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Original Research Article

Effects of *Englerina drummondii Balle ex Polhill and Wiens* leaves extract on selected female rat organs' weights

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ABSTRACT

Background: Herbal medicine are patronized by several people across the globe This herbal medicine is routinely use and are more accessible and available. This study aimed to investigate the effects of *Englerina drummondii Balle ex Polhill and Wiens* leaves on rat organs (thyroid gland, kidneys, ovary and fallopian tubes) weights in female rats.
Methods: 20 female rats were selected randomly into 4 groups with 5 rats per group. Group 1 received 5 ml/kg of water, group 2 received extract 100 mg/kg, group 3 received extract 200 mg/kg, and group 4 received extract 400 mg/kg. Administration of extract was done for 28 days.
Results: The study revealed significance decreased in the weight of the left ovary organ when extract of medium dose (200 mg/kg) and high dose (400 mg/kg) was administered, as compared to control. The result also shows decrease in the organs weight of the thyroid gland, left kidney, right and left fallopian tubes extract of low, medium and high dose were administered. The right kidney shows increase when low dose extract was given but decrease when both low and medium dose of extract was given. However, this decrease is not significance and could be due to dose or time dependent. Statistical analysis was done using statistical package for the social sciences (SPSS) version 23 and $p<0.05$ was significant.
Conclusions: There was significance decreased in the weight of the left ovary organ when extract of medium dose (200 mg/kg) and high dose (400 mg/kg) was administered. Also, there is decrease in other organs weight when low, medium and high dose was given but not significance.

Keywords: Effects, Organs, Rats, Weight

INTRODUCTION

Herbs from various plants are important to several ethnic groups across the globe. These herbs usage is on the increase due to several reasons such as accessibility, affordability and its ability to give results. However, most of these herbs when consumed by the people lacks scientific documentation and these may result in several complications.[1]

The plant *Englerina drummomdii Balle ex Polhill and Wiens* (mistletoe) is a species of a commonly known plant called mistletoe that belongs to a large family called Loranthacae.[2] Mistletoe (*Englerina drummomdii Balle ex Polhill and Wiens*) has a green leaves and fruits and grow on other plants as parasite.[3] It is locally called atabe in Ogoniland, Niger Delta, Nigeria.[4] Phytomedicine involves the use of various plant's parts such as leaves, stems, seeds, fruits, barks and roots to treat certain disease at home. Several people have been patronizing herbal medicine to obtain better health care.[4]

Extract preparation from *Viscum album* (mistletoe) has been found to be antidiabetic and anticancerous.[5-9]

The phytochemical constituents of mistletoe have been revealed and vary according to the host plant and it include: glycoprotein, polypeptides (viscotoxin), flavonoids, flavonol agylcones, lectins, triterpenes, saponins, caffeic acid, lignans, cholines derivatives related to acetylcholine, vitamin C, histamine, resins, thionins, cardionolids and phenolic compounds.[9-11]

METHODS

Plant collection, identification and preparation of extract

Englerina drummondii Balle ex Polhill and Wiens (mistletoe) leaves were obtained from a forest in Khana local government area, Rivers State, Nigeria. The plant was introduced to the researcher by professor B. A. Ekeke (professor of silviculture and forestry) of the forestry department, Faculty of Agriculture, Rivers State University, Port Harcourt, Nigeria, and identified and authenticated in the Department of Plant Science and Biotechnology, Faculty of Science, University of Port Harcourt, Rivers State, Nigeria.

The *Englerina drummondii Balle ex Polhill and Wiens* leaves were washed and thereafter completely air dried under normal room temperature. The dried leaves were grounded into powder. 3 kg of the grounded powder was placed in a maceration jar and 6.00 mils of 70% methanol (hydro methanol) was added. The extract was slowly evaporated to dryness in vacuum at 45°C using a rotary evaporator as described by Gbaranor et al.[3] The LD50 of the *Viscum album* was 0.4 gm/kg (400 mg) of body weight was used as determined by Matthew et al.[12]

Experimental animals and management

The animals were obtained from the animal house, Faculty of Basic Medical Sciences, University of Port Harcourt. 20 female rats were used. The animals were placed in cages under natural environmental condition. The animals were weighed before and after the commencement of administration of extract. The experimental animal's weight was between 160-180 gm. The animals were allowed free access to clean drinking water and feed.

