



Antifungal Activity of Extracts of Weed Biomass Against Major Seed Borne Fungi of Groundnut (*Arachis hypogaea* L.)

Deshmukh R. S.

Department of Botany, B. Raghunath College, Parbhani, MS, India, 431 401
rsdeshmukh19@gmail.com

Manuscript details:

Received: 28.05.2026
Accepted: 25.06.2026
Published: 30.07.2026

Cite this article as:

Deshmukh RS (2026) Antifungal Activity of Extracts of Weed Biomass Against Major Seed Borne Fungi of Groundnut (*Arachis hypogaea* L.). *Int. J. of Life Sciences*, 14 (2): 165-174.

Available online on <http://www.ijlsci.in>

ISSN: 2320-964X (Online)

ISSN: 2320-7817 (Print)

ABSTRACT

During the present studies, weeds found in fields were screened to observe their antifungal activity against major seed borne fungi of groundnut i.e. *Aspergillus flavus* Link ex Fr. and *Aspergillus niger* van Tieghem. To study the antifungal mechanism of plant extract, poisoned food technique was followed. The efficacy of weed extracts was expressed as percent inhibition of mycelial growth over control. Among these weeds *Parthenium hysterophorus* L. and *Commelina benghalensis* L. found to be most effective against major seed borne fungi of groundnut i.e. *Aspergillus flavus* Link ex Fr. and *Aspergillus niger* van Tieghem.

Keywords: *Aspergillus flavus*, *Aspergillus niger*, seed-borne fungi, *Parthenium hysterophorus*.

INTRODUCTION

Plant disease causing pathogens are mostly seed borne and seed transmitted. Seed-borne pathogens cause diseases of seed, seedling, and adult plants at various growth stages (Sangvikar, 2012). Approximately 5-15 % loss in the initial crop stand is due to seed-rot and seedling collapse (Pande and Narayana Rao, 2000). It is estimated that about 4% of the world's grains are lost due to biodeterioration caused by seed borne fungi (Clerke, 1966).

In recent years much attention has been given to non-chemical systems for seed treatment to protect them against seed-borne pathogens. Plant extracts have played significant role in the inhibition of seed-borne pathogens and in the improvement of seed quality and field emergence of plant seeds (Patel et al., 2007).

In India many unwanted plants so called weeds are very common, dominant and wide spread in the crop fields. In India diversity of unwanted plant in crop fields is very common, dominant and easily available. Weeds also occupy almost all open spaces. They spread like wildfire and grow abundantly in the crop fields, forest and roadsides.

During botanical excursions to different parts of this phytogeographic region every year, it is observed fact that weeds produce a huge biomass. This fact promoted to work on the present research topic.



Open Access This article is distributed under the terms of the **Creative Commons**

Attribution 4.0 International License (CC BY 4.0), which permits any use, provided proper credit is given to the author and source, a link to the license is provided, and changes are indicated. Third-party material is included under the same license unless otherwise credited. If your intended use is not permitted by the license or statutory exceptions, you must obtain permission from the copyright holder. Full license details: <http://creativecommons.org/licenses/by/4.0/>

The present investigation is undertaken to study the efficacy of common, dominant and easily available weeds in the crop fields against the seed borne fungi in a cost-effective and eco-friendly manner.

MATERIALS AND METHODS

i) Collection of seed samples

The method described by Paul Neergaard (1977) has been adopted for the collection of seed samples. Accordingly, three random samples of seeds (half Kg each) were collected from oil mills and market places. Groundnut cultivars used in the present study are TAG-24 and SB-XI.

ii) Detection of seed mycoflora

The seed mycoflora was detected by using standard moist blotter paper method as recommended by International Seed Testing Association (ISTA, 2003), Neergaard, (1977) and Agarwal, (1976).

iii) Identification of seed-borne fungi of groundnut

The seed borne fungi were preliminary identified on the basis of sporulation characters like asexual or sexual spores or fruiting structures. Detailed examination of fungal characters was done under compound microscope and their identification was confirmed with the help of latest manuals, (Subramanian (1971), Neergaard and Mathur (1980), Jha (1993) and Mukadam (1997). Pure culture of the identified fungi was prepared and maintained on PDA (Potato Dextrose Agar) slants.

iv) Preparation of weed extracts

Fresh samples were washed in tap water and finally washed thrice using sterilized distilled water. They were crushed in a sterilized pestle and mortar by adding a little quantity of sterile distilled water just enough to crush the sample easily. The extracts were collected by filtering through the two layers of muslin cloth. Finally, filtrates thus obtained from the leaves were used as stock solution (Kuntal Das, 2010).

v) Studies on antifungal activity of extracts of weed biomass on fungal growth *in vitro*

To study the antifungal mechanism of plant extract, poisoned food technique was followed as suggested by Nene and Thapliyal (1982). Fresh weed extract stock solution was used at three concentrations (1 %, 5 % and 10 %) prepared by mixing aseptically 1 ml, 5 ml

and 10 ml of stock solution in 100 ml semisolid sterilized potato dextrose agar medium (Tiwari *et al.*, 2005). Three replications were maintained for each treatment. Suitable control plates were maintained. Each plate was seeded with 5 mm mycelial discs aseptically taken from the periphery of 7 days old culture and incubated at 27°C till the growth of the colony touched the periphery in control plate. Mean colony diameter in each case was recorded (Dange, 2009).

vi) Efficacy of extracts of weed biomass against mycelial growth of *Aspergillus niger* van Tieghem by poisoned food technique.

