



## ANTIBACTERIAL ACTIVITY OF *PASSIFLORA LIGULARIS*

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### ABSTRACT

*Passiflora ligularis* A. Juss. leaf methanolic extract and isolated compound were tested for their *in vitro* antibacterial activity by disc diffusion technique against three Gram positive bacteria, viz., *Staphylococcus aureus*, *Staphylococcus faecalis* & *Bacillus subtilis* and three Gram negative bacteria viz., *E.coli*, *Proteus vulgaris* & *Salmonella typhi*. The isolated compound was found to have more antibacterial activity as compared to the methanolic leaf extract, but less than that of the standard drug ciprofloxacin.

**Key words:** *Passiflora ligularis*, Gram positive bacteria, Gram negative bacteria, Antibacterial.

### INTRODUCTION

*Passiflora ligularis* is a versatile medicinal plant belonging to the family passifloraceae were collected in Conoor hills, which is commonly known as passion fruit, sweet granadilla, granadilla china, yellow passion fruit etc.

The vein is a vigo strong grower, woody at the base climbing by tendrils, topping the highest trees, shading out and killing the understory. Its leaves are broadly heart shaped, pointed at the apex, 33/16 to 8 in (8-20 cm) long, 23/8 to 6 in (6-15 cm) wide, conspicuously veined, medium-green on the upper surface, pale-green with a bloom on the underside. Spaced along the petiol, are pairs of hairlike glands about 3/8 in (1 cm) long. At the leaf axils, these are paired, leaf like stipules, ovate-oblong and about 1 in. (2.5 cm) long and a little over 1/2 in. (1.25 cm) wide; more or less finely toothed. It is reported to possess flavorings, fruits are eaten raw, desserts.

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It contains various constituents such as C-flavonoid glycosides, isoschaftoside, iso-orientin, orirntin, isovitexin, vitexin<sup>1</sup> etc. A comparative study of fatty acid profiles of passiflora seed oil from Uganda has been reported.<sup>2</sup>

## EXPERIMENTAL

### Materials and methods

#### Plant material

The fresh leaves of plant specimens were collected from Cunnor in Nilgiri Hills and it was authenticated (No.BSI/SC/5/23/09-10/Tech.323) as *Passiflora ligularis* A. Juss. Family: Passifloraceae in Botanical Survey of India, Tamilnadu Agricultural University, Coimbatore, Tamilnadu, India.

#### Preparation of leaf extract

The dried leaf powder of *Passiflora ligularis* were extracted with methanol by using Soxhlet apparatus for 48 h and it was concentrated by vacuum distillate. The isolation was done by using the methanol extract and it was recrystallized with ethanol.

#### Antimicrobial activity

Antimicrobial activity for the crude methanolic extract of *Passiflora ligularis* and its isolated compound was tested for the antimicrobial effect against bacterial strains<sup>3-6</sup>. 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 h and used after standardization. Mueller-Hinton agar plates were prepared marked and inoculated with Gram positive and Gram negative bacteria by disc diffusion technique<sup>7</sup>.

The microorganisms used are Gram positive bacteria viz., *Staphylococcus aureus*, *Staphylococcus faecalis* and *Bacillus subtilis* & Gram negative bacteria viz., *E. coli*, *Proteus vulgaris* and *Salmonella typhi*. These 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 (200 µg/disc) and isolated pure compound (20 µg/disc) was compared with the effect produced by the positive control (Reference standard Ciprofloxacin; 5 µg/disc). (Table 1)

#### Disc diffusion technique

The antimicrobial activity of *Passiflora ligularis* methanolic leaf extract and its isolated pure compound against microorganisms was 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.

$$(100 - CT_D - S_D / T_D) \times 100 \quad \dots(1)$$

CT<sub>D</sub>– Calculated test dose; S<sub>D</sub>– Standard dose and T<sub>D</sub>– Test dose.

**Table 1: Antibacterial activity of crude methanolic extract and isolated compound of the leaves of *Passiflora ligularis***

Microorganisms	Zone of inhibition (in mm and %)					
	Samples					
	C	C5	STD	C%	C5%	STD%
<i>Staphylococcus aureus</i> (NCL 2079)	13	28	30	1.08%	23.3%	100%
<i>Staphylococcus faecalis</i> (NCL 2080)	20	20	32	1.56%	15.6%	100%
<i>Bacillus subtilis</i> (NCL 2063)	14	22	35	1.00%	15.7%	100%
<i>E. coli</i> (NCL 2065)	14	20	38	0.91%	13.1%	100%
<i>Proteus vulgaris</i> (NCL 2027)	14	25	32	1.16%	19.5%	100%
<i>Salmonella typhi</i> (NCL 2023)	16	18	30	1.25%	15.00%	100%

Abbreviations C - Crude methanolic extract; C5 - Pure compound; STD - Standard drug Ciprofloxacin

## RESULTS AND DISCUSSION

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