



ANTIBACTERIAL EVALUATION OF IPOMOEA CARNEA LEAVES EXTRACT

Garima Gupta*, Piyush Chahal, Ajit Kiran Kaur

Department of Pharmacy, Monad University, Delhi Hapur Road (NH-9), Pilkhuwa, Uttar Pradesh- 245304, India

Abstract: Traditionally, the crude extracts of different parts of medical plants, including root, stem, flower, fruit, and twigs, were widely used for treatments of some human diseases. Medicinal plants contain several phytochemicals such as flavonoids, alkaloids, tannins, and terpenoids, which possess antimicrobial and antioxidant properties. In this study *Ipomoea carnea* methanolic extract showed 24 extraction Yield (%), Greenish brown appearance and Sticky consistency. The preliminary phytochemical screening revealed the presence of alkaloid, saponin glycoside, coumarin glycoside, tannins, flavonoids, steroids, phenols, carbohydrates. *Ipomoea carnea* leaves methanolic extract showed antibacterial potency against gram +ve and gram -ve bacteria in dose dependent manner.

Index Terms - *Ipomoea carnea*, methanolic extract, antimicrobial activity

1 INTRODUCTION

Consuming herbs may help to prevent and manage heart disease, cancer diabetes and skin problems associated with bacterial infection. It may also help to reduce blood clots and provide anti-inflammatory and anti-tumour properties. Research is on-going but studies have shown that:

- Garlic, linseed, fenugreek and lemongrass may help lower cholesterol.
- Garlic is useful for people with mildly elevated blood pressure.
- Fenugreek can help control blood sugar and insulin activity (as can linseed, flaxseed and cinnamon).
- Garlic, onions, chives, leeks, mint, basil, oregano, sage and many other herbs can help protect against cancer.
- Herbs are rich in antioxidants, especially cloves, cinnamon, sage, oregano and thyme, by helping to reduce low-density lipoproteins ('bad' cholesterol).

Fresh herbs often contain higher antioxidant levels compared to processed or dried herbs but if you are using herbs in order to harness their health-promoting aspects first and foremost, aim to add your fresh herbs at the end of cooking or as you serve to preserve these properties [betterhealth.vic.gov.au].

The most common reasons for using traditional medicine are that it is more affordable, more closely corresponds to the patient's ideology, allays concerns about the adverse effects of chemical (synthetic) medicines, satisfies a desire for more personalized health care, and allows greater public access to health information. The major use of herbal medicines is for health promotion and therapy for chronic, as opposed to life-threatening, conditions. However, usage of traditional remedies increases when conventional medicine is ineffective in the treatment of disease, such as in advanced cancer and in the face of new infectious diseases. Furthermore, traditional medicines are widely perceived as natural and safe, that is, not toxic. This is not necessarily true, especially when herbs are taken with prescription drugs, over-the-counter medications, or other herbs, as is very common [Cohen et al. 2010].

Traditionally, the crude extracts of different parts of medical plants, including root, stem, flower, fruit, and twigs, were widely used for treatments of some human diseases. Medicinal plants contain several phytochemicals such as flavonoids, alkaloids, tannins, and terpenoids, which possess antimicrobial and antioxidant properties. The antimicrobial activities of some plant species have been widely researched. For example, the crude extracts of cinnamon, garlic, basil, curry, ginger, sage, mustard, and other herbs exhibit antimicrobial properties against a wide range of Gram-positive and Gram-negative bacteria [Gonelimali et al. 2018].

2 Profile of *Ipomoea carnea* Plant

2.1 Scientific Classification

Domain: Eukaryota
Kingdom: Plantae
Phylum: Spermatophyta
Subphylum: Angiospermae
Class: Dicotyledonae
Order: Solanales
Family: Convolvulaceae
Genus: *Ipomoea*
Species: *Ipomoea carnea*



Figure 1 *Ipomoea carnea* Plant

2.2 Preferred Scientific Name

- *Ipomoea carnea*

2.3 Preferred Common Name

- Bush morning glory

2.4 Other Scientific Names

- *Batatas crassicaulis* Benth.
- *Convolvulus batatilla* Kunth
- *Ipomoea batatilla* (Kunth) G. Don
- *Ipomoea crassicaulis* (Benth.) B.L. Rob.
- *Ipomoea fistulosa* Mart. ex Choisy

2.5 International Common Names

- **English:** Bush morning-glory; tree morning glory
- **Spanish:** Campana gallega; gloria de la mañana
- **Chinese:** Shu qian niu [cabi.org]

3 MATERIAL AND METHODS

3.1 Collection and Authentication of plant

The plant material was collected from Ghaziabad and nearby area Uttar Pradesh. The collected plants material was authenticated by Dr. Avinash Sharma, Assistant Professor, Department of Botany, Monad University, Hapur.

