

Screening of Bioactive Compounds and Antimicrobial effect of Orithazh Thamarai Chooranam

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Abstract: Since time immemorial, man has used various parts of plants in the treatment and prevention of various ailments. There is a continuous and urgent need to discover new antimicrobial compounds with diverse chemical structures and novel mechanisms of action because there has been an alarming increase in the incidence of new and re-emerging infectious diseases. Many infectious diseases have been known to be treated with herbal remedies throughout the history of mankind. The aim of the study was to find out the bioactive chemical constituents and to evaluate the antimicrobial activity of the aqueous extract of Orithazh thamarai Chooranam. Phytochemical screening was carried out on Orithazh thamarai chooranam. The results revealed the presence of tannins, flavonoids, phenols and terpenoids. The aqueous extract of polyherb was tested for its antimicrobial efficacy against *Salmonella Sp*, *Micrococci Sp*, *Proteus sp.*, and *Vibrio cholerae.*, *Proteus sp* and *Salmonella sp* were found to be sensitive against this polyherb extract.

Keywords : Polyherb, Phytochemicals, orithazh thamarai ,antimicrobial activity.

Introduction

The medicinal plants are of great importance to the health of individuals & communities. The medicinal value of these plants lies in some chemical substances that produce a definite physiological action on the human body & these chemical substances are called phytochemicals. These are non-nutritive substances that have protective or disease preventive property (1). Living cells may generate free radicals and other reactive oxygen species by-products as a results of physiological and biochemical processes. Free radicals can cause oxidative damage to lipids, proteins and DNA, eventually leading to many chronic

diseases, such as cancer, diabetes, aging, and other degenerative diseases in humans(2) . Many phytochemicals have antioxidant activity and reduce the risk of many diseases (Eg. Carotenoids) (3). The most important of these bioactive compounds are alkaloids, flavonoids, tannins and phenolic compounds (4). These are the important raw materials for drug production (5). Infectious diseases are the world's leading cause of premature deaths (6). Therefore, there is a continuous and urgent need to discover new antimicrobial compounds with diverse chemical structures and novel mechanisms of action. In recent years, secondary plant metabolites (phytochemicals), previously with unknown pharmacological activities,

have been extensively investigated as a source of medicinal agents. Thus, it is anticipated that phytochemicals with adequate antibacterial efficacy are used for the treatment of bacterial infections (7). Contrary to the synthetic drugs, antimicrobials of plant origin are not associated with side effects and have therapeutic potential to treat diseases (8). They are also cheap, easily available and affordable.

Orithazh thamarai chooranam is a powder form of siddha formulation, which is widely used for enhancing the secretion of milk in women (lactation) (9) and improves the quality of the semen in men. It is a polyherb composed of five medicinal plants for which antibacterial efficacy was tested in this present study (Table 1).

Materials and methods

Sample Collection

The chooranam powder was collected from siddha medical store, Chennai and was authenticated by Department of Biotechnology, FSH, SRM University, kattankulathur.

Aqueous extract preparation

10g of the sample was added to 100ml of distilled water and boiled on mild heat for 2 hours. It was then filtered through muslin cloth and centrifuged at 5000 rpm for 15 minutes. The supernatant was collected. This procedure was repeated twice. The sample was then concentrated to

one fourth volume of original volume. (10). It was then autoclaved at 121⁰ C and 15 lbs pressure at 4⁰ C.

Phytochemical screening

Phytochemical screening was done by the standard procedure to identify the constituents as described by (11, 12).

Microorganisms tested

Micrococci sp., *Proteus sp.*, *Salmonella sp.*, *Vibrio cholerae* were isolated from the clinical samples in the Department of Biotechnology, FSH, SRM University. Nutrient broth was used as the media for the culturing of bacterial strains and a loop full of the strains of all the human pathogens were inoculated in the nutrient broth and incubated for 37°C for 18 hours and was used for this present study.

Antimicrobial testing

The aqueous extract of the polyherb was tested for antimicrobial activity by disc diffusion method for the four microorganisms. Sterile discs were placed above the culture swabbed nutrient agar plates (13). The extract was tested in triplicates with 20µl concentration on the plates. The plates were incubated at 37°C for 24hr in an inverted position. The inhibition zones were recorded after the incubation period. Antibacterial activity of these extracts was expressed in mm (Table 2).

