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Phytochemical Screening of the Aqueous Root Extract of *Leptadenia hastata* (Asclepiadaceae) in Maiduguri, Northern Nigeria

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ABSTRACT

Phytochemical screening of aqueous root extract of *Leptadenia hastata* was investigated in Maiduguri northern Nigeria, to evaluate the active component of the plant. Soxhlet extraction method was used to determine the phytochemical component of the extract. Saponins and flavonoids had high scores in the extract, alkaloids and pentoses had moderate scores, while tannins and ketones had low scores. Combined anthraquinones, free anthraquinones, reducing sugar, carbohydrates, glycosides and monosaccharides were not detected in the extract. In conclusion, *Leptadenia hastata* aqueous root extract contains pharmacologically active components which support its Ethno-botanical claims of traditional herbalist in Northern Nigeria in the treatment of various ailments.

Key words: Evaluation, chemical components, aqueous extract, *Leptadenia hastate*

INTRODUCTION

Leptadenia hastata belongs to the family (Asclepiadaceae) is a common plant in the Saharan and sub Saharan Africa. The leaves and bark of the plant are used in folk medicine to prepare antispasmodic, anti-inflammatory, antihistaminic, antibacterial diuretic, urolith expulsion, expectorant, gout and rheumatism remedies (Cioffi *et al.*, 2006; Panwar and Tarafdar, 2006; Abd El-Ghani and Amer, 2003; Aquino *et al.*, 1996).

It is mostly used as an alternative medicine or therapy in most African orthodox medicine (Buratai *et al.*, 2011; Sy *et al.*, 2009), especially in north eastern Nigeria and it is medicinally used for the treatment of various diseases such as inflammatory conditions, Diabetes and Diarrhoea and as a dewormer by the natives (Obidah *et al.*, 2009). The plant which is readily available to the majority of rural and urban populace in the treatment of various diseases However, there is paucity of scientific information on its phytochemical constituent and pharmacological components. Therefore, this study was aimed to investigate the phytochemical constituents which warrant pharmacological importance to the plant (Ojo *et al.*, 2006).

MATERIALS AND METHODS

Plant material: Fresh root *Leptadenia hastata* was collected from the University of Maiduguri Campus were identified by a botanist from the Department of Biological Sciences, University of Maiduguri, Maiduguri, Nigeria and a set of voucher herbarium was sent to the Department of Chemistry, University of Maiduguri, Maiduguri, Nigeria. The root were air dried under shade and

hand crushed to obtain a 350 grams powder, which was extracted in 1000 mL distilled water at 60°C for 8 h using a Soxhlet extractor. Extract yielded 6.4% w/w which was then concentrated on an aluminium tray and stored at room temperature (27°C).

Phytochemical screening: Phytochemical screening for tannins, anthraquinones, flavonoids and carbohydrates was carried out using the method described by Trease and Evans (2002); while glycosides, alkaloids, reducing sugars, monosaccharides, ketones, pentoses and terpenes by Sofowora (1982) and saponins by Harborne (1973). All observations were recorded and the number of positive signs indicated the intensity of the reactions that represents the quantity present.

RESULTS AND DISCUSSION

The result of the phytochemical screening for active substances is shown in Table 1. Saponins and flavonoids had high scores in the extract; alkaloids and pentoses had moderate scores, while tannins and ketones had low scores. Combined anthraquinones, free anthraquinones, reducing sugar, carbohydrates, glycosides and monosaccharides were not detected in the extract. The phytochemical screening results indicated high scores for saponins and flavonoids, moderate scores for alkaloids and pentoses which is in agreement with the findings by Asase *et al.* (2008) and Geidam *et al.* (2007).

Low scoring for tannins and ketones in this study is in conformity with findings by Buratai *et al.* (2011). While combined anthraquinones, free anthraquinones, reducing sugar, carbohydrates, glycosides and monosaccharides were not detected in this study which disagree with the findings by Buratai *et al.* (2011) which reported a moderate scoring in the for the compounds.

These organic compounds may account for the medicinal usage of decoctions of *Leptadenia hastata*. Saponins have been reported to have antimicrobial effects and could serve as precursors of steroidal substances with a wide range of physiological activities (Mahato *et al.*, 1992; Madusolomuo *et al.*, 1999). Similarly, tannins have been reported to have hepato-protective potentials (Ojo *et al.*, 2006); and stimulates cyclo oxygenase-2 (COx-2) which produces prostanoids that mediate pain, fever and inflammation processes (Smith *et al.*, 2000) and this suggests the important role of COx-2 in the management of acute pain processes.

Table 1: phytochemical components of *L. hastata* root aqueous extract

Components	Test	Scoring
Alkaloids	Dragendorff's	++
Tannins	Ferric chloride	+
Carbohydrates	Molish's	-
Flavonoids	Lead acetate	+++
Saponins	Frothing	+++
Glycosides	Salkowski's	-
Free anthraquinones	Bontrager's	-
Combine anthraquinones	Bontrager's+Sulphuric acid	-
Reducing sugar	Fehlings	-
Monosaccharides	Barfoed's	-
Pentose	Standard	++
Ketones	Standard	+

-: Not detected, +: Low concentration, ++: Moderate concentration, +++: High concentration

CONCLUSION

In conclusion, the finding from the present study supports the current use of *Leptadenia hastata* in Nigerian traditional medicine.

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