

Research Article**Efficacy of Plants Leaf Extracts on Growth of Seedborne
fungi of *Cajanus cajan* L.Mill sp.****S. S. Ingle**Department of Botany, Narayanrao Waghmare Mahavidyalaya AK.
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E mail sudhakaringle2012@gmail.com**ABSTRACT**

Seeds of pigeon pea (*Cajanus cajan* L.Mill Sp.) carry a number of fungi . These fungi were found to be responsible for seed deterioration making them unfit for consumption. Subsequently, these seed-borne fungi inhibit seed germination, seedling emergence and cause diseases. To control these plant pathogenic fungi, pesticide compound of plant origin are more effective, safe for environment and no side effect on human hygiene. Ten plants were selected to evaluate their antifungal activity against seed borne fungi. All selected plants leaf extract showed inhibitory activity against above mentioned seed borne fungi and increased seed germination percentage, root and shoot length as compared to control. *Azadirachta indica*. A.Juss. and *Tephrosia purpurea* L. leaf extracts were showed good inhibitory activity against seed borne.

Key words: Seed borne fungi, Pigeon pea, Antifungal activity, Leaf extracts.

INTRODUCTION

Pigeonpea (*Cajanus cajan* (L.) Mill. Sp.) is commonly known as red gram, India is the one of largest producer of Pigeonpea in the world. A large number of fungi were found to be associated with pigeon pea seed at the stage of harvest, transport and during storage which bring about several undesirable changes making them unfit for human consumption and sowing [1] These fungi also reduce the germination and storability of the seed. They are responsible for seed rot, seedling blight, root/stem rot, foliar infection as well as pod blight diseases. [2, 3]

The seed borne fungi of Pigeon pea has been found interesting in its quality and its role in affecting the seed health. Seed borne diseases affect growth and productivity of crop plants [4] Different species of *Aspergillus*, *Alternaria*, *Curvularia*, *Fusarium*, *Penicillium*, *Dreschslera* are the most common fungi associates of seeds of pigeon pea [5]. Sinha and Prasad (1978) observed loss in protein contents of arhar seeds due to association of *Aspergillus flavus*, *Aspergillus niger* and *Fusarium moniliforme*. [6] They also noted that, *Aspergillus niger* was found to be more biodeteriorating than

the others. To control these plant pathogenic fungi harmful chemicals are used. Using of such chemicals unsafe for environment.

The pesticide compound of plant origin are more effective, safe for environment and no side effect on human hygiene.^[7] Considering the importance of plant origin compounds to control the seed borne fungi present investigation was under taken to evaluate selected plants for their antifungal activity against *Aspergillus niger*. The seeds of three varieties of Pigeonpea, were collected from field and store houses from different places in Marathwada and used different storage methods.

MATERIALS AND METHODS

Collection of plant material:

Azadirachta indica.A.Juss , *Acacia nilotica* L., *Catharanthus roseus* L, *Ocimum sanctum*.L., *Achyranthes aspera* L. *Argemone mexicana* L. *Tephrosia purpurea* L., *Datura alba* L. *Psoralea corylifolia* L. and *Curcuma longa* L. plants were selected. These are common and easily available plants in the vicinity. Their identification was confirmed using the 'Flora of Marathwada'^[8]. The fresh and healthy leaves of the selected plants were collected separately. Plants parts were washed thoroughly with tap water, surface sterilized with 0.1% HgCl₂ and washed repeatedly with sterile distilled water for several times and kept in shade for drying. After drying, the leaves were preserved separately in polythene bags at room temperature (27± 2°C) during the studies.

Preparation of plant extracts:

The dried leaves of selected plants were crushed separately in to fine powder with the help of blender. 10 gm powder of each of the plant leaves powder was dissolved separately in 100 ml sterilized hot distilled water in 250 ml pre sterilized conical flasks. Then extract were filtered with muslin cloth and flasks were kept in oven for 24 hours at 4°C and the content was again filtered through Whatman's filter paper

No.1. The filtrates were used as 5% plant extracts.

Assessment of seed Mycoflora and seed treatment

Seed sample of pigeon pea were obtained from local farmers and stored at room temperature 27°C. Hundred seeds of from sample were soaked in aqueous leaf extracts (5%) of selected plants and keep overnight. The seeds soaked in sterile distilled water served as control. The treated and control seed were keep in shade for drying. These dried seeds were plated on agar plates, incubated for seven days at room temperature and their seed mycoflora was detected, identified^[9] and percentage of seed germination, root length and shoot length are recorded.

