International Journal of Tropical Medicine 1 (4): 170-172, 2006

Therapeutic Effect of *Aristolochia bractealata* Extract Against Experimental *Trypanosoma evansi* Infection

[1]H.A.R. Samia, [2]K.H. Elmalik and [3]H.S. Khalid
[1]Department of Biochemistry, Central Veterinary Research Laboratory,
P.O. Box 8067 (Al-amarat) Khartoum, Sudan
[2]Department of Preventive Medicine, Faculty of Veterinary/Medicine, University of Khartoum
[3]Department of Phytochemistry, Medicinal and Aromatic Plant Research Institute

Abstract: *Aristolochia bracteolata* of the family Aristolochiaceae, which was reported in the treatment of malaria and sleeping sickness, was evaluated for its *in vivo* activity against *Trypanosoma evansi* infection in rats. Six groups of 10 rats each aged 5-7 weeks, average weight 150 grams were used. The plant extract was administered orally at dose rates of 250 and 500 mg kg^{-1} BW for both the chloroformic and methanolic extract. The activity was compared to Cymelarsan which was given at a dose rate of 2.5 mg kg^{-1} BW subcutanously. Results showed that the plant extract gave a promising trypansocidal effect. The chloroformic extract gave better result than that of the methanolic extract with both doses. Its use as a new trypanocidal preparation needs further work to identify the bio-active agent(s).

Key words: *Aristolocjia*, infection rats, cholorofomic, typanocidal

INTRODUCTION

Trypanosoma of the family trypmanosomatida cause a group of diseases called trypanosomosis. The diseases are widely distributed in Africa, South America, Asia and Middle East[1,2]. *Trypanosoma evansi* causes a disease called surra. It is an important disease of livestock in Africa and Asia causing great economic losses in camels and buffalo. *Trypanosoma evansi* is mechanically transmitted during the feeding of blood sucking diptera especially Tabanid flies[3]. The disease has been reported continuously in Western, central and Eastern Sudan[4-6].

Control of trypanosomosis depends beside vector control measures, on the use of trypanocidal drugs. The chemotherapy is often tried as the first priority in camel trypanosomosis. The extensive use of drugs has resulted in the appearance of drug-resistant trypanosomes in many parts of Africa and elsewhere[3]. The situation was made worse by the lack of new trypanocidal drugs. With the exception of cymelarsan, no new and effective trypanocidal compounds has brought into field use for at least twenty years.

In Sudan as in many other countries, herbal treatment of various diseases is a common practice. Because of the drug resistance, relapse and side effects, phytotherapy is therefore being restored to, in developing countries, owing to the low price and easy accessibility. Many natural products of plant origin, with a wide range of different chemical structure, have been reported to have activities against different species of protozoan parasites including, plasmodium, Trypanosoma, Leishmania and Entamoeba[7]. In Sudan however, herbal treatment of camel trypanosomosis was reported.

Aristolochia bracteolata is a member of the family Aristolochiaceae. It is used in Kenya, Tanzania, Ethiopia, and Sudan for the treatment of infections with nematodes[8].

MATERIALS AND METHODS

Materials: Swiss Albino rats (Albino wister) were obtained from the laboratory animal unit of the central Veterinary Research Laboratory, Soba. They were housed in plastic cages, fed on pelleted mixed diet and fresh vegetables and were watered *ad libitum* throughout the experiment.

Trypanosoma evansi was isolated from naturally infected camel at Soba region, Khartoum town. Infected blood was inoculated into a mouse for propagation and at the peak of parasitaemia, the infected mouse blood was cryopreserved in liquid nitrogen.

Trypanosomes counting was carried out by the rapid matching wet-count technique of Herbert/Lunsden[9] was used. this entailed examining a drop of mouse tail blood

Corresponding Author: H.A.R. Samia, Department of Biochemistry, Central Veterinary Research Laboratory, P.O. Box 8067 (Al-amarat) Khartoum, Sudan

under the X 40 magnification and counting the number of trypanosomes in each field. Each count per field was matched the log figures obtained from the reference table[9]. The log figures were converted to absolute number of trypanosomes per ml of blood.

Aristolochia bracteolata was collected from Joba, South of Sudan. Identification of the plant was carried out at the Medicinal and Aromatic Plant Research Institute. The whole aerial part of the plant after collection was sun dried and than later ground to powder. The powdered plant sample was extracted successively with chloroform and methanol respectively by percolation. It was evaporated at 40°C low pressure using a rotatory evaporator. The solid extract obtained was removed, weighed and stored as the stock solution for use.