The efficacy of weed extracts was expressed as per cent inhibition of mycelial growth over control which was calculated by using the formula as given by (Verma and Kharwar, 2006).

$$\% \text{ inhibition} = \frac{\text{Mycelial growth (control)} - \text{Mycelial growth (treatment)}}{\text{Mycelial growth (control)}} \times 100$$

RESULT

i) Detection of seed mycoflora

In order to study varietal variations in the seed mycoflora, seeds of Groundnut variety TAG-24 and SB-XI were plated on moist blotters and the percent incidence of seed-borne fungi was recorded and presented in table-1.

From the results it is clear that, there was variation in the degree of incidence of mycoflora in groundnut varieties. Groundnut variety TAG-24 showed maximum seed mycoflora including ten fungi while variety SB-XI showed presence of only two fungi. The seeds of both the varieties, TAG-24 and SB-XI invariably showed presence of *Aspergillus niger* and *Aspergillus flavus*.

i) Identification of seed-borne fungi of groundnut

Taxonomic identification of fungi (based on microscopic characteristics) was carried out according to International Scientific Mycological References and with the help of Information Bulletin of International Crops Research Institute for the Semi-Arid tropics (ICRISAT), Patancheru, Andhra Pradesh (India). Microscopic characteristics for the identification were conidial head, conidia shape, roughness and vesicle serration, etc were taken into consideration.

ii) Antifungal activity of extracts of weed biomass against seed borne pathogens of Groundnut by Poisoned food technique.

During the present investigation it was noticed that the seed borne fungi, *Aspergillus niger* and *Aspergillus*

flavus were dominant causing heavy damage to Groundnut seeds. Hence antifungal activity of extracts of weed biomass was tested against these pathogens by Poisoned food technique. The results are mentioned in table- 2 and 3 and Photo plate – 1,2,3 and 4.

Table- 1: Seed Mycoflora of Groundnut varieties TAG-24 and SB-XI (Moist Blotter Plate Method).

Sr. No.	Seed borne Fungi	Varieties of Groundnut	
		Per cent incidence of seed-borne fungi	
		TAG-24	SB-XI
1	<i>Alternaria alternata</i> (Fr.) Keissler	10	-
2	<i>Aspergillus candidus</i> Link	10	-
3	<i>Aspergillus flavus</i> Link ex Fr.	20	10
4	<i>Aspergillus fumigatus</i> Fresenius	10	-
5	<i>Aspergillus niger</i> van Tieghem	40	25
6	<i>Aspergillus terreus</i> Thom.	10	-
7	<i>Fusarium oxysporum</i> Schlechtend emend Sny. & Hans.	10	-
8	<i>Macrophomina phaseolina</i> (Tassi) Goldanich	10	-
9	<i>Rhizopus nigricans</i> Ehrenb.	20	-
10	<i>Sclerotium rolfsii</i> Sacc.	05	-