The study was an experimental model using rats and was carried out for a period of two weeks (August 1st to August 14th 2022).

Inclusion criteria

Inclusion criteria include non-pregnant female rats that weighs between 160 gm to 180 gm before commencement of the experiment and the exclusion criteria are male rats, pregnant female rats, female rats less than 160 gm and greater than 180 gm of weight before commencement of the experiment.

Statistical analysis

Statistical analysis was done using statistical package for the social sciences (SPSS) version 23 and $p<0.05$ was significant

This study was approved by the ethical committee of the School of Graduate Studies, University of Port Harcourt, Port Harcourt, Nigeria.

Study design

A total of 20 female animals were selected randomly into 4 groups with five rats per group. Group 1 (control) received 5 ml/kg of distil water, group 2 received extract 100 mg/kg, group 3 received extract 200 mg/kg, group 4 received extract 400 mg/kg

Administration of extracts was done for 28 days and on 29th day, the animals were sacrificed and organs were collected. The LD_{50} used was 0.4 gm/kg (400 mg) of body weight.

RESULTS

The results revealed significance decreased in the weight of the left ovary organ when extract of medium dose (200 mg/kg) and high dose (400 mg/kg) was administered, as compared to control. The result also shows decrease in the organs weight of the thyroid gland, left kidney, right and left fallopian tubes extract of low, medium and high dose were administered. The right kidney shows increase

when low dose extract was given but decrease when both low and medium dose of extract was given. However, this decrease is not significance and could be due to dose or time dependent.

Table 1: Effect of *Englerina drummondii Balle ex Polhill and Wiens* leaves on rat organs weights.

Groups	Thyroid gland mean±SD	Right kidney mean±SD	Left kidney mean±SD	Left ovary mean±SD	right fallopian tube mean±sd	Left fallopian tube mean±SD
Control	0. 84±0.02	0.69±0.04	1.00±0.38	0.29±0.09	0.22±0.11	0.21±0.12
Extract 100 mg/kg	0.77±0.03	0.77±0.19	0.49±0.01	0.17±0.11	0.15±0.03	0.13±0.02
Extract 200 mg/kg	0.76±0.07	0.56±0.02	0.52±0.01	0.05±0.00[a]	0.05±0.01	0.06±0.01
Extract 400 mg/kg	0.82±0.02	0.57±0.11	0.51±0.02	0.08±0.01[a]	0.13±0.03	0.14±0.02

a=p<0.05 when compared to normal control

DISCUSSION

Herbal medicine is patronized by several people across the globe This herbal medicine is routinely use and are more accessible and available. Several people have been depending on herbal medicine for the treatment of their illness without taking into consideration the effects of over dependence on the herbal medicine.

The study revealed significance decreased in the weight of the left ovary organ when extract of medium dose (200 mg/kg) and high dose (400 mg/kg) was administered, as compared to control.

The result also shows decrease in the organs weight of the thyroid gland, left kidney, right and left fallopian tubes when extract of low, medium and high dose was administered. The right kidney showed increase when low dose extract was given but decrease when both low and medium dose of extract was given. However, this decrease is not significance and could be due to dose or time dependent. This could be that, the extract can be a potent organs' weight reduction substance.

This study is in consonant with previous study which revealed decreased in the body weight of rats and this suggest that this extract could be used as a weight reduction substance but the people should also be cautious because excessive shrinkage in body's organs weight could be a pointer to a disease condition.[1]

Also, this significance decrease in the left ovary could affect reproductive process because the ovary will not be able to carry out its physiological functions including production of female sex cells and sex hormones (oestrogen and progesterone production).

