International Journal of Scientific Research in Engineering and Management (IJSREM)
Volume: 06 Issue: 01 | Jan - 2022 ISSN: 2582-3930

Comparative antifungal evaluation of *Pongamia pinnata* leaf extract against *Rhizoctonia solani* causing leaf blight of Turmeric.

Manisha k.Gurme and Madhuri M. Deshmukh

Dept.of Botany,

Dayanand Science College,Latur.

Abstract:

In the present study the ethanol and methanol leaf extract of *Pongamia pinnata* having different concentrations ranging from 10 to 50% were evaluated *in vitro* using food poisoned technique against *Rhizoctonia solani* causing leaf blight of Turmeric.The results revealed that the methanolic concentration of *Pongamia pinnata* was most effective than ethanolic leaf extract.The methanolic leaves extract at 40% and ethanolic leaves extract at 50% concentration were found to be superior in reducing the mycelial growth of *Rhizoctonia solani*.

Keywords: *Pongamia pinnata* leaves,*Rhizoctonia solani*, Turmeric.

Introduction:

Turmeric also known as 'Indian saffron' is an important commercial spice crop grown in India.It is used as a condiment,flavouring and colouring agent and as a principal ingredient in Indian culinary as curry powder.It is also having a strong sociocultural ties to the people of India.Many south Asian cultures have been using turmeric for thousands of years for medicinal purposes as well as cultural uses (Rathaur *et.al*.,2012).

Apart from the uses as spice ,it is also used as traditional medicine in Asian countries such as India, Bangaladesh and Pakistan because of its beneficial properties (Chattopadhyay *et.al.*,2004). The reported consumption of turmeric in Asian countries in humans is in the range of 200-1000mg/day (Thimmayamma,Rau and Rahaiah 1983;Polasa et.al.,1991).

It is also considered as an Indian folk medicine for the treatment of various illnesses.The old Hindu text have described it as an aromatic stimulant and carminative.In some parts of India,the powder is taken orally for the treatment of sore throat.The colouring principle of turmeric is called Curcumin,which has yellow and is the essential component of this plant (Ammon *et.al.*,1992).

Turmeric contains more than 100 componants. The main component of the root is volatile oil,containing tumerone and a colouring agent curcuminoids consisting of curcumin, demethoxycurcumin and dihydrocurcumin which are found to be natural antioxidants (Ruby *et.al*.1995;Selvam *et.al*.,1995).Such an economically and medicinally important crop gets suffered by different diseases.One of them is leaf blight of caused by *Rhizoctonia solani*.Taking into consideration the importance of crop and seriousness of disease,the present study was undertaken.

Materials and methods:

By using poisoned food technique (Mishra and Tiwari 1992) *in Vitro* at different concentrations having 10 to 50% ethanol and methanol leaf extract of *Pongamia pinnata* were tested against *Rhizoctonia solani*.For this healthy and noninfected leaves of *Pongamia pinnata* were collected from nearby region of Latur field and the leaves were washed thoroughly under tap water. The leaves were shed dried and the fine powder of leaves was made.The powder was extracted with 70% ethanol and 70% methanol solvents and was vaccum dried to obtain the dried ethanol and methanol extracts.

One liter of 70% ethanol extract solvent was mixed with 200gm of powdered plant material and it is kept for two days in tightly sealed vessels at room temperature.The mixture is stirred at regular intervals using sterile glass rod.Then this mixture was filtered through muslin cloth.The process of filteration is repeated until a clear colourless extraction liquid was obtained.The extracted liquid was subjected to water bath evaporation at 400^0c to remove the solvent.By using the same procedure,the methanol solvent was obtained.Then the extract was weighed and portion of it is used for phytochemical sceening.The antifungal evaluation of leaf extract was tested by food poisoned technique.The required amount of stock solution was mixed with sterilized molten PDA medium respectively so as to get 10,20,30,40 and 50% concentration.20 ml of medium was poured into 90mm sterilized petriplates and all plates were inoculated with actively growing 5mm mycelial disc of Rhizoctonia solani in the centre of media.Then the plates were incubated at room temperature for 8 days.Control plate was maintained without adding any leaf extract to the medium.The linear growth of the pathogen was measured in the form of millimeter (mm).

