



## ANTIBIOGRAM OF PLANT EXTRACTS AGAINST CLINICAL ISOLATES

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**ABSTRACT** A wide variety of microorganisms show resistance to antibiotics and multiple drug resistant bacteria are now emerging. In this study, the plant leaf extracts of seven different plants (*Azadirachta indica*(A), *Ocimum sanctum*(B), *Elipto prostrata*(C), *Vitex negundo*(D), *Aloe vera*(E), *Justicia gendarassa*(F) and *Tabernaemontana divaricate*(G)) were studied for their antibacterial activity against five clinical isolates(*Proteus*,*Salmonella*,*Klebsiella*,*Staphylococcus* and *Pseudomonas*). In the case of *Staphylococcus* and *Pseudomonas* are resistant to plant leaf extracts. But in the case of *Klebsiella*, *Salmonella* and *Proteus* species, they are sensitive to combination of different plant extracts. Here, *Proteus* and *Klebsiella* organisms showed sensitivity to the leaf extracts of *Azadirachta indica* combined with *Vitex negundo* (9mm and 7mm respectively), whereas *Pseudomonas* and *Staphylococcus* were resistant to this combination.

**KEYWORDS :** Plant extract, antibiogram and clinical isolates.

### 1. INTRODUCTION

The history of Ayurveda starts from the period of holy books. In Vedas "Ayur" means "Life" in Sanskrit. Ayurveda is the ancient science of healing longevity. It is considered as "Mother of Healing". It is divided into 8 sections namely Internal medicine, surgery, organic medicine, paediatrics, toxicology, rejuvenating remedy, aphrodisiac remedies and spiritual healing. Collectively, it is called as "Ashtanga Ayurveda".

The Susrutha Samhitha and Charaka Samhitha are encyclopaedia of medicine. Traditional medicine derived from medicinal plants are used by about 60% of world's population. These herbal formulations are effective in reducing the ill-effects of diabetes and its secondary complications. *Aloe vera* and *Aloe barbadensis* : Aloe, is a popular house plant which can be separated into two basic products called 'gel' and 'latex'. Aloe vera gel is a leaf pulp, commonly called as "aloe juice". The action of Aloe vera and its bitter principle is through the stimulation of synthesis or release of insulin from pancreatic beta cells. *Azadirachta indica* (Neem): Hydroalcoholic extract of this plant shows anti-hyperglycemic activity in streptozotocin treated rats and this is due to increase in glucose uptake and glycogen deposition in isolated rat hemidiaphragm. It also have antibacterial, antimalarial, hepatoprotective and antioxidant effects. It has two closely related species : *A.indica* and *A.juss. Karisalakanni* : It has an excellent hepatoprotective properties. It can strengthen the liver, increase the bile production and reduce inflammation. The herb taken along with Kizhanelli can cure jaundice within days. The herb is excellent for women with menstrual problems. It also arrests hair loss and helps in hair growth. *Justicia gendarussa* : The leaf is antiparasitic, carminative and have antiperiodic properties. Leaf juice is used for the treatment of ear ache. *Tabernaemontana divaricate* : It belongs to the family Apocynacea and genus Tabernaemontana. It is known as Crape Jasmine in English and Nandiyarvattam in Malayalam.

### 2. OBJECTIVES

- To isolate pathogenic bacteria from hospital sample.
- To identify and characterize bacterial isolates.
- To study the antibacterial effects of selected plant extracts.

### 3. MATERIALS AND METHODS

The leaves of *Azadirachta indica*, *Tabernaemontana divaricate*, *Justicia gendarussa*, *Ocimum sanctum*, *Ellipta prostrata*, *Vitex negundo* and *Aloe vera* were collected from local areas of K. G. Chavadi, Coimbatore. The collected materials were washed properly and dried in shade followed by hot air oven on drying for 6 hours at 50 degree C to 60 degree C. Then they were powdered.

The extract was prepared by adding 4gm of dry leaf powder which was soaked in 50ml of distilled water and made a paste using mortar and pestle. Then this paste was pressed and filtered through sterile cheese cloth. The extract obtained was stored in a refrigerator for antimicrobial activity assays.