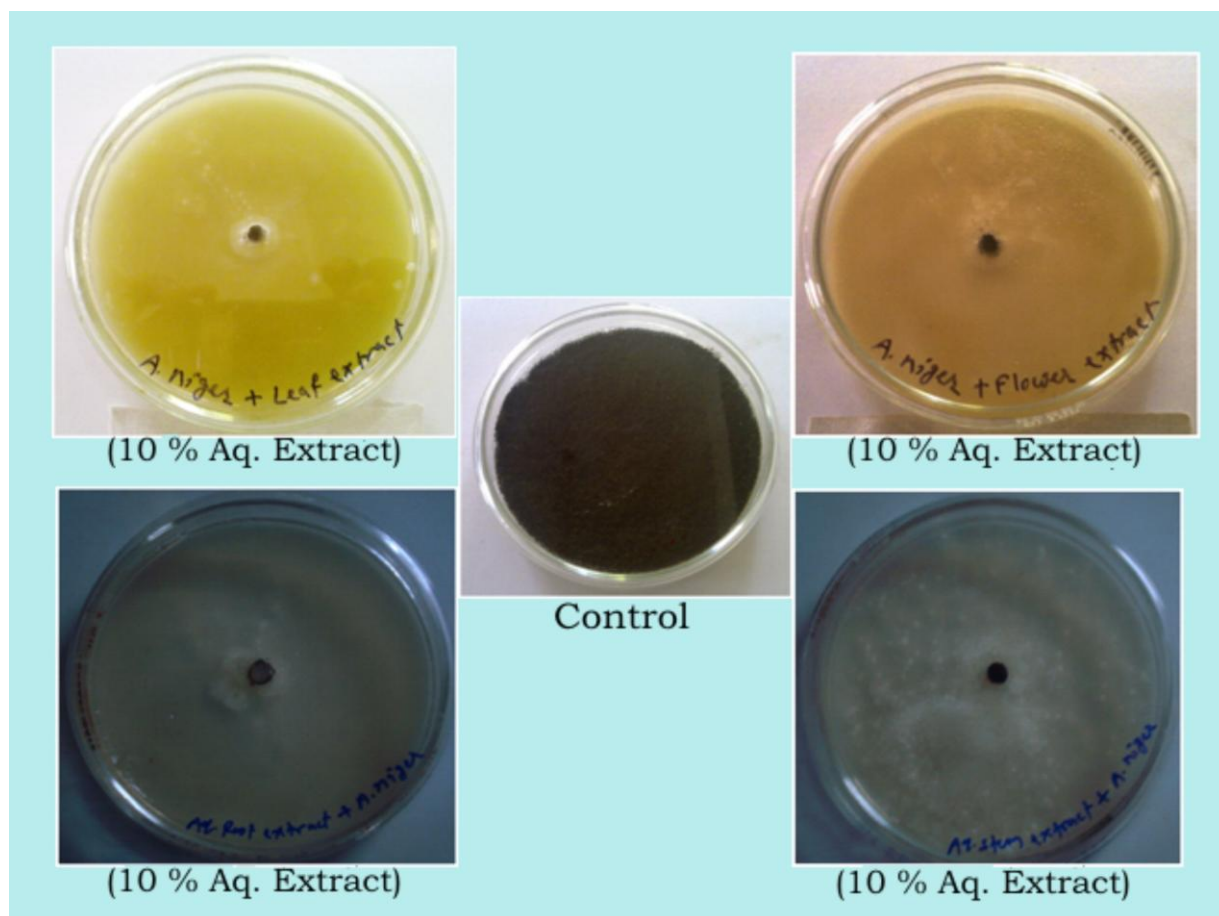


Photo Plate1: Antifungal Activity of *Parthenium hysterophorus* L. against *Aspergillus niger* van Tieghem

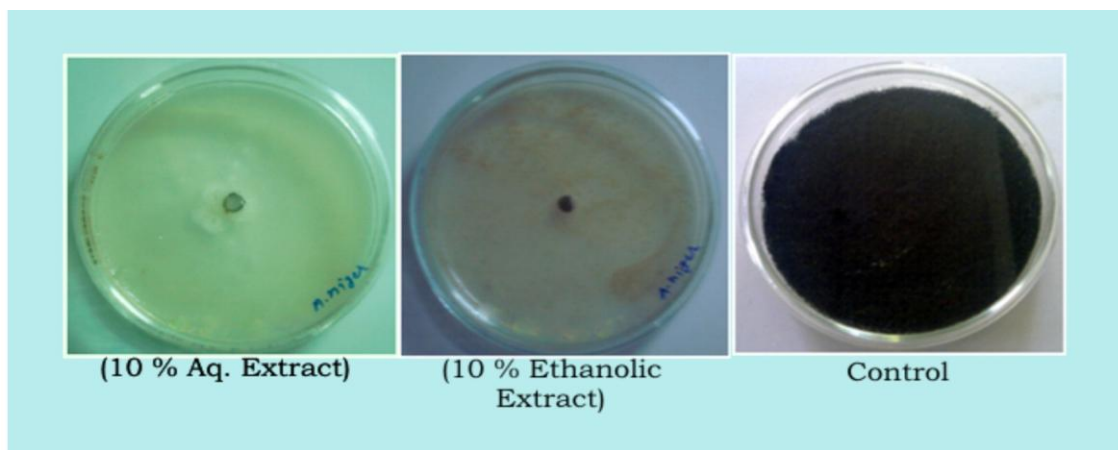


Photo Plate 2: Antifungal Activity of *Commelina benghalensis* L. against *Aspergillus niger* van Tieghem

