

Study of Seedmycoflora of *Pisumsativum* and Its Control

Lovepreet Kaur¹ and Mamta Pujari^{1*}

¹School of Bioengineering and Biosciences,
Lovely Professional University, Phagwara (Punjab)

***Correspondence to mamta.21901@lpu.co.in**

ABSTRACT

Seeds of Pea (*Pisumsativum*) were collected from different shops, market and also from farmers and the collected seeds were tested by different methods to detect the fungi under laboratory conditions and different forms of fungi were isolated from seeds. Fungi of different frequency and different percentage were recorded from seeds. Two seed samples of *Pisumsativum* was studied under laboratory conditions and the seeds collected were tested by performing two methods i.e. blotter method and agar plate method. Seed samples were collected from the seed store having variety AP-3 AND GS-10. Seeds were kept in petri plates in incubator after providing suitable environmental conditions and fungal growth was seen on the seeds and later seed mycoflora was studied under the microscope. Both treated and untreated seeds were examined. Preventive control measures were also taken by giving both herbal as well as chemical treatment.

INTRODUCTION

Pea is a legume plant and they are rich in minerals, vitamins, energy. Pea is rabi crop and belongs to family leguminosae and it is sown in the month of October to November [1]. They also make the soil fertile. Pea grows best in soil whose pH is 6-7. Major problem arises of transfer of pathogen arises while seed storage which later causes fungal infection and it may lead to loss of crop yield. On moisture free seeds growth of fungi takes place which in turn leads to fungal growth. Fungal disease in plants results in billion dollars loss per year as fungi has wide variety of species which reduce the crop production and hence reduces the yield. Different fungus varieties were found such as *Ascochyta* spp., *Fusarium* spp., *Sclerotinia* sp., *Mucor*, *Aspergillus* spp. Fungi which is seed borne made the seed unhealthy and incompetent as it produces mycotoxins which releases toxic compounds [2].

Seeds which are healthy, gives good yield and good to harvest. Fungi which is seed borne or present on the extracellular surface of seed tells the type and quality of seeds because infected seeds affects the evolution of the seeds and also its production rate [3-5]. Fungi make the seed infected and two type of infection occurs, it may be systemic and non-systemic infection. Seeds which get infected intracellularly through various parts, mainly infection occurs inside seeds as pathogen enters inside seed. On the other hand non-systemic infection occurs extracellularly or comes from outside by pathogens. In life cycle of fungi both sexual and asexual reproductive stages are present [6]. Various diseases are caused by fungi such as powdery mildew, downy mildew etc. these diseases can occur at any stage of seedling development and loss of yield takes

place under suitable environmental conditions [7].

Plants are infected by plant pathogens and the disease is spread in three ways i.e. pre penetration, penetration and post penetration. During initial stage when the disease is spread, the nutrition is taken by the pathogen from the host plant. The pathogen affects the efficiency of the host to grow and germinate [8-12].

MATERIALS AND METHODS

SEED COLLECTION

The pea seeds (*Pisumsativum*) were collected from different seed stores and one sample was taken from home and marked as homemade. These samples were tested under laboratory conditions through different methods providing suitable environmental conditions. Seeds were properly washed and sterilized with the distilled water.

BLOTTER METHOD

In this method, blotting sheets were cut in three layers according to the size of the petri plates. Petri plates were properly sterilized first. The circles of blotting paper were placed in the petri plates and it was made wet with the help of distilled water, about 10 seeds of Peas were placed in each petri plates at proper distance and later these plates are covered with the parafilm to avoid bacterial contamination. These plates were kept in the incubator at 25-28°C temperature. After incubation of one week, different fungal species were found on the pea seeds and the fungal spores were studied under the microscope and their preventive measures were taken.

AGAR PLATE METHOD

Potatoes were peeled and sliced into small pieces and boiled in the 1000 ml distilled water. After boiling the potato slices, dextrose and agar, each 20 g were added to the potato extract and the final volume was made up to 1000ml. It was boiled for 20 minutes and later this media was sterilized in the autoclave. After autoclaving the media, it was transferred to the petri plates as well as test tubes and slants were prepared for culturing the fungus.

CONTROL

There are number of methods for controlling the seed borne fungi. Seeds were treated with both chemical as well as herbal treatment.

In herbal treatment, seeds are treated with the garlic, turmeric, ginger and clove. Seeds are kept in the herbal paste for few hours as they have antioxidant and antifungal properties. Later, seeds are kept in petri plates having blotter paper and PDA, same technique was followed and kept under incubation for few days and result were seen.