0.5ml of different leaf extracts were taken and mixed in different combination of selected plants such as Neem leaf(A), Tulsi(B), Kursilangunni(C), Nochi(D), Aloe vera(E), Vadhakolli(F) and Nandiyarvattam(G).

The bacterial isolates were inoculated into nutrient growth and incubated for 24 hours at 37 degree C.

Mueller Hinton Agar plates were prepared for checking antibacterial activity, after autoclaving the medium at 121 degree C at 15 lbs pressure for 15 minutes.

The isolated organism were aseptically inoculated into sterile nutrient agar, blood agar and MacConkey plates and incubated at 37 degree C for 24 hours.

Initially, gram staining was done to identify the gram reaction. Various biochemical reactions such as indole, MR, VP, citrate utilization test and sugar fermentation tests were carried out.

Nutrient growth was used for the growth of bacterial culture. Standard disc diffusion was adopted for antibacterial activity of leaf extracts. Mueller Hinton Agar plates were prepared and sterilized, then allowed to solidify. The plates were inoculated with isolated microorganism by means of a cotton swab to ensure confluent growth of organism. After inoculation, the discs were aseptically applied to surface of sterile Mueller Hinton Agar plates and then incubated at 37 degree C for 24 hours. The plates were examined for the growth of inhibition, which is indicated by a clear zone surrounding each disc. The susceptibility of organism is determined by size of the zone of inhibition. Its size was compared to that contained in the standard chart. Based on this comparison, the test organism was determined to be resistant, intermediate or susceptible to the antibiotic.

### 1. RESULT

**Table No.1 : The isolated bacterial strains are tabulated.**

S No.	Gram staining	Cultural characteristics			Biochemical reactions				Sugar fermentation tests				Organisms
		Nutrient agar	MacConkey Agar	Blood agar	Indole	MR	VP	Citrate	Glucose	Lactose	Maltose	Sucrose	
1	Gram negative	Grey, Round, Shiny and mucoid	Pink, mucoid colonies	No hemolysis	-ve	-ve	+ve	+ve	+	+	+	+	Klebsiella

2	Gram negative	Large, flattened greenish colony	Colourless colonies	A clear hemolysis	-ve	-ve	-ve	+ve	+	-	-	-	Pseudomonas
3	Gram negative	Circular, smooth, opaque	Colourless colonies	No hemolysis	+ve	+ve	-ve	-ve	+	-	+	+	Proteus
4	Gram negative	Medium sized, greyish colonies	Colourless colonies	No hemolysis	-ve	+ve	-ve	+ve	+	-	+	-	Salmonella
5	Gram positive	Medium sized, opaque, smooth edged	Small pink colonies	Show hemolysis	-ve	+ve	-ve	-ve	+	+	+	+	Staphylococcus