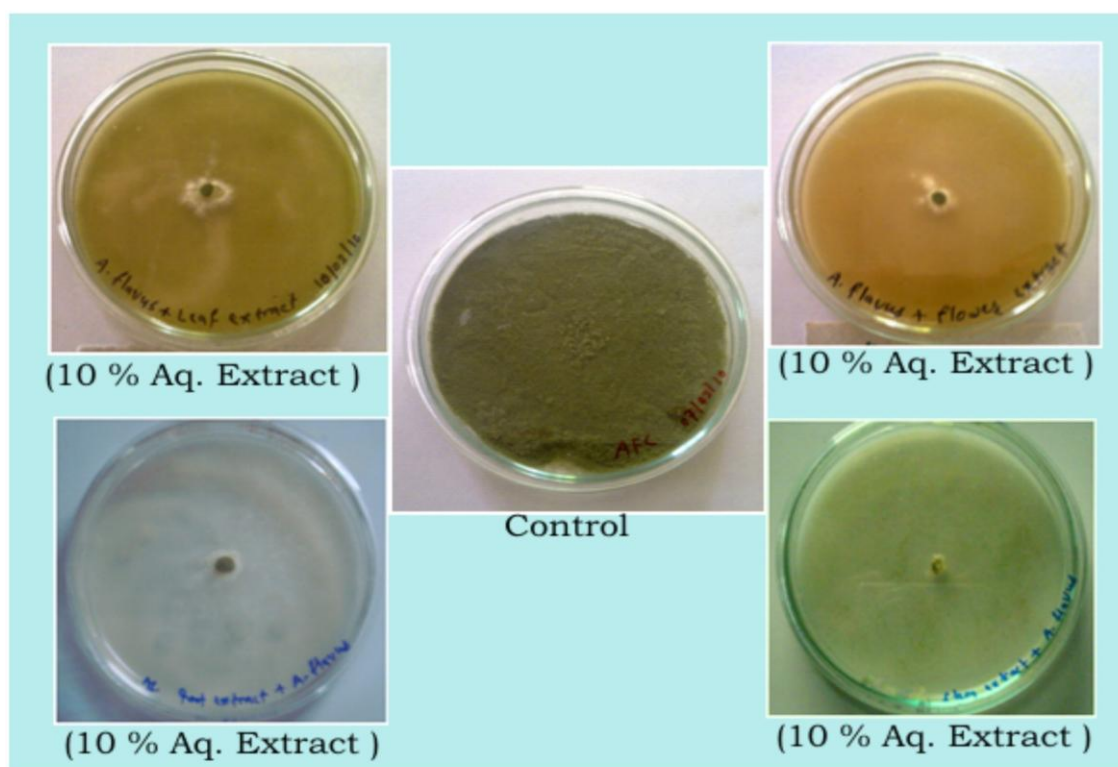


Photo Plate 3: Antifungal Activity of *Parthenium hysterophorus* L. against *Aspergillus flavus* Link ex Fr.

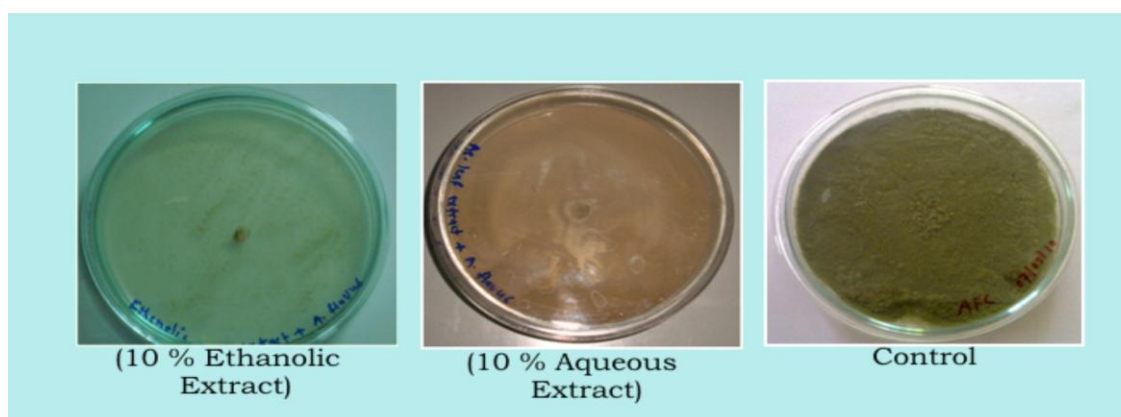


Photo Plate 4: Antifungal Activity of *Commelina benghalensis* L. against *Aspergillus flavus* Link ex Fr

Table 2: Antifungal activity of extracts of weed biomass against *Aspergillus niger* van Tieghem by poisoned food technique.

