

## INVIVO STUDY ON THE EFFICACY OF *Vernonia amygdalina* (BITTER LEAF) EXTRACT ON *Ascaris lumbricoides*, USING MICE

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### ABSTRACT

*Vernonia amygdalina* apart from being use for human consumption is a medicinal plant used locally in Nigeria for the management of parasite worms and other ailments. The study was conducted to determine the effect of ethanolic leaf extract of *Vernonia amygdalina* on *Ascaris lumbricoides*. Three (CBA strain) were grouped into six groups, each with the exception of those in group A were infected with *Ascaris lumbricoides* by feeding mice with food contaminated with mature Ova of *Ascaris*. Infected test groups were treated with graded doses of methanol extract of *Vernonia amygdalina* leaf invivo. Groups B & C served as both positive and negative control while groups D, E & F were treated with 200, 400 and 800mg/kg body weight of *Vernonia amygdalina* extract changes in weight and faecal examination of the infected groups were taken after a period of one month, 2 weeks. Evidence of treatment was detected in the study which shows difference in weight of the treated mice. The study revealed that *Vernonia amygdalina* might be better tolerated when administered orally, thus, it has a toxic potentiality against the organism *Ascaris lumbricoides*. The phytochemical constituents of the extract showed the presence of Tannin, saponins, Alkaloids, Cardiac glycosides and Anthraquinone.

**Keywords:** *Vernonia amygdalina*, *Ascaris lumbricoides*, mice, invivo, Phytochemical.

### INTRODUCTION

Herbal medicine, sometimes referred to as herbalism is the use of herbs for their therapeutic or medicinal value. A herb is a plant or plant part valued for its medicinal aromatic or savory qualities. It produces and contains a variety of chemical substances that act upon the body [1]. He also reported that 60-80% of the population of the developing countries receive treatment with the use of indigenous medicine.

Herbalist uses the leaves flowers, stems, berries and roots of plants to prevent, relieve and treat illness [2]. From a "Scientific" perspective, many herbal treatments are considered experimental [3]. [4] encourages the use of herbal medicine in our society because according to him, herbs are more accessible to most of the population. Today, science has isolated the medicinal properties of a large number of plants and their healing components and are now synthesized in large laboratories for use in pharmaceutical preparations [5]. Many drugs commonly used today are of herbal origin. Indeed, about 25% of the prescribed drugs dispensed in the United States contain at least one active ingredient derived from plant materials. Some are made from plant extracts, others are synthesized to mimic a natural plant compound, an example of such a plant is *Vernonia amygdalina* (Bitter leaf) [3].

***Vernonia amygdalina* (Bitter leaf)**

*Vernonia amygdalina* is a shrub of 2.5m tall with petiolate green leaves. Its branches are brittle, leaves green, oblong to lance shaped, veined and with pale soft hairs beneath [2]. The leaves are characteristically bitter but the bitterness can be abated by boiling or by soaking severally in clean water [6].

As the leaves of *Vernonia amygdalina* are used for consumption, they are washed before eating to reduce the bitter taste. The leaves are also used to stimulate the digestive system and reduce fever [2]. Furthermore, the leaves are used as local medicine against leish, which transmits bilharziasis [7]. Traditional healers also believe that the leaves possess anti-parasitic and bacterial agents [7]. In Sub-Saharan Africa, bitter leaf treats 25 more ailments including fever and intestinal complaints [8].

***Ascaris lumbricoides* (roundworm)**

*A. lumbricoides* parasitizes man in the tropics; it is more common in children than adults. The adult worm lives in the lumen of the small intestine of man.

The male is 15-20cm in length with tail that curved vertically with conical tip. Female is longer, stouter, measures 25-40cm with tail end neither curved nor pointed but conical. Their eggs are liberated from a fertilized female with faeces of the host [9]. The mode of infection is by swallowing embryonated eggs or inhalation of desiccated eggs of an infecting larvae through the lungs by man who is the only known definitive host [9].

**METHODOLOGY****Preparation of crude extract**

Healthy fresh leaves of *Vernonia amygdalina* were collected, sorted, washed to remove debris and dust particles without squeezing and shade dried. The dried leaves were milled into a coarse powder using mortar and pestle from which 40g was soaked with 350ml of distilled water in a beaker and the mixture shaken and left to stand for 24 hours before filtering. The filtrate was evaporated using a water bath to obtain a solid residue (aqueous extract). Different weights of the residue were prepared in distilled water and used for the test [10].

**Collection of stool sample**

Samples containing eggs of *Ascaris lumbricoides* were collected from a hospital laboratory and used for the study. Samples were preserved using 10% formal saline and stored in the refrigerator.

**Mode of infection**

CBA strains of mice were purchased from University of Jos, animal house. The mice were allowed access to water and feed to get used to the environment for 2 weeks before infection. Infection was carried out by contaminating their feed with positive samples of stool containing the eggs of *Ascaris lumbricoides*. Mice were observed for 10-14 days for any symptom of infection, while the control group was fed with feed which was not contaminated.

### Treatment of mice with crude extract

Mice were treated with crude extract of various concentrations, observed and fed with water frequently during this period.