**Table No.2 : Plant Leaf Extract against Proteus species**

Sl. no	Extract	Zone size(mm)
1	<i>Azadirachta indica</i> (A)	7mm
2	<i>Ocimum sanctum</i> (B)	12mm
3	<i>Elipta prostrata</i> (C)	Resistant
4	<i>Vitex negundo</i> (D)	Resistant
5	<i>Aloe vera</i> (E)	Resistant
6	<i>Justicia gendarassa</i> (F)	Resistant
7	<i>Tabernaemontana divaricate</i> (G)	Resistant
8	<i>Azadirachta indica</i> and <i>Ocimum sanctum</i> (A+B)	Resistant
9	<i>Azadirachta indica</i> and <i>Elipta prostrata</i> (A+C)	Resistant
10	<i>Azadirachta indica</i> and <i>Vitex negundo</i> (A+D)	9mm
11	<i>Azadirachta indica</i> and <i>Aloe vera</i> (A+E)	Resistant
12	<i>Azadirachta indica</i> and <i>Justicia gendarassa</i> (A+F)	Resistant
13	<i>Azadirachta indica</i> and <i>Tabernaemontana divaricate</i> (A+G)	Resistant
14	<i>Ocimum sanctum</i> and <i>Elipta prostrata</i> (B+C)	5mm
15	<i>Ocimum sanctum</i> and <i>Vitex negundo</i> (B+D)	Resistant
16	<i>Ocimum sanctum</i> and <i>Aloe vera</i> (B+E)	Resistant
17	<i>Ocimum sanctum</i> and <i>Justicia gendarassa</i> (B+F)	Resistant
18	<i>Ocimum sanctum</i> and <i>Tabernaemontana divaricate</i> (B+G)	Resistant
19	<i>Elipta prostrata</i> and <i>Vitex negundo</i> (C+D)	Resistant
20	<i>Elipta prostrata</i> and <i>Aloe vera</i> (C+E)	Resistant
21	<i>Elipta prostrata</i> and <i>Justicia gendarassa</i> (C+F)	Resistant
22	<i>Elipta prostrata</i> and <i>Tabernaemontana divaricate</i> (C+G)	Resistant
23	<i>Vitex negundo</i> and <i>Aloe vera</i> (D+E)	Resistant
24	<i>Vitex negundo</i> and <i>Justicia gendarassa</i> (D+F)	Resistant
25	<i>Vitex negundo</i> and <i>Tabernaemontana divaricate</i> (D+G)	Resistant
26	<i>Aloe vera</i> and <i>Justicia gendarassa</i> (E+F)	Resistant
27	<i>Justicia gendarassa</i> and <i>Tabernaemontana divaricate</i> (F+G)	Resistant
28	<i>Azadirachta indica</i> , <i>Ocimum sanctum</i> , <i>Elipta prostrata</i> and <i>Vitex negundo</i> (A+B+C+D)	Resistant
29	<i>Azadirachta indica</i> , <i>Ocimum sanctum</i> , <i>Elipta prostrata</i> , <i>Vitex negundo</i> and <i>Aloe vera</i> (A+B+C+D+E)	Resistant
30	<i>Vitex negundo</i> , <i>Aloe vera</i> , <i>Justicia gendarassa</i> and <i>Tabernaemontana divaricate</i> (D+E+F+G)	Resistant

31	<i>Azadirachta indica</i> , <i>Ocimum sanctum</i> , <i>Elipta prostrata</i> , <i>Vitex negundo</i> , <i>Aloe vera</i> and <i>Justicia gendarassa</i> (A+B+C+D+E+F)	Resistant
32	<i>Azadirachta indica</i> , <i>Ocimum sanctum</i> , <i>Elipta prostrata</i> , <i>Vitex negundo</i> , <i>Aloe vera</i> , <i>Justicia gendarassa</i> and <i>Tabernaemontana divaricate</i> (A+B+C+D+E+F+G)	Resistant