Sr. No.	Name of Weeds	Part Used	Mean colony diameter (in mm)					
			Aqueous Extracts			Ethanollic Extracts		
			1%	5%	10%	1%	5%	10%
1	<i>Argemone maxicana</i> L.	Leaves	37	35	35	36	35	34
		Stem	39	36	36	38	37	35
2	<i>Commelina benghalensis</i> L.	Leaves	18	14	12	16	14	11
		Stem	32	27	26	30	27	25
3	<i>Cynodon dactylon</i> (L.) Pers.	Leaves	38	37	35	37	37	35
		Stem	39	37	33	38	35	32
4	<i>Cyperus rotundus</i> L.	Leaves	35	35	32	34	33	30
		Rhizome	39	37	33	38	35	32
5	<i>Euphorbia hirta</i> L.	Leaves	40	40	40	38	35	34
		Stem	39	38	38	39	39	36
6	<i>Parthenium hysterophorus</i> L.	Leaves	15	11	08	14	11	09
		Stem	22	15	12	22	14	12
7	<i>Phyllanthus amarus</i> Schumach.& Thonn	Leaves	45	42	40	45	40	40
		Stem	43	41	40	42	41	41
8	<i>Portulaca oleracea</i> L	Leaves	30	30	29	30	28	27
		Stem	30	30	27	30	28	28
9	<i>Solanum nigrum</i> auct.	Leaves	35	34	32	36	32	32
		Stem	36	35	35	35	30	30
10	<i>Tridax procumbens</i> L.	Leaves	47	45	42	45	43	42
		Stem	50	50	49	47	47	45
11	Control		100			100		
	Leaves	S.E. $\pm$	1.37	1.10	1.40	1.98	1.33	1.25
		C.D. at 0.05%	4.04	3.24	4.12	5.83	3.92	3.70
	Stem	S.E. $\pm$	1.05	0.95	1.23	1.34	0.97	1.20
		C.D. at 0.05%	3.11	2.81	3.63	3.95	2.88	3.54

a) Antifungal activity of extracts of weed biomass against *Aspergillus niger* van Tieghem by poisoned food technique.

From the results presented in table-2 and Photo plate: 1 and 2, it is clear that maximum antifungal activity was observed in *Parthenium hysterophorus* L. at the concentration of 10 % Aqueous and 10 % Ethanollic extracts as compared with control (100 mm). All the test parts of *Parthenium hysterophorus* L. (Root, Stem, Leaves and Flowers) showed maximum antifungal activity in all the concentrations and in both Aqueous and Ethanollic extracts.

Among the root, stem, leaves and flowers extracts of *Parthenium hysterophorus* L., 10 % Aqueous and 10 %

Ethanollic flower extracts were found most effective against *Aspergillus niger*, followed by 10 % Aqueous and 10 % Ethanollic leaf extracts of *Parthenium hysterophorus* L. Out of the ten weeds tested the leaf extracts of *Commelina benghalensis* L. also showed inhibitory action over the mycelial growth of *Aspergillus niger*. 10 % Aqueous and 10 % Ethanollic leaf extracts of *Commelina benghalensis* L. were found to be effective than 1 % and 5 % leaf extracts. The weed extracts of *Tridax procumbens* L. showed maximum growth of the test fungus i.e. *Aspergillus niger* in all concentrations clearly indicating least effective in controlling the test pathogen followed by Aqueous and Ethanollic root and leaf extracts of *Portulaca oleracea* L. in all concentrations.

From the results presented in table-2 and Photo plate1 and 2 it is evident that root, stem, leaf and flower extracts of *Parthenium hysterophorus* L. in both Aqueous and Ethanolic forms and at all concentrations (1 %, 5 % and 10 %) were found effective as compared with other test weed extracts and with control.

b) Antifungal activity of extracts of weed biomass against *Aspergillus flavus* Link ex Fr. by poisoned food technique.

From the results presented in table-3 and Photo plate 3 and 4, it is clear that maximum antifungal activity was

observed in 10 % Aqueous and 10 % Ethanolic stem extracts of *Parthenium hysterophorus* L. (05 mm and 06 mm respectively) followed by 10 % Ethanolic leaf extracts of *Commelina benghalensis* L. (05 mm), 10 % Aqueous and 10 % Ethanolic root extracts of *Parthenium hysterophorus* L. (06 mm each) as compared with control (100 mm). Other test weeds do not show much antifungal activity as compared with *Parthenium hysterophorus* L. and *Commelina benghalensis* L.

Table 3: Antifungal activity of extracts of weed biomass against *Aspergillus flavus* Link ex Fr. by poisoned food technique.

