REPORT

PHYTOCHEMICAL COMPONENTS OF HUNTERIA *UMBELLATA* (K. SCHUM) AND ITS EFFECT ON ISOLATED NON –PREGNANT RAT UTERUS IN OESTRUS

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ABSTRACT
Hunteria umbellate plant is used by West African traditional midwives as phytomedicine in herbal remedies to treat pregnancy related ailment and most especially to augment or induce labour in gravid uterus.The purpose of this study was to investigate this claim with view to validating scientifically the ethno - medicinal usage.
The phytochemical analysis of the crude medicinal plant extract revealed the presence of saponin, saponin glycosides, steroid, tannins, volatile oils, phenols and copious amount of alkaloids.
The aqueous extract obtained by maceration technique was subjected to pharmacological testing in vitro on a piece of isolated rat uterus previously pretreated with stilbesterol, suspended in De Jalon at 37^{o}C and aerated with 95% Oxygen and 5% CO_2. The oxytocic activity of the aqueous pulp extract of the pulp of *Hunteria umbellata* was compared with uterine stimulant like oxytocin.
The extract affected the contractility of the uterus significantly ($P<0.05$) in a dose dependent manner. The effect of 10mg/ml extract was blocked by 0.1ml of 0.1mg/ml atropine. The extract also potentiated the response shown by various doses of oxytocin.
This preliminary investigation revealed that *Hunteria umbellata* has oxytocic effect thus justifying the use by the traditional birth attendants.

Keywords: *Hunteria umbellata*, rat uterus, oxytocic.

INTRODUCTION

Traditional medicine practice is generally gaining wide acceptance in both developed and developing countries. In Africa the use of herbal medicine is as old as mankind (Sofowora, 1983). This is probably due to the natural abundance and easy availability of these natural products.

Hunteria umbellata is a small tree having smaller flowers and fruits and the leaves broad, elongated, measuring about 10-20 x 3.5-10cm.

Hunteria umbellata (K.Schum) is a tree of about 12m high and 1 m in girth. It resembles *Picralima nitida* but has much smaller flowers and fruits. The use of this plant in herbal medicines has been reported (Bevan *et al.*, 1967). The active chemical principles responsible for the medicinal properties of the plant have also been determined and these are alkaloids such as the vinca and the indole type. The main alkaloids are acetyl corymine, corylmine and isocorymine (Bevan *et al.,* 1967). The effect of the seed on the haematological parameters was also determined (Ibeh *et al.*, 2005).

The plant is also used for the treatment of yaws, stomach ulcers, diabetes and dysmenorrheal and the seeds of *Hunteria umbellata* have also been shown to be very active against microorganisms such as *E. coli*, *Proteus spp* and *Staphylococcus areus* (Ejimadu and Falodun, 2002).

The aqueous extract of *Hunteria umbellata* is used by the traditional midwives in the South and Western parts of Nigeria to induce or augment labour. The present study is aimed at investigating the claim by the traditional birth attendants/midwives with a view to validating the claims.

MATERIALS AND METHODS

Collection of plant materials
The fruits of *Hunteria umbellata* were obtained from Ekosodin Village in Ovia Local Governmemnt, Edo State. The plant and fruit were identified and authenticated by Dr. M. Idu of the Department of Botany, University of Benin, Benin City. Nigeria.

Preparation of plant material
The fresh ripe fruits of *Hunteria umbellata* were opened and the pulp removed. The seeds were squeezed out of the pulp. The pulp was sun dried for a period of one week and powdered with aid of a mechanical grinder.

Extraction
The powdered pulp (100g) was dissolved in 200ml of distilled water and left overnight. The solution was filtered

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and concentrated in rotary evaporator at reduced pressure and kept in a refrigerator at -4°C until use.

Phytochemical screening of the extract

The powdered crude drug was subjected to qualitative chemical tests using the methods of Trease and Evans (1989) and Harborne, (1984). The components analyzed for are saponins, saponin glycosides, steroid, glycosides, anthraquinones, tannins, flavonoids alkaloid, volatile oils, phenols and reducing sugars.

Animal treatment

Female albino rats (four) weighing between 160-220g, obtained from the animal house of the Department of Pharmacology and Toxicology, Faculty of Pharmacy, University of Benin were brought into oestrus by injecting subcutaneously 48 hours before and with 0.1mg/kg stilbesterol in 50% ethanol (Vaele 1989,1992).The rat were killed by cervical dislocation and exasanquinated, uterine horns were removed, trimmed off mesenteric fat and a strip of longitudinal uterine smooth muscle 1.0-1.5cm were prepared and transferred into dish containing DeJalon solution. A thread was attached to each end of each piece and the preparation mounted in a 50ml organ bath containing the physiological salt solution (pH 7.35) of the following chemical composition NaCl, 9 g/l, $NaHCO_3$, 0.5 g/l, D-Glucose, 0.5 g/l, KCl, 0.402 g/l, $CaCl_2.2H_2O$, 0.08 g/l (Staff of the Department of Pharmacology,1970).

