lungs of the control group. And this states that at the particular dosage and exposure to cannabis through inhalation has no effect on the lung.[11]

There was a mild change when compare to the normal histology of the lungs from control in the group expose to cannabis twice a day at interval of six hours. The group expose to cannabis (marijuana flame) three times a day at interval of six hours shows the presences of inflammation which suggest rapture of blood vessel.

## 2. Conclusion

In conclusion, from the histological slides analysis in this research, cannabis shows evident that could damage the human lungs especially in young adult. Smoking cannabis in an inhale form injures and destroys the cell linings of the large airways, this explains how smoking Cannabis can trigger symptoms like chronic cough and phlegm production.

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