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# Transmission Studies Associated with Sesamum Phyllody Disease

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**ABSTRACT**

*In the present study investigations were carried out on the symptomatology, transmission of this disease. Infected plants are showed characteristic symptoms of witch's broom, bushy appearance. Under field condition, infected plants showed the most common characteristic symptom is phyllody. In the present studies, sesamum phyllody disease could not transmit through sap and seed. This indicates that the sesamum phyllody can not transmit through seed and sap. Out of the twenty inoculated plants with sap, no symptoms were observed on inoculated plants. Out of twenty sap inoculated plants, no one is showed positive reaction in PCR assay. Out of the twenty grafts inoculated plants, only seventeen inoculated plants are showed phyllody symptoms 45 days after inoculation. Out of the twenty inoculated plants, only seventeen grafts inoculated are showed positive reaction to the sesamum phyllody in PCR. Sesamum phyllody was transmitted successfully from infected plants to healthy plants through grafting*

***Key words:*** *PCR, phyllody, Sesamum indicum, Phytoplasmas*

## INTRODUCTION

Sesame (*Sesamum indicum* Linnaeus) is an important oilseed crop grown in tropics and subtropics and it is also known by "queen of oil seeds". Sesame seed is a rich source of protein (20%) and edible oil (50%), and contains about 47% oleic acid and 39% linolenic acid[8]. Phytoplasmas are non-helical obligate parasites that belong to the prokaryotic class Mollecutes and are transmitted by sap-feeding insects and vegetative plant propagation materials[4]. The symptoms starts with vein clearing of leaves. The disease manifests itself mostly during flowering stage, when the floral parts are transformed into green leafy structures, which grow profusely. The flower is rendered sterile. The other disease symptoms are floral virescence, proliferation, seed capsule cracking, formation of dark exudates on foliage and floral parts, and yellowing. Sesame phyllody is transmitted by a leafhopper (*Orosius albicinctus*). Phytoplasmas are able to move within plants through the phloem from source to sink and they are able to pass through sieve tube elements[2]. Phytoplamas are pleomorphic and have small genome.

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In plants, they are restricted to the phloem tissue and spread throughout the plant by moving through the pores of the sieve plates which divide the phloem sieve tubes. Plants infected by phytoplasmas exhibit a wide range of specific and non-specific symptoms. Symptoms of diseased plants may vary with the phytoplasma, host plant, stage of the disease, age of the plant at the time of infection and environmental conditions[3].

## MATERIALS AND METHODS

**Transmission:**

**Sap inoculation:**

Phytoplasmal inoculum for sap transmission was prepared by ground the symptoms in 0. 02M phosphate buffer (pH-7.4) with a mortar and pestle. The sap a clarified through two fold muslin cloth and inoculated on young leaves of the seedling by previously dusted with 500 mesh carborandum powder as a abbresive.immediatley after inoculation, the inoculated leaves were washed with a gentle stream water to remove excess of inoculums. All the inoculated plants were maintained in an insect proof cage house with proper labelling till the development of symptoms.

**Graft inoculation:**

For graft inoculation, a slice cut was made on the stem 2cm below the tip. The sesamum shoots were collected from phytoplama infected plants. The similar cut made on this shoot and corresponding cut surfaces were brought together and tied with parafilm. The inoculated plants were kept in insect proof glasshouse for symptom development. Four weeks old sesamum plants were used for the graft inoculation of phytoplasma inoculam under green house conditions[1].

**Seed transmission:**

One hundred fifty phytoplasma infected seeds a healthy seeds of sesamum were planted on pots in green house condition. The plants were observed for symptoms development.

## RESULTS AND DISCUSSION

**Transmission:**

Fifty phyllody infected seeds and healthy seeds of sesamum were Planted in pots under green house conditions. In the present studies, sesamum phyllody disease could not transmit through sap and seed. This indicates that the sesamum phyllody can not transmit through seed and sap. Out of the twenty inoculated plants with sap, no symptoms were observed on inoculated plants. Out of twenty sap inoculated plants, no one is showed positive reaction in PCR assay. The present results were in agreement with the results obtained by Akhtar *et al*[1] and Pathak *et al*[5]. Sesamum phyllody was transmitted successfully from infected plants to healthy plants through grafting. Out of the twenty grafts inoculated plants, only seventeen inoculated plants are showed phyllody symptoms 45 days after inoculation. Out of the twenty inoculated plants, only seventeen grafts inoculated are showed positive reaction to the sesamum phyllody in PCR. These results indicate that the 85 percent of disease transmitted into the graft inoculated plants. The inoculated plants showed characteristic symptoms phyllody, floral virescenceans, yellowing of leaves and stunted growth .these similar results were also earlier reported by the Akhtar[1]. The successfully transmission of Sunflower phyllody phytoplasma through grafting by Salehi *et al*[6]. The transmission of sesamum phyllody by grafting was reported by Sertkaya[7].

**Table 1: Sesamum phyllody transmission by sap and seed**

| S.No. | No of seeds or no of plants inoculated | No of seeds germinated or no of plants infected | % of disease transmision |
|---|---|---|---|
| 1 | Disease seed -50 | 32 | - |
| 2 | Healthy seeds-50 | 35 | - |
| 3 | Plant -20 | - | - |

**Table 2: Sesamum phyllody transmission by grafting**

| S.no. | Total no of plants | inoculated plants | no of plant infected / Total no of plant | % of transmission |
|---|---|---|---|---|
| 1 | 20 | 20 | 17/20 | 85 |

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