Observation Table No.1:Effect of ethanolic leaf extract of *Pongamia pinnata* on linear growth of *Rhizoctonia solani*

Sr. No.	Conc. Of leaf Extract %	Linear growth(mm)							
		Incubation period (Days)							
		1	2	3	4	5	6	7	8
1	10	5.00	12.00	15.00	22.66	24.00	32.00	38.66	40.00
2	20	4.00	11.00	16.00	19.00	23.00	31.00	36.40	38.00
3	30	3.00	9.00	14.00	17.00	22.00	28.00	34.50	36.00
4	40	0.00	0.00	0.00	0.00	9.00	11.00	12.00	16.00
5	50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	Control	15.00	17.00	20.15	33.44	47.00	62.00	76.00	78.00
7	S.E.±	3.84	4.36	5.52	6.18	8.36	11.62	13.16	15.24
8	C.D.at P=0.01	30.44	36.18	42.05	54.20	72.15	90.44	92.45	107.15
9	C.D.at P=0.05	20.04	23.16	30.15	37.15	45.15	62.18	71.25	83.20

Observation Table No.2:Effect of methanolic leaf extract of *Pongamia pinnata* on linear growth of *Rhizoctonia solani.*

Sr.No.	Conc. of Leaf Extract	Linear growth (mm) Incubation period (Days)							
		1	2	3	4	5	6	7	8
1	10	9.00	12.00	16.00	21.00	25.00	28.66	30.66	36.00
2	20	7.00	10.00	14.00	19.00	23.00	27.40	29.00	33.00
3	30	0.00	0.00	0.00	10.00	12.00	15.00	17.00	19.00
4	40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	Control	15.00	17.00	20.15	33.44	47.00	62.00	76.00	78.00
6	S.E.±	3.84	4.36	5.52	6.18	8.36	11.62	13.16	15.24
7	C.D.at P=0.01	30.44	36.18	42.05	54.20	72.15	90.44	92.45	107.15
8	C.D.at P=0.05	20.04	23.16	30.15	37.15	45.15	62.18	71.25	83.20

Results and Discussions:

The ethanolic and methanolic leaf extract of *Pongamia pinnata* were used to study its effect on growth of *Rhizoctonia solani* causing leaf blight of turmeric.The different concentrations of leaves extract used were 10,20,30,40 and 50%.The control plate is without leaf extract.The *Pongamia pinnata* ethanolic leaves extract at 10% shows 40.00mm growth ,at 20% shows 38.00mm growth,at 30% 36.00mm growth,at 40% 16.00mm growth and at 50% shows 0.00mm growth on 8thday of incubation.The 50% ethanolic of *Pongamia pinnata* is found to be superior in reducing mycelial growth of the pathogen.At this concentration the growth was 0.00mm from 1st to 8th day of incubation period.

On the other hand the methanolic leaf extract of *Pongamia pinnata* at 40% concentration is found most effective in inhibiting growth of *Rhizoctonia solani*.The growth of *R.solani* was 0.00mm at 40% concentration from 1st to 8thday of incubation.At 10% the growth was 36.00mm,at 20% 33.00mm and at 30% the growth was 19.00mm on 8th day of incubation.While the control plate shows 78.00 mm growth on 8thday of incubation.

From the observations it was clear that both ethanolic and methanolic leaf extract of *Pongamia pinnata* reduces the mycelial growth of *Rhizoctonia solani* as mentioned in the table 1 and 2.

Conclusion: Above study concluded that both the ethanolic and methanolic extracts of *Pongamia pinnata* inhibits the mycelial growth of *Rhizoctonia solani* with increasing concentration.

References:

1)Rathaur, P.,Waseem,R.,Ramteke,P.W.and John,S.A.(2012). Turmeric:The golden spice of life.*Inter.J.Pharma.Sci.Resea*. 3:1987-1984.

2)Thimmayamma B.V.S.,Rau, P. and Radhaiah, G.Use of spices and condiments in the dietaries of urban and rural families.*J.Indian Nutr.Diet*.1983;20:153-162.

3)Chattopadhyay,I.,Biswas,K.,Bandopadhaya,U.and Banarjee,K.K.(2004).Turmeric and Curcumin:Biological actions and medicinal applications.J.Curr.Sci.India;87:44-53.

4)Ammon,H.P.,Anazodo,M.I.,Safayhi,H.,Dhavan,B.N. and Srimal,R.C.(1992).Curcumin: A Potent inhibitor of leukotriene B4 formation in Rat peritoneal polymorphonuclear neutrophils (PMNL)*J.Planta Med*.:58-226.

5)Ruby,A..J.,Kuttan, G.,Babu, K.D.,Rajasekharan, K.N.,Kuttan,R. Antitumour and antioxidant activity of turmeric.*J.Ethnopharmacol*.1995;47:59-67 [PubMed].

6)Mishra,M.and Tiwari,S.N.(1992).Toxicity of Polyalthia longifolia against fungal pathogens of rice.*J.Indian Phytopatho*.45:56-61.