**Table No.3 : Plant Leaf Extract against Salmonella species**

Sl. no	Extract	Zone size(mm)
1	<i>Azadirachta indica</i> (A)	Resistant
2	<i>Ocimum sanctum</i> (B)	Resistant
3	<i>Elipta prostrata</i> (C)	Resistant
4	<i>Vitex negundo</i> (D)	9mm
5	<i>Aloe vera</i> (E)	Resistant
6	<i>Justicia gendarassa</i> (F)	Resistant
7	<i>Tabernaemontana divaricate</i> (G)	Resistant
8	<i>Azadirachta indica</i> and <i>Ocimum sanctum</i> (A+B)	7mm
9	<i>Azadirachta indica</i> and <i>Elipta prostrata</i> (A+C)	5mm
10	<i>Azadirachta indica</i> and <i>Vitex negundo</i> (A+D)	5mm
11	<i>Azadirachta indica</i> and <i>Aloe vera</i> (A+E)	Resistant
12	<i>Azadirachta indica</i> and <i>Justicia gendarassa</i> (A+F)	Resistant
13	<i>Azadirachta indica</i> and <i>Tabernaemontana divaricate</i> (A+G)	Resistant
14	<i>Ocimum sanctum</i> and <i>Elipta prostrata</i> (B+C)	Resistant
15	<i>Ocimum sanctum</i> and <i>Vitex negundo</i> (B+D)	Resistant
16	<i>Ocimum sanctum</i> and <i>Aloe vera</i> (B+E)	Resistant
17	<i>Ocimum sanctum</i> and <i>Justicia gendarassa</i> (B+F)	Resistant
18	<i>Ocimum sanctum</i> and <i>Tabernaemontana divaricate</i> (B+G)	Resistant
19	<i>Elipta prostrata</i> and <i>Vitex negundo</i> (C+D)	Resistant
20	<i>Elipta prostrata</i> and <i>Aloe vera</i> (C+E)	Resistant
21	<i>Elipta prostrata</i> and <i>Justicia gendarassa</i> (C+F)	Resistant
22	<i>Elipta prostrata</i> and <i>Tabernaemontana divaricate</i> (C+G)	Resistant
23	<i>Vitex negundo</i> and <i>Aloe vera</i> (D+E)	Resistant
24	<i>Vitex negundo</i> and <i>Justicia gendarassa</i> (D+F)	Resistant
25	<i>Vitex negundo</i> and <i>Tabernaemontana divaricate</i> (D+G)	Resistant
26	<i>Aloe vera</i> and <i>Justicia gendarassa</i> (E+F)	Resistant
27	<i>Justicia gendarassa</i> and <i>Tabernaemontana divaricate</i> (F+G)	Resistant
28	<i>Azadirachta indica</i> , <i>Ocimum sanctum</i> , <i>Elipta prostrata</i> and <i>Vitex negundo</i> (A+B+C+D)	5mm
29	<i>Azadirachta indica</i> , <i>Ocimum sanctum</i> , <i>Elipta prostrata</i> , <i>Vitex negundo</i> and <i>Aloe vera</i> (A+B+C+D+E)	Resistant
30	<i>Vitex negundo</i> , <i>Aloe vera</i> , <i>Justicia gendarassa</i> and <i>Tabernaemontana divaricate</i> (D+E+F+G)	Resistant
31	<i>Azadirachta indica</i> , <i>Ocimum sanctum</i> , <i>Elipta prostrata</i> , <i>Vitex negundo</i> , <i>Aloe vera</i> and <i>Justicia gendarassa</i> (A+B+C+D+E+F)	Resistant
32	<i>Azadirachta indica</i> , <i>Ocimum sanctum</i> , <i>Elipta prostrata</i> , <i>Vitex negundo</i> , <i>Aloe vera</i> , <i>Justicia gendarassa</i> and <i>Tabernaemontana divaricate</i> (A+B+C+D+E+F+G)	7mm

**Table No.4 : Plant Leaf Extract against Klebsiella species**

Sl. no	Extract	Zone size(mm)
1	<i>Azadirachta indica</i> (A)	Resistant
2	<i>Ocimum sanctum</i> (B)	Resistant
3	<i>Elipta prostrata</i> (C)	Resistant
4	<i>Vitex negundo</i> (D)	Resistant
5	<i>Aloe vera</i> (E)	Resistant
6	<i>Justicia gendarassa</i> (F)	Resistant
7	<i>Tabernaemontana divaricate</i> (G)	Resistant
8	<i>Azadirachta indica</i> and <i>Ocimum sanctum</i> (A+B)	Resistant
9	<i>Azadirachta indica</i> and <i>Elipta prostrata</i> (A+C)	5mm
10	<i>Azadirachta indica</i> and <i>Vitex negundo</i> (A+D)	7mm
11	<i>Azadirachta indica</i> and <i>Aloe vera</i> (A+E)	Resistant
12	<i>Azadirachta indica</i> and <i>Justicia gendarassa</i> (A+F)	Resistant

