

Bioefficacy of Leaf Extract of *Tagetes erecta* Against Linear Growth of *Taphrina maculans*

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Abstract: The present study deals with the evaluation of antifungal effect of leaf extract of *Tagetes erecta* against *Taphrina maculans*. The experiment was carried out *in vitro* using different concentrations of leaf extract from 1.0 to 3.0 each was tested by food-poisoning technique. As the concentration of *Tagetes erecta* increases, the linear growth of fungus gets decreased. The *Tagetes erecta* leaf extract at 3.0% concentration completely inhibits the linear growth of *Taphrina maculans* (8.00 mm).

Keywords: *Tagetes erecta*, *Taphrina maculans*, Leaf spot of turmeric

I. INTRODUCTION

Turmeric (*Curcuma longa L.*) is one of the major condiment in India. It is a rhizomatous plant belongs to the family Zingiberaceae. It is the ancient and sacred spice of India which is used in diversified forms as a condiment, flavouring and colouring agent and as a principal ingredient in Indian culinary as a curry powder. It is commonly grown in the states of Andhra Pradesh, Tamilnadu, Kerela, Karnataka, Bihar, Orissa and Maharashtra. The area under cultivation is about 99200 Hectare with a production of 167500 Tonnes per annum. There is variation in morphology, rhizome and quality characters in different varieties of turmeric [1]. The different varieties of turmeric are Allepy, Armour, Chintamani, Duggirala, Erode, Krishna, Lokhandi, Rajapuri, Salem, Tekurpeta red and Waigaon [2].

Apart from the uses as a spice, it is used as a traditional medicine in Asian countries such as India, Pakistan and Bangladesh because of its beneficial properties [3]. Current traditional medicine claims its powder against gastrointestinal diseases especially for biliary and hepatic disorder, diabetic wound, rheumatism, inflammation, sinusitis, anorexia and cough. It is also considered as an Indian folk medicine for the treatment of various illnesses. It is also having great importance in ceremonial and religious function in India. In such a way the rhizome is the main commercial, medicinal and edible part of the turmeric which is also useful in cosmetic industry. The rhizome of turmeric contains curcumin, mentanil yellow, lead chromate. The main constituent of rhizome are tumeron, zingiberene and also oleoresin. Oleoresin contains curcumin which gives turmeric its yellow-orange colour and have anti-oxidant properties [4].

Such economically important crop is affected by different fungi causing various diseases. Due to infection by fungi, the productivity of rhizome and overall yield is decreased. The plant extracts have antifungal activities due to presence of alkaloids, tannins, quinines, coumarins, phenolic compounds and phytoalexins [5]. Therefore the present experiments has been planned to control leaf spot of turmeric caused by *Taphrina maculans in vitro*.

II. LITERATURE SURVEY

Rajvanshi and Dwivedi [6] reported the presence of phytochemicals such as alkaloids, tannins, flavonoids and phenolic compounds in *Tagetes erecta* plant parts such as fresh flower, dry flower, fresh leaves and dry leaves. Padalia and Chanda [7] reported the antimicrobial potential of different solvent extracts of *Tagetes erecta* by agar well diffusion method against pathogenic microorganisms. The acetone extract inhibits *B. cereus* and *K. pneumonia*. The polar

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solvent acetone extract show antibacterial and synergistic activity. Behidj-Benyomes et al. [8] isolated the flavonoids from *Tagetes erecta* and evaluated against 5 different pathogenic bacteria and 2 fungi. The flavonoids are having inhibitory action against bacteria and fungi. Faizi S et al. [9] reported the antimicrobial efficacy of different parts of *Tagetes patula* Linn. The methanolic extract of flower was found to be highest antimicrobial activity.

III. MATERIALS AND METHODS

The effect of plant extract was studied against *Taphrina maculans* by food poisoning techniques [10]. The extract of *Tagetes erecta* have antifungal activities due to presence of alkaloids, tannins, quinines, coumarins, phenolic ompounds and phytoalexins.

The healthy leaves of *Tagetes erecta* were collected and washed with distilled water for three times. The mortar and pestle was swapped with alcohol. Then leaves were crushed y using 10% alcohol with the help of mortar and pestle. The extract was filtered by using muslin cloth. The leaf extract was added in 100 ml of 10% alcohol. The required concentration of plant extract was obtained by adding 1.0 ml, 1.5 ml, 2.5 ml, 3 ml in 10 ml of warm medium. The medium was poured in sterilized petri plates. These plates were inoculated by 5 mm disc of *Taphrina maculans* in the center of Czapak Dox agar medium and the linear growth was measured in mm [10].

IV. RESULTS AND DISCUSSIONS

This section is about to evaluate the antifungal potential of Leaf extract of *Tagetes erecta*. The effect of leaf extract of *Tagetes erecta* of linear growth of *Taphrina maculans* was observed (Table 1 and Fig. 1).

Conc. %	Linear Growth (mm)							
	Incubation Period (Days)							
	1	2	3	4	5	6	7	8
1	11	15	20.3	24	28	31.3	35	45
1.5	0	8	12	16	19	21	24.4	35
2	0	0	0	10	12.3	13	15	22
2.5	0	0	0	0	0	0	0	8
3	0	0	0	0	0	0	0	0
3.5	14	18.3	23	27	31	38	48	75
Control	3.2	3.71	4.54	5.15	6.45	8.92	11.3	13.3
CD at P.O.05	13	14.6	17.9	20.4	25.4	35.1	44.5	52.1

Table 1. Efficacy of leaf extract of *Tagetes erecta* on linear growth of *Taphrina maculans*.

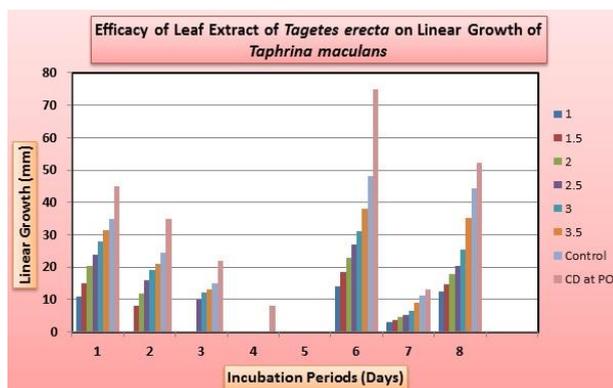


Fig. 1. Efficacy of leaf extract of *Tagetes erecta* on linear growth of *Taphrina maculans*.

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It was found that as the concentration of *Tagetes erecta* increases, linear growth of *Taphrina maculans* decreases. In control, linear growth was 75 mm on 8th day of incubation. The linear growth at 1.0% was 45.00 mm, at 1.5% was 35 mm at 2.00% was 22.00 mm. The maximum inhibition was 8.00 mm at 2.5% and there was complete inhibition of growth of *Taphrina maculans* at 3.00%.

V. CONCLUSION

The results of the present study reveal that leaf extract of *Tagetes erecta* flowers present a huge potential for the biopharmaceutical applications.

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