Seed treated with the garlic, shows no fungus in both blotter and agar plate method, but seed treated with ginger shows white fungus

Seed treated with ginger show growth of one fungal species both in blotter method and agar plate method.

In chemical treatment, seeds were treated with the chemicals i.e. Thiram 75 WP and

carbendazim. Fungicides are used for the seed treatment and treatment can be used to improve the yield so that it can produce resistant varieties.

RESULTS AND DISCUSSIONS

Seeds treated with fungicides gives more accurate results, as chemical pesticides were used to control the disease in the plants whether the seeds are stored or in the field. For controlling the seed borne fungi, seeds were treated with different fungicides. Fungicides were given directly in powder form or in the form of foliar spray according to the presence of active ingredients per unit amount of water i.e. 10% or 45-50%. Seed treated with fungicides was considered as the safest method for controlling the mycoflora. Sprays of thiram, carbendazim and metalaxyl used in proper concentration shows good result in controlling the seed borne fungi. Herbal treatment given to seeds also shows active result in inhibiting the fungus growth.

CONCLUSION

From the study of mycoflora of *Pisumsativum* it was concluded that seeds cultured in the PDA media and blotter method shows variety of fungal species i.e. *Fusarium*, *Alternaria*, *Rhizopus*, *Aspergillus* etc. when kept incubated and later these fungus were cultured in the test tubes and were examined under the microscope for study. Fungi detected were given two types of treatment i.e. Herbal treatment as well as chemical treatment. In herbal treatment, seeds were treated with garlic, ginger, and turmeric paste. In chemical treatment, seeds were treated with fungicides i.e. Thiram, metalaxyl, carbendazim etc. in proper concentration. Most effective result comes from fungicides in chemical treatment and garlic shows good result in herbal treatment and the growth of fungus was controlled.

REFERENCES

- [1] SP.Seghal, A. L.Deshpande, V. S.Srivastava, "A new disease of coriander caused by *Colletotrichum capsici* (Syd.) Butler, Bisby from India. 1965.
- [2] S K.Maheshwari, P. C. Gupta, and, L. S. Suhag, "Management of powdery mildew of pea through fungicides" *Legume Res.* vol. ED-15 (1), pp. 51-52, 1992.
- [3] K. Kubiak and M.Korbas, "Occurrence of fungal diseases on selected winter wheat cultivars", *Postępy Ochrony Roslin*, vol. ED-39 (2), pp. 801-804, 1999.
- [4] W.A.J.M. Dawson, and G.L.Bateman, "Bateman. Fungal communities on roots of wheat and barley and effects of seed treatments containing fluquinconazole applied to control take-all". *Plant Pathology*, vol. ED-50, pp. 5-82. 2001.
- [5] R. B.Weber, B.Hrynczuk, Runowska Hrynczuk and B.Kita, "Influence of the mode of tillage on diseases of culm base in some winter wheat varieties, oats, and spring wheat", *J. Phytopathol.* vol. ED-149, pp.185-188, 2001.

- [6] Glawe, “Mycological production of citric acid in India. III effect of the different nitrogen compounds”, Sydowia, vol. ED- 26(1-6), pp.227-234,2008.
- [7] R.Lukman, A. Afifuddin, T. Lubberstedt, “Unraveling the genetic diversity of maize downy mildew in Indonesia”. J. Plant Pathol. Microb. vol. ED- 4 pp. 162, 2013.
- [8] UK.Sinha, M. L.Nagar, S. K. Chouhan, “Storage rotting microorganism and physiochemical studies of gram seeds”. J. India Bot. SOC., vol. ED- 58, pp. 94-97, 1979.
- [9] Maheshwari, R. K. Mathur, S. K. Mathur, “Effect of seed born fungi on seed viability and seedling vigour”. Indian Phytopath., vol. ED-37(4):713-714. Science-Business Media, LLC. 1984
- [10] R. Chaudhary, C. Aujla, S. S. Sharma, Indu, R. P. Singh, “Effect of black- point on germination and quality characters of WL-711”. Indian Phytopath., vol. ED-37(2), pp.351-353, 1984.
- [11] N. Nair, “Seed pathology of some important legume crops of Chhattisgarh” Ravishankar University, Raipur (M.P.), 1994.
- [12] R. Bindu, “Seed pathology of Coriander and groundnut with special reference to the nutritive value and biological control of insect pest in stored condition” Ph. D. thesis, Ravishankar University, Raipur (M. P.) 1997.