13	<i>Azadirachta indica</i> and <i>Tabernaemontana divaricate</i> (A+G)	Resistant
14	<i>Ocimum sanctum</i> and <i>Elipta prostrata</i> (B+C)	Resistant
15	<i>Ocimum sanctum</i> and <i>Vitex negundo</i> (B+D)	Resistant
16	<i>Ocimum sanctum</i> and <i>Aloe vera</i> (B+E)	Resistant
17	<i>Ocimum sanctum</i> and <i>Justicia gendarassa</i> (B+F)	Resistant
18	<i>Ocimum sanctum</i> and <i>Tabernaemontana divaricate</i> (B+G)	10mm
19	<i>Elipta prostrata</i> and <i>Vitex negundo</i> (C+D)	Resistant
20	<i>Elipta prostrata</i> and <i>Aloe vera</i> (C+E)	Resistant
21	<i>Elipta prostrata</i> and <i>Justicia gendarassa</i> (C+F)	Resistant
22	<i>Elipta prostrata</i> and <i>Tabernaemontana divaricate</i> (C+G)	Resistant
23	<i>Vitex negundo</i> and <i>Aloe vera</i> (D+E)	Resistant
24	<i>Vitex negundo</i> and <i>Justicia gendarassa</i> (D+F)	Resistant
25	<i>Vitex negundo</i> and <i>Tabernaemontana divaricate</i> (D+G)	Resistant
26	<i>Aloe vera</i> and <i>Justicia gendarassa</i> (E+F)	Resistant
27	<i>Justicia gendarassa</i> and <i>Tabernaemontana divaricate</i> (F+G)	Resistant
28	<i>Azadirachta indica</i> , <i>Ocimum sanctum</i> , <i>Elipta prostrata</i> and <i>Vitex negundo</i> (A+B+C+D)	7mm
29	<i>Azadirachta indica</i> , <i>Ocimum sanctum</i> , <i>Elipta prostrata</i> , <i>Vitex negundo</i> and <i>Aloe vera</i> (A+B+C+D+E)	Resistant
30	<i>Vitex negundo</i> , <i>Aloe vera</i> , <i>Justicia gendarassa</i> and <i>Tabernaemontana divaricate</i> (D+E+F+G)	Resistant
31	<i>Azadirachta indica</i> , <i>Ocimum sanctum</i> , <i>Elipta prostrata</i> , <i>Vitex negundo</i> , <i>Aloe vera</i> and <i>Justicia gendarassa</i> (A+B+C+D+E+F)	Resistant
32	<i>Azadirachta indica</i> , <i>Ocimum sanctum</i> , <i>Elipta prostrata</i> , <i>Vitex negundo</i> , <i>Aloe vera</i> , <i>Justicia gendarassa</i> and <i>Tabernaemontana divaricate</i> (A+B+C+D+E+F+G)	Resistant

**Table No.5 : Plant Leaf Extract against Staphylococcus species**

Sl. no	Extract	Zone size(mm)
1	<i>Azadirachta indica</i> (A)	Resistant
2	<i>Ocimum sanctum</i> (B)	Resistant
3	<i>Elipta prostrata</i> (C)	Resistant
4	<i>Vitex negundo</i> (D)	Resistant
5	<i>Aloe vera</i> (E)	Resistant
6	<i>Justicia gendarassa</i> (F)	Resistant
7	<i>Tabernaemontana divaricate</i> (G)	Resistant
