

**SPASMOLYTIC ACTIVITY OF METHANOL LEAF EXTRACT OF *LUPINUS ARBOREUS* ON GUINEA PIG ILEUM.***¹Ohadoma S. C., ²Osuala F. N. and ³Nnatuanya I. N.¹Department of Pharmacology, College of Medicine, Imo State University, Owerri, Nigeria.²Department of Pharmacognosy, Faculty of Pharmacy, Madonna University Elele, Nigeria.³Department of Chemical Pathology, Faculty of Medical Laboratory Science, Madonna University Elele, Nigeria.

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ABSTRACT

Aim: To investigate the spasmolytic activity of *Lupinus arboreus* on guinea pig ileum. **Methods:** The crude methanol extract (CME) of the dried leaves was obtained by 72 h cold maceration. The intestinal contents were removed by flushing with Tyrode's solution. The tissue was mounted in a 50 ml Organ bath containing Tyrode's solution, maintained at 35°C and aerated with air. A load of 0.5 g was applied. Response was recorded isometrically using Ugo Basile Unirecorder 7050. The CME, and in the presence of atropine (1×10^{-5} g/ml) and in the presence of atropine (1×10^{-5} g/ml), responses served as control. **Result:** The CME showed contractile effect on the guinea pig ileum; while the contractile effect was inhibited by atropine and reduced in the presence of epinephrine. **Conclusion:** The contractile effect suggest that *Lupinus arboreus* may not be effective in the management of colic pain.

KEYWORDS: Spasmolytic activity, *Lupinus arboreus*, Chikadoma, Guinea pig ileum, Leaf extract.**INTRODUCTION**

Spasticity is characterized by an increase in tonic stretch reflexes and flexor muscle spasms together with muscle weakness. It is often associated with conditions that involve abnormal function of the bowel and bladder as well as of skeletal muscle.^[1] Diazepam- a benzodiazepine, has useful antispastic activity by facilitating the action of γ -aminobutyric acid (GABA) in the central nervous system (CNS).^[1] Diazepam apparently acts at all GABA_A synapses, but its site of action in reducing spasticity is at least partly in the spinal cord.^[2] It can be used in muscle spasm of almost any origin, however, it produces undesired sedation in most patients at the doses needed to significantly reduce muscle tone.^[2] Other antispasmodics whose mechanism of action on the gut is similar to that of the opioids are diphenoxylate and loperamide. Loperamide may cause less sedation and be less addicting than diphenoxylate but none of them should be used in patients with severe ulcerative colitis, since toxic megacolon may be precipitated.^[3] The need for effective spasmolytic agents with less adverse effects makes the search of phytomedicine imperative.

Lupinus arboreus is known as "Chikadoma" in Igbo, South-eastern Nigeria.^[4] In English, it is called Yellow bush.^[5] *L. arboreus* is an ornamental plant with purple white colours blended with the bright yellow, sweet-

smelling flowers; a bushy shrub up to 1.8 m tall.^[6] Conditions in which the ancients employed lupine medically without scientifically proven documentation include ulcers, scabies, scal heads, deformities of the skin and other cutaneous distempers.^[7] The macerated boiled leaves of *L. arboreus* are applied for toothache and chest pain to reduce swelling and pain in folkloric medicine. The leaf extracts and fractions, have been reported to have a plethora of phytochemicals^[8] including terpenoids, alkaloids, steroids, glycosides, tannins, saponins and flavonoids; exerts antimicrobial effect^[9] and antinociceptive and anti-inflammatory effects.^[4] In this work, we investigated the effect of *L. arboreus* leaf on isolated guinea pig ileum.

MATERIALS AND METHODS**Collection and extraction of plant material**

The fresh leaves of *L. arboreus* were collected from Owerri, Imo State, Nigeria; and authenticated at the Department of Pharmacognosy, Madonna University, Elele, Nigeria, where a voucher specimen has been deposited in the herbarium. The leaves were air-dried at room temperature for 28 days.

The leaves ground to fine powder (2 kg) were extracted using absolute methanol (Sigma Aldrich, Germany) for 48 h. After filtration, the crude methanol extract (CME) was concentrated using a rotary evaporator (RV 05 Basic

IB, IKA, Staufen, Germany) and further oven dried and stored in a refrigerator.

Animals

Guinea pigs from the Animal House of Department of Pharmacology and Toxicology, Madonna University, Elele, Nigeria; under standard environmental conditions and fed with standard diet (NITR, Nigeria) and water *ad libitum*, were used.

Spasmolytic activity

The Guinea pigs were sacrificed by cervical dislocation and exsanguinations. Segments of the ileum (2.0 cm long) were removed and dissected free of adhering mesentery. By flushing with Tyrode's solution, the intestinal contents were removed. Maintained at 35°C and aerated with air, the tissue was mounted in a 50 ml Organ bath containing Tyrode's solution. A load of 0.5 g was applied. One hour (60 min) equilibrium period was allowed during which the physiological solution was changed every 15 min. The effects of acetylcholine (1×10^{-5} g/ml) and epinephrine (1×10^{-5} g/ml) at the end of the equilibrium period, were determined. The effects of the graded doses of the CME of *L. arboreus* leaf were determined. Likewise, the effects of the various doses of the CME in the presence of atropine (1×10^{-5} g/ml) and epinephrine (1×10^{-5} g/ml), which were incubated for 3 min prior to the introduction of the CME, was determined. Each concentration had a contact time of 1 min, which was followed by washing three consecutive times. The tissue was allowed for 15 min resting period before the next addition. Responses were recorded isometrically using Ugo Basile Unirecorder 7050.