Table 1: Composition of Orithazh thamarai chooranam

Common name	Botanical name	Family
orithazh thamarai	<i>Hybanthus enneaspermus</i>	Violaceae
Seeragam	<i>Cuminum cyminum</i>	Apiaceae
Senchandanam	<i>Pterocarpus santalinus</i>	Fabaceae
Jaadhikkai	<i>Myristica fragans</i>	Myristicaceae
Sugar cane	<i>Saccharum officinarum</i>	Poaceae

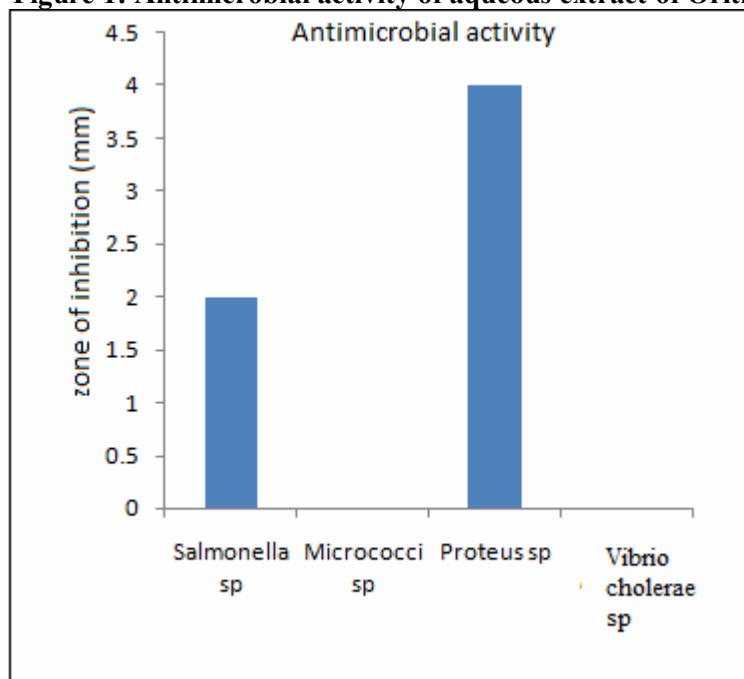
Table 2: Antimicrobial activity of aqueous extract of Orithazh thamarai chooranam

S.No	Concentration (µl)	Zone of Inhibition (mm)			
		<i>Salmolla sp</i>	<i>Micrococci sp</i>	<i>Proteus sp</i>	<i>Vibrio cholerae</i>
1.	20	2	-	4	-

Table 3: Phytochemical activity of Orithazh thamarai chooranam

Compound	Aqueous extract
Tannin	+
Saponin	-
Cardiac glycosides	-
Flavonoids	+
Phenol	+
Terpenoids	+

+ - Positive; - - Negative

Figure 1: Antimicrobial activity of aqueous extract of Orithazh thamarai chooranam

Result & Discussion

The present study carried out on the *Orithazh thamarai* chooranam sample revealed the presence of medicinally active constituents such as flavonoids, tannins, terpenoids and phenols (Table 3). Plants phenolics are a major group of compounds that act as a primary antioxidant (14). Terpenoids as vitamins acts as regulators of metabolism and play a protective role as antioxidant (15). The presence of flavonoids, terpenoids and tannins in the aqueous extract of polyherb may be the strong contributing factor to the application of the *Orithazh thamarai* chooranam in the management and treatment of various diseases. Antioxidants prevent oxidative stress caused by free

radicals, which damages cells (16). Therefore, the presence of flavonoids, phenols and tannins in this polyherb could be responsible for the observed antimicrobial property. Saponins and glycosides were found to be absent in the sample studied. The aqueous extract of the polyherb was found to be effective against *Proteus Sp* and *Salmonella Sp* whereas *Micrococci Sp* and *Vibrio cholerae Sp* were found to be resistant (Table 2) (Figure 1). Thus the chooranam studied here can be a source of high pharmacological importance and potential source of new drugs. Further studies on such bioactive compounds and their antimicrobial activity will unravel the potentiality of these traditional medicines.

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