**ABSTRACT**

Arsha or its closed modern counterpart disease hemorrhoids is one of the commonly prevailing diseases which is affecting nationally and internationally. Over 23 million incidents had been reported in the world in 2005. Ayurveda also mentioned Arsha as a very harmful, very painful disease, creating disturbances and complications to the patient. According to Ayurveda there are four types of treatment for Arsha. Among them Ayurveda Kshara (Alkaline powder) treatments are very successful, highly efficacious treatment for Arsha or Hemorrhoids. The objective of the present study was to screening of preliminary phytochemicals of *Calotropis gigantia* Kshara(CGK), (vern: ArkaKshara). CGK was prepared according to the Susruta Samhitha which is the main surgical text book in Ayurveda and it was analyzed. Five grams portions of powdered CGK were each separately dispersed in 50ml of each Five solvents viz; water,70%, ethanol, acetone, methanol and hexane were used to obtain extracts from CGK. The extracts were subjected to qualitative phytochemical screening using standard procedures. Qualitative phytochemical screening of CGK was studied. Alkaloids by Wagner’s reagent test, Carbohydrate by Molisch’s test, Protein by Ninhydrin test, Saponine by Foam test, Cardiac glycoside by Keller Kellani’s test, Terpenoids by Salkowki’s test, Tannins by Braymer’s test, Sterols by Liebermann-Burchard test, quinone by HCL test and Phlobatanninsby Precipitate test, Flavonoids by Alkaline reagent test, Phenols by Ferric chloride test and also Anthraquinone, Coumarins and Oxalates were also tested by standard procedures. Results show that ten of fifteen phytochemicals screened were present. They are; Carbohydrate, Protein, Alkaloids, Cardiac glycosides, Oxalates, Terpinoids, Tanin, Phenolic compounds, Sterols and saponins. Further studies will be planned for develop standard drug in experimental level.

**Keywords:** Phytochemical Screening, Herbal Alkaline Preparation, Hemorrhoids, Arsha, Kshara, Arka, *Calotropis gigantia*. 

**INTRODUCTION**

In the world over 23 million people reported incident of Hemorrhoids and 36 million people reported ever having hemorrhoids in their life Ayurveda also mentioned Arsha as a very harmful, very painful disease, creating disturbances and complications to the patient. According to the signs and symptoms of Arsha, patient gets much worried and thoroughly inactive (Ash/Ni/7/2). Therefore patient badly suffers mentally, physically and socially. In modern medicine the diseases piles (Hemorrhoids) can be correlated with Arsha to some extent. Although prevalence of the Hemorrhoids are high, the success rate of cure of the disease in modern medicine is not satisfactory. As people are continuously affected with this disease and there is lack of successful treatment in allopathic medicine system, mortality and morbidity rate considered to be high due to complications of Hemorrhoids. There are various treatment modalities for hemorrhoids available in modern medical system in present. But they almost all are associated with symptomatic relief and which are not fully curative and presence complications due to surgeries. Hence present need is to find out effective, successful treatment to cure this disease completely. Ayurveda having about 3000 years medical history treated successfully these diseases. According to Ayurveda there are four types of treatments for Arsha as; Bheshaja (medical treatments), Kshara treatments (caustics), Agni treatments (fire cauterization) and surgery. Among them one of the Ayurveda Kshara treatments/Pratisaraneeya Kshara (external application of caustics) is very successful, highly efficacious and cost instrumental effective treatment for Arsha or hemorrhoids and it cures diseases completely. It gives many benefits to the...
patient such as quick action ,less side effects ,less toxic ,less ambulatory time, cost (include the coma) effectiveness, highly efficacious, simply and with free availability of the ingredients etc. Sushruta Samhitha which is the main surgical text book in Ayurveda describes about Kshara in detail and it indicates many suitable plants for Kshara preparation. Calotropis gigantia (Arka) is one of such plants described in Susruta Samhitha. Because of the above mentioned benefits of Kshara it was planned to develop this authentic, clinical tested Ayurvedic preparation (Calotropis gigantia Kshara (CGK) (vern: ArkaKshara) on this research study. Arka is easily available in Sri Lanka and easy to handle in Kshara preparation. The aim of this research work was to analysis of qualitative preliminary phytochemicals of CGK. Results show that ten of fifteen phytochemicals screened were present. They are; Carbohydrate, Protein, Alkaloids, Cardiac glycosides, Oxalates, Terpinoids, Tanin, Phenolic compounds, Steroles and saponins. This may be further helped in studies to develop standard CGK drug in experimental level.

MATERIALS AND METHODS

Collection of Plant Materials
Calotropis gigantia was obtained from natural habitat in Sri Lanka. The Whole plant was taken for the herbal Kshara(Caustic powder) preparation. The plant materials were transported in polythene bags to the Department of Shalya Shalakaya laboratory, Institute of Indigenous medicine, University of Colombo.

