

## Phytochemical Screening of *Leucas aspera*

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### ABSTRACT

Nature is a resource of therapeutic agents for centuries and a remarkable number of drugs have been known to be isolated from natural sources. Medicinal plants are the unique source of medicines, food supplements, pharmaceutical intermediates and chemical entities for synthetic drugs. *Leucas aspera* is an important plant species which is commonly used in traditional medicinal system in Assam, India primarily for the treatment of wounds. However it is not experimentally proven if they are useful for the same. This work was attempted to screen the phytochemical properties of *Leucas aspera*. Phytochemical screening was carried out for ethanol and water extract and it was found that the plant contains alkaloids, flavonoids, steroids, saponins, tannins, glycosides. In a developing country like India issues of affording modern medicines due to high cost is a huge problem in health care. There is a great chance of *Leucas aspera* for being a potent source of med-

icine possessing antibacterial and chemoprotective activities. Further studies may help with the findings of some reliable alternatives of high cost medicines in wound care.

**Keywords** *Leucas aspera*, Phytochemical screening, Antioxidant, Antibacterial.

### INTRODUCTION

Plants have been used in traditional medicinal system to treat and prevent diseases for centuries. In India, “Ayurveda” has been practiced for more than 5000 years as a natural treatment system using plants. In India there are 2500 plants having medicinal values and nearly 6000 plants are used in traditional medicinal system (Patel 2014). Herbs like *Aloe vera*, *Cantella asiatica*, *Bryophyllum pinnatum*, *Acorus calamus*, *Helianthus annuus*, *Mimosa pudica* have excellent wound healing activity (Sabale *et al.* 2012), (Kumar *et al.* 2017). Plant species that are traditionally used to cure diseases have been extensively studied to identify their bioactive constituents and develop new drugs. Herbs like *Leucas aspera* are also traditionally used in Assam, the study area, for healing wounds. Since this claim has not been investigated scientifically, this investigation was designed to evaluate the phytochemical properties of *Leucas aspera*. *Leucas aspera* belonging to family *Lamiaceae*, commonly known as doron in Assam has believed to have important antimicrobial and antioxidant activity. It is well known traditional measure to cure the conditions of delayed wound

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**Table 1.** Phytochemical screening of *Leucasaspera*.

Sl. No.	Phytochemical test	Test performed	Inference	Result
1	Alkaloid test	Mayer's test	Yellow colored precipitation	Present
2	Carbohydrate test	Fehling's test	Red colored precipitation	Present
3	Flavonoid test	Lead acetate test	Yellow colored precipitation	Present
4	Tannin test	Gelatin test	White colored precipitation	Present
5	Glycoside test	Borntrager's test	Pink color formation	Present
6	Protein and amino acid test	Ninhydrin test	Blue color formation	Present
7	Saponin test	Foam test	Production of foam	Present
8	Phenol test	Ferric chloride test	Bluish black color formation	Present
9	Steroid test	Salkowski's test	Green color formation	Present

healing. Since this claim is not proven scientifically this attempt was made to evaluate the phytochemical properties of *Leucas aspera* and how can it be utilized in medicinal aspects. A significant proportion of the population in a developing country like India cannot afford all modern medicines and the use of herbal remedies can benefit these groups. This attempt was aimed to find out whether the selected herb has the qualities to enrich the medicinal world with such benefits.

## MATERIALS AND METHODS

### Plant material collection and extraction

*Leucas aspera* was collected locally. Plant material was carefully washed with tap water and left to dryness in dark at room temperature and finally stored in well closed cellophane bags. The shade-dried and coarse powdered leave (2 kg) was subjected to defat with petroleum-ether (boiling point 40-60°C) using Soxhlet extraction apparatus (Quick fit, England). The defatted sample was air dried in order to remove the solvent residue. Extract was prepared by extracting the defatted powder with ethanol solvent (80% v/v) for period of 48 h, which was then concentrated

to a semisolid mass under reduced pressure (Buchi Rotavor R-200, Switzerland) for 20 min at 70°C (yield: 6.7% w/w).

### Phytochemical screening

The chemical tests were carried out using the aqueous and ethanol extract followed by standard procedure to identify the phytochemical components (Sofowara 1993), (Trease and Evans 1989), (Harborne 1973).

## RESULTS

Preliminary phytochemical screening of extracts of *Leucas aspera* leaves revealed the presence of alkaloids, flavonoids, tannins, glycosides, saponins, phenols (Table 1).

## DISCUSSION

The preliminary phytochemical screening of *Leucas aspera* revealed the presence of alkaloids, flavonoids, glycosides, saponin, phenol, steroid. *Leucas aspera* as contains so much of bioactive components it may perform some important pharmacological roles which needed to be investigated. Phytoconstituents like alkaloids, flavonoids, phenols provide specific

antibacterial, anticancer, larvicidal and chemoprotective activities (Muralidhar *et al.* 2013). Phenols are very important plant constituent. The total phenol contents share a positive relationship with the antioxidant properties of a plant species. The phenolic compounds can scavenge hydrogen peroxide by donating electrons and thus can neutralize it to water (Chang and Yang 2002). Again flavonoids possess wide varieties of activities as anti-microbial, anti-inflammatory and importantly wound healing (Ozay 2018). It was also found as wound healing agents in different wound models. Medicinal plants like *Buddleja globosa* (Mensah 2001), *Butea monosperma* (Muralidhar *et al.* 2013), *Ononis spinosa* (Ergene *et al.* 2018) possessing flavonoids are extensively used for healing wound.

Tannins are plant phenol derivatives of various molecular weights naturally synthesized by plants as metabolic products. Tannins also found to promote wound healing activities in studies by promoting fibroblast proliferation (Xiaowen and Kun 2017). In some studies Tannic acid modified silver nanoparticles are found to promote better wound care, epithelialization, angiogenesis and formation of the granulation tissue. It is also proved that they elicited the expression of cytokines which are involved in wound healing.

Saponins are compounds which are extensively found in plants and can accelerate numerous biological activities including hemolytic (Baumann and Stoya 2000), anti-bacterial (Killen and Madigan 1998), anti-viral and anti-oxidant activities (Yogeswari *et al.* 2012). In addition it has anti-inflammatory activity which can reduce skin inflammation (Vanden Berghe and Haegeman 2010). Tannins showed beneficial healing effects in various experiments (Young and Ik Hyun 2011). Glycosides are also reported to have wound healing property (Raina and Verma 2008) (Venkatanarayana *et al.* 2010).

Our studied plant *Leucas aspera* showed the presence of phytoconstituents like phenols, glycosides, tannins, saponins all of which show extensive wound healing properties. These phytochemicals have the potential to provide better tissue remodeling when applied on wounds and also to act as proangiogenic

agents during wound healing. It has been proved in many researches that plants providing antioxidant properties are excellent wound healer. Therefore there is a great chance of *Leucas aspera* of being a potent wound healer for different wound.

## CONCLUSION

Use of plants as a source of drugs is the backbone of traditional medicine. Several research groups across the world have shown phytochemicals may play a critical role in preventing and treating a number of diseases and also provide medicinal benefits to wound healing and skin regeneration. The concept of using phytochemicals on wound healing and skin regeneration has established the potential clinical utility of plant based compounds. From this point of view *Leucas aspera* definitely can demand some importance in the field of medicinal research to establish its benefits experimentally in wound healing and skin regeneration. If happens so there is a great possibility that it will come out as an effective alternative source for wound care medicines. In a developing country like India issues of affording modern medicines due to high cost is a huge problem in health care for patients. Further study may help those patients with the findings of some reliable alternatives.

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