8	<i>Azadirachta indica</i> and <i>Ocimum sanctum</i> (A+B)	Resistant
9	<i>Azadirachta indica</i> and <i>Elipta prostrata</i> (A+C)	Resistant
10	<i>Azadirachta indica</i> and <i>Vitex negundo</i> (A+D)	Resistant
11	<i>Azadirachta indica</i> and <i>Aloe vera</i> (A+E)	Resistant
12	<i>Azadirachta indica</i> and <i>Justicia gendarassa</i> (A+F)	Resistant
13	<i>Azadirachta indica</i> and <i>Tabernaemontana divaricate</i> (A+G)	Resistant
14	<i>Ocimum sanctum</i> and <i>Elipta prostrata</i> (B+C)	Resistant
15	<i>Ocimum sanctum</i> and <i>Vitex negundo</i> (B+D)	Resistant
16	<i>Ocimum sanctum</i> and <i>Aloe vera</i> (B+E)	Resistant
17	<i>Ocimum sanctum</i> and <i>Justicia gendarassa</i> (B+F)	Resistant
18	<i>Ocimum sanctum</i> and <i>Tabernaemontana divaricate</i> (B+G)	Resistant
19	<i>Elipta prostrata</i> and <i>Vitex negundo</i> (C+D)	Resistant
20	<i>Elipta prostrata</i> and <i>Aloe vera</i> (C+E)	Resistant
21	<i>Elipta prostrata</i> and <i>Justicia gendarassa</i> (C+F)	Resistant
22	<i>Elipta prostrata</i> and <i>Tabernaemontana divaricate</i> (C+G)	Resistant
23	<i>Vitex negundo</i> and <i>Aloe vera</i> (D+E)	Resistant
24	<i>Vitex negundo</i> and <i>Justicia gendarassa</i> (D+F)	Resistant
25	<i>Vitex negundo</i> and <i>Tabernaemontana divaricate</i> (D+G)	Resistant
26	<i>Aloe vera</i> and <i>Justicia gendarassa</i> (E+F)	Resistant
27	<i>Justicia gendarassa</i> and <i>Tabernaemontana divaricate</i> (F+G)	Resistant
28	<i>Azadirachta indica</i> , <i>Ocimum sanctum</i> , <i>Elipta prostrata</i> and <i>Vitex negundo</i> (A+B+C+D)	Resistant
29	<i>Azadirachta indica</i> , <i>Ocimum sanctum</i> , <i>Elipta prostrata</i> , <i>Vitex negundo</i> and <i>Aloe vera</i> (A+B+C+D+E)	Resistant
30	<i>Vitex negundo</i> , <i>Aloe vera</i> , <i>Justicia gendarassa</i> and <i>Tabernaemontana divaricate</i> (D+E+F+G)	Resistant
31	<i>Azadirachta indica</i> , <i>Ocimum sanctum</i> , <i>Elipta prostrata</i> , <i>Vitex negundo</i> , <i>Aloe vera</i> and <i>Justicia gendarassa</i> (A+B+C+D+E+F)	Resistant
32	<i>Azadirachta indica</i> , <i>Ocimum sanctum</i> , <i>Elipta prostrata</i> , <i>Vitex negundo</i> , <i>Aloe vera</i> , <i>Justicia gendarassa</i> and <i>Tabernaemontana divaricate</i> (A+B+C+D+E+F+G)	Resistant