Processing of Plant Materials
The whole plants (stems, roots, leaves, flowers and seeds) of Calotropis gigantia (Arka) were washed in running water and cut into small bits to facilitate drying. Pieces of plant material were dried completely for 5 days from the sun shine. Five Kilograms of dried Arka plant materials were burnt with lime (CaO) completely and collected the final 500 grams ash. 500 grams of ash dissolved into 3 liters of water and kept it 24 hours. That solution filtered many (21) times. Final Filtrate is available in Sri Lanka and easy to handle in Kshara preparation. The aim of this research work was to analysis of qualitative preliminary phytochemicals of CGK. Results show that ten of fifteen phytochemicals screened were present. They are; Carbohydrate, Protein, Alkaloids, Cardiac glycosides, Oxalates, Terpinoids, Tanin, Phenolic compounds, Steroles and saponins. This may be further helped in studies to develop standard CGK drug in experimental level.

Solvent Extraction
Five grams portions of CGK powdered materials were each separately dispersed in 50ml of each water, 70% ethanol, acetone, methanol and hexane. The solution was left to stand at room temperature for 24hrs and was filtered with Whatman No. 1 filter paper. The filtrate was used for the phytochemical screening using the following tests.

Phytochemical Screening
Test for Alkaloids (Wagner’s reagent)
A fraction of extract was treated with 3-5drops of Wagner’s reagent [1.27g of iodine and 2.00 g of potassium iodide in100 cm$^3$ of water] and observed for the formation of reddish brown precipitate (or coloration).

Test for Carbohydrates (Molisch’s test)
Few drops of Molisch’s reagent were added to 2.00cm$^3$ portion of the various extracts. This was followed by addition of 2cm$^3$ of conc. H$_2$SO$_4$ down the side of the test tube. The mixture was then allowed to stand for two-three minutes. Formation of a red or dull violet colour at the interphase of the two layers was a positive test.

Test for Cardiac glycosides (Keller Kelliani’s test)
5cm$^3$ of each extract was treated with 2cm$^3$ of glacial acetic acid in a test tube and a drop of ferric chloride solution was added to it. This was carefully undelayed with 1cm$^3$ concentrated sulphuric acid. A brown ring at the interface indicated the presence of deoxyysugar characteristic of cardenolides. A violet ring may appear below the ring while in the acetic acid layer, a greenish ring may form.

Test for Flavonoids (Alkaline reagent test)
2cm$^3$ of extracts was treated with few drops of 20% sodium hydroxide solution. Formation of intense yellow colour, which becomes colourless on addition of dilute hydrochloric acid, indicates the presence of flavonoids.

Test for Amino acids and Proteins (1% ninhydrin solution in acetone).
2cm$^3$ of filtrate was treated with 2-5 drops of ninhydrin solution placed in a boiling water bath for 1-2 minutes and observed for the formation of purple colour.

Test for Saponins (Foam test)
To 2cm$^3$ of extract was added 6cm$^3$ of water in a test tube. The mixture was shaken vigorously and observed for the formation of persistent foam that confirms the presence of saponins.

Test for Sterols (Liebermann-Burchard test)
1cm$^3$ of extract was treated with drops of chloroform, acetic anhydride and conc. H2SO4 and observed for the formation of dark pink or red colour.

Test for Tannins (Braymer’s test)
2mls of extract was treated with 10% alcoholic ferric chloride solution and observed for formation of blue or greenish colour solution.

Test for Terpenoids (Salkowki’s test)
1cm$^3$ of chloroform was added to 2ml of each extract followed by a few drops of concentrated sulphuric acid. Reddish brown precipitate produced immediately indicated the presence of terpenoids.

Test for Quinones
A small amount of extract was treated with concentrated HCL and observed for the formation of yellow precipitate (or colouration).

Test for Oxalate
To 3cm$^3$ portion of extracts were added a few drops of ethanoic acid glacial. A greenish black colouration indicates presence of oxalates.
RESULTS AND DISCUSSION

Results
- Results obtained for qualitative screening of phytochemicals in CGK are presented as follows.
- Out of the fifteen phytochemicals screened, ten were found present in the extract. They are Carbohydrate, Protein, Alkaloids, Cardiac glycosides, Oxalates, Terpinoids, Tanin, Phenolic compounds, Sterols and saponins
- According to Tiwari et al., the factors affecting the choice of solvent are: quantity of phytochemicals to be extracted, rate of extraction, diversity of different compounds extracted, diversity of inhibitory compounds extracted, ease of subsequent handling of the extracts, toxicity
- The CGK extract had the presence, Carbohydrate, Protein, Alkaloids, Cardiac glycosides, Oxalates, Terpinoids, Tanin, Phenolic compounds, Sterols and saponins

The result indicates CGK water extract holds promise as a source of pharmaceutically important phytochemicals. Alkaloids generally present in CGK, play some metabolic role and control development in living system. They are also involved in protective function in animals and are used as medicine especially the steroidal alkaloid anti-inflammatory, anti-carcinogenic etc. They are also involved in protective function in animals and are used as medicine especially the Steroidal alkaloids. Tannins are known to inhibit pathogenic fungis. The flavonoids and phenolic compounds in plant have been reported to exert multiple biological effects including antioxidant, free radical scavenging abilities, anti-inflammatory, anti-carcinogenic etc.

CONCLUSION

Phytochemicals found present in CGK in water extracts indicates their potential as a source of Principles that may supply novel medicines. Further studies are therefore suggested to use different solvents and to ascertain their antimicrobial, proteolytic and on healing mechanism, body defense mechanism, antispasmodic and anthelmintic activities. Furthermore, isolation purification and characterization of the phytochemicals found present will make interesting studies.

REFERENCES


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