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In-vitro* antibacterial activity of various extracts on the leaves of *Passiflora mollissima

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ABSTRACT

The methanolic extract and Isolated pure compound of the leaves of *Passiflora mollissima* were screened against antibacterial activity with six different bacterial strains. Gram positive bacteria, viz., *Staphylococcus aureus*, *Staphylococcus faecalis*, *Bacillus subtilis* and Gram negative bacteria, viz., *E.coli*, *Proteus vulgaris*, *Salmonella typhi*. by Disc Diffusion Technique in Nutrient agar medium. The effect produced by the extract was compared with the effect produced by the standard Ciprofloxacin 5µg/disc for bacteria.

Keywords: *Passiflora mollissima*, Gram positive bacteria, Gram negative bacteria, Disc Diffusion Technique, Ciprofloxacin.

INTRODUCTION

The world use of antibacterial compounds to treat infection leads to the evolution of microbes resistant to existing drugs [1]. The emergence of resistance to the major classes of antibacterial agents is recognized as serious health concern. The search for antibacterial agents with new mode of actions will always remain as an important and challenging task [2]. The therapeutic value of a medicinal plant depends on the presence of one or more constituents possessing certain physiological and pharmacological activity. Plants based antimicrobial have enormous potential they are effective in the treatment of infectious diseases while simultaneously mitigating many of the side effects that are often associated with antimicrobials [3]. Many commercially proven drugs used in modern medicine were initially

used in crude form in traditional or folk healing practices or for other purposes that suggested potentially useful biological activity [4].

Passiflora mollissima (H.B.K.) Bailey a traditional medicinal herb belonging to the family Passifloraceae were collected in conoor hills. Which is commonly known as Passion fruit, banana poka in Hawaii, American home land in latin, curuba, curuba de castilla or curuba sabanera blanco in Colombia, tacso,tagso,tauso in Ecuador, parcha in Venezuela, tumbo or curuba in Bolivia, tacso, tumbo, tumbo del norte, trompos, tintin in peru[5]. To treat various diseases. The reported main constituents are Passiflorin, Volatile constituents, aromatic and terpene hydrocarbons, fatty acids and esters [6,7].

The present work is to study the antibacterial activity methanolic extract and isolated pure compound of the leaf powder of *Passiflora mollissima* against *Staphylococcus aureus* (NCL 2079), *Staphylococcus faecalis* (NCL 2080), *Bacillus subtilis* (NCL 2063), *E.coli* (NCL 2065), *Proteus vulgaris* (NCL 2027), *Salmonella typhi* (NCL 2023), by disc diffusion method in the nutrient agar medium. The activity was compared with the standard ciprofloxacin under similar condition [8].

EXPERIMENTAL SECTION

Plant Material

The fresh leaves of plant specimens were collected from Coonor and it was authenticated [No.BSI/SC/5/23/06-07/Tech.17] as *Passiflora mollissima* (H.B.K.) Bailey Family: Passifloraceae in Botanical Survey of India, Tamilnadu Agricultural University, Coimbatore. Tamilnadu, India.

Preparation of leaf extract

The dried leaf powder of *Passiflora molissima* were extracted with methanol by using soxhlet apparatus for 48 hrs and it was concentrated by vacuum distillate. The Isolation was done by using the water extract and it was recrystallized with Ethanol .

Antimicrobial activity

Antimicrobial activity for the crude methanolic extract of *Passiflora molissima* and its isolated pure compound were tested for the antimicrobial effect against bacterial strains[9-12]. The inoculums for the experiment were prepared fresh in Mueller Hinton broth from preserved frozen slants. It was incubated at 37°C for 18-24 hours and used after standardization. Mueller-Hinton agar plates were prepared marked and inoculated with Gram positive and Gram negative bacteria by Disc diffusion Technique[13]. The least microorganisms are

Gram positive: *Staphylococcus aureus*, *Staphylococcus faecalis* and *Bacillus subtilis*,

Gram negative: *E.coli*, *Proteus vulgaris* and *Salmonella typhi*,

Were obtained from National Chemical Laboratory (NCL) Pune and maintained by periodical sub culturing on Nutrient agar medium for bacteria. The effect produced by the crude methanolic extract 200µg/disc and isolated pure compound 20µg/disc was compared with the effect produced by the positive control (Reference standard Ciprofloxacin 5µg/disc). (Table No: 1)

Disc diffusion assay

The anti-microbial activity of *Passiflora mollissima* methanolic leaf extract and its isolated pure compound against microorganisms examined in the present study and their potency were assessed by the presence and absence of zone of inhibition. The percentage of zone of inhibition was calculated by using following formula.

$$(100 - CT_D - S_D / T_D) \times 100$$

CT_D – Calculated test dose; S_D – Standard dose; T_D – Test dose

TABLE 1: Antibacterial Activity of Crude methanolic extract and isolated crystals of the leaves of *Passiflora mollissima*

S.No	Microorganisms	Zone of Inhibition in Mm and %					
		Samples					
		B	B5	STD	B%	B5%	STD%
01.	<i>Staphylococcus aureus</i> (NCL 2079)	12	30	30	1.00%	25.00%	100%
02.	<i>Staphylococcus faecalis</i> (NCL 2080)	16	15	32	1.25%	11.71%	100%
03.	<i>Bacillus subtilis</i> (NCL 2063)	20	28	35	1.42%	20.00%	100%
04.	<i>E.coli</i> (NCL 2065)	16	16	38	1.05%	10.51%	100%
05.	<i>Proteus vulgaris</i> (NCL 2027)	8	20	30	0.66%	15.63%	100%
06.	<i>Salmonella typhi</i> (NCL 2023)	20	24	32	1.56%	18.74%	100%

Crude methanolic extract – **B**; Isolated pure compound – **B5**; Standard Drug Ciprofloxacin – **STD**

RESULTS AND DISCUSSION

The results reveal that isolated pure compound of *Passiflora mollissima* were significantly effective against Gram positive bacteria *Staphylococcus aureus* and Gram negative bacteria *Salmonella typhi* when compared with the methanolic extract and standard ciprofloxacin under similar condition.

In conclusion the isolated pure compound showed promising activity when compared with the crude methanolic extract and standard ciprofloxacin against both Gram positive bacteria and Gram negative bacteria.

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