

## Antibacterial and Cytotoxic Actions of Chloroform Crude Extract of *Leptadenia hastata* (Pers) Decnee

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### Abstract

**Objective:** The study presented here was carried out for the evaluation of bacterial and cytotoxic potential of chloroform extract of Leaves of *Leptadenia hastata*. The Bacterial effects was tested against 4 bacteria namely *Salmonella typhi*, *Escherichia coli*, *Staphylococcus aureus*, and *Klebsiella pneumonia*.

**Methods:** The bacterial effect of the plant *Leptadenia hastata* was evaluated for potential antimicrobial properties *in vitro* by agar well diffusion method with four standard bacterial strains. *Artemia salina*; a brine shrimp species; was used to asses' cytotoxic activity of the plant extract.

**Result:** Among the subjected four bacteria; in case of *Staphylococcus aureus*, *E. coli* and *Salmonella typhi*; their zone of inhibition was higher ( $1.13 \pm 0.15$ ,  $1.23 \pm 0.12$  and  $1.03 \pm 0.06$ ) at 1000 ppm concentration. Whereas in the case of *Klebsiella pneumonia*, the zone of inhibition was higher ( $1.13 \pm 0.06$ ) at 500 ppm. The extract exhibited effectiveness against the four species of bacteria was significant. Cytotoxicity property which was reflected in LC50 value and was found to be dose dependent manner

**Conclusion:** The present results showed potential of the medicinal plant used by traditional herbal medical practitioners as natural anti-bacteria and can effectively be used for its significant action. It is also an effective cytotoxic agent and thus justify its use among herbal medical practitioners.

**Keywords:** *Leptadenia hastata*; Brine shrimps; Bacteria; Chloroform

### Introduction

Infectious disease remains a major public health problem throughout the world [1]. Pharmacological industries have produced many new antibiotics in the last three decades, but still resistance to these drugs by microorganisms has increased. In general, bacteria have the genetic ability to transmit and acquire resistance to drugs, which are utilized as therapeutic agents [2].

However, nature has blessed us with various herbs which are enriched with nutrient as well as medicinal values. For centuries, the purpose of food as well as medicine is served using herbs. Various herbs were in focus of research interest that possess anti-bacterial, anti-ulcer, anti-tumor, anti-diabetic properties that may be of use in adjuncts in helping the risk of diseases and ailments [3].

Most important effects of these herbs are because of compounds, such as alkaloids, tannins, flavonoids, terpenoids, saponins, and phenolic compounds [4]. The herbs are now in great demand in the developing world for primary health care not because they are inexpensive but because of their therapeutic, performance, better compatibility and acceptability with human body with low toxicity and minimal side effects [5].

The World Health Organization (WHO) estimates that 80% of the total population of some Asian and African countries, even the world

at large are presently uses herbal medicine for some aspects of primary health care which must compound derive from medicinal herbs [6].

Even as many plants are used traditionally for their antimicrobial properties, which results from the phytochemicals present in these plants. The plant *Leptadenia hastata* is one of such plants with antibacterial potentials.

*Leptadenia hastata* (pers) Decne is a perennial plant of the family of Asclepiaceae, the plant is edible non-domesticated vegetable and it is collected in wild throughout Africa. It is a voluble herb with creeping latex stems, glabrescent leaves, glomerulus and racemes flowers as well as follicle fruits, the leaves are up to 10 cm long, mostly ovate and light green. The flowers are cream or yellowish-green [7]. The vernacular names *Leptadenia hastata* include; hagalhadjar in Arabic and in chad, yadiya in Nigeria and Niger, while in Kusum hyala in Ethiopia. Ekamongo from Turkina in Kenya. Moore people call it mlolongo in Burkina Faso, Darhat from Wolof in busumba, amata from Jola in Senegal and Bambara's call it nzongne in Mali [8].

The plant is a very drought-resistance plant and can grow with 100-450 mm per year. It can tolerate high pH and high exchangeable sodium and potassium with the environment [9]. The leaves are edible, young leaves are collected washed and cooked before consumption. Farmers deliberately grow the species in their homes as food readily available [10]. Local healers use the plant for hypertension, catarrh and skin diseases [11]. The breeders commonly used the leaf and the stems for the treatment of parasites and against placental retention among their animals [12,13].