*IOSR Journal of Pharmacy and Biological Sciences (IOSR-JPBS)*
*e-ISSN:2278-3008, p-ISSN:2319-7676. Volume 13, Issue 1 Ver. II (Jan. – Feb. 2018), PP 01-04*
*www.iosrjournals.org*

# Phylloplane, Gemmiplane and Carpoplane Mycoflora of Capsicum annuum (Solanaceae) of Amravati region

Ishwarkar S.J.
*Department of Botany, Brijlal Biyani Science College, Amravati.*

***Abstract:*** *Phylloplane, Gemmiplane and Carpoplane mycoflora of Capsicum annuum was carried out from July 2014 Jan 2015 and pre and post harvest diseases of this fruit was recorded Aspergillus niger, Colletotrichum capsici, Curvularia lunata, Alternaria alternata and Fuarium oxysporum were isolated in pre harvest condition out of which Colletotrichum capsici, Alternaria alternata and Fusarium oxysporum, Curvularia lunata , Dhashlera rostrata and Cladosporium cladosporoides were isolated in post harvest condition.Alternaria alternata, Fusarium oxysporum, Colletotrichum capsici were recorded in both condition. Pathogen of phylloplane mycoflora found to be inoculum for stored condition, abundance, density and frequency of pathogen in different phages were recorded to observed disease résistance.Aspergillus niger and Fusarium oxysporum were present though out the crop season while Colletotrichum capsici and Alternaria alternata were present during early stages of infection i.e. Sept to Oct while Curvularia lunata, Aspergillus niger and Fusarium oxysporum appears on phylloplane at the end of seasons. Aspergillus niger, Fusarium oxysporum and Colletotrichum capsici were reported in gemmiplane while Aspergillus niger and Fusarium oxysporum were present in the carpoplane mycoflora through out the seasons. Biochemical changes under pathogenesis were also recorded.*

***Keywords****: Phylloplane, Gemmiplane,Carpoplane,Mycoflora,Capsicum annum*

---

Date of Submission: 28-12-2017 Date of acceptance: 13-01-2018

---

## I. Introduction

Diseases are form due to physiological disorders which may be nutritional imbalance or attack of pathogens. Edible fruits available in market shows most of the saprophytic and parasitic pathogens which may cause toxicity to human being. Various surveys on pathogen causing diseased to fruits and vegetable are carried out in India by Tondon and Singh 1976, Rai, 1981, Janardhan chary 1982, V.V. Rajan *et.al*. 1999 and they have investigated pre and post harvest diseases of vegetable and fruits.

The various mycological investigation about the fruit diseases concern to the diseases of fruits in field condition, but post- harvest diseases on these fruits are neglected. So in present investigation an attempt was made to study diseases of chilli plant in field as well as in stored condition. Survey of post- harvest diseases of Solanaceous vegetable have been studied in different countries including wzant and breatly (1948), Smith, *et.al*. (1964), Richarson and Booth (1970).

Pre and post harvest diseases of fruits and vegetable in vidarbha region carried out by Rao, V.G. (1964), Rao, V.G. (1965), Singh R.P. *et.al* (1988), Raut *et.al* (1989), Raut, *et.al* (1990), Pakl, H.N and J.G. Raut (1991), Patel, R.L and M.U. Vaishnav (1991), Dandge V.S. (1998).

Hence in present investigation the attempt has been made to study the pre and post harvest diseases of chilli (*Capsium annuum* L)

Chilli *(Capsium annuum* L) is important cash crop of vidarbha region of Maharashtra. This crop comes in fruiting from November- January and different varieties of chillies like NP-46A, $K_2$, Jwala-7, cluster chilli, Panshnagar, Bhivapur local, etc are commonly grown in this part out of which Nagkanya and tejashvinee varieties of chillies are selected for present investigation.

Present investigation mainly concern with collection, identification, proper systematization of saprophytic and parasitic organisms. Identification of fungal organism was made with the help of available literature and identified from cultures present in mycological laboratory of Brijlal Biyani Science College, Amravati. Pathogensity of fungus was conformed by Koch's Postulate Method.

## II. Materials and methods

Regular survey of Phylloplane, Gemmiplane and Carpoplane mycoflora of chilli was carried out from July 14 to January 2015 chilli growing natural habitat as well as from market were selected for this perpose. Chilli is commonly used for vegetable perpose and in preliminary survey it is observed that, the vegetables were

infected by some pathogenic forms. In order to known the causal organism investigation of pathogens was carried out in natural as well as stored condition.

The diseased leaves, buds and fruits were collected separately in polythene bag. Their symptoms were carefully noted completely rotten fruits were avoided for isolation as they contain secondary infections. Phylloplane, Gemmiplane and Carpoplane mycoflora was investigated by washing method. Healthy plant parts were also consider for this purpose washes were made by distilled water and were allow to grow on the medium. At the same time infected leaf, bud and fruits were artificially inoculated on culture medium and comparative account of saprophytic and parasitic flora was recorded. Slides were prepared by scrapping infected tissue of the fruits bodies. The disease tissue were surface sterilized by 90% of alcohol and transper aseptically to either PDA or Asthana and Howker's Medium "A". After 2 or 3 days mycellium coming out of disease tissue was pick up and transfer to another fresh slant. They were further purified by raising monosporic cultures with the help of dummy cutter objective (Keyworth, 1959) Morphological and cultural characters of the organisum were carefully observed and recorded.