29	<i>Azadirachta indica</i> , <i>Ocimum sanctum</i> , <i>Elipta prostrata</i> , <i>Vitex negundo</i> and <i>Aloe vera</i> (A+B+C+D+E)	Resistant
30	<i>Vitex negundo</i> , <i>Aloe vera</i> , <i>Justicia gendarassa</i> and <i>Tabernaemontana divaricate</i> (D+E+F+G)	Resistant
31	<i>Azadirachta indica</i> , <i>Ocimum sanctum</i> , <i>Elipta prostrata</i> , <i>Vitex negundo</i> , <i>Aloe vera</i> and <i>Justicia gendarassa</i> (A+B+C+D+E+F)	Resistant
32	<i>Azadirachta indica</i> , <i>Ocimum sanctum</i> , <i>Elipta prostrate</i> , <i>Vitex negundo</i> , <i>Aloe vera</i> , <i>Justicia gendarassa</i> and <i>Tabernaemontana divaricate</i> (A+B+C+D+E+F+G)	Resistant

**Table No.6 : Plant Leaf Extract against Pseudomonas species**

Sl. no	Extract	Zone size(mm)
1	<i>Azadirachta indica</i> (A)	Resistant
2	<i>Ocimum sanctum</i> (B)	Resistant
3	<i>Elipta prostrata</i> (C)	Resistant
4	<i>Vitex negundo</i> (D)	Resistant
5	<i>Aloe vera</i> (E)	Resistant
6	<i>Justicia gendarassa</i> (F)	Resistant
7	<i>Tabernaemontana divaricate</i> (G)	Resistant
8	<i>Azadirachta indica</i> and <i>Ocimum sanctum</i> (A+B)	Resistant
9	<i>Azadirachta indica</i> and <i>Elipta prostrata</i> (A+C)	Resistant
10	<i>Azadirachta indica</i> and <i>Vitex negundo</i> (A+D)	Resistant
11	<i>Azadirachta indica</i> and <i>Aloe vera</i> (A+E)	Resistant
12	<i>Azadirachta indica</i> and <i>Justicia gendarassa</i> (A+F)	Resistant
13	<i>Azadirachta indica</i> and <i>Tabernaemontana divaricate</i> (A+G)	Resistant
14	<i>Ocimum sanctum</i> and <i>Elipta prostrata</i> (B+C)	Resistant
15	<i>Ocimum sanctum</i> and <i>Vitex negundo</i> (B+D)	Resistant
16	<i>Ocimum sanctum</i> and <i>Aloe vera</i> (B+E)	Resistant
17	<i>Ocimum sanctum</i> and <i>Justicia gendarassa</i> (B+F)	Resistant
18	<i>Ocimum sanctum</i> and <i>Tabernaemontana divaricate</i> (B+G)	Resistant
19	<i>Elipta prostrata</i> and <i>Vitex negundo</i> (C+D)	Resistant
20	<i>Elipta prostrata</i> and <i>Aloe vera</i> (C+E)	Resistant
21	<i>Elipta prostrata</i> and <i>Justicia gendarassa</i> (C+F)	Resistant
22	<i>Elipta prostrate</i> and <i>Tabernaemontana divaricate</i> (C+G)	Resistant
23	<i>Vitex negundo</i> and <i>Aloe vera</i> (D+E)	Resistant
24	<i>Vitex negundo</i> and <i>Justicia gendarassa</i> (D+F)	Resistant
25	<i>Vitex negundo</i> and <i>Tabernaemontana divaricate</i> (D+G)	Resistant
26	<i>Aloe vera</i> and <i>Justicia gendarassa</i> (E+F)	Resistant
27	<i>Justicia gendarassa</i> and <i>Tabernaemontana divaricate</i> (F+G)	Resistant
28	<i>Azadirachta indica</i> , <i>Ocimum sanctum</i> , <i>Elipta prostrata</i> and <i>Vitex negundo</i> (A+B+C+D)	Resistant
29	<i>Azadirachta indica</i> , <i>Ocimum sanctum</i> , <i>Elipta prostrata</i> , <i>Vitex negundo</i> and <i>Aloe vera</i> (A+B+C+D+E)	Resistant
30	<i>Vitex negundo</i> , <i>Aloe vera</i> , <i>Justicia gendarassa</i> and <i>Tabernaemontana divaricate</i> (D+E+F+G)	Resistant
31	<i>Azadirachta indica</i> , <i>Ocimum sanctum</i> , <i>Elipta prostrata</i> , <i>Vitex negundo</i> , <i>Aloe vera</i> and <i>Justicia gendarassa</i> (A+B+C+D+E+F)	Resistant
32	<i>Azadirachta indica</i> , <i>Ocimum sanctum</i> , <i>Elipta prostrata</i> , <i>Vitex negundo</i> , <i>Aloe vera</i> , <i>Justicia gendarassa</i> and <i>Tabernaemontana divaricate</i> (A+B+C+D+E+F+G)	Resistant

**6. DISCUSSION AND SUMMARY**

In the present study, the plant leaf extracts of *Azadirachta indica*, *Tabernaemontana divaricate*, *Justicia gendarassa*, *Ocimum sanctum*, *Elipta prostrata*, *Vitex negundo* and *Aloe vera* showed antibacterial activities. In the case of *Proteus* sp, it is sensitive to the *Azadirachta indica*, *Ocimum sanctum* and the combination of *Ocimum sanctum* and *Elipta prostrata* and the combination of *Elipta prostrata* and *Vitex negundo*. Here, *Proteus* and *Klebsiella* organisms showed sensitivity to the leaf extracts of *Azadirachta indica* combined with *Vitex negundo* (9mm and 7mm respectively), whereas *Pseudomonas* and *Staphylococcus* were resistant to this combination.

In case of the plant leaf extract of *Vitex negundo*, it is sensitive to *Salmonella* sp, gram negative and highly pathogenic infectious agent. It causes illness such as Typhoid, Paratyphoid fever and Food poisoning. *Salmonella* can be found in the digestive system of humans and so, this plant extract can be used for the treatment of such infections. *Staphylococcus aureus* and *Pseudomonas* sp are resistant to combination of different plant extracts. Because of this, no zone formation has occurred.

Bacterial test organisms used in this study are associated with different types of infections such as Urinary tract infection, Diarrhoea, Pneumonia, Meningitis and Eye infections.

The indigenous system of medicine in India is known by many names such as Ayurveda, element in all the branches, is the use of medicinal plants. These plants are used because they do not produce any side effects (Agarkara et al., 1999).

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