Sr. No.	Name of Weeds	Part Used	Mean colony diameter (in mm)					
			Aqueous Extracts			Ethanolic Extracts		
			1%	5%	10%	1%	5%	10%
1	<i>Argemone maxicana</i> L.	Leaves	39	38	35	32	32	30
		Stem	38	38	38	35	32	30
2	<i>Commelina benghalensis</i> L.	Leaves	11	09	07	11	07	05
		Stem	25	24	20	26	25	25
3	<i>Cynodon dactylon</i> (L.) Pers.	Leaves	37	35	35	36	32	31
		Stem	39	36	35	38	35	35
4	<i>Cyperus rotundus</i> L.	Leaves	35	34	32	34	32	30
		Rhizome	39	36	35	38	35	35
5	<i>Euphorbia hirta</i> L.	Leaves	40	39	39	41	40	40
		Stem	42	42	40	40	40	40
6	<i>Parthenium hysterophorus</i> L.	Leaves	13	11	09	12	10	09
		Stem	08	07	05	08	06	06
7	<i>Phyllanthus amarus</i> Schumach.& Thonn	Leaves	41	41	41	40	36	35
		Stem	42	40	40	41	40	40
8	<i>Portulaca oleracea</i> L.	Leaves	28	28	27	25	22	22
		Stem	28	25	25	24	20	20
9	<i>Solanum nigrum</i> auct.	Leaves	37	35	35	35	32	30
		Stem	39	38	35	35	30	30
10	<i>Tridax procumbens</i> L.	Leaves	42	41	40	40	40	39
		Stem	45	43	42	45	40	40
11	Control		100			100		
	Leaves	S.E. $\pm$	0.97	1.31	0.91	1.08	1.07	1.38
		C.D. at 0.05%	2.86	3.86	2.68	3.20	3.16	4.07
	Stem	S.E. $\pm$	1.20	1.70	1.81	1.20	2.15	1.27
		C.D. at 0.05%	3.55	5.00	5.33	3.55	6.33	3.74
	<i>Parthenium hysterophorus</i> L.	Root	10	08	06	10	08	06
		Flower	09	08	06	10	08	07
	Control		100			100		

Table- 4: Efficacy of extracts of weed biomass against mycelial growth of *Aspergillus niger* van Tieghem by poisoned food technique.

Sr. No.	Name of Weeds	Part Used	Per cent mycelial inhibition					
			Aqueous Extracts			Ethanollic Extracts		
			1%	5%	10%	1%	5%	10%
1	<i>Argemone maxicana</i> L.	Leaves	63	65	65	64	65	66
		Stem	61	64	64	62	63	65
2	<i>Commelina benghalensis</i> L.	Leaves	82	86	88	84	86	89
		Stem	68	73	74	70	73	75
3	<i>Cynodon dactylon</i> (L.) Pers.	Leaves	62	63	65	63	63	65
		Stem	61	63	67	62	65	68
4	<i>Cyperus rotundus</i> L.	Leaves	65	65	68	66	67	70
		Rhizome	61	63	67	62	65	68
5	<i>Euphorbia hirta</i> L.	Leaves	60	60	60	62	65	66
		Stem	61	62	62	61	61	64
6	<i>Parthenium hysterophorus</i> L.	Leaves	85	89	92	86	89	91
		Stem	78	85	88	78	86	88
7	<i>Phyllanthus amarus</i> Schumach.& Thonn	Leaves	55	58	60	55	60	60
		Stem	57	59	60	58	59	59
8	<i>Portulaca oleracea</i> L	Leaves	70	70	71	70	72	73
		Stem	70	70	73	70	72	72
9	<i>Solanum nigrum</i> auct.	Leaves	65	66	68	64	68	68
		Stem	64	65	65	65	70	70
10	<i>Tridax procumbens</i> L.	Leaves	53	55	58	55	57	58
		Stem	50	50	51	53	53	55
11	Control		00			00		
	Leaves	S.E. $\pm$	1.93	1.75	1.39	2.10	1.49	1.65
		C.D. at 0.05%	5.70	5.16	4.11	6.20	4.38	4.88
	Stem	S.E. $\pm$	1.59	1.59	1.53	1.37	1.57	1.54
		C.D. at 0.05%	4.68	4.70	4.51	4.05	4.64	4.52
	<i>Parthenium hysterophorus</i> L.	Root	82	88	90	83	88	90
		Flower	86	88	93	86	88	93
	Control		00			00		

c) Efficacy of extracts of weed biomass against mycelial growth of *Aspergillus niger* van Tieghem by poisoned food technique.

The results are presented in table-4. From the results it was observed that maximum per cent mycelial growth inhibition of *Aspergillus niger* was done by 10% Aqueous and 10% Ethanollic leaf extracts of *Parthenium hysterophorus* L. (92 % and 91 % respectively) followed

by 10 % Aqueous and 10% Ethanollic leaf extracts of *Commelina benghalensis* L. (88 % and 89 % respectively). Among all test weeds, leaf and stem extracts of *Tridax procumbens* L. showed minimum per cent mycelial growth inhibition. 1% Aqueous and 5 % Aqueous stem extracts of *Tridax procumbens* L. showed only 50 % mycelial inhibition of the test seed borne fungus.

d) Efficacy of extracts of weed biomass against mycelial growth of *Aspergillus flavus* Link ex Fr by poisoned food technique.

