

Preliminary phytochemical screening and antimicrobial activity of *Delonix regia* (Bojer ex hook) extract

Priti Kokate¹, Firoj Tamboli^{1*}, Harinath More¹, Shubhangi Gawali¹, Anagha Ajgekar¹, Sharmila Gote²

¹ Department of Pharmaceutical Quality assurance, Bharati Vidyapeeth College of Pharmacy, Kolhapur, Maharashtra, India

² D.S.T.S. Mandal's College of Pharmacy, Solapur, Maharashtra, India

Abstract

Delonix regia, belongs to family leguminosae, a well-known plant with high medicinal value with antioxidant, hepatoprotective, gastroprotective, wound healing, antiarthritic, larvicidal, antimalarial, antiemetic, antibacterial, antifungal, antiinflammatory, analgesic, antidiarrhoeal, antiheamolytic, diuretic, and anthelmintic activities. The aim of the present investigation was Preliminary Phytochemical screening and antimicrobial activity of *Delonix regia* (Bojer Ex Hook) extract. The ethanolic extract of the leaves of *Delonix regia* was prepared and carried out for phytochemical constituents using standard methods. Antimicrobial activity of ethanolic extract were carried out against *Staphylococcus aureus* and *Klebsiella*. The testing was done by the disc diffusion method. Phytochemical analyses revealed the presence of alkaloids, flavonoids, phenol, terpenes. The in-vitro anti-microbial activity of the ethanolic extract of the plant showed results against the test organisms.

Keywords: *Delonix regia*, phytochemical, anti-microbial, agar disc diffusion method, zone of inhibition

Introduction

Medicinal plants are a powerful source of biologically active compounds and have always been interested in effective chemotherapeutic agents and offer a wide range of activities with a greater emphasis on preventive action. In developing countries, the bacterial infections are one of the major issues. Bacteria such as Gram + ve like *Staphylococcus aureus* are responsible for the food poisoning, septicemia, postoperative wound infection, etc. Whereas, Gram-ve bacteria like *Escherichia coli* cause urinary tract infection, septicemia^[1,4]. Due to the complicated interaction between the pathogen, the host and the environment of infectious diseases arise. The invention of antibiotics and their subsequent use eliminated diseases that once interfered with humans. Still, use of antibiotics is going through an emergency due to the development of resistance of the disease-causing organism. Before the discovery of antibiotics as remedies, the plant has been used for the treatment of a number of diseases. They are effective in the treatment of communicable diseases with fewer side effects that are frequently occur with synthetic antimicrobial agents^[5].

Delonix regia is a flowering plant occur in all over Asia it belongs to the family Leguminosae. This plant was reported to have anti-oxidant, anti-arthritis, anti-inflammatory, analgesic, anti-diarrhoeal, anti-ulcer activity^[6-8].

Materials and methods

Plant collection

The leaves of *Delonix regia* collected from area of D.S.T.S College of pharmacy, Solapur. The leaves were cleaned, dried in shade for 12 to 15 days and crushed the leaves into coarse powder.

Extract preparation

Dried 30 gm of leaves of *Delonix regia* where exhaustively extracted with ethanol using soxhlation method. The extracts was evaporated on steam water bath and the it was stored in an air tight container free from any contamination until it was used^[9].

Qualitative phytochemical analysis of plant extract

The *Delonix regia* extract obtained was subjected to the preminiray phytochemical analysis to identify the presence or absence of various active principals like phenolic compounds, carbohydrates, phenolics, glycosides, saponins, alkaloids^[10, 11].

Antibacterial activity

Micro-organisms used:

Cultures of gram positive *Staphylococcus aureus* and gram negative organism *Klebsiella*.

Preparation of culture media and inoculation:

MacConkey agar was used as bacteriological medium. The medium was sterilized by autoclaving at 121 °C under 15 psi pressure for 13 minutes. 25 ml of the medium was poured in spread in petri dish. Plates were kept at room tempeature for solidification then bacterial culture was MacConkey agar plates.

Antibacterial testing

This test was carried out by using well diffusion method in this wells were made in the medium. The dried plant extract was dissolved in methanol to get concentration of 100 um per ml. Each hole in plate filled with extract and plates are incubated at 37 °C for 24 hours to observe zone of inhibition

[12, 14].

Results and discussion

Qualitative phytochemical analysis of plant extract

All the extracts were screened detection of phytoconstituents using general and specific chemical reagents as per following

Table 1: Phytochemical screening of methanolic extract of *Delonix regia*

Sr. No.	Test	Present(+)/absent(-)
1	Carbohydrates	+
2	Non reducing polysaccharide	+
3	Monosaccharides	+
4	Proteins	+
5	Fats and oils	+
6	Tannins and Phenolic Compounds	+
7	Alkaloides	+
8	Flavonoids	+
9	Mucilage	+
10	Gums	-

Evaluation of Antibacterial activity

D. regia extract were tested using an *in vitro* disc diffusion method in *S. aureus* *Klebsiella* and microbial strains, viz., The zones of inhibition demonstrated that extract inhibited *S.aureus* (12 mm) and *Klebsiella* (19 mm). The results suggested that the antibacterial activity of extract might be due to the presence of flavonoids, alkaloids, and phenolic compounds.

Table 2: Zone of inhibition

Organism used	Zone of inhibition(mm)
<i>S. aureus</i>	16
<i>Klebsiella</i>	19



Fig 1: *S. aureus*

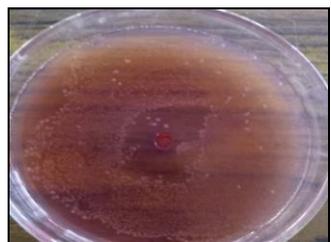


Fig 2: *Klebsiella*

Conclusion

The present work revealed that most of the biologically active phytochemicals were present in the extract of *Delonix regia*. The antibacterial activities of *Delonix regia* may be due to the

presence of phenolics compounds, glycosides, saponins and alkaloids.

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