This was aerated with 95% O_2 and 5% CO_2 at 37°C. The tissue was connected to Ugo basil isometric transducer. Mechanical responses were recoded isometrically by means of the transducers connected to amplifier and a multi-channel recorder. The tissue was immersed in a physiological salt solution and equilibrated for 30 minutes under a resting tension of 0.5g.

The interaction of the extract of *Hunteria umbellata* alone on the tissue and also in the presence of 0.1mg/ml of Atropine was investigated.

Drug: Oxytocin (Glaxosmithkline Beecham)

Statistical analysis and data presentation

Data were subjected to analysis of variance using the Student t-test from the Instat package version a and b. Differences of $P< 0.05$ were considered to be statistically significant. Major differences between the various drugs and extract are noted in the text with n = 4.

RESULTS AND DISCUSSIONS

Table 1 show the phytochemical constituents identified in the plant, as alkaloids, saponins, tannins and reducing sugars. The thin layer chromatography TLC profile revealed the presence of 5 spots using a solvent system of Chloroform: methanol 1/1.

Table 1: Phytochemical compositions of the methanolic extract of *Hunteria umbellata (K.Schum)*

Chemical constituents	Aqueous extract
Alkaloids	+
saponins	+
Flavonoids	-
Tannins	-
Reducing sugars	+
Anthraquinone glycosides	-

+, Presence of component -, Absence of component

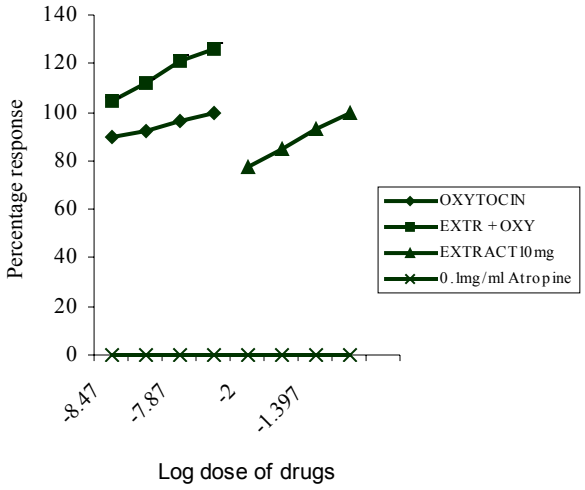

Fig. 1: Dose response curves of oxytocin and extract of hunteria umbellata (K. Schum).

Oxytocin elicited concentrationdependent contraction. 3.32 X 10^{-9} mg gave a contraction of 89.5% response while 2.56 X 10^{-8} gave 100% as the maximum response. The aqueous crude extract also contracted the uterus but much higher doses were needed. 0.05% of 10mg/ml (1X10^{-2} mg) gave a percentage response of 77.60 while 0.08mg/ml produced a maximum percentage response of 100 as shown in fig. 1. The aqueous extract of the plant potentiated the effect oxytocin induced contractions as shown in fig. 1.

The crude extract of *Hunteria umbellata* contracted the uterus thus indicating that the plant has oxytocic effect. The dose that elicited this effect is much higher compared to that of oxytocin. This could be due to the fact that the crude

extract could be less potent than oxytocin. The extract potentiated the effect of oxytocin induced contractions, probably because the extract has an additional synergistic effect to that of oxytocin or the extract could be working through the same mechanisms as oxytocin and therefore gave rise to an enhanced effect.

CONCLUSION

The results of this study indicate that the crude extract of *Hunteria umbellata* pulp contained one or more active principles with agonist activity on the uterine contractile response. It was established in this study that the aqueous extract of *Hunteria umbellata* has oxytocic activity. It stimulated uterine contractions to varying degrees. It significantly ($P<0.05$) augmented the initial response to oxytocin and were able to produce initial phasic contractions followed by tonic contractions at higher doses. The study also revealed that the extract of this plant interact with receptors of the muscarinic cholinergic system in the uterus as it was blocked by atropine, (muscarinic antagonist) but results of this receptor interaction are not given. However, further studies would be carried out to ascertain the mechanism of action.

The results of this study lend support to the folkloric use of the plant as oxytocoics.

Further studies will be carried out to isolate, characterize and determine the mechanism of action of the drug.

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