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ANTISCHISTOSOMAL PROPERTIES OF EXTRACTS OF *JATROPHA CURCAS* (L) ON *SCHISTOSOMA MANSONI* INFECTION IN MICE.

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Abstract

Mice aged between 4-5 weeks infetected with *Schistosoma mansoni* were treated with 20 mg/kg of methanolic leaf extracts of *Jatropha curcas* per day for five days using praziquantel as positive control.. The untreated control group was administered with 0.5ml of liquid paraffin. The extract of *J. curcas* produced a worm reduction of 8.33% while praziquantel gave a 97% reduction in worm burden showing that the extract possess little or no antischistosomal activity.

Key words: *Jatropha curcas, Schistosoma mansoni*

Introduction

Schistosomiasis otherwise known as Bilharziasis is a public health problem with considerable magnitude in man and domestic animals. The disease is caused by a digenetic trematode of the family Schistosomatidae and genus *Schistosoma*. Currently it affects over 200 million people in 76 countries of the world with another 600 million at risk (WHO, 1990).

Many community-based programmes depend on Praziquantel for treating patients with schistosomiasis and other fluke infections. There is however, loss of Praziquantel efficacy (Charles et al.,2000) and its inaccessibility (Anthony et al., 1994) and high cost requiring hard currency (Kloos and McCollough 1982) which set back helminthes control efforts. There is the need to screen local plants as other alternative source of schistosome chemotherapeutic agents. This claim is due to the frequent use of plants by most people in the developing third world countries in primary health care (Fransworht, 1993., Houghton, 1995). Plants are known to offer excellent perspective for the discovery of new therapeutic products (Cox and Balik, 1994) whose subsequent development may lead to discovery of a safe and therapeutically effective form of useful drugs (Philipson, 1994). In several trials using different plants, promosing antischiostosomal compounds were reported by several

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workers (Aliou et al., 1986., Canxi and Enst, 1982., Kucera and Kucerova, 1975., Per et al., 2001 and Istifanus and Adamu, 2001)

The promising results obtained from plants, encaurages the screening of more plants for their antischistosomal activity so as to come up with more natural products that are effective schistosomicides. Thus, a good substitute to the current singularly used synthetic antischistosomal drug, Praziquantel, may be obtained for chemotherapeutic treatment of Schistosomiasis especially in rural communities where these plants abound. It therefore becomes very important to screen and evaluate the potency of some local plants that are active on parasitic organisms such as schistosomes (WHO, 1993). *Jatropha curcas* (Euphorbiacaea) is a shrub that grows to a height of about 6 metres and its distribution is worldwide. The roots, stems, leaves seeds and fruits of the plant have been widely used in traditional folk medicine in many parts of West Africa. (Adam, 1974).

Material and Methods

Collection and processing of plant sample

The leaves of *Jarropha curcas* ealier identified (Adamu, 1998) were collected along Bauchi-Kano road where they abound. Specimen samples of plant was collected and preserved in plant pressed (Kela, 2000). Voucher specimens (*Jatropha curcas*, NIPRD 5485) was subsiquently deposited in the herbarium of the National Institute for Pharmarceutical research and Drug Development, Idu, Abuja, Nigeria.

Sample was allowed to dry at room temperature on the laboratory bench for 3 weeks before being pulverized to fine powder in a wooden motar and a pistle. 200gm of pulverized material was soaked in 250ml methanol (Analar grade) in 500ml round bottom flask. The mixture was left on the laboratory bench for 72 hours with frequent stirring after every 24 hours. Soaked sample was filtered and the filterate was allowed to evaporate at ambient temperature of the laboratory in a fume chamber. This methanolic extract obtained without concentration by heat were scrapped and stored at 4^{o}C in a refrigirator in labelled specimen bottles for use in the *in vivo* screening tests.

Thirty five male albino mice aged between 3-4 weeks were collected from National Veterinary Research Institute, Vom, Nigeria. Fifteen animals were challenged each with 130-150 *Schistosoma mansoni* cercaria obtained from laboratory infected *Biomphalaria pfeifferi* snails by modified tail immersion technique (Stirewalt and Branson, 1955). Infected animals were caged and fed mice chow and drinking water ad libatum. At day 40 post infection, mice were devided in to three groups of 5 each each. The first group was treated with 2mg of *J. curcas* via 0.5ml paraffin over five days period consecutively. The second group were treatd with Praziquantel at 200mg/kg. b.w via 70% glycerine while the third group were administered with 0.5ml of blank liquid paraffin over five days period. Maximum tolerated dose (MTD) of the extract was determined (Basil, 1963) using 15 mice of the same age with the experimental animals. Treated mice were allowed a 10 days resting period after which they were sacrificed and worms were recovered by dissection method of recovery(Olivier, 1953). Results obtained were subjected to Students' t-test (Sabah, et al., 1985).

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Results and Discussion

The antischistosomal properties of methanolic extracts of leaves of *Jatropha curcas* have been evaluated. Worm burden of animals represents the total number of worms recovered from each group of treated animals and the untreated control group. During the recovery of these worms, their sexes as well as the number of paired male and female worms were recorded. The total number of worms obtained per treated group was considered as the total worm burden of that particular treatment. An overall total of two hundred and sixty four (264) worms were recovered from the fifteen infected animals used in the experiment.

Table 1:. Total *Schistosoma mansoni* worm recovered from infected mice treated with Praziquantel, *Jatropacurcas e*xtracts and Blank control

		Worms recovered				
	animal (n)	male	female	paired	Total Mean	Liver score
Praziquantel	5	08	03	0	11	-
J.curcas	5	26	17	39(2)	121	2.8
Control	5	37	19	38(2)	132	3.2

One hundred and twenty one worms were recovered from mice treated with extract of *J. curcas*. This gave a mean worm burden of 24.2 $\pm$ 4.76 per mouse. A total of 26 (21.48%) male worms were recovered while 17 (14.04%) of the worms recovered were females, with 39 (64.46%) as paired worms (Table 1). A total of 11 worms were recovered from the praziquantel treated mice. This gave a mean worm burden of 2.20. $\pm$ 0.84 for the group. Out of the eleven worms recovered, 8 (72.72%) were found to be males and 3 were females. No paired worms were recovered from any of the animals treated with praziquantel. A significant difference in reduction of worm burden was observed between all the animals treated with praziquantel compared with those from the untreated control group administered with liquid paraffin ($P < 0.05$)

The total worm burden recovered from the untreated control group gave an idea of the rate of experimental infection. A total of 132 worms recovered represent an infection rate of 18.8 %. This corraborates with other work (Standen, 1963) where the rate of development of cercaria to adult schistosomes worms was found to be between 18-22%.The maximum tolerated dose (MTD) of *Jatropha curcas* was found to be 125mg/kg and toxicity signs of extracs include drowsiness, loss of conciousness, limbness of the test animals and subsequent death six hours after oral administration of 125mg of the extract. This conforms with the reports of other works on the toxicity of

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various parts of this plant particularly the seeds and the seed oil which is also known as hell oil (Jourbert et al., 1984).

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