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THE EFFECT OF AQUEOUS LEAF EXTRACT OF *TELFARIA OCCIDENTALIS* ON ISOLATED GUINEA PIG ILEUM

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The effect of aqueous extract of *Telfaria occidentalis* was studied *in vitro* on the guinea pig ileum. The extract elicited a dose dependent contractions of the ileum. These responses were blocked by 5×10^{-7} M mepyramine and 5×10^{-7} M atropine, suggesting that it has both histaminergic and cholinergic properties. The usefulness of the plant as potent naturally available purgative is presented in this study.

Key words: Vegetables, Contraction, Ileum, Cholinergic and Histaminergic

INTRODUCTION

Leafy vegetables and citrus fruits are commonly taken as natural purgative as a remedy for constipation. The leafy vegetables belong to the bulk type of purgative and it is believed to be the most satisfactory prophylactic and treatment for functional constipation because of its richness in fibre (Selvendran, 1984). The fibre acts as a laxative by virtue of binding water and ions in the colonic lumen and thereby softening the faeces and increasing their bulk. The increase in the volume of intestinal content also causes distension of the intestine which induces a reflex countering of musculature and increase in power and speed of peristalsis (Stephen and Cummings, 1980).

Arowolo *et al* (1989) reported that consumption of some of these vegetables is sometimes accompanied by some side effects such as gastrointestinal discomfort and ulcer. The side effects were attributed to the cathartic property of the vegetables. These altogether raises strong curiosity on the mechanism of action of the cathartic effect of these vegetables. In this study, we report the pharmacological potency of *Telfaria occidentalis*, a commonly consumed Nigerian vegetable on the guinea pig ileum muscle.

MATERIALS AND METHOD

Plant material

Fresh leaves of *Telfaria occidentalis* were bought at a local market in Ibadan, Nigeria. The leaves were identified and authenticated by a qualified taxonomist at the botany department, University of Ibadan. The leaves were then washed and cut into very small pieces. 100g of each vegetable was weighed, the aqueous extract was obtained by squeezing the vegetables pieces in 100mls of distilled water and then filtered with a filtering funnel packed in glass wool. The final filtrate concentration (1gm/ml) of each of the extracts from which further dilutions were made when desired were used in this study.

Guinea pig ileum preparation

The terminal portions of freshly killed guinea pig ilea were used. Clean ileal segments 2-3cm long were prepared. One end was fixed to a pin attached to the glass aerating tube and the other to a writing lever which was adjusted for tension (0.5g) and for recording (six times magnification) on Kymograph drum Biosciences, Kent, England). The whole preparation was set up in a 20ml organ bath containing aerated Tyrode solution (NaCl 0.0, CaCl₂ 0.2; KCl 0.2; MgCl₂ 6H₂O 0.2; NaH₂PO₄ 0.05 NaHCO₃

1.0 and glucose 2.0g/dl) and maintained at a temperature of 37°C. After an equilibration for 30 minutes the aqueous extracts were added sequentially in graded doses to the bath. After a dose response curve for the extract had been established, the preparation was exposed to predetermined doses of 5×10^{-7} M mepyramine maleate (Poulenc Ltd. Montreal, Quebec.) and 5×10^{-7} M atropine sulphate (Nutritional Biochemical Corporation, Cleveland, Ohio) for a period of 10 minutes and the dose response curve reestablished for the extracts.

RESULTS

The extract of *Telfaria occidentalis* produced dose dependent contractile responses of the isolated guinea pig ileum. The response elicited by the extract was blocked by both atropine (Table 1) and mepyramine (Table 2).

Table 1: The means + S. E. M of percentage responses of guinea pig ileum to varying doses of extract of *Telfaria occidentalis* alone (ET) and in the presence of 5×10^{-7} M mepyramine (ET + MEP)

Log Dose	(ET)	(ET + MEP)
2.7	8.00 ± 1.01 ^a	0.41 ± 0.41 ^b
3.0	17.48 ± 1.33 ^a	2.27 ± 1.42 ^b
3.3	47.98 ± 5.45 ^a	11.87 ± 4.04 ^b
3.6	83.80 ± 9.	28.43 ± 13.84
3.9	100.00 ± 0.00	43.43 ± 12.27
4.2	90.70 ± 3.97	-

N.B Different superscripts within rows are significant at ($P < 0.05$).

Table 2: The means + S. E. M of percentage responses of guinea pig ileum to varying doses of extract of *Telfaria occidentalis* alone (ET) and in the presence of 5×10^{-7} M atropine (ET + ATP).

Log Dose	(ET)	(ET + ATP)
2.7	8.00 ± 1.01	7.37 ± 5.13
3.0	17.48 ± 1.33	15.96 ± 4.10
3.3	47.98 ± 5.45	28.93 ± 4.73
3.6	83.80 ± 9.12	51.10 ± 7.49
3.9	100.00 ± 0.00 ^a	48.03 ± 2.32 ^b
4.2	90.70 ± 3.97 ^a	38.60 ± 2.27 ^b

The dose-response relationship for the extract with or without the known antagonists, atropine and mepyramine is shown in Tables 1 and 2. There was a shift to the right on the dose response curve plotted from the contractions elicited by the extracts in the presence of atropine or mepyramine. The dose ratio at ED₂₅ between the values obtained for extract alone (ET) and in the presence of atropine (ET + ATP) approximated unity, an indication of antagonism. The differences of the mean values of contractions caused by extracts alone and in the presence of both blockers are significant for most of the doses used.

DISCUSSION

The results obtained from this study point clearly to the fact that *Telfaria occidentalis* significantly contract the smooth muscle of the small intestine and these contractile effects are mediated by cholinergic and histaminergic receptors. The responses produced by extracts of *Telfaria occidentalis* on the intestinal preparation and the consequent inhibition of the responses by mepyramine and atropine respectively is an evidence of its cholinergic and histaminic properties. The contractile responses observed in this study appeared to resemble the recordings of the contractile effect of chemical transmitters on the smooth muscles of mammalian stomachs (Bovet *et al*, 1973; Ashton *et al* 1975; Vassilev *et al*, 1975; Bolton, 1979). Arowolo *et al* (1989) discovered that certain Nigeria vegetables are capable of contracting the intestinal wall and also lowering the blood pressure by stimulating the cholinergic and histaminergic receptors on the smooth muscle of the intestine and blood vessels respectively.

The present work further confirms another Nigerian vegetable as potent naturally available neuromuscular purgative. However, it should be noted that heavy consumption of these vegetable may be contraindicated, as reported for all laxatives by Devroede (1983) in patients with cramps, colic, nausea, vomiting

or other symptoms of appendicitis or any undiagnosed abdominal pain.

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