The results are presented in table-5. From the results it was observed that maximum per cent mycelial growth inhibition of *Aspergillus flavus* was done by 10% Aqueous stem extract of *Parthenium hysterophorus* L (95%) and 10% Ethanolic leaf extracts of *Commelina*

benghalensis L (95 %) followed by 5% and 10 % Ethanolic stem extracts of *Parthenium hysterophorus* L. (94 %) as well as 10% Ethanolic root extracts of *Parthenium hysterophorus* L.

Among all test weeds, leaf and stem extracts of *Tridax procumbens* L. and *Euphorbia hirta* L. showed minimum per cent mycelial growth inhibition.

Table-5: Efficacy of extracts of weed biomass against mycelial growth of *Aspergillus flavus* Link ex Fr. by poisoned food technique.

Sr. No.	Name of Weeds	Part Used	Per cent mycelial inhibition					
			Aqueous Extracts			Ethanolic Extracts		
			1%	5%	10%	1%	5%	10%
1	<i>Argemone maxicana</i> L.	Leaves	61	62	65	68	68	70
		Stem	62	62	62	65	68	70
2	<i>Commelina benghalensis</i> L.	Leaves	89	91	93	89	91	95
		Stem	75	76	80	74	75	75
3	<i>Cynodon dactylon</i> (L.) Pers.	Leaves	63	65	65	66	68	69
		Stem	61	64	65	62	65	65
4	<i>Cyperus rotundus</i> L.	Leaves	65	66	68	66	68	70
		Rhizome	61	64	65	62	65	65
5	<i>Euphorbia hirta</i> L.	Leaves	60	61	61	59	60	60
		Stem	58	58	60	60	60	60
6	<i>Parthenium hysterophorus</i> L.	Leaves	87	89	91	88	90	91
		Stem	92	93	95	92	94	94
7	<i>Phyllanthus amarus</i> Schumach.& Thonn	Leaves	59	59	59	60	64	65
		Stem	58	60	60	59	60	60
8	<i>Portulaca oleracea</i> L.	Leaves	72	72	73	75	78	78
		Stem	72	75	75	76	80	80
9	<i>Solanum nigrum</i> auct.	Leaves	63	65	65	65	68	70
		Stem	61	62	65	65	70	70
10	<i>Tridax procumbens</i> L.	Leaves	58	59	60	60	60	61
		Stem	55	57	58	55	60	60
11	Control		00			00		
	Leaves	S.E. $\pm$	1.93	2.1	2.49	2.54	2.04	2.30
		C.D. at 0.05%	5.68	6.20	7.33	7.47	6.00	6.77
	Stem	S.E. $\pm$	2.40	1.86	2.25	2.11	2.30	2.28
		C.D. at 0.05%	7.08	5.48	6.64	6.22	6.77	6.71
	<i>Parthenium hysterophorus</i> L.	Root	90	92	94	90	92	94
		Flower	91	92	94	90	92	93
	Control		00			00		

DISCUSSION

i) Seed mycoflora of Groundnut

Variation in the composition of seed mycoflora in different varieties of Groundnut gives an idea about the degree of varietal resistance against the incidence of seed borne fungi. It is clear from the data summarized in table 1 that seeds of variety TAG-24 showed maximum seed mycoflora including then fungi while variety SB-XI showed presence of only one fungus. The seeds of all five varieties invariably showed presence of *Aspergillus niger*.

Similar type of variations in mycoflora in different varieties of Groundnut has been reported by various workers. Embaby and Adbal- Galil (2006), Hossain *et al.*, (2007), El-Wakil *et al.*, (2007) also studied the seed mycoflora of Groundnut and reported varietal variations in Groundnut. Biradar (2010) also reported varietal variations in the seed mycoflora of different Groundnut varieties by blotter, agar and seed washet methods.

Jogdand and Talekar (2010) isolated seed mycoflora of four groundnut varieties by standard blotter paper method and agar plate method and found that *Aspergillus flavus*, *Aspergillus niger*, *Fusarium oxysporum*, *Macrophomina phaseolina* and *Penicillium* sp. were predominant.

ii) Antifungal activity of extracts of weed biomass against seed borne fungi of groundnut

Similar types of results were reported by many workers. Patel *et al.*, (2007) screened six weeds for their antifungal activity and found that leaf extracts of *Parthenium hysterophorus* L. inhibited growth of *Aspergillus niger*, *Aspergillus flavus*, *Aspergillus niger* and *Aspergillus awamori*.

Deepak Sharma *et al.*, (2009) also reported antifungal activity extracts of *Parthenium hysterophorus* L. against *Aspergillus niger*.