Experimental design: Six groups of 10 rats each were divided as follows:

Group 1 infected and untreated control.

Group 2 infected and treated with cymelarsan at a dose rate of 2.5 mg kg^{-1} BW.

Groups 3 infected and treated with 500 mg kg^{-1} BW chloroformic extract.

Group 4 infected and treated with 250 mg kg^{-1} BW choroformic extract.

Group 5 infected and treated with 500 mg kg^{-1} BW methanolic extract.

Group 6 infected and treated with 250 mg kg^{-1} BW methanolic extract.

Trypanosomes were injected intraperitonially at an inoculation of 5×10^5. At the onset of parasitaemia, the plant extracts were administered orally till the absence of parasitaemia. Cymelarsan was administered subcutaneously at a dose rate of 2.5 mg kg^{-1} BW as prescribed by manufacture. Parasitaemia was checked daily for 30 days.

RESULTS

Cymelarsan was used as a standard drug for treatment of *T. evansi*. It was clear that no relapse occurred after clearance of the parasite occurred in the second day of treatment till the end of the experimental speriod. When the chloroformic extract was administered at a dose rate of 500 mg kg^{-1} BW. The parasite disappeared at day 2 of treatment with relapse only on two rats with percentage rate 20% at day 15 of treatment and when the extract was repeated the rats became a parasitaemic till the end of experimental period. With 250 mg kg^{-1} BW chloroformic extract there is clearance of the parasite on day 7 of treatment in 8 rats but relapse occurred on day 12 and no clearance occurred after till the end of experimental period. The 500 mg kg^{-1} BW methanolic extract caused clearance of the parasite on day 3 and 4 of treatment for 8 rats but relapse occurred at day 15 of treatment for 5 rats with no clearance of the parasite occurred when the extract was repeated. With 250 mg kg^{-1} BW of the methanolic extract there is decrease in the parasitic count with slow movement but without clearance till the end of the experimental period. The untreated control rats showed increase in the parasitic count till the rats died or slaughtered at the end of the experimental period.

DISCUSSION

Aristolochia bracteolata extracts produced a very promising antirypanosomal activity. The highest activity was found in the chloroformic extract where the clearance occurred in all rats used and 20% percentage rate of relapse. The highest activity displayed by the chloroformic extract, as compared to the methanolic extract, indicates that the chloroform might be capable to extract the biological active principles(s) responsible for the trypanosocidal effect of *A. bracteolata*. Given the promising result of this initial investigation and as effect on trypanosomes, it is necessary to carry a phytochemical study to characterize its active components, before it could be used in other animal models including camels.

ACKNOWLEDGEMENT

This research was supported by the animal resources Research Corporation and carried out in the Central Veterinary Research Laboratory.

REFERENCES

1. Hoare, C.A., 1972. The trypanosomes of mammals, Blackwell Scientific Publications. Oxford.
2. Molyneux, D.H. and R.W. Ashford, 1983. Una nuova cause didematite de contatto: La Propolis. Giornale Ltalino diDermatologia a Venereologia, 117: 119-122.
3. Ford, J., 1971. The role of trypanosomes in African Ecology. A study of the Tsetse fly Problem, Oxford, Clarendon Press.
4. Hakimadar, E.S., 1987. Some epidemiological studies on camel trytpanosomosis in Northern Kordofan. M.V.Sc. thesis. University of Khartoum.

5. Homeida, T.A., 1993. Some epidemiological studies on animal trypanosomiasis at Sinnar, Kosti and Eldeum districts. (Central States of Sudan). M.Sc. Thesis. University of Khartoum.
6. ElRayah, I.E., 1997. Some epidemiological studies on drug-resistant *Trypanosoma evansi* isolated from Sudan. A Ph.D. thesis. Vet. Sci. Univ. Khartoum, pp: 15-17.
7. Barbara Raz, 1998. Isolation and evaluation of antiparasitic lead compounds from African Medicinal plants. A Ph.D. thesis University of basil.
8. El-Tahir, A., G.M.H. Satti and S.A. Khalid, 1998. Antiplasmodial activity of selected Sudanese medicinal plants with emphasis to *Acacia nilotica*. Phytotherapy, Res., 13: 474-478.
9. Herbert, W.J. and W.H.R. Lunsden, 1976. *Trypanosoma brucei:* A rapid "matching" method for estimating the hosts parasitaemia. Expt. Parasit, 40: 427-431.