The mice were randomly distributed into five groups:

Groups A (normal control group).

Groups B (positive control) were infected with *Ascaris lumbricoides* received 5mg/kg of mebendazole.

Groups C (negative control) were infected with *Ascaris lumbricoides* receive no treatment.

Groups D were infected with *Ascaris lumbricoides* received 200mg/kg of *Vernonia amygdalina* extract.

Groups E were infected with *Ascaris lumbricoides* received 400mg/kg of *Vernonia, amygdalina* extract.

Groups F were infected with *Ascaris lumbricoides* received 800mg/kg of *Vernonia, amygdalina* extract.

### RESULTS

The results obtained from the phytochemical screening of *Vernonia amygdalina* ethanolic leaf extract revealed the presence of some secondary metabolites as shown in Table 1. The presence of these secondary metabolites in this extract may be responsible for the anti-ascaris activity of *V. amygdalina*.

**Table 1: The phytochemical constituents of ethanolic leaf extract of *V. amygdalina***

Phytochemical component	Inference
Tannins Ferric chloride test	++
Saponins Frothing test	++
Alkaloids Meyers' test	++
Cardiac glycosides sulphuric test	++
Anthraquinone Ammonium test	++
Glycosides Fehlings' test	++

**Key: ++ (Present in moderate concentration)**

The ethanolic leaf extract of *V. amygdalina* caused 25%, 20% and 15% suppression in parasitaemia *A. lumbricoides* infected mice at 200mg/kg, 400mg/kg and 800mg/kg respectively while mebendazole (vermex), a standard drug used exerted 100% suppression at 5mg/kg (Table 2). Extract with 200mg/kg of *V. amygdalina* showed the highest suppression (25%) compared to others.

**Table 2: suppressive effect of *V. amygdalina* ethanolic leaf extract and mebendazole against *A. lumbricoides* infected mice**

Treatment	Worm density	Percentage growth inhibition (%)
Group A	Nil	Nil
Group B	Nil	100
Group C	Nil	Nil
Group D	5	25
Group E	4	20
Group F	3	15

The result obtained, mice infected and treated showed that the extract have effective therapeutic effect on the parasite (Table 3).

**Table 3: summary of experimental result obtained from infection of mice**

TEST	NO	%
Those infected and treated	3	15
Those infected and not treated	3	15
Those that die during infection	4	20
Those that die during acclimatization	5	25
Those not infected	5	25

## DISCUSSION

The result obtained from the treatment of the infected animal showed the medicinal value of the plant. The plant extract showed effective therapeutic effect on *Ascaris lumbricoides* in mice. The extract was administered to the mice for seven days. Positive result was observed from the fourth day while a total cure was seen at the seventh day. Phytochemical screening of the plant revealed the presence of Tannins, Saponins, Alkaloids, Anthraquinone, Cardiac glycosides and glycosides. Based on this, the plant *Vernonia amygdalina* can be used in the treatment as *Ascaris lumbricoides* as an alternative to synthetic drugs. This is in agreement with the findings of [10] that the plant is used in the treatment of intestinal infections.

## CONCLUSION

In conclusion, based on the experiment carried out, it was observed that the plant has medicinal value against *Ascaris lumbricoides* and can be used as an alternative to synthetic drug.

## REFERENCES

1. Owonubi, M.O. (1988): Medicinal Plant and Traditional Position. Problems perspectives of their standardization Edited Sofowora Ibadan University Press pp 65-70.
2. Ojiako, O. A. and Nwanjo, H.U (2006): Is *Vernonia amygdalina* hepatotoxic or hepatoprotective? Response from biochemical and toxicity studies in rats. *African Journal of Biotechnology* Vol. 518: 1684-1651.
3. Sofowora A.E. (1982): Medicinal Plants and Traditional Medicine in Africa. John Wiley and Sons Limited New York 2<sup>nd</sup> pp 143-145.

4. Fawole, M.O. and Oso, B. A (1988): Laboratory Manual for Microbiology “Spectrum Books Limited, Ibadan 68-74.
5. Anonymous (1999): A Bitter Principle and a Related Steroid Glucosides of *Vernonia amygdalina* Leaves, Extracts and Purified Saponins in Mice Production. “Bioactive substance in food of Plant Origin. 22-24 September 394-399.
6. Anonymous (2000): Antimicrobial Activity of *Vernonia amygdalina* leaves fitoterapia. *Journal for the study of Medicinal Plant*. 70 428-432.
7. Butter, G.W. and Bailey, R.W (1993), Chemistry and Biochemistry of Herbage Vo.1 Academic Press, New York.
8. Oguz F. Agop Citak, Emin Unuvar (2000): Airway foreign bodies in children. *International journal of parasitology*. Edited 52: 11-16.
9. Ibrahim M.A, Nwude,N, Ogunsusi, R.A and Aliu, Y.O (1984). Screening of West African Plants for Antihelmintic activity. *International livestock centre for Africa Bulletin* 17: 19-23.
10. Richard, M., Michael, M., Pamela, M., Duff, J., and John, S. (1988). The complete New Herbal. A Practical Guide to Herbal Living. Oxford Press New York 140-143.