RESULT AND DISCUSSION

The result from agar plat method revealed the presence of 12 fungi belongs to 7 genera on seed sample of Pigeon pea. These seed borne fungi were isolated and identified. Six species belongs to *Aspergillus* genara- *A. niger*, *A. flavus*, *A. tenuis*, *A. terreus*, *A. alternata*, and *A. nidulans*. *Curvularia lunata*, *Fusarium oxysporum*, *Rhizopus stolonifer*, *Penicillium* sp. *Trichoderma* sp. Incidence *Aspergillus* sp. is more, this is also reported by Bhikane 1988. Association of these fungi with seeds damage seeds in various ways. The quality of seed gets deteriorated and some time the grains are not suitable for animal consumption due to the production of mycotoxin substance by the seed fungi accompanied by change in the chemical nature of the seed.^[10] The germination of seed is also appreciably affected by fungi. Studies on seed germination and radicle growth of certain oil seeds, fungi cause inhibition of seed germination to varying degree.^[11] Moisture content of seeds has been considered to be the next important factor for establishment of seed mycoflora. Umecheruba *et al.* (1992) also confirmed that increase in moisture content cause severe infection of *A. flavus*, *A. niger* and *M.*

phaseolina.^[12] Safflower seeds having 13 % moisture favoured sufficiently to develop species of *Aspergillus*, *Penicillium*, *Curvularia*, *Botrytis*, *Alternaria*, and *Cercospora*^[13].

Attempts have been made on the biocontrol of seed-borne fungi using plant extracts. The results obtained during the present investigations gave an idea that the plant extracts can successfully control the spore germination, growth of seed-borne fungi like *Alternaria tenuis*, *Aspergillus flavus*, *Curvularia lunata*, and *Fusarium oxysporum*. The plant extracts can prevent percentage incidence of seed mycoflora and also can stimulate seed germination seedling emergence. All selected plants leaf extract showed good inhibitory activity against above mentioned seed borne fungi and increased seed germination percentage, root and shoot length as compared to control. *Azadirachta indica*. A.Juss. and *Tephrosia purpurea* L. leaf extracts were showed good inhibitory activity against seed borne fungi 78% of seed germination, 5.20 cm root length, 4.75 cm shoot length and 75% seed germination, 5.10 cm root length, 4.78 cm shoot length respectively. Followed by these plants *Psoralea corylifolia* L and *Ocimum sanctum*, showed good inhibitory effect against seed borne fungi they showed 65% of seed germination, 4.89

cm root length, 3.95 cm shoot length and 63% seed germination, 4.50 cm root length, 3.85 cm shoot length respectively.

Similar results were observed in case of different crop plants by different workers^[14]. Rathore (1994) reported hot water, cold water and ethanolic leaf extracts of *Andrographis paniculata*, *Artabotrys hexapetalus*, stem extract of *Peristrophe bicalyculata*, bulb extract of *Allium sativum*, flower extract of *Woodfordia fruticosa*, fruit and seed extracts of *Prosopis Juliflora* and entire plant extract of *Enicostemma littorale* effective against *ASN* and *Helminthosporium longirostrata*. He also found that the Garlic and *Artabotrys* extracts were very much effective in preventing the growth and sporulation of the test fungi^[15] Jalandhar V. and M. Mamatha (2009) studied the antifungal effect of weeds leaf extracts on seed borne fungi of Pigeon pea seed regarding seed germination percentage seedling length and vigor index. They have been reported that leaf extract of some weeds gave good result against seed borne fungi of Pigeon pea^[15] The results obtained during the present investigations gave an idea that the plant extracts can successfully control the spore germination, growth of seed-borne fungi.

Table No.1 Antifungal effect of leaf extract prepared from selected plants against seed borne fungi on pigeon pea.

Sr.No.	Name of plants	% of germination	Root length in cm	Shoot length in cm
1	<i>Achyranthes aspera</i> L	48.00	3.32	2.95
2	<i>Acacia nilotica</i> L	51.10	3.37	2.98
3	<i>Argemone mexicana</i> L	47.00	3.45	2.75
4	<i>Azadirachta indica</i> A.Juss	78.00	5.20	4.75
5	<i>Catharanthus roseus</i> L.	60.23	4.00	3.75
6	<i>Curcuma longa</i> L	58.09	3.50	3.47
7	<i>Datura alba</i> L.	47.00	3.10	2.90
8	<i>Ocimum sanctum</i> L.	63.00	4.50	3.85
9	<i>Psoralea corylifolia</i> L.	65.00	4.89	3.97
10	<i>Tephrosia purpurea</i> L.	75.50	5.10	4.10
11	Control	41.00	2.75	1.67

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