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## Screening of selected plants for their effectiveness in the treatment of kidney stone

Susmita Gudulkar, Karishma Rajbhar, Himanshu Dawda and Usha Mukundan\*

Plant Biotechnology Laboratory, Department of Botany, Ramniranjan Jhunjhunwala College, Ghatkopar (West), Mumbai 400086, India

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### Abstract

Kidney ailments have increased several folds in the last two decades. Kidney stones are one of the most common urinary tract problems to be found. It has been associated with increased risk of renal failure if not treated in the early stages. Kidney stones are well known as renal calculus. They are mainly composed of minerals like calcium oxalate. An interaction with the local practitioners in Raigad district of Maharashtra, India revealed that several plant species are being used as lithotriptic agents. A simple technique has been designed to evaluate the lithotriptic activity of extracts of leaves of *Bauhinia purpurea* L., seeds of *Colosia argentea* L. and seeds of *Macrotyloma uniflorum* (Lam.) Verde. Cystoliths and raphides which are aggregation of minerals are used as target minerals and their dissolution by the extracts of these plants are used as technique for evaluating the efficacy of these plants as lithotriptic agents.

### 1. Introduction

India has a glorious past of traditional medical system. Botanically derived medicine has played a major role throughout the history. Traditional knowledge is a valuable system continuously developed over generations by tribal and rural communities and transmitted from one generation to the other orally. The documentation of the indigenous knowledge on the utilization of local plant resources by traditional practitioners is one of the main objectives of ethnobotanical research. As these traditional knowledge is fast disappearing with time due to lack of scientific research, analysis and written documents. The authentication of herbal drugs is the need of the day (Alok *et al.*, 2013; Talele *et al.*, 2012).

The information of medicinal plants properties have been gathered from centuries based on diverse medicinal systems like Ayurveda, Unani and Siddha. It was found by the WHO report, that 60 % of the world's population depends predominantly on the traditional medicine while 80 % population in developing countries mostly use traditional medicinal practices and herbal medicines as a primary healthcare. Exploration of traditional medicine is an interesting and scientifically significant task for the ethnobotanists (Ram *et al.*, 2015). The process of calculi or stone formation is known as lithiasis. Lithiasis is concretion of material mainly mineral salts in any tissue of the body. Antilithics are the agents known for prevention from the formation of stone or promote the dissolution of formed calculi. The mainstream medical management of kidney stone problems is

expensive and may result in reoccurrence of the problems and the drugs used in the treatment also have a many side effect. Plant based medicines are effective and devoid of any such side effects (Choubey *et al.*, 2010; Arya *et al.*, 2017).

Herbal medicines are more effective with fewer side effects and reduce recurrence rate of kidney stone formation. Thus, it has gained much recognition for antilithiatic drug from natural sources. It is of greater importance and it is also future promising. Herbal medicines have many phytoconstituents which are helpful and beneficial in kidney stone treatment. Plant extracts contain phytochemicals that hinder stone formation by inhibiting synthesis or by agglomeration of crystals. Although, use of herbal medicine is popular and promising, it is fundamental to carry out further research to understand the pathophysiology of disease, mechanism of action of herbal medicines in order to develop an efficient and safe litholytic agent (Ram *et al.*, 2015).

An ethnomedicinal survey was undertaken to gather information from traditional healers of various parts of Maharashtra, India to cure kidney stone. Most kidney stones are calcium stones, combined with oxalate, phosphate and some time with uric acid (Choubey *et al.*, 2010; Arya *et al.*, 2017). Many plants were being used for effective treatment of kidney stones, out of which *Bauhinia purpurea* L., *Colosia argentea* L., *Macrotyloma uniflorum* (Lam.) Verde were selected in the present study.

Our study shows the efficacy of leaves of *B. purpurea*, *C. argentea* and *M. uniflorum* seeds in the treatment of kidney stones. To demonstrate the effectiveness of these plants on mineral stones, the *Ficus elastica* (containing cystolith) and *Colocasia esculenta* containing raphides were used. Cystolith is a term used for inorganic concretions generally of calcium carbonate and calcium oxalate which are formed in cellulose matrix in special

Corresponding author: Dr. Usha Mukundan,

Plant Biotechnology Laboratory, Department of Botany, Ramniranjan Jhunjhunwala College, Ghatkopar (West), Mumbai 400086, India.

E-mail: [umukundan@botanylab.com](mailto:umukundan@botanylab.com)

Tel.: +91-9869005339

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Ramniranjan Jhunjhunwala College,  
Ghatkopar (W), Mumbai-400086.