A Gemmiplane, Phylloplane and Carpoplane mycoflora was carried out in petriplate and surface mycoflora was investigated. In this case these saprophytic mycoflora from disease as well as healthy plants parts were selected for comparative purpose. Pathogenesity test were carried out for parasitic forms by Koch's postulate method.

## III. Observation

Pre Harvest Diseases

1. *Curvularia lunata*: (Wakker) Proedijn.
2. *Colletotrichum capsici*: (H.syd.) Built and Bishy, Scott Fit.
3. *Alternaria alternata*: (fr) C. keissier.
4. *Fusarium oxysporum*: Schlecht ex fries.

Post Harvest Diseases

The disease appears as water soaked area on the pericarp and it gradually extend toward the central part, the colour of the spot was light brown which turns black due to production of conidia. Following fungi were isolated.

1. *Curvularia lunata* (Wakker) Proedijn.
2. *Drechslera rostrata* (Drechler) Richardson and Fraser.
3. *Cladosporium cladosporioides* (fr) devries.
4. *Fusarium oxysporum*: Schlecht ex fries.
5. *Colletotrichum capsici* (H.syd) Butl and bisby.
6. *Alternaria alternata* (fr) C. keissler.

**Phylloplane Mycoflora**

*Aspergillus niger* and *Fusarium oxysporum* were present through the crop seasons while *Colletotrichum capisici* and *Alternaria alternata* were present during early months of crop i.e. September and October. While *Curvularia lunata*, *Aspergillus niger* and *Fusarium oxysporum* appears at the end of season.

*Rhizopus* and *Aspergillus niger* were highest in their percentage of abundance while *Curvularia lunata* was the least. *Asprgillus niger* and *Fusarium oxysporum* were highest in their percentage of frequency followed by *Rhizopus stolonifer, Alternaria alternata, Curvularia lunata* and *Colletotrichum capsici.*

**Table 1:** Presence, percentage of abundance and frequency of fungi occurring on the leaves of *Capsicum annuum L.*

| Name of organisum | 2014 | | | | Abundance (%) | Frequency (%) |
|---|---|---|---|---|---|---|
| | Sept | Oct | Nov | Dec | | |
| *Curvularia lunata* | + | + | + | + | 2.1 | 29.2 |
| *Aspergillus niger* | + | + | + | + | 16.4 | 87.0 |
| *Fusarium oxysporum* | + | + | + | + | 11.6 | 69.0 |
| *Rhizopus stolonifer* | - | - | + | + | 20.0 | 57.0 |
| *Colletotrichum capsici* | + | + | - | + | 7.7 | 28.2 |
| *Alternaria alternata* | + | + | - | + | 7.0 | 44.0 |

**Gemmiplan Mycoflora:**

In chilli, *Aspergillus niger* and *Fusarium oxysporum* were present throughout the crop season. While *Curvularia lunata* and *Alternaria alternata* were present in early months of crop season i.e. September to October while *Rhizopus stolonifer* and *Colletotrichum capsici*,*Alternaria alternata* appear at the end of season.

*Curvularia lunata* and *Fusarium oxysporum* were highest in their percentage of abundance while *Alternaria alternata* was the least, *Curvularia lunata* and *Fusarium oxysporum* were highest in their percentage of frequency followed by*Alternaria alternata* and *Rhizopus stolenifer.* There were no co-relation between percentage of frequency and percentage of abundance. *Curvularia lunata* shows highest percentage of frequency while least percentage of abundance on gemmiplane mycoflora, same case is observed in *Aspergillus niger*, *Fusarium oxysporum* and *Rhizopus stolonifer.*

**Table 2:** Presence, percentage of abundance and frequency of fungi occurring on gemmiplane of *Capsicum annuum* L.

| Name of organisum | 2015 | | | | Abundance (%) | Frequency (%) |
|---|---|---|---|---|---|---|
| | Sept | Oct | Nov | Dec | | |
| *Curvularia lunata* | + | - | + | + | 17.6 | 79.2 |
| *Aspergillus niger* | + | + | + | + | 15.2 | 64.0 |
| *Fusarium oxysporum* | + | + | + | + | 24.4 | 75.0 |
| *Rhizopus stolonifer* | - | - | + | + | 14.0 | 42.2 |
| *Colletotrichum capsici* | - | + | + | + | 20.0 | 77.0 |
| *Alternaria alternata* | - | + | - | + | 1.5 | 19.0 |

**Carpoplane Mycoflora:**

*Aspergillus niger* and *Fusarium oxysporum* were present in the corpoplane of Chilli through the crop season while *Alternaria alternata* and *Curvularia lunata* were present during September to October 2014. While *Phoma exigua, Colletotrichum capsici* appears at the end of the plant.

