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Antibacterial activity of two new compounds: Alascholaridine & alascholidide isolated from *Alastonia scholaris* and their comparison with constituents isolated from *Plumeria bicolor*, *Capparis decidua* and *Mimusops elengi*

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Abstract

Introduction: Natural products perform various function and many of them have interesting and useful biological activity [1]; Researches are increasingly turning for new leads to develop better drugs for viral and microbial infections [2, 3].

Present study reports screening of nine active constituents isolated from *Alastonia scholaris*, *Plumeria bicolor*, *Capparis decidua* and *Mimusops elengi* for their antimicrobial properties against five gram positive and three negative bacteria.

Keywords: *Alastonia scholaris*, alascholaridine, alascholidide

Introduction

Material and Methods

Active constituents

These nine pure compounds have been isolated from medicinal plants namely *Alastonia scholaris*, *Plumeria bicolor*, *Capparis decidua* and *Mimusops elengi*.

These compounds have been identified using chemical and spectral studies. For this purpose column chromatography is used. These isolated pure compounds were then subjected to antibacterial activity.

Test microorganism and microbial culture

Eight bacterial strains were used in the study

Gram positive bacteria; *Bacillus subtilis*, *Staphylococcus aureus*, *S. warneri*, *Lactobacillus*, *A. adiacens* and Gram negative bacteria *Escherichia coli*, *Pseudomonas aeruginosa* and *Salmonella typhi*. The test microorganism were obtained from Pathological Laboratory, Santokba Durlabhji, Jaipur. Bacteria strains were cultivated at 37°C and maintained on nutrient agar at 4°C.

Antimicrobial activity assay

Antimicrobial activity was determined against eight bacterial pathogens by the agar disc diffusion assay [NCCLS (National Committee for Clinical Laboratory Standards), 2005].

Pure compounds were dissolved in water and C₂H₅OH and then antimicrobial effects were tested. Petri-dishes measuring 90 mm each side, containing 20 ml of mueller hinton agar concentration of pure compounds dissolved in ethanol and plates were incubated at 37°C for 18-24hrs. The antibacterial activity was evaluated by measuring zone of growth inhibition surrounding the discs. Diameter of inhibition zone was measured in millimeters by vernier caliper. All tests were repeated twice to minimize test error.

Results and Discussions

This study reports the antimicrobial activity of nine active compounds namely Alascholaridine, Alascholidide, 3-β-Acetoxyurs-5-ene, Plumeride, Quercetin-3-O-galactoside, Lupeol acetate, Plumericine, β-Sitosterol and α-Amyrin isolated from four medicinal plants namely *Alastonia scholaris*, *Plumeria bicolor*, *Capparis decidua* and *Mimusops elengi*.

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In Gram +ve bacteria**1. *Bacillus subtilis***

The biological activity is shown in compound I, II, III, VII, VIII and IX and above compounds are of dissolving nature in water but compound IV, V and VI show no activity when treated with this bacteria in NA media.

The diameter of effective area is increasing in all groups. But it was significant in compound II, VII and IX treated with ethanol.

2. *Staphylococcus aureus*

The biological activity shows dissolving nature of compound II, III, VII, VIII and IX in water but compound IV, V, VI shows no activity when treated with bacteria in NA media.

The diameter of effective area increases in all compounds treated within ethanol but in compound IV, V, VI shows no any changes when treated with water.

3. *S. warneri*

In compound I, III, VII, VIII and IX the biological activity shows dissolving nature but in compound IV, V and VI it shows no activity.

The diameter of effective area increases in all compounds treated with ethanol but in compound V and VI shows no any changes when treated with water. In compound III, V and VII it significant treated with ethanol.

4. *Lactobacillus*

The biological activity is shown in compound I, III, VII and VIII and they are soluble in water, but compound V and VI shows no biological activity.

The diameter of effective area increases in all compounds when treated with ethanol, but compound V and VI show no changes when treated with water.

5. *A. adiacens*

The biological activity is shown in compound I, II, III and

VIII and are soluble in water. The compound IV, V and VI show no activity.

The diameter of effective area increases in all compounds treated with ethanol. But in compound IV, V and VII occurs no change when treated with water. In compound II, III and IX it was significant when treated with ethanol.

In gram-ve bacteria**6. *Escherichia coli***

The biological activity is shown in compound I, II, III, VIII and IX and are soluble in water but compound V and VI show no any activity when treated with bacteria in agar-agar media.

The diameter of effective area increases in all compounds treated with ethanol. In compound V and VI show no effect on treating with water. In compound II, III and IX it was more significant when treated with ethanol.

7. *Pseudomonas aeruginosa*

The biological activity shown in compound I, II, III, VIII and IX and are of dissolving nature in water but compound V and VI show no any activity when treated with bacteria in agar-agar media.

The diameter of effective area increases in all compounds treated with ethanol. Compound V and VI show no any change for effect when treated with water. It was more significant in compound III and IX.

8. *Salmonella typhi*

The biological activity is shown in compound I, II, III, VIII and IX. They are of dissolving nature in water but compound V and VI show no activity when treated with bacteria in agar-agar media.

The diameter of effective area increases in all compounds treated with ethanol. Compound V and VI show no effect when treated with water. In compound VIII it was more significant.

Table 1: The results of antimicrobial activity of investigated pure compounds are shown

Compounds→ Bacteria ↓	I		II		III		IV		V		VI		VII		VIII		IX		Media
	W	E	W	E	W	E	W	E	W	E	W	E	W	E	W	E	W	E	
<i>Bacillus subtilis</i>	+	+	++	+++	++	++	x	++	x	++	x	++	+	+++	++	++	++	+++	NA
<i>Staphylococcus aureus</i>			++	++	++	++	x	++	x	++	x	+	++	++	+	++	++	++	NA
<i>S. warneri</i>	++	++			+	+++	x	+	x	+++	x	++	+	+++	++	++	+	++	NA
<i>Lactobacillus</i>	+	++			++	++			x	++	x	+	+	++	+	++			NA
<i>A. adiacens</i>	++	++++	+	+++	+	++	x	++	x	++	x	+++			+	++			Agar-agar
<i>Escherichia coli</i>	+	++	+	+++	++	+++			x	++	x	++			++	++	++	+++	Agar-agar
<i>Pseudomonas aeruginosa</i>	++	++	+	++	++	+++			x		x	++			+	++	+	+++	Agar-agar
<i>Salmonella typhi</i>	+	+	+	+	+	++			x		x	+			+	+++	+	++	Agar-agar

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