However, during present studies, it was observed that literature regarding antifungal activity of *Commelina benghalensis* L. against *Aspergillus niger* and *Aspergillus flavus* remain unreported till date hence the leaf extracts of *Commelina benghalensis* L. which were found effective against *Aspergillus niger* and *Aspergillus flavus* after *Parthenium hysterophorus* L. is reported for the first time.

iii) Efficacy of extracts of weed biomass against seed borne fungi of groundnut

Extracts from common weed biomass show strong potential as eco-friendly, botanical treatments to suppress seed-borne fungi in groundnut (such as *Aspergillus flavus* and *Aspergillus niger*). Bioactive secondary metabolites in weed leaves and stems inhibit mycelial growth and spore germination without toxic chemical residues.

Acknowledgements:

I am thankful to Dr. S.S. Bodke, Head. Department of Botany & Horticulture, Yeshwant Mahavidyalaya, Nanded for providing the necessary laboratory facilities.

Conflict of interest

The authors declare no competing interests.

Data Availability Statement: Not applicable.

Correspondence and requests for materials should be addressed to **Deshmukh RS**

Reprints and permissions information is available at <https://www.ijlsci.in/reprints>

REFERENCES

- Agrawal VK (1981) Seed-borne fungi and viruses of some important crops. Research Bulletin 108, G.B. Pant University of Agri. and Tech. Pantnagar. Agric Biology 2(1&2): 144-146.
- Biradar RG (2011) Utilization of medicinal plants to control the seed borne pathogens of oil seeds. Ph.D. Thesis, Swami Ramanand Teerth Marathwada University, Nanded, India.
- Clerke JH (1966) Fungi in stored products. Pans 13: 473-481.
- Dange Vinod (2009) Studies on root rot of chilli caused by *Sclerotium rolfsii* Sacc. [M.Sc.](#) Thesis, University of Agricultural Sciences, Dharwad.
- Deepak Sharma, Aditi Anil Lavania, Anshu Sharma (2009) In vitro comparative screening of antibacterial and antifungal activities of some common plants and weeds extracts. Asian J Exp Sci 23(1): 169-172.
- El-Wakil MA, El-Metwally MA (2007) Seed-borne fungi of peanut in Egypt: Pathogenicity and transmission. Pak J Biol Sci 4: 63-68.
- Embaby EM, Mona M, Abdel-Galil (2006) Seed borne fungi and mycotoxins associated with some legume seeds in Egypt. J Appl Sci Res 2(11): 1064-1071.
- Hossain MD, Rahman MZ, Abeda Khatun, Rahman MM (2007) Screening of Groundnut Genotypes for Leaf Spots and Rust Resistance. Int J Sustain Crop Prod 2(1): 07-10.
- ISTA (2003) International Rules for Seed Testing. In: Draper (ed), Rules 2003. International Seed Testing Association, Zurich, pp 1-520.

- Jha DK (1993) A text book on seed pathology. Vikas Publishing House Pvt. Ltd., New Delhi, 132 pp. (reprint 1995).
- Jogdand SK, Talekar SM (2010) Fungal population on seeds of *Arachis hypogaea* L. *Journal of Ecobiotechnology* 2/6: 11-13.
- Kuntal Das, Tiwari RK, Shrivastava DK (2010) Fungitoxic properties of rhizome extracts of some medicinal plants. *Life Science Bulletin* 7(1): 01-05.
- Mukadam DS (1997) The illustrated kingdom of fungi (some selected genera). Akshar Ganga Prakashan, Aurangabad, India.
- Neergaard P, Mathur SB (1980) University teaching of seed pathology. Prasaranga, University of Mysore, India.
- Nene YL, Thapliyal PN (1973) Fungicide in Plant Diseases control (3rd ed.). Oxford and IBH Publishing Co. Pvt. Ltd., New Delhi, p 325.
- Pande S, Narayana Rao J (2000) Changing scenario of groundnut diseases in Andhra Pradesh, Karnataka and Tamil Nadu states of India. *International Arachis Newsletter* 20: 42-44.
- Patel SJ, Venugopalan N, Pradeep S (2007) Screening for antimicrobial activity of weeds. *The Internet Journal of Microbiology* 4(1).
- Paul Neergaard (1977) Seed Pathology, Vol. I. John Wiley and Sons, New York.
- Sangvikar RV (2012) In-vivo Testing of Plant Extracts against Seed borne Pathogens. *International Journal of Biological Sciences* 1(6).
- Subramanian CV (1971) Hyphomycetes: An account of Indian species except *Cercospora*. ICAR, New Delhi, 930 pp.
- Tiwari RKS, Chandravanshi SS, Ojha BM (2005) *J Mycol Pl Pathol* 34(2): 461-464.
- Verma VC, Kharwar RN (2006) Efficacy of neem leaf extract against its own fungal endophyte *Curvularia lunata*. *Journal of Agricultural Technology* 2: 329-335.

© The Author(s) 2026

Publisher's Note

IJLSCI remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.