3.2 Extraction

The dried leaves of *Ipomoea carnea* were powdered. Further the extraction was carried out using solvent Petroleum Ether (60-80°C), and methanol. For extraction Soxhlet extraction method was employed. The extracts were evaporated to dryness using rotary evaporator.

3.3 Phytochemical Investigation

Methanolic extract of *Ipomoea carnea* leaves was subjected to various phytochemical tests for determination of various secondary metabolites present in its leaves (Khandelwal 2008).

3.4 Evaluation of Anti-bacterial Activity

In the present study, Anti-bacterial screening was carried out by cup plate method [Shubha et al. 2010 and Indian Pharmacopoeia, 2007].

3.4.1 Preparation of test and standard solutions

The stock solution of test compounds was prepared by dissolving the dried extracts at a concentration of 5 and 10 mg/ml in DMSO respectively. The stock solution of reference standard (Spectinomycin) was prepared at a concentration of 0.6 mg/ml in sterile water. Antimicrobial activity was screened by adding 0.05 ml stock solution to each cup by using micropipette.

3.4.2 Culture media

The nutrient agar media was used for Anti-bacterial study. The nutrient agar media consist of Beef extract- 0.3%, Sodium chloride- 0.5%, Peptone- 0.5%, and Agar- 2.0%. The above ingredients weighing 28 g were dissolved in distilled water (1000 ml). pH was adjusted to 7.2-7.4.

3.4.4 Sterilization

Sterilization of the media, water, etc., was carried out by autoclaving at 15 lbs/inch² for 20 minutes. The glassware like syringes, petridishes, and pipettes were sterilized by dry heat in an oven at a temperature of 160°C for one hour.

The sterilized medium was cooled to 40°C and poured into the petridishes to contain 6 mm thickness. The media was allowed to solidify at room temperature.

3.4.6 Determination of zone of inhibition by cup plate method (Indian Pharmacopoeia, 2007).

The cylinder plate assay of drug potency is based on measurement of the diameter of zone of inhibition of microbial growth surrounding cylinders (cups), containing various dilutions of test compounds. A sterile borer was used to prepare four cups of 6 mm diameter in the agar medium spread with the micro-organisms and 0.1 ml of inoculum was spread on the agar plate by spread plate technique. Accurately measured (0.05 ml) solution of each concentration and reference standards were added to the cups with a micropipette.

All the plates were kept in a refrigerator at 2 to 8°C for a period of 2 hours for effective diffusion of test compounds and standards. Later, they were incubated at 37°C for 24 hours. The presence of definite zone of inhibition of any size around the cup indicated antibacterial activity. The solvent control was run simultaneously to assess the activity of DMSO and water which were used as drug vehicles. The experiments were performed three times. The diameter of the zone of inhibition was measured and recorded.

4 RESULTS AND DISCUSSION

4.1 Extraction Yield (%), appearance and consistency of Extract of Leaves of *Ipomoea carnea*

Result of % extraction yield, appearance and consistency of extract is presented in Table-1

Table-1 Extraction Yield (%), appearance and consistency of *Ipomoea carnea* extract

Extract	Extraction Yield (%)	Appearance	consistency
Methanolic	24	Greenish brown	Sticky

