REVIEW OF RESEARCH

INFLUENCE OF TEMPERATURE AND DIFFERENT CULTURE MEDIA ON GROWTH OF *FUSARIUM OXYSPORUM F. SP. CORIANDRII* CAUSING WILT OF CORIANDER

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ABSTRACT:

During present investigation coriander wilt causing fungus Fusarium oxysporum f. sp. coriandrii were isolated from infected roots of coriander and its pure culture were obtained to check there physiological characters. Coriander leaf and Czapexdox agar medium was more suitable for mycelial growth and sporulation of Fusarium oxysporum f. sp. coriandrii. The optimum temperature for growth of Fusarium oxysporum f. sp. coriandrii 28 ± 2°C

KEYWORDS: *Coriander wilt , Fusarium oxysporum f. sp. coriandrii, temperature, culture media.*

INTRODUCTION

Coriander (*Coriandrum sativum* L.) is an important spice crop belonging to the family Apiaceae . It is one of the first species to be consumed by human beings as common flavoring substances. A pleasant aromatic odour is present in the leaves and fruit of the coriander, which is due to an essential oil containing coriandrol (Roy and Sharma, 1992). India is the largest producer of coriander in the world and the major regions where coriander is cultivated are mainly Maharashtra, Rajasthan , Gujarat , Andhra Pradesh ,Madhya Pradesh and Tamilnadu covering an area of 507.94 million hectares with an annual production of 461.66 million tones (Anonymous 2012) . The plant is used in preparing chutney and leaves used for flavoring curries soups and savouries. Dry fruits are extensively used in pickle preparation curry power seasoning and sausages. The seeds are also considered to be carminative ,diuretic stomatic , tonic antibilious , refrigerant and aphrodisiac (lagappan and Manoharan,2011). Hundred grams of coriander supplies 32.6 gms of fibres, 21.6 gms Carbohydrate, 16.1 gms fat, 14.1gms protein, 630 mg Calcium, 393 mg Phosphorus and 17.9 mg Iron and major vitamins present in coriander seeds are Thiamine, Riboflavin, Niacin and Carotene (Roy *et.al*., 2007).

The crop is affected by many fungal and bacterial pathogens but coriander wilt caused by *Fusarium oxysporum f. sp. coriandrii* is very serious fungal disease in India which causes 70 to 80 percent yield loss in field (Nene and Reddy 1987). During the present study *Fusarium oxysporum f. sp. coriandrii* was isolated and its pure culture was done from infected roots of coriander and its physiological characters were studied.

MATERIAL AND METHODS

The infected roots was cut down in to small pieces (5-7 mm) and kept in sterile petriplates having 0.1 % mercuric chloride (Hgcl2) solution for 1-2 minutes. Then it transferred to petridishes having sterile distilled water. The rinsed pieces were blotted by pre sterilized blotting paper and the pieces (4-5) were placed equidistance on solidified CzapexDox agar medium. Plates were incubated

at 25 ± 2 °C and after incubation for 3 days fungal culture were examined and identified by using standard mannuals(Subramanian 1971). The pure mycelial culture of Fusarium oxysporum f. sp. coriandrii were maintained on CDA slants and were used for throughout the experiments. Effect of temperature on the radial growth of Fusarium oxysporum f. sp. coriandrii was observed by inoculating 90 mm diameter plates of CDA agar with actively growing 8 mm diameter mycelial disc of Fusarium oxysporum f. sp. coriandrii and incubated in incubator at 0, 5, 10, 15, 20, 25, 30, 35, 40°C. To study the effect of different culture media on growth of Fusarium oxysporum f. sp. coriandrii , different culture media were prepared and used for growing Fusarium oxysporum f. sp. coriandrii (Table 1). The culture media was prepared (Ronald 2006) by the extract obtained from plant parts of coriander. Each treatment was replicated 3 times and the culture media were maintained at 28 ± 2^{0}C for 8 days, after which fungal growth was determined and number of spores /cm^3 were counted.

Table1 : Culture media containing host plant tissue

Coriander seed Agar	Coriander leaf agar	Coriander stem agar	Coriander root agar
Coriander seeds 200 gram	Coriander leaves 200 gram	Coriander stem 200 gram	Coriander roots 200 gram
Dextrose 20 gram	Dextrose 20 gram	Dextrose 20 gram	Dextrose 20 gram
Agar 20 gram	Agar 20 gram	Agar 20 gram	Agar 20 gram
Distilled water 1000 ml	Distilled water 1000 ml	Distilled water 1000 ml	Distilled water 1000 ml

RESULTS AND DISCUSSION

The obtained results showed that the optimum temperature for the radial mycelial growth and spore production of *F. oxysporum f. sp. coriandrii in vitro* was within range 25-30°C .Mycelial growth and spore count were reduced at temperature bellow 15°C and above 35°C. (Table 2). Maximum growth of *Fusarium oxysporum f. sp. coriandrii* was obtained on culture medium containing host plant tissue such as coriander seed agar, coriander leaf agar, coriander stem agar, coriander root agar followed by Czepeckdox agar medium (Table 3).

Table2 :Mycelial diameter (mm) and number of spores/ cm^3 of *F. oxysporum f. sp. coriandrii* cultured on czepeckdox agar at various temperatures.

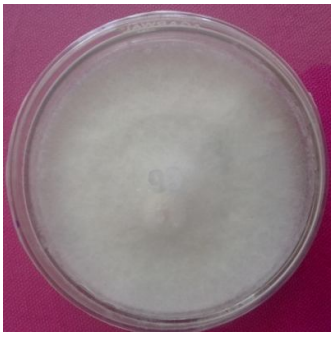
Temperature C°	Radial mycelial growth (mm)	Spores number / cm^3
0	00	0
5	10.33	0
10	13.66	8
15	17.66	58
20	28.33	122
25	60.33	154
30	89.66	210
35	13.33	34
40	00	00

Table 3 : Effect of different culture medium on radial mycelia growth of *F. oxysporum f. sp. coriandrii* at 28 ± 2°C for 8 days of incubation.

Culture media	Radial mycelial growth (mm)	Spores number/ cm^3
Coriander root Agar	89.33	190
Coriander stem Agar	86.66	184
Coriander leaf Agar	86.33	200
Coriander seed Agar	88.33	220
Potato dextrose Agar	83.33	178
Czapexdox Agar	85.67	202
Sabouraud Agar	65.66	170
Corn meal Agar	45.33	90
Malt Extract Agar	30.66	70

CONCLUSION

Mycelial growth of *F. oxysporum f. sp. coriandrii* observed on root extract agar was 89.33 and 88.33 on coriander seed agar followed by coriander leaf agar (table 3). This showed that the fungus growth was maximum on sap extract of roots as compared to seeds and leaves which proves soil-borne nature of *F. oxysporum f. sp. coriandrii.*



***F. oxysporum f. sp.coriandrii.* pure culture**

Culture in slant

Infected root of coriander

***F. oxysporum f. sp.coriandrii* conidia**

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