*Fusarium oxysporum* and *Aspergillus niger* were highest in their percentage of abundance while *Phoma exigua* was the least. *Fusarium oxysporum* and *Aspergillus niger* were highest in their percentage of frequency. There was no co-relation between percentage of abundance and frequency, *Fusarium oxysporum* shows highest percentage of frequency while lowest percentage of abundance on carpoplane mycoflora. Same is observed in case of *Aspergillus niger* and *Alternaria alternata*.

**Table 3:** Presence, percentage of abundance and frequency of fungi occurring on Carpoplane of Capsicum annuum L.

| Name of organisum | 2014-15 | | | | Abundance (%) | Frequency (%) |
|---|---|---|---|---|---|---|
| | Sept | Oct | Nov | Dec | | |
| *Aspergillus niger* | + | + | + | + | 14.8 | 70.0 |
| *Fusarium oxysporum* | + | + | + | + | 18.0 | 94.0 |
| *Alternaria alternata* | + | - | + | + | 8.0 | 64.0 |
| *Curvularia lunata* | - | + | - | + | 3.2 | 5.7 |
| *Colletotrichum capsici* | - | + | + | + | 11.0 | 24.2 |
| *Phoma exigua* | - | + | + | + | 1.4 | 2.4 |

## IV. Conclusion

In phylloplane mycoflora there was no co-relation between abundance and density of pathogen in both the years. Appearance of fungi remain same, but abundance and density varies in next year. *Curvularia lunata* which was showing moderate frequency in 2014 became dominant in 2015. Dixit and Gupta 1981, Moghe *et al*, 1983 and Raut *et al*, 1989 observed same type of co-relation in *Colletotrichum capsici.*

In gemmiplane mycoflora *Alternaria alternata* which was showing moderate frequency in 2014 become dominant in 2015 and in carpoplane mycoflora *Phoma exigua* which was moderate in 2014 became dominant in 2015.

It can be concluded from present investigation that leaf may acts as one of the sources of inoculum for fruit rot diseases in pre and post harvest stage, so fungi present in phylloplane and carpoplane may act as inoculums for post harvest stages. Several worker including Sinha (1971) reported saprophytic existence of fungi before they become parasitic on the host. The fungi which are associated with the plant in field may come in contact with fruits, remain inactive during harvest and transport but become active in storage condition and causes the diseases. Prasad and Bilgrami (1973) reported that phyllopshere of litchi contributed in causing fruit rot in post harvest stages.

In present investigation *Colletotrichum capsci, Curvularia lunata and Fusarium oxysporum* found on leaf of chilli remains continuous on fruit.

## Acknowledgement

Authors are very much thankful to Dr .S .B. Lohiya, Principal, Brijlal Biyani Science College, Amravati for giving permission to research work in college laboratory. Thanks are also to Dr. A.U.Pachkhede, Head Department of Botany for necessary help during the present work.

## References

**[1].** Prasad, S.S. and R.S. Bilgrami 1973, pectic and cellulotytic enzymes in litchi fruits infected with five species of Aspergillus. Proc. Nat. Acad. Sci. India. 43 (B) 255-264
[2]. Dixit R.B. and S.p. Gupta 1981: Seasonal variation in the Phyllosphere Microflora of two Cultivars of Barley. Ind Jour of Myco. P1. Pathol 11: 173-177.
[3]. Gupta J.S. S.P. Agrawal and S.K. Sharma 1982. Role of surface microorganisum of chilli In relation of Pathogen. Alternaria solani. Indian phytopathol 33 (1) : 111-112.
[4]. Moghe, P.G., N.N. Khune, J.G. Raut and P.D. Wangikar 1983 Phytopthora leaf blight Chilli in vidarbha. Indian Phytopath 36-371.
[5]. Rao V.G. 1964 a new fruit spot of chilli from india plant DisReper 18 : 733-734.
[6]. Rao V.G. 1967 A new disease of capsicum annuum (L) phytopath 58 : 277-280.
[7]. Raut V.G. and K.B. Gahulkar, Deshmuh R.N. Fungi causing fruit rot of Chilli in Vidarbha P.K.V. Res. J. Vol. 13 (1) 1989.
[8]. Sinha S. 1971. The mycoflora of leaves of capsicum annuum (L) watt E.D. Solanum melogen (L), Solanum tuberosum L and Lycopersicon esculentus will. In ecology of leaf surface micro organisum P 175-169.

IOSR Journal of Pharmacy and Biological Sciences (IOSR-JPBS) is UGC approved Journal with Sl. No. 5012, Journal no. 49063.

Ishwarkar S.J."Phylloplane, Gemmiplane and Carpoplane Mycoflora of Capsicum annuum (Solanaceae) of Amravati region ." IOSR Journal of Pharmacy and Biological Sciences (IOSR-JPBS) 13.1 (2018): 01-04.