

ANTIMICROBIAL ACTIVITY OF *EMBLICA OFFICINALIS*

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Summary

The aqueous and successive extracts of the fruit pulp of *Emblica officinalis* were prepared and evaluated for antimicrobial activity. The successive extracts such as petroleum ether, chloroform, ethyl acetate and methanol were prepared by successive solvent extraction method and aqueous extract by maceration process and screened for antimicrobial activity against gram positive bacteria *Staphylococcus aureus*, gram negative bacteria *E.coli* and fungal strains of *Candida* species by using agar cup plate method . The extracts showed different degree of activity against pathogenic microbes. The results obtained were compared with standard drugs Amoxicillin (10µg) and Amphotericin B(10µg) . The methanolic extract of *Emblica officinalis* was found to be more effective in inhibiting all the microbial strains.

Key Words: *Emblica officinalis*, Antimicrobial activity, Amoxicillin, Amphotericin, Muller Hington agar, Antifungal activity.

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Introduction

Emblica officinalis (*Phyllanthus emblica*) belonging to the family Euphorbiaceae are called as Amla. This plant found through out Tamil nadu, South India. Fresh fruits of Amla are globose, depressed, shining yellowish green when ripe. Six vertical furrows are distinct. Astringent and sour taste followed by delicately sweet taste. The fruit contains mainly tannins, gallic acid, ellagic acid, phyllembic acid, emblicol, vitamin C, alkaloids of phyllantidine and phyllantine, pectine and minerals. Useful in the treatment of peptic ulcer, skin diseases, dyspepsia, antacid and as an antioxidant. The objective of the present study is to assess the antimicrobial activity of the aqueous and successive extract of *Emblica officinalis*.

Materials and Methods

The fruits of *Emblica officinalis* were collected from nearby districts. Identified and authenticated by Botanist, the present study was carried out at GSMC, Tirunelveli. The fruits of Amala were dried under shade and then powdered. The powdered material was extracted with successive solvent extraction method in a soxhlet apparatus. Extracts such as petroleum ether, chloroform, ethyl acetate and methanol were obtained. Aqueous extract was obtained separately by maceration process. The extracts obtained were concentrated under controlled temperature (25-30°C) and preserved in a desiccators and used for further studies.

PHYTOCHEMICAL STUDIES

The extracts of Amla fruit were subjected to qualitative chemical tests for the identification of various plant constituents. The results are tabulated in Table 1.

ANTIMICROBIAL STUDIES

TEST ORGANISMS

Cultures were selected from the range of gram- positive and gram- negative bacteria and fungal strains listed in Indian pharmacopoeia. Gram- positive bacteria *Staphylococcus aureus*, gram-negative bacteria *E.coli* and fungal strains *Candida* species were used for the experiment by using Amoxicillin and Amphotericin B as standards. Muller Hinton agar medium were used for bacterial culture and Sabouard's Dextrose medium were used for fungal culture.

ANTIMICROBIAL ASSAY

The Antimicrobial assay was carried out by using agar cup plate method. Plant extracts at the concentration of 200µg/ml was prepared by dissolving the extracts in the respective solvents. The standards, Amoxicillin (10µg) and Amphotericin B (10µg) used as standards for gram-positive, gram-negative bacteria and fungi respectively. The required volume of the medium was poured in to the sterilized petri dishes. After solidification of the medium bacterial and fungal strains were streaked on it. Four wells were made in petri dishes and filled with the test samples of 0.1ml of extract solution. The bacterial culture in Muller Hinton agar media was incubated at 37°C for 24 hours and the fungal culture in sabouard medium. The zone of the inhibition produced by the different crude extracts was measured and compared with standards. The results are tabulated in table 2.

Results and Discussion

The results obtained are tabulated in table 1 & 2. Preliminary phyto chemical analysis of the aqueous and successive extracts of *Emblica officinalis* showed the presence of alkaloids and tannins in ethyl acetate, methanol and aqueous extracts.

In comparing various extracts of *Emblica officinalis* for anti microbial activity with the standards significant antibacterial activity was found in methonal extract of *Emblica officinalis*. Ethyl acetate and aqueous extract of *Emblica officinalis* also showed antibacterial activity. The maximum zone of inhibition was produced by the methonal extract of *Emblica officinalis* against *E.coli* and *Stphylococcus aureus*. Antifungal activity was not produced by the extracts.

TABLE 1

Phytochemical analysis of various extracts of *Emblica officinalinalis*

S.NO	Phyto constituents	EXTRACTS				
		Pet ether	Choloroform	Ethyl acetate	Methanol	Aqueous
1.	Alkaloids	-	-	-	-	-
2.	Carbohydrates	-	-	-	-	-
3.	Proteins	-	-	-	-	-
4.	Fixed oil	-	-	-	-	-
5.	Volatile oil	-	-	+	+	+
6.	Saponins	-	-	-	-	-
7.	Tannins	-	-	-	-	-
8.	Glycosides	-	-	-	-	-
9.	Gums	-	-	-	-	-

TABLE 2

Antimicrobial screening of *Emblica officinalis*

Standards: Amoxicillin-23mm (-ve)

Amoxicillin-28mm (+ve)

Amphotericin B-21 (-ve)

(-) No antimicrobial activity

S.NO.	Micro organism	Extracts (Zone of Inhibition in mm)				
		Pet. ether	Chloroform	Ethyl acetate	Methanol	Aqueous
1.	E.coli (gram -ve)	-	-	10mm	19mm	9mm
2.	S.aureus (+ve)	-	-	7mm	16mm	-
3.	Candida sp.	-	-	-	-	-

Conclusion

The antibacterial activity of methanol extract of *Emblica officinalis* was found to be most significant when compared to all other extracts. Antifungal activity was not produced by the aqueous and successive extracts of *Emblica officinalis*

References

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