Limitations of the study was that it faced inadequate finance, non-availability of sone equipment's required for the study and unstable power.

CONCLUSION

Herbal medicine is patronized by several people across the globe. This herbal medicine is routinely used and are more accessible and available. Several people have been depending on herbal medicine for the treatment of their illness without taking into consideration the effects of over dependence on the herbal medicine and the results from our findings revealed a significance decrease in the left ovary of the animal's rat's organs weight and also decrease in the rat's organs weight such as thyroid gland, left kidney, right and left fallopian tubes when extract of low, medium and high dose was administered. However, this decrease is not significance and could be due to dose or time dependent.

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REFERENCES

1. Gbaranor BK, Alasia OM, Tee PG, Nonju TI, Austin-Asomeji I, Nonju II, et al. Effects of hydro-alcohol extract of mistletoe leaves on changes in body-weight, uterus-weight, right ovary and liver in female rats. Int J Res Med Sci. 2022;10(7):1421-5.
2. Gbaranor KB, Ovili-Odili BZ, Okpara EP, Tamuno-Opubo A, Victor PD, Orupabo CD, et al. Effect of hydroalcohol extract of *Englerina drummondii Balle ex Polhill and Wiens* (mistletoe) leaves on prolactin and thyroid stimulating hormone (TSH) in female Wistar rats. Greene J Med Sci. 2021;11(2):109-12.
3. Gbaranor KB, Tee PG, Agara HN, Victor PD, Alasia OM, David-Sarogoro N, et al. Phytochemical analysis of leaf extract of *Englerina drummomdii Balle Ex Polhill and Wiens*. World J Pharm Res. 2021;10(11):128-34.

4. Gbaranor KB, Adienbo OM, Alasia OM, Tee PG, Gilbert UD, Nonju TI, et al. Effect of *Hydroalcohol Extract of Englerina Drummondii Balle Ex Polhill and Wiens* leaves and MSG on oestrous cycle of Wistar rats. World J Innov Res. 2021;11(4):19-21.
5. Obatomi DK, Bikomo EO, Temple VJ. Antidiabetic properties of the African mistletoe in streptozotocin induced diabetic rats. J Ethnopharmacol. 1994;43:13-7.
6. Kuttan G, Vasudevan DM, Kuttan R. Effect of a preparation from Viscum album on tumour development in vitro and in mice. J Ethnopharmacol. 1990;29:35-41.
7. Hajto T, Hostanska K, Saller R. Mistletoe therapy from the pharmacologic perspective. Forsch Komplementarmed. 1990;6:186-94.
8. Stein GM, Pfuller U, Schietzel M, Bussing A. Toxic proteins from European mistletoe (*Viscum album L.*): increase of intracellular IL-4 but decrease of IFN-gamma in apoptotic cells. Anticancer Res. 2000;20:1673-8.
9. Lyu SY, Park S M, Choung B Y, Park W B. Comparative study of Korean (*Viscum album var. coloratum*) and European mistletoe (*Viscum album*). Arch Pharmacol Res. 2000;23:592-8.
10. Edlund U, Hensel A, Frose D, Pfuller U, Scheffler A. (2000). Polysaccharides from fresh *Viscum album L.* berry extract and their interaction with *Viscum album agglutinin. I.* Arzneimi Helforschung. 2000;50:645-51.
11. Wollenweber E, Wieland A and Haask A. Epicutical wax and flavonol aglycones of the European Mistletoe *Viscum album L.* Zeitschrift Fur Naturforschung C-A. J Biosci. 2000;55:311-7.
12. Matthew O, Earnest O, Erhirhie, Oluwatosin A. Effects of *Englerina drummondii Balle ex Polhill and Wiens* (mistletoe) from three host plants (cocoa, kola and coffee) on semen quality of Wistar albino rats. 2016.

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