4.2 Phytochemical investigation of *Ipomoea carnea* methanolic extract

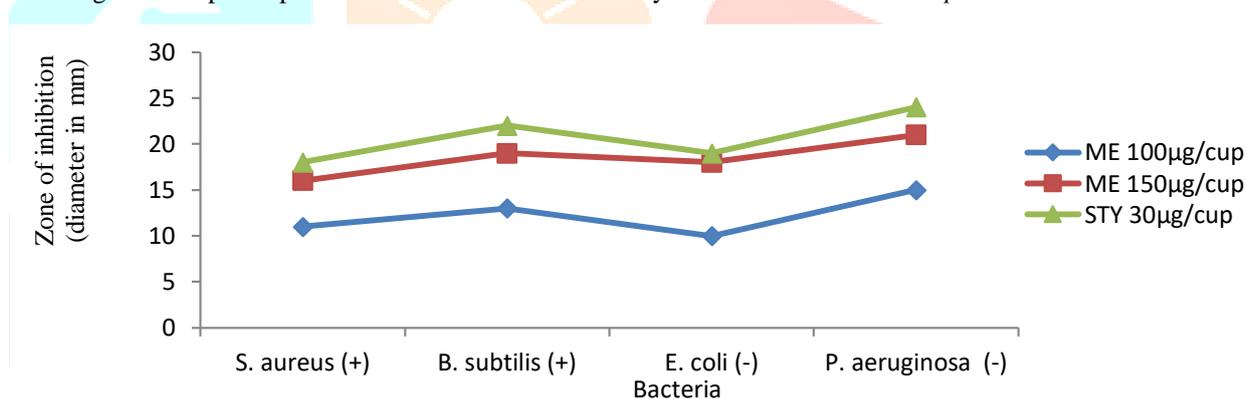
Methanolic extract of *Ipomoea carnea* revealed the presence of alkaloid, saponin glycoside, coumarin glycoside, tannins, flavonoids, steroids, phenols, carbohydrates.

4.3 Antibacterial Activity of *Ipomoea carnea* Leaves Extract (Cup Plate Method)

Table-2 Antibacterial potential of *Ipomoea carnea* against bacterial stains

Treatment	Dose (µg/cup)	Zone of Inhibition (diameter in mm)			
		gram (+)ve		gram (-)ve	
		<i>S. aureus</i>	<i>B. subtilis</i>	<i>E. coli</i>	<i>P. aeruginosa</i>
Methanolic extract	100	11	13	10	15
	150	16	19	18	21
Spectinomycin	30	18	22	19	24
DMSO(Vehicle)	30	-	-	-	-
Water(Vehicle)	30	-	-	-	-

Figure 2 Graphical presentation of antibacterial activity of methanolic extract of *Ipomoea carnea* leaves



5 CONCLUSIONS

From the results obtained in the present study, it is concluded that, Preliminary phytochemical screening of methanolic extract of *Ipomoea carnea* leaves revealed the presence of alkaloid, saponin glycoside, coumarin glycoside, tannins, flavonoids, steroids, phenols, carbohydrates. Extracts showed antibacterial potency against gram +ve and gram -ve bacteria in dose dependent manner. At high dose had produced good antibacterial activity with 16mm, 19mm, 18mm, and 21mm zone of inhibition at a dose 150 µg/cup while 11mm, 13mm, 10mm, and 15mm zone of inhibition at a dose 100 µg/cup when compared to standard drug spectinomycin 30µg/cup against *S. aureus* and *B. subtilis* *E. coli* *P. aeruginosa* bacterial strains.

6 REFERENCES

- Cohen, P. A., & Ernst, E. (2010). Safety of herbal supplements: A guide for cardiologists. *Cardiovascular Therapeutics*, 28(4), 246–253.
- Dr, Khandelwal, k.r. (2002). *Practical Pharmacognosy*.
- Gonelimali, F. D., Lin, J., Miao, W., Xuan, J., Charles, F., Chen, M., & Hatab, S. R. (2018). Antimicrobial properties and mechanism of action of some plant extracts against food pathogens and spoilage microorganisms. *Frontiers in Microbiology*, 9, 1639.
- <https://www.betterhealth.vic.gov.au/health/healthyliving/herbs>.
- <https://www.cabi.org/isc/datasheet/28785>.
- Indian pharmacopoeia. (2007). Vol, -I, the Controller of Publications. New Delhi.
- Shubha, H. S., & Hiremath, R. S. (2010). Evaluation of antimicrobial activity of Rasaka Bhasma. *Ayu*, 31(2), 260–262.