RESULTS

CME of *L. arboreus* leaf contractile effect on the guinea pig ileum (Fig. 1). Contraction induced by CME of *L. arboreus* was inhibited by atropine (Fig. 1) and epinephrine (Fig. 3). In the control experiment, the contractile effect of acetylcholine on the guinea pig ileum was antagonized by atropine (Fig. 2). The effect of CME of *L. arboreus* was similar to that of acetylcholine (Fig. 2 and 3).

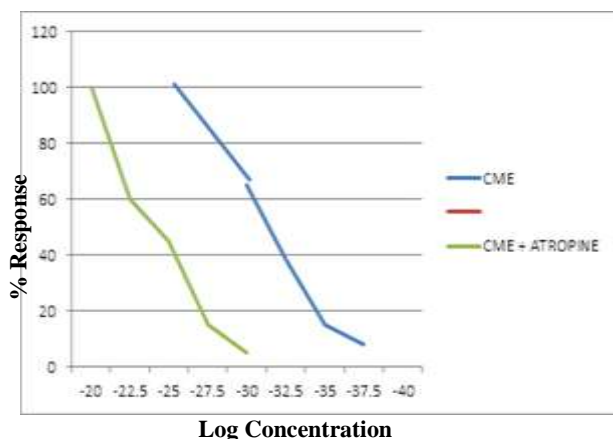


Fig 1: Spasmolytic effect of CME of *L. arboreus* and in the presence of atropine.

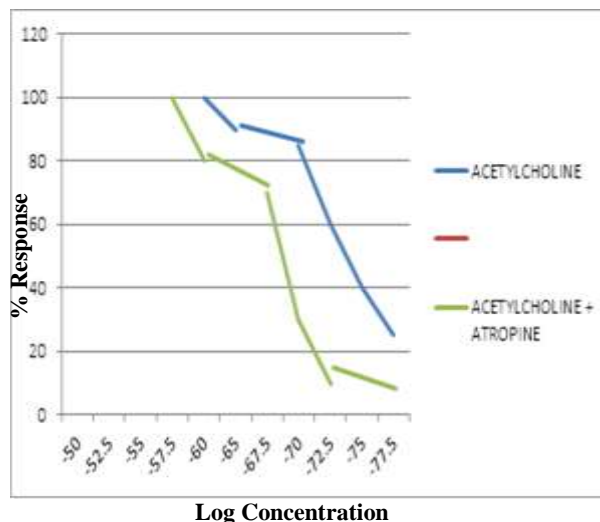


Fig 2: Spasmolytic effect of acetylcholine and in the presence of atropine.

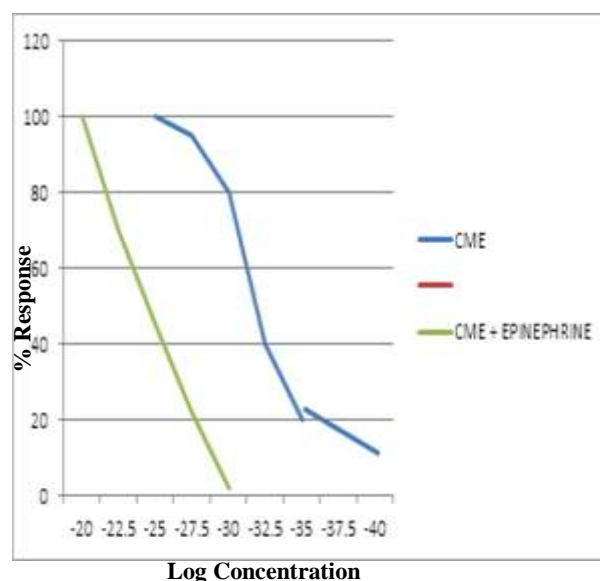


Fig 3: Spasmolytic effect of CME of *L. arboreus* and in the presence of epinephrine.

DISCUSSION

The results obtained in this study showed that methanol extracts of *L. arboreus* possess contractile effect. The observed contractile effect in this plant may cause constipation when used for a long duration of time. This corroborates previous studies which have shown that plant extract exerting contractile effect may not be effective in the management of colic pain except its analgesic effect overwhelms its colic effect on the gastrointestinal tract.^[10] The effect of *L. arboreus* was similar to that of acetylcholine (Fig. 2 and 3); supporting that *L. arboreus* has acetylcholine-like activity in which the alkaloid muscarine mimick parasympathetic effect.^[11] Most agents for colic pain have mechanism of action on the gut similar to that of the opioids and involve inhibitions of acetylcholine release through presynaptic opioid receptors in the enteric nervous system; and the use of anticholinergic agents as antispasmodics.^[3]

CONCLUSION

The leaf extract of *L. arboreus* was not spasmolytic on guinea pig ileum but contractile in effect, hence gives no credence to the folkloric use of *L. arboreus* for the management of colic pain.

Conflict of interest

The authors have not declared any conflict of interest.

Source of Support: Nil.

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